The Study of Digital Device Use and the Implementation of Electronic Hotel Solutions: Findings from a Survey

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This study investigates travelers' digital device use and their expectations for electronic solutions in hotels. Online surveys were completed by 340 participants to examine their digital habits, preferences, and perceptions of hospitality digital services. Mobile phones dominate daily life, and over 94% of respondents consider Wi-Fi essential. Key findings reveal that participants value cashless payments, in-room entertainment, and contactless check-in/out, while expressing concerns about data security. Many appreciate hotel digitalisation but point out issues like unreliable Wi-Fi and limited online service options. The findings emphasise the necessity of reliable connectivity and user-centric digital solutions for enhancing guest satisfaction. These insights inform hoteliers to optimise their offerings, ultimately advancing efficient, and secure hospitality experiences.

Keywords: digital, ICT, hotel, traveller's experience

1. Introduction

The pervasive digitalization of daily life has fundamentally reshaped consumer behaviour across various industries, with the hospitality sector being no exception (Buhalis−Moldavska 2021, Amirulloh Anwar et al. 2024). As travellers increasingly integrate digital solutions into their routines, their expectations for seamless, convenient, and personalized experiences extend directly to accommodation services (Nadkarni et al. 2019). This evolving landscape necessitates a deep understanding of travelers' needs concerning digital solutions in accommodations, moving beyond simply offering technology to strategically integrating it to enhance the overall guest journey and foster satisfaction (Kim−Han 2022).

The importance of examining these needs is underscored by several converging trends. Firstly, the experience economy increasingly dictates travel choices, where lodging is no longer merely a place to stay but an integral part of the travel experience itself, demanding digital integration for enhanced engagement (Amirulloh Anwar et al. 2024). Secondly, digital transformation presents substantial opportunities for hospitality businesses to enhance operational efficiency, minimise expenses, and provide exceptional customer service via automation, personalisation, and data analytics (Ivanov 2019). Finally, the accelerated adoption of contactless technologies spurred by recent global events has further cemented digital solutions as critical for guest safety and comfort (Shin−Kang 2020). Neglecting these evolving expectations risks competitive disadvantage and diminished guest loyalty (Kim−Han 2022).

Crucially, the effectiveness and acceptance of digital solutions in accommodations are not solely dependent on their availability but are profoundly influenced by travelers' existing digital skills and prior experiences with digital tools. Travelers' digital literacy impacts their perceived ease of use, their engagement with digital services, and ultimately their overall satisfaction and loyalty (Kim−Han 2022). For

instance, comfort with mobile applications, online booking platforms, and digital communication channels in daily life directly translates into expectations for similar functionalities within accommodation settings (Mondok 2025). Conversely, a lack of digital proficiency can create a "digital divide", leading to a sense of deprivation or vulnerability when confronted with technologically advanced environments (Buhalis–Moldavska 2021). Therefore, understanding the interplay between travelers' established digital habits and their desires for digital accommodation services is paramount for developing effective strategies that truly meet diverse guest needs and optimize the digital guest experience.

The widespread adoption of IT solutions has led to a substantial increase in tourism studies on this subject published across various countries globally. The studies encompass both supply and demand aspects; however, the predominant emphasis is on travellers' utilisation of digital devices, their expectations, and shifts in consumer behaviour. As generational theories gain prominence in management sciences, cohort-based studies have similarly proliferated. The research methodology typically involves the use of questionnaires, which may adhere to established procedures, such as the Kano model, or be developed by the authors in accordance with the research questions. The results obtained are generally applicable to a specific group of travellers or target area, or their utility may be constrained by alterations in consumer behaviour since the research was conducted. Research undertaken in Hungary or pertaining to Hungarian contexts examines the utilisation of digital marketing tools by travellers, the application of AI in hotel services, the correlation between sustainability and digital solutions, or alterations in consumer behaviour during travel induced by COVID. The literature study indicates that no studies have both investigated the use of digital tools and hotel services from the traveler's viewpoint.

Consequently, this paper aims to investigate the extent of travelers' existing digital tool usage and how these skills and experiences shape their specific requirements and preferences for digital solutions within accommodation services. The four research questions are outlined in the materials and methods section following the introduction. The next chapter presents the findings from the primary questionnaire research, detailing the sociodemographic characteristics of the sample and the responses to each of the questions from the two main research sections. The article concludes with a summary and recommendations following the conclusion of the research questions.

2. Material and Method

This primary research aimed to evaluate the prevalence of digital tools and methods utilised by respondents, specifically their digital consumption habits in accommodation and other tourism services. The research investigated the following questions concerning the content presented in this article:

Q.1. To what extent do respondents utilise digital solutions in their daily lives, specifically regarding their experience as digital consumers?
Q.2. Which services do respondents most seek in a digital manner in accommodation providers?

Q.3. What experiences have respondents had with digital accommodation services in relation to their past travels?

Q.4. What is the impact of digital device usage on expectations for digital solutions in accommodation?

A questionnaire method was employed to investigate the research questions, with the instrument being refined and enhanced following a pilot survey. The author compiled the questions in accordance with the research questions, considering the aspects of effective processability and diversity. Driven by the feedback from thirty-five respondents during the trial survey, the questions that were ambiguous or inadequately addressed the perceived characteristics of travellers were revised. The primary objective in developing the measurement tool was to ensure that the questions were easily interpretable for individuals unfamiliar with infocommunication tools, while also engaging those with advanced ICT knowledge who utilise various technologies in their daily activities and travels.

The respondents completed the online questionnaire during two data collection periods: from 4 November 2024 to 2 December 2024, and from 3 February 2025, to 28 February 2025. Each period allowed one month for questionnaire completion. This was due not only to the goal of increasing the number of responses but also to the research process's potential integration into the university course material for both the fall and spring semesters. The questionnaire in Hungarian language was administered via the Google Forms platform, as it offers better user experience compared to alternative platforms. The questionnaire link was disseminated on Facebook and Instagram, with paid advertising enhancing visibility on the former platform and made it accessible to a broader audience of Hungarian social media users. The research focusses on examining digital tools and methods from the consumer perspective. While the sampling method aligns with the topic, it is important to note a limitation: the sample cannot be deemed representative due to the use of convenience sampling.

During the specified timeframe, 340 participants completed the questionnaire. The method of inquiry mandated that all questions be answered, resulting in fully completed questionnaires that were straightforward to process and appropriate for data analysis. I utilised Microsoft Excel for coding and data processing. The data collected during the trial survey were excluded from the analysis because the modification of the questionnaire resulted in inconsistent answer options across questions.

The updated version of the questionnaire applied in the study comprised four groups of professional questions and one group of socio-demographic questions. The first set of questions addressed the respondent's general consumer habits related to digital solutions. The second set focused on the respondent's expectations for digital solutions in travel arrangements or accommodation booking.The third set investigated the respondent's expectations for digital solutions within the accommodation itself. Finally, the fourth set examined the respondent's expectations for digital solutions at the tourist destination or with other tourism service providers.

The questionnaire comprised five questions per section, resulting in a total of 25 questions for respondents to answer. The questionnaire comprised multiple choice

questions, six-point Likert-scale questions, closed, semi-open and open questions, with mandatory responses required for all items, including options for 'other' and 'don't know/no answer'.

For the analysis of the obtained data set, I employed frequency distributions, analysis of variance, mean, mode, and median in the univariate analyses, while utilising only cross-tabulations in the multivariate analyses. The extensive nature of the database necessitates that multivariate analyses will constitute a subsequent phase of the research.

This article will analyse responses regarding daily ICT technology use and experinces and expectations towards hotel digital services, alongside sociodemographic attributes.

3. Discussion of Survey Results

3.1. Sociodemographic Attributes of the Sample

In the sample of 340 participants who completed the questionnaire, women were significantly over-represented, comprising 71% of the responses. This characteristic has been documented in multiple research methods articles (Guijt 2001, Slauson-Blevins–Johnson 2016, Minhas–Oksol 2019), attributed to women's greater propensity to engage and collaborate, with their keen interest. Alongside the 94 male responses, 5 individuals opted not to answer with their gender (Table 1).

Table 1. Sample composition by gender

Gender	Number of respondents	Distribution
Male	94	27.6%
Female	241	70.9%
Does not wish to specify	5	1.5%
Total	340	100%

Source: self-editing according to the research findings

The age distribution of respondents, caused by convenience sampling, does not align with the age structure of Hungarian society. Two predominant groups are identified: individuals aged 18–25 (38.8%), who are heavy social media users, and those aged 36–55 (27.4%), who represent the parental demographic. The representation of individuals under 18 and over 65 in the sample is minimal, at 3.2% and 2.9%, respectively (Table 2). In the two preceding age groups, there is only one male respondent, while the remainder are female. The proportions of men in the 18–25 and 26–35 age groups are 47.7% and 53.3%, respectively.

Table 2. Sample composition by age

Age group	Number of respondents	Distribution
< 18 years	11	3.2%
18–25 years	132	38.8%
26–35 years	65	19.1%
36–55 years	93	27.4%
56–65 years	29	8.5%
> 65 years	10	2.9%
Total	340	100%

Source: self-editing according to the research findings

The sample distribution by type of residence indicates that those living in cities constitute the largest group of respondents at 35.3%, closely followed by residents of the county seat, also at 35.3%. The questionnaire failed to reach a significant number of capital residents, whereas the village population is precisely half that of the county seat, totalling 60 individuals (Table 3). Among the sample, 44.6% of individuals aged 26–35 reside in the city, whereas 47.3% of those aged 36–55 inhabit the county seat. Fifty percent of respondents from the villages are within the 18–25 age range.

Table 3. Sample composition by settlement type of residence

Settlement type of residence	Number of respondents	Distribution
Capital city	34	10.0%
County seat	120	35.3%
Town	126	37.1%
Village	60	17.6%
Total	340	100%

Source: self-editing according to the research findings

The respondents' highest level of schooling reveals that 54.1% possess a secondary vocational school or high school diploma, while 36.8% hold higher education degrees. The two groups of respondents collectively represent nearly 90% of the total, indicating a substantial over-representation relative to individuals with lower educational qualifications (Table 4). In the capital, 55.9% of respondents possess a higher education degree. City residents exhibit the highest rate of professional qualifications acquired through vocational training, at 60.9%. 45.6% of individuals with higher education degrees fall within the age range of 36 to 55. Additionally, 60% of individuals aged over 65 possess either a secondary vocational school diploma or a high school diploma.

Table 4. Sample composition by highest educational qualification

Highest educational qualification	Number of respondents	Distribution
Less than 8 or 8 primary school years	8	2.4%
Occupation acquired through vocational training	23	6.8%
Vocational high school or high school graduation certificate	184	54.1%
Higher education degree	125	36.8%
Total	340	100%

Source: self-editing according to the research findings

To evaluate the income status, considering the sensitivity of the topic, I requested the respondent's evaluation of their standard of living rather than soliciting specific income data. Fifty percent of the respondents are financially independent or, if not currently earning, rely on parental income, which they can save. Adequate standards of living are maintained for 37.6% of respondents; however, they can no longer save. Meanwhile, 10.9% report increased difficulty in managing their available income. Only four respondents reported that their livelihoods are not secure and that they are experiencing financial difficulties (Table 5). 57.3% of individuals possessing a secondary vocational or high school diploma reside in optimal financial circumstances. The response option "I/we just make a living from my income" is indicative of 63.2% of individuals holding secondary vocational or upper secondary school leaving certificates. Similarly, the statement "I/we do not make a living from my income, I/we struggle with financial difficulties" is also representative of those possessing only secondary school leaving certificates within the sample. While 49.5% of individuals in the 36–55 age demographic report a satisfactory quality of life, they are unable to save financially. Among the 18–25 age group, 60.6% who do not primarily rely on their own income perceive themselves as living well and capable of saving. Conversely, all responses indicating financial struggles were also sourced from this demographic.

Table 5. Sample composition by financial status

Financial status	Number of respondents	Distribution
I/we maintain a comfortable standard of living on the income and can also allocate funds for savings.	171	50.3%
I/we maintain a comfortable lifestyle on my income, however I am unable to save it.	128	37.6%
I/we just make a living from my income.	37	10.9%
I/we do not make a living from my income, I/we struggle with financial difficulties.	4	1.2%
Összesen:	340	100%

Source: self-editing according to the research findings

3.2. General Consumer Habits of Respondents Concerning Digital Solutions

3.2.1. The Utilisation of Digital Devices in Daily Life

The examination of respondents' digital device usage is essential for addressing the first and fourth research questions. Participants rated their frequency of use of the specified digital devices on a six-point Likert scale, ranging from never to several times a day. The smartwatch is the least utilised device among respondents, with a median usage frequency of one, indicating "I never use it". Laptop and tablet devices are increasingly displacing personal computers, paralleling the trend of respondents primarily utilising mobile phones for data traffic. Mobile phones with data traffic are utilised multiple times daily, with an average frequency of 5.7. The median for this device usage aligns with this response option (Table 6).

Table 6. Statistical attributes of responses regarding respondents' utilisation of digital devices

Frequencies	Mobile phone with data traffic	Mobile phone without data traffic	Laptop/tablet	Personal computer	Smart watch
Mean	5.7	3.5	4.6	3.3	2.7
St. deviation	0.5	0	0	0	0
Minimum	1	1	1	1	1
Maximum	6	6	6	6	6
Mode	6	6	6	1	1
Median	6	3	5	3	1

Source: self-editing according to the research findings

The 18–25 age group exhibits the highest frequency of mobile phone usage with data traffic at 83.6%, followed by residents of the capital at 72.9%. Respondents aged 36-55 demonstrate the highest usage rates for personal computers and mobile phones without data traffic, at 57.3% and 62.1%, respectively. Individuals with higher education utilise personal computers at the highest rate, 56.6%, most likely in professional settings. Individuals facing livelihood challenges do not use smartwatches.

3.2.2. Examining Attitudes Towards Digital Solutions

The second question included statements pertaining to digital experience and behaviour, assessed using a six-point Likert scale (1: I completely disagree, 6: I completely agree). Some statements included were contradictory, serving verification purposes (Table 7).

The initial statement, "I feel lost without the Internet", exhibits a high standard deviation and an average response of "somewhat agree". Although mobile phones are utilised multiple times daily with significant data traffic, the respondent value is lower than anticipated.

The mean agreement with the statement "I handle my daily routine tasks with the help of digital solutions." is 4.5, while the median is five; however, the standard deviation is comparably high as that of the initial statement.

The statement "I only use digital solutions during my work or studies, I try to avoid them in other areas." exhibits the highest divisiveness, as indicated by a standard deviation of 2.5, and is marked by the lowest average agreement value of 2.8. This aligns with the findings that mobile phones with data traffic are commonly utilised by respondents, with only a minority avoiding frequent use or opting for alternative devices.

The average value obtained was 4.8 for the statement "I feel proficient in using digital solutions". The lowest standard deviation and a median of 5 indicate that respondents possess sufficient digital practice and experience to support tasks essential for daily life using digital solutions. The proficiency is evidenced by the statement that respondents express the highest average agreement (5.3) with the assertion that "Digital solutions make my life significantly easier"; the median of the statement is "I completely agree", and the standard deviation is moderate.

The sixth statement, pointing to that "Due to the lack of sufficient foreign language knowledge, I feel vulnerable when using digital devices", received an average value of 3 and exhibited a moderately high standard deviation, suggesting that respondents slightly disagree with it. The mode of this statement is 4, indicating a tendency to agree, as this response was the most frequently provided by respondents, representing the peak of the frequency distribution. The absence of foreign language proficiency should be considered a limiting factor in the effective use of digital devices among the sample group.

In terms of data security, the mean response to the statement "I consider the use of the Internet to be safe from a data protection perspective" is 3.2, with both the mode and median at 3. This indicates that, on average, participants in the study exhibit a slight disagreement with the statement. The issue of data security serves as a deterrent concerning digital solutions.

The eighth statement contradicts the third, as it asserts that digital solutions have transformed one's life by replacing offline solutions with online alternatives. The statement received a mean score of 4.5, accompanied by a high standard deviation. However, both the mode and median are 5, indicating a significant proportion of respondents selected the "I tend to agree" option.

Table 7. Respondents' attitudes towards the use of digital solutions

Frequencies	Feeling lost	Routine tasks	Only for work or study	ICT skills	Makes life easier	Foreigh lang.	Data security	Trans-formed life
Mean	4.0	4.5	2.8	4.8	5.3	3.0	3.2	4.5
St. deviation	2	2	2.5	0.5	1	1.5	1	2
Minimum	1	1	1	1	1	1	1	1
Maximum	6	6	6	6	6	6	6	6
Mode	5	6	2	5	6	4	3	5
Median	4	5	2	5	6	3	3	5

Source: self-editing according to the research findings

In the analysis of socio-demographic factors, individuals aged 18–25 exhibit a strong consensus regarding their feelings of disorientation without internet access, with an average rating of 5.7. Conversely, those aged 26–35 report the highest average of 5.3 in relation to the execution of daily routine tasks. Older individuals exhibit the lowest

proficiency in utilising digital devices, with an average rating of 2.5, and similarly demonstrate a deficiency in language skills, reflected in an average score of 5.1. Data security concerns are more pronounced among individuals with higher incomes (mean: 4.7) and males (mean: 4.1). The age group of 36–55 years exhibits the highest agreement rate concerning a transformed life, with an average score of 5.4.

3.2.3. Typical Activities Involving the Utilisation of Digital Solutions

Respondents were queried regarding the activities in which they utilise digital solutions in a multiple-valued question format, allowing for unlimited choices. All 186 respondents indicated that digital solutions are present across all aspects of life. Among the 330 respondents, maintaining contact, facilitating communication, and acquiring knowledge and assistance were noted as significant factors. All respondents selected one of the two answer options (Table 8). The frequency of buying and ordering products or services is comparable to that of working and studying, with 297 and 303 mentions, respectively. The handling of official matters and entertainment is represented in a comparable manner, with 268 and 252 mentions, respectively, indicating a less typical occurrence relative to other categories.

Other response options involve structuring daily tasks for three respondents and seeking recipes for one respondent; however, this does not constitute a distinct category from the "obtaining information and orientation" response option.

Table 8. Common activities involving the application of digital solutions in the sample

Activities	Number of responses
Purchase or order of products or services	297
Keeping contact, communication	330
Working and/or studying	303
Obtaining information and/or assisstance	330
Entertainment	252
Managing official matters	268

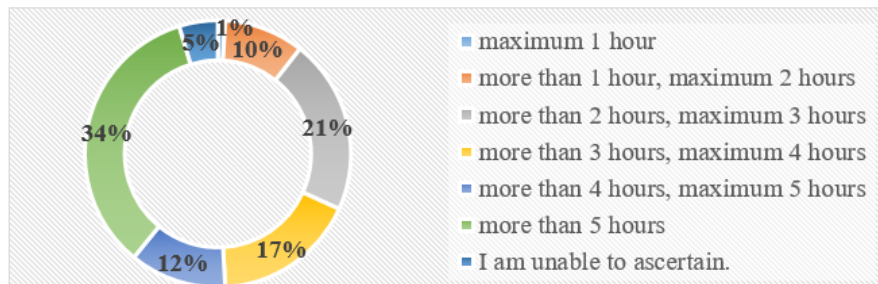*Source:* self-editing according to the research findings

The response to "managing official matters" is notably prevalent within the 26–35 age demographic, accounting for 48% of responses, and among participants from the capital, representing 51% of responses. The objective of "entertainment" is evident in 84% of the responses from participants aged 18–25. No differences are evident regarding the socio-demographic characteristics associated with the activity of purchasing or ordering products or services; this activity is uniformly distributed across the various strata of the examined sample.

3.2.4. The Mean Daily Duration of Internet Usage

The prior significant utilisation of digital devices is evident in the responses to this question, with 34% of the sample reporting more than 5 hours of daily online activity.

21% utilise the World Wide Web for a minimum of two hours. 94.4% of the respondents utilise the internet for a minimum of one hour (Figure 1).

Figure 1. Average daily time spent using the internet

Source: self-editing according to the research findings

The 18–25 age group exhibits a significant tendency towards extensive daily internet usage, contributing 72% of responses, whereas individuals over 65 demonstrate the least internet use, accounting for 82% of responses. Only individuals under 18 and those aged 18–25 are unable to assess their usage of the World Wide Web. Residents of the capital engage in internet usage for 4–5 hours more frequently than individuals residing in other locations. Additionally, men constitute a larger proportion of those who utilise the internet for over 5 hours compared to women.

3.2.5. The Usual Daily Usage Patterns of the Internet

Forty-two respondents utilise the Internet throughout the day, while seventeen individuals access it solely during the morning and afternoon, corresponding to working hours. Fifty-four respondents utilise the Internet during the afternoon and evening, whereas three individuals primarily access it in the evening and at night. The evening period was noted with the highest frequency (284 marks), while the afternoon also emerged as a favoured time for Internet usage (240 marks). A total of 65 responses were recorded for the night period (Table 9). Respondents were permitted to select multiple answer options for this question.

Table 9. Common intervals of internet usage

Common intervals of internet usage	Number of responses
in the time period of 6–9 am	143
in the time period of 9–12 pm	166
in the time period of 12–6 pm	240
in the time period of 6–10 pm	284
during night	65

Source: self-editing according to the research findings

Nighttime internet usage is prevalent among individuals under 18 and those aged 18–25, comprising 79% of total responses. Individuals aged 65 and older primarily utilise

the internet during the morning and afternoon, with no significant usage observed during nighttime hours. No significant difference exists in the response patterns based on place of residence or income category.

3.2.6. Assessment of Q1

The data indicates a high degree of integration of digital solutions into the respondents' daily lives. They are active digital consumers who rely on the internet and digital devices for communication, information, commerce, work, and entertainment. While concerns about data security and language barriers exist, the overall sentiment is that digital solutions make life easier and are essential for daily routines.

The average consumers in the sample are someone who deeply integrates digital solutions into nearly every facet of their daily life, viewing them as essential tools for efficiency and convenience rather than mere luxuries. They are highly proficient with technology and rely heavily on their mobile phone for constant connectivity.

While digital usage is widespread, the average persona leans younger, likely between 26 and 35 years old, given their high engagement with daily routine tasks via digital solutions (average of 5.3 agreement). However, significant digital immersion is also seen in the 18–25 age group (highest mobile phone usage at 83.6%, 72% contribute to over 5 hours of daily internet use, and 84% use digital solutions for entertainment). Likely to have higher education, as individuals with higher education utilise personal computers at the highest rate (56.6%), most likely in professional settings. More likely to be a resident of the capital, as they demonstrate higher mobile phone usage (72.9%) and engage in internet usage for 4–5 hours more frequently than those in other locations.

Their primary digital device is their mobile phone with data traffic, which they use multiple times daily (average frequency of 5.7; median of 5). They feel "lost without the internet", highlighting their dependence on mobile connectivity. They are increasingly using laptops and tablets, displacing traditional personal computers for data traffic. Smartwatches are rarely, if ever, used. They likely use personal computers for specific tasks, often professionally.

They feel confident in their digital skills, with an average agreement of 4.8 that they "feel proficient in using digital solutions" (median of 5). They strongly believe that "Digital solutions make my life significantly easier", with the highest average agreement. They frequently "handle my daily routine tasks with the help of digital solutions" (mean agreement of 4.5, median of 5). They do not restrict digital solutions to only work or study; their usage permeates other areas of life (lowest average agreement of 2.8 with avoiding digital solutions outside work/studies). They agree that digital solutions have significantly transformed their lives by replacing offline alternatives (mean of 4.5, mode/median of 5). They have reservations about internet safety from a data protection perspective, showing a slight disagreement (mean of 3.2, mode/median of 3). While aware of a potential vulnerability due to lack of foreign language knowledge (average of 3, mode of 4), it is not a major deterrent for most.

Digital solutions are crucial for maintaining contact, facilitating communication, and acquiring knowledge and assistance. All 186 respondents indicated digital solutions are present across all aspects of life, with communication and knowledge acquisition being highly significant. Buying and ordering products or services is a very frequent activity,

comparable to working and studying (297 mentions for purchasing vs. 303 for work/study). This activity is uniformly distributed across all demographics. They use digital solutions for work, studies, and managing official matters (268 mentions). They also utilize digital solutions for entertainment (252 mentions), especially if they are in the 18-25 age group (84% of their responses). They spend a significant amount of time online. A substantial 34% of respondents report using the internet for more than 5 hours daily, and 94.4% use it for at least one hour. They are likely to be online throughout the day, or at least during multiple periods. The evening (284 marks) and afternoon (240 marks) are the most favored times for internet usage.

In essence, the average user's persona is a digitally native or highly adapted individual who sees digital solutions as an indispensable part of their personal and professional life, leveraging them for convenience, efficiency, and connection, even while acknowledging some inherent risks.

3.3. Expectations of Respondents Concerning Digital Solutions in Accommodations

3.3.1. Digital Services and Tools Are Considered Essential in Accommodations

The initial question aimed to identify the digital services deemed essential by respondents in accommodation, selected from a list of ten items, allowing for multiple responses. Among the 340 participants in the study, 321 deemed wireless internet service essential for accommodation (Table 10). The provision of cashless payment options ranked as the second most significant service, receiving 217 mentions, with 62 respondents identifying only these two aspects as essential. The third significant service element is the availability of a smart TV, noted 133 times, followed by a digital concierge, referenced 102 times. This service provides guests with information regarding hotel or local programs. Comparable rates were observed; however, only 20–25% of respondents reported the availability of contactless check-in and check-out, room service and service booking via the app, digital control of guest room features (lighting, temperature), or electronic door access. Respondents perceive the inclusion of guest room entertainment systems, such as game consoles, as largely unnecessary, despite their promotion as a distinguishing feature in many Hungarian hotels. The presence of robot waiters is deemed non-essential by respondents, with only five individuals considering their importance in the accommodation context. Nine respondents indicated that all services were utilised except for the robot waiter.

Table 10. Digital services and tools are considered essential in accommodations

Digital services and tools	Number of responses
Wi-fi service	321
Cash-free (digital) payment options	217
Smart / interactive TV	133
Digital concierge (e.g., local program recommendations, restaurant suggestions)	102
Digital access control system, electronic door opening	84
Room lighting and temperature control via smart device (phone/tablet)	72
Room service and service booking (e.g., massage) available via app	68

Digital services and tools	Number of responses
Contactless check-in and check-out	65
Guest room entertainment systems (e.g., game console)	27
Robot waiter	5

Source: self-editing according to the research findings

Respondents aged 26–35 prioritised contactless check-in and check-out more than those in other age groups. Individuals in higher income brackets more commonly reference cashless payment options, whereas the expectation for in-room entertainment systems is significantly greater among men compared to women (74% to 26%). Only respondents aged 18–25 mentioned the expectation of robot waiters.

3.3.2. Perception of Mobile Phone-accessible Services in Accommodations

Digital services encompass offerings delivered through mobile devices, including mobile-optimized websites and hotel applications. The second question in the set of enquiries examined the perceived usefulness of the provided digital services by respondents during their accommodation stay. One response endpoint of the question, measured on a six-point Likert scale, is "not very useful" (value 1), while the other is "highly useful" (value 6). The online payment function is regarded as highly useful, with an average score of 5.2, while both the mode and median are 6. This function is further enhanced by features such as the ability to view the room bill, access hotel information and opening hours, and receive recommendations for local programs and events, which are categorised as digital concierge services (see Table 11). The front desk staff's chat function has an average rating of 4.5, suggesting it is perceived as moderately useful. In contrast, ordering room service or other services has an average rating below four, yet it still falls within the useful range of the measurement scale, despite exhibiting the highest standard deviation. The previously significant concierge service of wake-up calls has become redundant, as the hotel's digital devices now facilitate this function with ease. The service is generally assessed as "somewhat not useful", with a modal response of 1. Additionally, filtering is identified as the most prominent function to be evaluated in this context.

Table 11. Perception of mobile phone-accessed services in accommodations

Mobile phone-accessed services	Aver.	St. dev.	Min.	Max.	Mode	Med.
Ordering room service or other services	3.9	1.6	1.0	6.0	5.0	4.0
Examining hotel service descriptions and operating hours	5.0	1.2	1.0	6.0	6.0	5.0
Recommendation of local programmes and events	5.0	1.1	1.0	6.0	5.0	5.0
Access reception or concierge via chat	4.5	1.3	1.0	6.0	4.0	5.0
Online payment for services used	5.2	1.1	1.0	6.0	6.0	6.0
Possibility to view the balance of room account	5.1	1.2	1.0	6.0	6.0	5.0
Wake-up service	3.2	1.7	1.0	6.0	1.0	4.0

Source: self-editing according to the research findings

The mean frequency of wake-up calls is markedly elevated in the 55−65 and over 65 age categories (4.9 and 5.1) compared to other respondents. Men prioritise contacting the receptionist via chat more than women, with average scores of 5.1 and 4.2, respectively. Respondents from higher income backgrounds exhibit a greater tendency to order room service or other services, with an average rating of 4.3.

3.3.3. Perceived Advantages of Digital Solutions in Accommodation

The sample indicated that digital solutions in accommodation were recognised as beneficial for specific functions. However, it was deemed essential to investigate the perceived advantages of these solutions relative to non-digital alternatives. Of the 340 respondents, 92.6% indicated that time savings are the primary advantage of utilising digital solutions over traditional methods. This is followed by the benefit of guests having control over their own matters, which was mentioned by 215 respondents (Table 12). Environmental protection is prominently featured in discussions of paperless administration, with 200 mentions. In contrast, the benefit of having "more options than would be available in a traditional or personal form" accounts for nearly half the significance, with 116 mentions, while the avoidance of personal interaction is noted 67 times. Only five individuals regarded the avoidance of personal interaction and their own control as significant, indicating a strong openness to the staff-free hotel operation model. Twenty-two individuals deemed it essential to specify all the reasons provided. Alternative response options were not provided.

Table 12. Perceived advantages of digital solutions in accommodation

Advantages of digital solutions	Number of responses
Time saving (no need to stand in a queue)	315
Environmental protection (paperless administration)	200
Avoiding personal interaction	67
More alternatives than would be available in a traditional or in-person context	116
The assurance of autonomy and the ability to manage tasks independently.	215

Source: self-editing according to the research findings

The environmental aspect is more significant in the 26−35 age group compared to other respondent groups. The perception of greater opportunities compared to in-person options was predominantly expressed by individuals with higher incomes, accounting for 78.2% of all nominations from this demographic. Men, particularly those aged 26−35, place significant importance on peace of mind and control.

3.3.4. Digital Solutions Are Absent from the Used Accommodations

Following an overview of digital services and functions, I posed an open-ended question to the respondents, requesting them to articulate in text the digital solutions

they felt were lacking in the accommodations they had utilised thus far. The analysis of the open-ended question involved distilling responses into keywords and categorising them based on content. The primary issue identified was the lack of well-functioning or free Wi-Fi, noted 34 times (Table 13). Online room service and service ordering were mentioned in 18 responses, with a comparable proportion reflecting the absence of electronic information and the availability of contactless online check-in and check-out. Only 10 respondents indicated a desire for the ability to digitally regulate the temperature or lighting intensity in the guest room. Additionally, the absence of a dedicated hotel application and electronic payment options were noted with the same frequency. Fewer than 3% of the sample indicated the absence of a variety of TV channels, paperless administration (including confirmation and billing), the option to view the bill, and electronic door access. Two individuals said that the presence of digital services was not significant to them, resulting in no sense of loss.

One hundred eighty respondents reported no instances in which a requested digital service was unavailable at their accommodation. Thus, 52.9% of the sample report positive experiences regarding the level of digitalisation in the accommodation, aligning with their expectations.

Table 13. Digital solutions are absent from the used accommodations

Digital solutions are absent	Number of responses
Respondents did not encounter a deficiency of digital services	180
Wi-fi (effective and complimentary)	34
Room service, online ordering	18
Digital provision of program recommendations and hotel information	17
Online check-in, check-out	16
Accessibility of reception (online, non-stop)	11
Ability to digitally regulate the temperature or lighting in the room	10
Proprietary hotel application	10
Electronic payment methods include bank cards and online banking	10
TV channels (wide range or channels in Hungarian)	9
Paperless administration (confirmation, billing)	8
Access to view the room account	7
Electronic door opening	7
Cleanliness (non-digital factor)	3
Does not necessitate digital solutions	2
There were no alternatives; digital options were unavailable	2

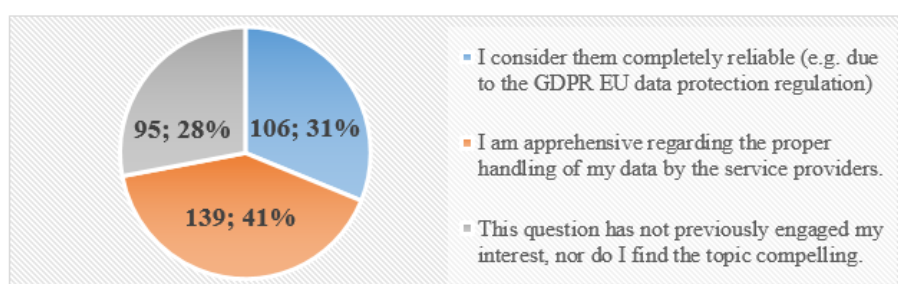*Source:* self-editing according to the research findings

Electronic door opening and the capability for room control, including heating and lighting, were predominantly overlooked by men. The absence of room service and online ordering elicited a sense of deprivation among higher-income individuals when these amenities were unavailable at the accommodation. Two responses

indicating a lack of necessity for digital solutions were provided by individuals aged 65 and older.

3.3.5. Evaluating Digital Solutions in Accommodation Facilities Through the Lens of Data Protection

The implementation of digital solutions necessitates considerations regarding data management. The obligation for all tourist accommodation providers in Hungary to supply real-time data to the National Tourism Data Centre and to transmit guest information to the Guest Information Closed Database necessitates the establishment of suitable data management procedures. The subject is notably contentious among participants, with 28% indicating they have never considered this issue, while 31% express complete trust in accommodation providers regarding the lawful handling of personal data, in compliance with GDPR regulations (Figure 2). In the sample, 41% express concern regarding the issue and fear potential mishandling of their personal data by accommodation providers. No additional responses were provided by the individuals participating in the research.

Figure 2. The evaluation of digital solutions offered by accommodation facilities concerning data protection in the sample (number of responses, %)

- I consider them completely reliable (e.g. due to the GDPR EU data protection regulation)
- I am apprehensive regarding the proper handling of my data by the service providers.
- This question has not previously engaged my interest, nor do I find the topic compelling.

Source: self-editing according to the research findings

Seventy-four percent of men express scepticism regarding data protection, whereas eighty-two percent of individuals aged 18 to 25 have not considered the issue, indicating that data security is not a priority for them. The proportion of individuals concerned with data security is greater among those with higher incomes compared to those facing livelihood challenges. Additionally, residents of county seats exhibit a higher level of concern regarding data security than individuals residing in other types of locations.

3.3.6. Assessment of Q2, Q3 and Q4

Respondents overwhelmingly prioritise wireless internet service (Wi-Fi), with 321 out of 340 participants (94.4%) deeming it essential in accommodation. This indicates that reliable and accessible internet connectivity is the foundational digital expectation for travellers – as a main outcome of Q2. Following Wi-Fi, the second most sought-after digital service is cashless payment options, mentioned by 217 respondents. Notably, 62 respondents considered only Wi-Fi and cashless payment as essential,

highlighting their critical importance. Individuals in higher income brackets more commonly referenced cashless payment options.

The third significant digital service is the availability of a smart TV, noted 133 times, indicating a strong desire for in-room entertainment access. This is followed closely by a digital concierge service, referenced 102 times, which provides guests with information about hotel or local programs. Other digital services desired by a smaller, though still notable, proportion of respondents (20−25%) include: contactless check-in and check-out (prioritized more by respondents aged 26−35), room service and service booking via an app, digital control of guest room features and electronic door locking.

Conversely, certain digital services were perceived as largely unnecessary by respondents. Guest room entertainment systems, such as game consoles, were considered largely unimportant. The presence of robot waiters was deemed non-essential by almost all respondents, with only five individuals considering their importance, all of whom were aged 18−25. This suggests a strong preference for practical, utility-driven digital solutions over novelty or advanced automation in the accommodation context.

Travellers in sample primarily benefit from digital solutions in accommodation due to significant time savings and enhanced personal control over their stay. Environmental considerations from paperless operations are also highly valued, followed by access to a wider array of options and, for some, the convenience of reduced personal interaction.

To assess Q3, respondents generally report a positive and relatively satisfied experience with the level of digitalization in accommodation services during their past travels. Over half of the sample (52.9%) indicated no instances where a requested digital service was unavailable, suggesting that their experiences largely aligned with their expectations.

However, a significant portion of respondents identified several areas where digital solutions were lacking, indicating a desire for more comprehensive and advanced digital offerings. The most prominent issue highlighted was the absence of well-functioning or free Wi-Fi, which was mentioned 34 times. This suggests that while Wi-Fi may often be present, its quality or accessibility is a key pain point.

Other notable gaps in digital services, each mentioned by 18 respondents, included: lack of online room service and service ordering, absence of electronic hotel and destionation information and the unavailability of contactless online check-in and check-out. Lesser but still desired digital features, each noted by 10 respondents, included the ability to digitally regulate in-room temperature or lighting intensity, as well as the absence of a dedicated hotel application and electronic payment options.

Socio-demographic factors also played a role in perceived deprivation. Men predominantly overlooked the absence of electronic door opening and in-room digital controls (heating and lighting). Higher-income individuals felt a stronger sense of deprivation when online room service and ordering options were unavailable.

In summary, while many respondents were satisfied, there's a clear demand for reliable Wi-Fi, convenient online ordering, digital information, and seamless check-in/out processes to enhance their digital accommodation experience.

I aim to address research question Q4 through the cross-tabulation of the two aforementioned groups of questions. The research findings indicate that individuals utilising mobile phones with data traffic necessitate a greater proportion of electronic services in hotels. Conversely, users of mobile phones and laptops without data traffic place significant importance on the availability of Wi-Fi services. The findings indicate that guests' behaviours at the accommodation reflect their daily lifestyles, and their consumer needs are consistent with this alignment. A similar pattern is observed among individuals for whom digital solutions are integral to their lives and who possess advanced ICT skills. This group necessitates a diverse array of digital services within the hotel, including online payment systems, digital programme and local event recommendations. Respondents who utilise digital solutions across all aspects of life regard the robot waiter as an essential digital service, as indicated by their selection of 5 activities outlined in subsection 3.2.3.

A correlation is found between average daily internet usage time and the perception of Wi-Fi service quality. Among individuals who utilise the internet for over three hours daily, 82% reported inadequate Wi-Fi connectivity. Among internet users at night, 87% considered the availability of entertainment services to be very important in hotels. Conversely, 79% of users who accessed the internet for less than 3 hours did not report any absence of digital services in their prior hotel experiences.

Ninety percent of respondents, who utilise digital solutions extensively for daily tasks, indicated a desire to employ digital hotel solutions to enhance autonomy for administration and process control. This finding reiterates that the norms and routines established in daily activities significantly impact guest behaviour during their hotel stay.

4. Conclusion and Suggestions

This research examined the utilisation of digital devices by travellers and their expectations regarding electronic solutions in hotel settings. The study employed an online survey administered to 340 participants, examining their digital habits, preferences, and perceptions regarding digital hospitality services.

In the survey regarding hotel services, Wi-Fi was deemed essential by 321 respondents, followed by cashless payment options with 217 mentions and smart TVs with 133 mentions. There is a demand for digital concierges. Guest room entertainment systems, such as game consoles, and robot waiters are generally deemed superfluous. Online payment functions demonstrate significant utility, with an average rating of 5.2 on a hexavalent Likert-scale. The main identified benefits of digital solutions in accommodation include time savings, reported by 92.6% of respondents, and increased guest control, noted in 215 responses.

While 52.9% reported no deficiencies, prevalent shortcomings in digital solutions within accommodations include inadequate or absent Wi-Fi (34 mentions), lack of online room service, and absence of contactless check-in/out options. Data security is a concern for 41% of respondents; 28% have not considered it, and 31% express trust in service providers.

Key findings indicate the prevalence of mobile phones in everyday life, with more than 94% of respondents deeming Wi-Fi as essential. Participants place significant

importance on cashless payments, in-room entertainment, and contactless check-in/out; however, they also raised concerns regarding data security. Although hotel digitalisation is generally valued, concerns have been raised regarding unreliable Wi-Fi and restricted online service offerings. The research highlights the necessity of dependable connectivity and user-focused digital solutions to enhance guest satisfaction. This analysis seeks to assist hoteliers in enhancing their services, resulting in improved efficiency and security in hospitality experiences.

The results suggest several recommendations for hotel operators.

- *Proactive Wi-Fi quality assurance*: hotels must adopt measures that extend beyond simple availability to guarantee the consistent quality and performance of their Wi-Fi networks. This encompasses routine audits, bandwidth management, and transparent communication concerning internet access.
- *Extensive digital service platforms*: the high demand for online room service, digital information, and contactless check-in/out highlights the necessity for cohesive and user-friendly online platforms or specialised hotel applications that integrate these services. However, minimising superfluous automation is a key point, direct digital investments towards practical, utility-oriented services, avoiding novelty features such as robot waiters that provide minimal perceived value is recommended.
- *Align with lifestyle*: hoteliers should acknowledge that guests' digital expectations are influenced by their daily routines; thus, hotel digital offerings must correspond to and accommodate these established behaviours.
- *Customised digital interactions*: operators should utilise socio-demographic insights, such as the preference for online room service among higher-income individuals and the reduced concern for electronic door opening among men, to customise digital service offerings and marketing strategies.
- *Target-specific deprivations*: focus on the identified challenges, including the lack of effective Wi-Fi, online ordering capabilities, and access to digital information is essential. Directly addressing these issues will markedly improve guest satisfaction.
- *Iterative digital development*: hotels should implement an agile methodology for digital service development, consistently gathering guest feedback and refining their offerings to align with changing expectations and resolve new challenges.

Further research directions involve enhancing and refining the findings through multivariate data analysis techniques utilising the established database, as well as identifying correlations that may yield valuable, targeted recommendations for the industry in question, e.g., by developing a segmentation model based on guests' digital lifestyles and explore how different segments perceive and utilize various hotel digital services.

Acknowledgments

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