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Between Innovations and Over-Reliance: Impact of Digital Technology on Guest Perceptions and Expectations in Hotels

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Abstract: This research aims to examine the influence of digital technology on guests' experiences in hotels, with more targeted focus on the risks associated with over-reliance on automatic systems. For the purpose of this paper, quantitative research was employed, using an online questionnaire in which 400 respondents with recent hotel experience participated. The questionnaire addressed several key dimensions: perceptions of digital technology efficiency, experiences with technical failures, attitudes regarding the balance between human interaction and digital technology, expectations and preparedness for potential technical failures, and views on the future development of digital technology in hotels. The analysis involved several statistical methods, including exploratory factor analysis, correlations, multiple regression, and mediation analysis. Results indicate that guests recognize the value of digital technology, with the over-reliance on automation without proper human support leading to increased service vulnerability and decreased trust. In addition, the preparedness of hotels to react to failures mitigates the negative impact on attitudes about future digital technology. Findings further indicate the need to carefully maintain the balance between digital technological efficiency and the human element.

Keywords: digital technology, guest experience, over-reliance on digital technology, human-technology balance.

Introduction

Digital technology plays a complex and multi-layered role in the hotel industry, impacting its success in many areas of hotel operations and guest experiences (Anwar et al., 2024; Bilgihan & Ricci, 2024). Mass investments in automation solutions such as mobile check-in or self-service check-in kiosks, mobile keys, and smart systems for room control and communication through applications (Mandić et al., 2023; Ivanov, 2023; Stringam & Gerdes, 2021; Gupta & Sharma, 2021) promise more personalized services (García-López et al., 2025), operational efficiency (Mavitha & Kushe Shekhar, 2025), and ultimately improvement of the guest experience, as well as a sense of modernity that positively influences the perception of the guests. Existing research indicates that digital technology can significantly improve and optimize the quality of hotel services and increase the perceived value of the stay (Albesher et al., 2025; Mavitha & Kushe Shekhar, 2025; Dianawati et al., 2024).

However, several studies indicate that excessive automation has led to the disruption of the human dimension of hospitality (Nanu, 2025; Roy & Pagaldiviti, 2025; Mandić & Savić, 2025; Zahidi et al., 2024; Kattara & El-Said, 2013), which traditionally rests on personal communication, warmth, and emotional support (Park, 2018). In situations when automation and digital technology take over many hospitality workflows by becoming the only source of access to hotel services, guests become vulnerable to technical failures (Wynn & Jones, 2022). But digital systems, beside their advantages, are fallible: internet connections can be disrupted, errors can occur in the property management system, and digital keys can be non-functional, or mobile applications can fail. Any disruption of such nature, if not managed quickly by a

competent human intervention, can have a negative impact on the guest experience, particularly in moments of distress or confusion, therefore losing trust in the hotel (Das, 2023; Mandić et al., 2023).

Although it is well supported that digital technology is revolutionizing the industry, little is known about how guests react in situations when technology is failing and what support the human has in those moments. This represents a significant research gap in hotel management: much research focuses on the effectiveness and acceptance of technology, but few focus on the guest experience in conditions of dependence on digital technology and its failure.

Because of this, this research has an objective to examine the guest experience in the context of the growing digitalization of hotel services and further explores how over-reliance on technology influences trust, perception of service, and attitude toward future technology development. Additionally, this research analyzes the role of human support and readiness in the event of system failures.

Which leads to the following research question:

1. How do the use and experiences with technical failures in digital hotel services influence guests' perceptions, trust, and expectations of future technology developments in hotels, and do readiness/expectations play a mediating role in this relationship?

Thus, the research contributes to a better understanding of the boundary between digital technological innovation and maintaining the core values of hospitality.

Materials and Methods

Research aim and design

This paper uses a quantitative design in approaching the objective of the research to examine how guests perceive the use of digital technology in hotel operations and how technical failures influence their trust and perception, and it asks whether preparedness and expectations of guests change (mediate) the relationship between the negative experience and views on future development of digital technology in hotel services. The structured questionnaire collected suitable numerical data amenable to statistical analysis to identify trends and relationships between primary variables. As an exploratory design, the research seeks to examine relationships among theories posed by the hypotheses.

In accordance with the purpose of this research, the following hypotheses were formulated:

1. H_1: There is a positive relationship between the perception of the effectiveness of digital technology and attitudes towards the future development of technology in hotels.
2. H_2: There is a negative relationship between experiences with technical failures and attitudes towards the balance between technology and human interaction.
3. H_3: Perceptions of efficiency, attitudes toward technology versus human interaction, and preparedness for technical failures significantly predict attitudes toward future technology development.
4. H_4: Experiences with technical failures and attitudes about human-technology balance significantly predict preparedness for technical failures.

5. H_5: There are significant differences in perceptions and attitudes towards digital technology across different age groups.
6. H_6: There are significant differences in perceptions and attitudes towards digital technology across genders.
7. H_7: Technical failure readiness mediates the relationship between experiences with technical failures and attitudes about future technology development.

Data collection methods

Data was collected through a structured questionnaire consisting of 22 close-ended questions using the Likert scale, among which demographic data such as age and gender was included. The questionnaire was distributed online from July 2025 to October 2025 to a convenience sample of hotel guests who stayed in hotels offering digital services through technology within the past 12 months. A total of 400 respondents were gathered.

Data analysis methods

Data was analyzed using SPSS. The following statistical analysis methods were used:

1. *Exploratory factor analysis*: to identify dimensions/factors in guests' perception and expectations of digital technology in hotels.
2. *Pearson correlation analysis*: to examine whether there are statistically significant relationships between factors that represent different aspects of the digital technology guest experience.
3. *Multiple regression analysis*: to model dependent variables and understand which aspects influence the future development of digital technology in hotels the most.
4. *One-way ANOVA* and *Independent sample t-test*: to analyze if the identified factors vary by age and gender.
5. *Mediation analysis*: to determine if one variable mediates the relationship between two others. The purpose of this analysis is to examine whether someone who experiences technological problems values more preparedness, which leads to a different perception of future digital technology usage in hotels.

Justification of methods

The selection of statistical analysis methods corresponds with the objective of the research and provides thorough testing of the proposed hypotheses. Using Likert-scale questions delivers reliable quantitative data, thus enabling SPSS to employ the proper statistical methods for hypotheses testing. PROCESS Macro was chosen for its capacity to evaluate mediation and estimate indirect effects, both of which are crucial for understanding how preparedness influences guests' perceptions of future digital technology usage.

Ethical consideration

The participation of respondents was voluntary and anonymous. No personal data was collected, and all respondents provided online informed consent prior to completing the questionnaire.

Limitations

Several methodological limitations have to be acknowledged:

1. Because of the convenience sample, the generalizability of the results is restricted.

2. Reliance on self-reported data raises the risk of bias and social-desirability bias.

However, despite these limitations, this research is able to provide statistical and theoretical analysis on guests' perceptions and expectations of digital technology in hotels.

Results and Discussions

In line with the research objective, this section presents the results from demographic frequency statistics, exploratory factor analysis, correlation analysis, regression models, independent sample t-test, ANOVA test, and mediation analysis, which examines guests' experience by their perceptions and expectations related to digital technology usage in hotels.

Table 1: Demographic profile of respondents

Age group				
	Frequency	Percent	Valid Percent	Cumulative Percent
Under 18	44	11.0	11.0	11.0
18–24	93	23.3	23.3	34.3
25-34	98	24.5	24.5	58.8
35-44	68	17.0	17.0	75.8
45-54	57	14.2	14.2	90.0
55+	40	10.0	10.0	100.0
Total	*400*	*100.0*	*100.0*	
Gender				
	Frequency	Percent	Valid Percent	Cumulative Percent
Male	187	46.8	46.8	46.8
Female	213	53.3	53.3	100.0
Total	*400*	*100.0*	*100.0*	

Based on the results from Table 1, the sample consisted of 400 respondents. In terms of age distribution, the largest group of respondents (24.5%) were between ages 25 to 34 years old, followed by those between the ages of 18 to 24 years old (23.3%) and 35 to 44 years old (17%). Age groups from 45 to 54 years old (14.2%), under the age of 18 (11%), and 55 and above (10%) had lower percentages. As for gender, 46.8% of the respondents were men, while 53.5% were female.

Table 2: Exploratory factor analysis and reliability statistics

FAC1 Perception of efficiency of digital technology				
Cronbach's Alpha = 0.802				
Questions/Topics: *Digital technology enhances experience, Comfort using digital systems in hotels, Tech-heavy hotels are more modern and efficient, Technology enhances efficiency even if there are failures*				
Eigenvalue	% of Variance	KMO	Bartlett's Sig.	Rotated loadings
2.237	55.914%	0.751	.000	.763, .741, .835, .801
FAC2 Impact of technical failures on guest experience				
Cronbach's Alpha = 0.719				
Questions/Topics: *Experienced service failure due to digital technology, Frequency of technology issues (Wi-Fi, apps), Negative impact of technology failures, Experienced service failure due to system error, Digital check-in lowers guest experience quality*				
Eigenvalue	% of Variance	KMO	Bartlett's Sig.	Rotated loadings
2.786	55.91%	0.744	.000	.758, .765, .551, .751, .804
FAC3 Preparedness and expectations for technology failure				
Cronbach's Alpha = 0.778				

Questions/Topics: *How quickly should hotels resolve technology issues, Frustration due to lack of assistance (technology dependence), Staff should be trained to manage technology failures, Would still stay even if hotel technology fails*				
Eigenvalue	% of Variance	KMO	Bartlett's Sig.	Rotated loadings
2.399	59.96%	0.749	.000	.557, .622, .641, .580
FAC4 Attitudes towards digital technology-human balance interaction				
Cronbach's Alpha = 0.739				
Questions/Topics: *Difficulty interacting with staff due to over-reliance on technology, Hotels should balance technology and human interaction, Preference for human staff over technology, Hotels prioritize technology over service, Hotels prefer to invest in people more than technology*				
Eigenvalue	% of Variance	KMO	Bartlett's Sig.	Rotated loadings
2.382	43.74%	0.708	.000	.752, .685, .685, .604, .564
FAC5 Perceptions of the future development of digital technology in hotels				
Cronbach's Alpha = 0.801				
Questions/Topics: *Preference for human staff over technology, Hotels invest in people more than technology, Tech-heavy hotels are more modern and efficient, Technology enhances efficiency even if there are failures*				
Eigenvalue	% of Variance	KMO	Bartlett's Sig.	Rotated loadings
2.653	53.06%	0.788	.000	.699, .576, .690, .735

Exploratory factor analysis using principal component analysis with varimax rotation is presented in Table 2. Results indicate that Bartlett's Test of Sphericity was significant ($p < .001$) for all factors, suggesting acceptability for the factor analysis, and the Kaiser–Meyer–Olkin test confirmed the sample adequacy for each factor (KMO > 0.70). All five factors that were extracted explain between 43.74% and 59.96% of the variation, as well as having satisfactory levels of internal consistency (Cronbach's α ranged from 0.719 to 0.802).

Table 3: Pearson correlation matrix

		Perception of efficiency of digital technology	Perceptions of the future development of digital technology
Perception of efficiency of digital technology	**Pearson Correlation**	1	.640**
	Sig. (2-tailed)		.000
	N	400	400
Perceptions of the future development of digital technology	**Pearson Correlation**	.640**	1
	Sig. (2-tailed)	.000	
	N	400	400
**. Correlation is significant at the 0.01 level (2-tailed).			

Based on the result from the Pearson correlation in Table 3, there is a strong positive relationship supporting H1 ($r = .640$, $p = .000$), meaning as more guests perceive digital technology to be efficient, the more optimistic they are about its future development in hotels.

Table 4: Pearson correlation matrix

		Impact of technical failures on guest experience	Balance between digital technology-human for interaction
Impact of technical failures on guest experience	**Pearson Correlation**	1	.326**
	Sig. (2-tailed)		.000
	N	400	400
Balance between digital technology-human interaction	**Pearson Correlation**	.326**	1
	Sig. (2-tailed)	.000	
	N	400	400
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 4 presents another result from the Pearson correlation, which indicates a more moderate positive relationship (r = .326, p = .000), but not negative. Results mean that the higher the guests perceive the impact of technological failure, the more they appreciate the balance between digital technology and humans for interaction, therefore not supporting H2.

Table 5: Multiple regression predicting future digital technology perspective

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.074	.061		1.204	.229
	Perception of efficiency of digital technology	.411	.012	.557	35.166	.000
	Balance between digital technology-human interaction	.560	.014	.701	40.782	.000
	Preparedness and expectations for technology failure	.015	.017	.015	.877	.381

a. Dependent Variable: Perceptions of the future development of digital technology.

The results from the multiple regression analysis from Table 5 have a remarkably high percentage of 90.3% (R^2 = .903), supporting H3, which indicates that the three selected predictors have a strong relationship with guests' perspectives on future digital technology development in hotels. The model is statistically significant, F(3,396) = 1232.196, p < .001, whereas the predictors, perception of efficiency of digital technology and balance between digital technology-human interaction, have a positive influence, while preparedness and expectations for technology failure (p = .381) do not have a direct positive influence on the perspective for future digital technology development. As for perception of efficiency of digital technology (β = .557, p < .001) and balance between digital technology-human interaction (β = .701, p < .001), results indicate that when guests perceive digital technology to be useful and there is a good balance between human and digital service, their perception of future digital technology development in hotels increases.

Table 6: Multiple regression predicting guests' preparedness and expectations

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.534	.045		11.837	.000
	Balance between digital technology-human interaction	.091	.013	.116	7.240	.000
	Impact of technical failures on guest experience	.753	.013	.910	57.023	.000

a. Dependent Variable: Preparedness and expectations for technology failure.

The results from the multiple regression analysis from Table 6 show that the model explains 91% (R^2 = .910) of the variance in preparedness and expectations for technology failure. Such high explained variance means that the two selected variables explain guest preparedness and expectations very well. Notably, the model is statistically significant, F(2, 397) = 1999.407, p < .001, supporting H4; however, the strongest predictor for preparedness and expectations is the impact of technical failures on guest experience (β = .910, p < .001), which means that when guests have previous experiences with technical issues, they tend to expect or be more

prepared for them in the future. As for the balance between digital technology-human interaction, which is also a significant but weaker predictor ($\beta = .116$, $p < .001$), it suggests that when guests sense a good balance between human and technology, they have more confidence and are more open to any potential technical failures.

Table 7: One-way ANOVA results by age group

		Sum of Squares	df	Mean Square	F	Sig.
Perception of efficiency of digital technology	Between Groups	18.517	5	3.703	3.977	.002
	Within Groups	366.880	394	.931		
	Total	385.397	399			
Impact of technical failures on guest experience	Between Groups	16.318	5	3.264	3.351	.006
	Within Groups	383.722	394	.974		
	Total	400.040	399			
Preparedness and expectations for technology failure	Between Groups	16.669	5	3.334	3.290	.006
	Within Groups	399.268	394	1.013		
	Total	415.937	399			
Balance between digital technology-human interaction	Between Groups	11.442	5	2.288	2.392	.037
	Within Groups	376.995	394	.957		
	Total	388.438	399			
Perceptions of the future development of digital technology	Between Groups	13.267	5	2.653	2.668	.022
	Within Groups	391.843	394	.995		
	Total	405.110	399			

A one-way ANOVA test from Table 7 revealed that age affects each of the five factors, where, according to the results, all of them are statistically significant:

1. Perception of efficiency of digital technology: $F(5,394)=3.977$ and $p=.002$.
2. Impact of technical failures on guest experience: $F(5,394)=3.351$ and $p=.006$.
3. Preparedness and expectations for technology failure: $F(5,394)=3.290$ and $p=.006$.
4. Balance between digital technology-human interaction: $F(5,394)=2.392$ and $p=.037$.
5. Perceptions of the future development of digital technology: $F(5,394)=2.668$ and $p=.022$.

Using the Tukey HSD test, additional post-hoc comparisons revealed particular group differences. For instance, notable differences were perceived between:

1. Perception of efficiency of digital technology: Under 18 vs 55+ ($p = .004$); 45–54 vs 55+ ($p = .024$).
2. Impact of technical failures on guest experience: Under 18 vs 25–34 ($p = .013$); 25–34 vs 35–44 ($p = .018$).
3. Preparedness and expectations for technology failure: 35–44 vs 55+ ($p = .003$); under 18 vs 55+ ($p = .032$).
4. Balance between digital technology-human interaction: 35–44 vs 55+ ($p = .050$)
5. Perceptions of the future development of digital technology: Under 18 vs 55+ ($p = .035$)

In summary, there is a statistically significant difference in the perception of efficiency of digital technology and failure impact between certain age groups, especially the youngest and oldest, therefore supporting H5. Older guests also have significantly different views on digital technology-human balance, and differences in expectations and readiness for digital

technology are more pronounced between generations. Younger guests have significantly higher expectations and a positive outlook for future technology compared to older guests.

Table 8: Independent samples t-test results by gender

Factor	t	df	Sig. (2-tailed)	Mean Difference
Perception of efficiency of digital technology	-6.95	398	.000	-1.68
Impact of technical failures on guest experience	-5.49	398	.000	-1.15
Preparedness and expectations for technology failure	-7.32	398	.000	-1.23
Balance between digital technology-human interaction	-5.46	398	.000	-1.53
Perceptions of the future development of digital technology	-7.30	398	.000	-1.57

An independent sample t-test from Table 8 found that for each of the five factors, there is a statistically significant difference between male and female guests, supporting H6. Results indicate that:

1. Perception of efficiency of digital technology: $t(398) = -5.46$, $p<.001$.
2. Impact of technical failures on guest experience: $t(398) = -6.95$, $p<.001$.
3. Preparedness and expectations for technology failure: $t(398) = -5.49$, $p<.001$.
4. Balance between digital technology-human interaction: $t(398) = -7.32$, $p<.001$.
5. Perceptions of the future development of digital technology: $t(398) = -7.30$, $p<.001$.

Across all five factors, female guests reported considerably higher mean scores, suggesting a more positive view of digital technology in hotels, increased readiness, and greater expectations for future development.

Table 9: Mediation analysis: guests' preparedness and expectations as mediator

Path	B (Unstd.)	SE	t	p	95% CI
Impact of technical failures on guest experience → Preparedness and expectations for technology failure (a)	0.7838	0.0133	59.12	< .001	[0.7578 – 0.8099]
Preparedness and expectations for technology failure → Perceptions of the future development of digital technology (b)	1.3601	0.1368	9.94	< .001	[1.0911 – 1.6292]
Impact of technical failures on guest experience → Perceptions of the future development of digital technology (direct effect, c′)	-0.8448	0.1132	-7.46	< .001	[-1.0674 – -0.6223]
Indirect effect (a × b)	1.0661	0.1770	—	—	[0.6993 – 1.3989]

With 5000 bootstrap samples, the mediation analysis from Table 9 using PROCESS Model 4 demonstrated a significant indirect impact of the impact of technical failures on guest experience on the perceptions of the future development of digital technology in hotels via the preparedness and expectations for technology failure (indirect effect = 1.0661, 95% CI [0.6993, 1.3989]), thereby supporting H7. While digital technology services may influence guests' confidence and enthusiasm over future digital hotel technology, the direct effect was negative and significant (B = -0.8448, p < .001), indicating that this effect can be reduced and reversed if guests feel more informed and well-prepared to handle these kinds of situations. Results from the table can be further explained as "suppression effect," meaning without the mediator, the

effect can be perceived as unidirectional. But when the mediator is introduced, an opposite effect occurs that is even stronger than the direct one.

Conclusion

The research indicates that digital technology significantly influences the guest experience in hotels. The results confirm that guests who view digital technology as effective and beneficial demonstrate a higher trust in its future developments inside hotel operations. Still, over-reliance upon automated systems lacking proper human interaction compromises guests' trust.

The results also demonstrate that unpleasant encounters with technology failures may not necessarily diminish the tendency for using digital technology; instead, they raise what is considered the importance of the balance between human and digital components in the service. This suggests that the issue lies not inside the digital technology itself, but rather in the absence of prompt human involvement during failures. The mediation model further highlights guest readiness and expectations as mediating elements that change the negative effects of technology failures into favorable attitudes towards future developments. This result underscores the significance of clear communication, emergency protocols, and the professional preparedness of employees in digitally focused hotel services.

All things considered, the research indicates that human-technology interaction, not replacement, is the key to a successful digital transformation in the hotel industry. Hotels that integrate technological efficiency with compassionate and responsive human assistance can foster enhanced trust, resilience, and guest satisfaction, assuring a sustainable and balanced approach to innovation.

From a theoretical viewpoint, the results contribute to a more profound understanding of the relationship between trust, technological efficacy, and human interaction in the hospitality context. The research demonstrates that subsequent research need to examine more thoroughly the threshold of "technological saturation," which is the intersection at which intensified automation ceases improving and instead diminishes the perceived value of a service. Practically, the paper delivers a conclusive message: digitalization is not an ultimate goal, but rather a process that requires continual support from human compassion and operational adaptability.

Conflict of Interest

The author declares no conflict of interest.

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