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THE EFFECT OF DIGITAL TECHNOLOGY UTILIZATION ON HOTEL SERVICE OPERATIONS AND CUSTOMER PERCEPTION

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Abstract: This study analyzes the effect of digital technology utilization on hotel service operations and customer perception of hotels in Central Bangka Regency, Indonesia. The research examines how ease of use, technology-based service quality, and feature availability influence system efficiency, and how system efficiency subsequently affects customer perception. Security and privacy are also included to evaluate their direct and moderating roles. Based on data collected from 134 hotel guests, the model was tested with Partial Least Squares Structural Equation Modeling. The findings show that all three technological factors significantly enhance system efficiency, which in turn strongly improves customer perception. Security and privacy also have a significant direct effect, although their moderating influence was not supported. Overall, the study highlights the importance of efficient and user-friendly digital systems in shaping customer evaluations and provides practical insights for strengthening digital service implementation in regional hotels.

Keywords: *Digital Technology Utilization, System Efficiency, Hotel Service Operations, Customer Perception*

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1. Introduction

The rapid advancement of digital technologies has transformed service industries globally, particularly the hospitality sector, where digital systems increasingly support operational efficiency and customer experience. Hotels now adopt tools such as automated check-in kiosks, digital reservation systems, mobile service applications, and smart room technologies to enhance convenience, accuracy, and responsiveness (Buhalis & Leung, 2018; Jayawardena, 2023). In Indonesia, digitalization is growing but remains uneven, especially in regions outside major tourism centers. Central Bangka Regency is one such area where hotels have begun integrating digital solutions to modernize service delivery. The sampled hotels in this region has implemented several digital tools to improve both internal processes and customer-facing interactions. These digital services include, but are not limited to, online reservations, digital check-in and check-out, digital information displays, and technology-supported service interactions. This emerging digital environment provides a relevant context for examining how digital technology utilization influences hotel service operations and customer perception in regional hospitality settings.

Despite their potential, digital technologies in the hospitality sector often face implementation challenges that limit their effectiveness. In many regional hotels, including

those in Central Bangka Regency, digital systems are not fully optimized due to factors such as limited employee training, inconsistent system integration, and inadequate feature availability (Morosan & DeFranco, 2016). Customers may also encounter difficulties when using digital tools, particularly when systems are slow, unintuitive, or unreliable, which can negatively affect their service experience. Preliminary observations at the sampled hotels in Central Bangka Regency indicate that although various digital tools are available, their operational impact remains inconsistent. This raises questions about whether digital investments have translated into meaningful improvements for customers. Consequently, the link between digital technology utilization and customer perception is still unclear, underscoring the need to understand whether digitalization enhances service quality or introduces new operational complexities.

Previous studies on hospitality digitalization have largely focused on large hotels or technologically advanced environments, leaving limited empirical evidence on how digital technologies operate in medium-scale hotels in developing or peripheral regions (Bilgihan & Bujisic, 2014; Daimah & Anwar, 2025). The existing studies assume strong digital infrastructure and high levels of digital literacy, conditions that may not fully reflect the realities of regional areas such as Central Bangka Regency. This creates a contextual research gap regarding how regional hotels adopt and benefit from digital technologies. Another gap concerns the mechanisms through which digital tools shape customer perception. Much of the research literature ignores the operational processes that link technology use to customer evaluations. This is important because even advanced digital features may fail to improve customer experiences if internal workflows are inefficient or poorly integrated. Therefore, a more comprehensive research model is needed to capture both technological factors and operational efficiency (Buhalis & Leung, 2018; Gretzel et al., 2015; Ukpabi & Karjaluoto, 2018). However, existing studies have not explicitly conceptualized system efficiency as a mediating operational mechanism that explains how different dimensions of digital technology utilization translate into customer perception. As a result, it remains theoretically unclear whether improvements in customer perception stem directly from digital features or indirectly through enhanced operational efficiency.

This study makes a conceptual contribution to digital hospitality research by explicating system efficiency as a central operational mechanism that links digital technology utilization to customer perception. Specifically, the study integrates ease of use, technology-based service quality, and feature availability as distinct technological dimensions whose effects on customer perception are transmitted through system efficiency. Although these variables have been examined individually in prior studies, prior research has largely overlooked how their combined effects operate through internal service efficiency to shape customer evaluations. By positioning system efficiency as a mediating construct, this study advances existing models by shifting the focus from direct technology customer relationships to an operationally grounded explanation of customer perception. Furthermore, the inclusion of security and privacy as an independent evaluative factor responds to increasing concerns regarding data protection in digital hospitality services (Sharma, 2023). The proposed conceptual model is empirically validated in a regional hotel context in Central Bangka Regency, providing contextual support for the theoretical framework while extending its applicability beyond metropolitan hotel settings.

Given the increasing reliance on digital systems and the challenges observed in their adoption at the sampled hotels in Central Bangka Regency, this study aims to analyze how digital technology utilization affects hotel service operations and customer perception.

Specifically, the research examines whether ease of use, technology-based service quality, and feature availability improve system efficiency and subsequently influence customer perception. The study also incorporates security and privacy as additional factors to understand their role in shaping customer evaluations within digital service environments. Accordingly, this study responds to the conceptual gap in digital hospitality research by empirically validating an operationally grounded model that explains customer perception through system efficiency in a regional hotel context.

Research Hypothesis

Figure 1 shows the research model in which Ease of Use, Quality of Technology-Based Services, and Technology Feature Availability influence Customer Perception indirectly through System Efficiency, and also indicating its mediating role. The model also positions Security and Privacy as both a direct predictor of Customer Perception and a moderating variable that may strengthen the relationship between System Efficiency and Customer Perception.

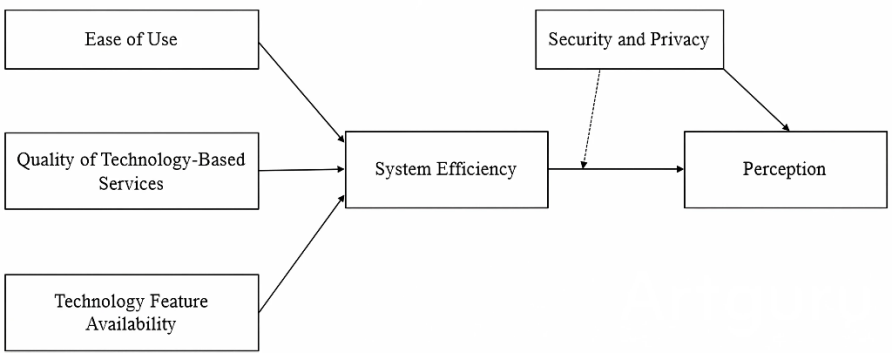

Figure 1. The relationship of this study's variables
Source: (Hair et al., 2021)

Based on the foregoing explanation, the following provisional hypotheses are formulated in this study:

H1 : Ease of use has a significant positive effect on system efficiency in hotel service operations.
H2 : Quality of technology-based services have a significant positive effect on system efficiency in hotel service operations.
H3 : Technology feature availability have a significant positive effect on system efficiency in hotel service operations.
H4 : System efficiency has a significant positive effect on customer perception in digital hotel services.
H5 : System efficiency mediates the relationship between ease of use and customer perception.
H6 : System efficiency mediates the relationship between quality of technology-based services and customer perception.
H7 : System efficiency mediates the relationship between technology feature availability and customer perception.
H8 : Security and privacy have a significant positive effect on customer perception in the context of hotels in Central Bangka Regency.
H9 : Security and privacy moderate the effect of system efficiency on customer perception.

2. Literature Review

Digital technology utilization in the hospitality industry refers to the use of information systems and digital tools to support service delivery, operational processes, and customer interactions (Brandano, 2023; Ivanov & Webster, 2019; Luxamimongkolchai, 2024). From a service operations perspective, digital technologies are expected to improve system efficiency, which reflects the ability of service systems to operate quickly, accurately, and reliably. Technology acceptance theory suggests that ease of use plays a critical role in determining how effectively users interact with digital systems, as intuitive systems reduce effort and operational delays (Davis, 1989). In addition, technology-based service quality emphasizes system reliability, responsiveness, and accuracy, which are essential for ensuring smooth service operations and minimizing service failures. Feature availability further complements system performance by providing functional completeness that allows digital systems to support a wide range of service activities. Together, these technological attributes influence how efficiently hotel services are delivered and, consequently, how customers evaluate their service experience. Furthermore, concerns related to security and privacy have become increasingly important in digital hospitality services, as customers expect their personal data to be protected when using digital systems (Sharma, 2023; Yu, 2022). Thus, digital technology utilization should be understood not only as the adoption of digital tools, but also as an integrated operational mechanism that shapes customer perception through system efficiency.

System efficiency plays a crucial role in translating digital technology utilization into positive customer perception in hospitality services. In service operations, system efficiency reflects the ability of digital systems to streamline processes, reduce waiting time, and ensure service accuracy, which directly affects customers' service experiences (Park, 2023). Previous studies suggest that when digital technologies function efficiently, customers perceive hotel services as more reliable and responsive, leading to more favorable evaluations (Buhalis & Leung, 2018; Lemon & Verhoef, 2016). From a technology acceptance perspective, efficient system performance reinforces users' positive attitudes toward digital services by reducing effort and uncertainty during service interactions (Venkatesh et al., 2012). However, customer perception is not determined solely by efficiency; security and privacy also serve as important evaluative factors in digital service environments. Customers expect hotels to protect personal and transactional data when using digital systems, and failure to meet these expectations may negatively influence trust and perception (Morosan & DeFranco, 2016; Sharma, 2023). Therefore, system efficiency and security considerations jointly form the foundation through which digital hotel services are evaluated by customers.

3. Research Method

This study employed a quantitative research design with a causal-explanatory approach to examine the influence of digital technology utilization on hotel service operations and customer perception. The research model incorporates several technological constructs: ease of use, technology-based service quality, and feature availability with system efficiency serving as a mediating variable. Security and privacy were included to examine both their direct and moderating effects on customer perception. The population of this study consisted of hotel guests who had used one or more digital services offered by six sampled hotels in Central Bangka Regency, Bangka Belitung Islands Province. A non-probability purposive sampling technique was applied to ensure that respondents had relevant experience with the

hotel's digital features. A total of 134 respondents participated in the study, meeting the minimum sample size requirement for PLS-SEM.

The measurement model comprised six latent variables: ease of use (EU), system efficiency (SE), technology-based service quality (QT), security and privacy (SP), feature availability (TF), and customer perception (P). All constructs were modeled as reflective constructs and measured using indicators adapted from prior studies. Indicators for ease of use and technology-based service quality were adapted from (Davis, 1989; Venkatesh et al., 2012), while indicators for system efficiency and customer perception were derived from hospitality service quality literature. Indicators for security and privacy were adapted from studies on digital service trust and data protection in hospitality contexts (Morosan & DeFranco, 2016; Sharma, 2023). Feature availability indicators were developed based on concepts of service functionality and system completeness commonly discussed in digital technology adoption literature and adjusted to reflect the digital features implemented in the sampled hotels. All measurement items were assessed using a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree.

4. Results and Discussion

4.1. Results

Respondents' Profile

Table 1. Respondents' Profile

Profile	Characteristics	N	Percentage (%)
Gender	Male	61	45,52
	Female	73	54,48
	Total	134	
Age	< 20	4	2,99
	20-30	73	54,48
	31-40	40	29,85
	> 40	17	12,69
	Total	134	
Education Level	High School	78	58,21
	Diploma	19	14,18
	Bachelor Degree	37	27,61
	Total	134	
Tourist Category	Indonesia / Outside Bangka Belitung	28	20,90
	Indonesia / Bangka Belitung	106	79,10
	Total	134	
Length of Stay	1 night	70	52,24
	2 nights	56	41,79
	3 nights	8	5,97
	Total	134	
Use of Digital Facilities	No	2	1,49
	Yes	132	98,51
	Total	134	

Source: Data Collection

Measurement Model Evaluation

The measurement model was evaluated to assess the reliability and validity of the reflective constructs used in this study. The outer loading results indicate that most indicators exceed the recommended threshold of 0.708, reflecting strong indicator reliability. Several indicators with loading values between 0.60 and 0.70 (such as EU2, QT1, and QT5) were retained. This decision was justified by the need to maintain comprehensive content validity aligned with the specific digital service environment of regional hotels, where these indicators represent key features or usability aspects. The retention was also supported because their respective constructs demonstrated satisfactory convergent validity and internal consistency reliability, in line with the recommendations by (Hair et al., 2021). Overall, the indicators for Ease of Use (EU1-EU5), System Efficiency (SE1-SE3), Quality of Technology-Based Services (QT1-QT5), Security and Privacy (SP1-SP5), Technology Feature Availability (TF1-TF3), and Perception (P3-P7) were considered adequate for measuring their intended constructs.

Convergent validity was established through the Average Variance Extracted (AVE), where all constructs reported AVE values above the minimum criterion of 0.50, confirming that each construct explains more than half of the variance of its indicators. Internal consistency reliability was assessed using Composite Reliability (CR), the preferred measure in PLS-SEM, and all constructs demonstrated CR values exceeding 0.70, indicating high reliability. Although Cronbach's Alpha values were also above 0.70 for most constructs, the interpretation primarily relied on Composite Reliability because it provides a more accurate estimate for models with unequal indicator loadings. Discriminant validity in Table 3 was assessed using the Fornell-Larcker Criterion, which showed that the square root of each construct's AVE was greater than its correlations with other constructs. This confirms that each latent variable is empirically distinct from the others. Based on these results, the measurement model satisfies all the required criteria for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity, demonstrating that the reflective measurement model is robust and suitable for further structural analysis.

Table 2. The loading factor & VIF

Indicator	Ease of Use	Perception	Quality of Technology-Based Services	System Efficiency	Security and Privacy	Technology Feature Availability	VIF
EU1	0.868						1.648
EU2	0.684						1.268
EU5	0.821						1.471
P3		0.726					1.401
P4		0.754					1.451
P5		0.773					1.474
P7		0.734					1.302
QT1			0.689				1.111
QT2			0.761				1.189
QT5			0.711				1.142
SE1				0.777			1.351
SE2				0.803			1.317

SE3			0.777		1.372
SP1				0.763	1.627
SP2				0.788	1.807
SP3				0.772	1.723
SP4				0.734	1.611
SP5				0.777	1.618
TF1					0.704 1.247
TF2					0.756 1.261
TF3					0.831 1.314

Source: Data analysis by SmartPLS 4

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

Indicator	Ease of Use	Perception	Quality of Technology-Based Services	System Efficiency	Security and Privacy	Technology Feature Availability
EU	0.795					
P	0.393	0.747				
QT	0.347	0.498	0.721			
SE	0.503	0.594	0.486	0.786		
SP	0.387	0.485	0.505	0.389	0.767	
TF	0.406	0.629	0.520	0.582	0.526	0.766

Source: Data analysis by SmartPLS 4

Table 4. Heterotrait-Monotrait Ratio (HTMT)

	EU	P	QT	SE	SP	TF	SP x SE
EU							
P	0.526						
QT	0.558	0.793					
SE	0.701	0.824	0.810				
SP	0.514	0.610	0.756	0.506			
TF	0.605	0.890	0.883	0.843	0.738		
SP x SE	0.067	0.100	0.203	0.066	0.072	0.103	

Source: Data analysis by SmartPLS 4

In addition to the Fornell-Larcker criterion, discriminant validity was further assessed using the Heterotrait-Monotrait ratio (HTMT). As shown in Table 4, all HTMT values were below the recommended threshold of 0.90, indicating that discriminant validity among the constructs was satisfactorily established (Hair et al., 2021).

Reliability Test

Table 5. Realibility Test

Variables	Composite Reliability (CR)	Threshold	Information
Ease of use	0.836	≥ 0.70	Reliable
Perception	0.835	≥ 0.70	Reliable
Quality of Technology-Based Services	0.764	≥ 0.70	Reliable

System Efficiency	0.829	≥ 0.70	Reliable
Security and Privacy	0.877	≥ 0.70	Reliable
Technology Feature Availability	0.809	≥ 0.70	Reliable

Source: Data analysis by SmartPLS 4

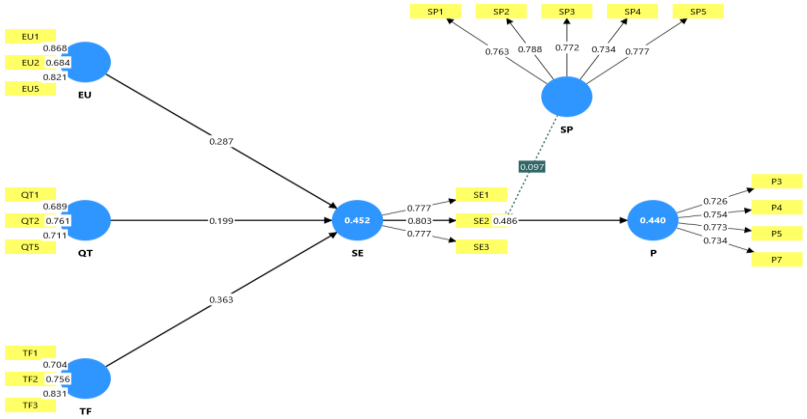

Figure 2. Measurement model
Source: Data analysis by SmartPLS 4

Structural Model Evaluation

The structural model was assessed to examine the predictive power and significance of the hypothesized relationships. The R-square value for System Efficiency (SE) was 0.680, indicating that Ease of Use, Quality of Technology-Based Services, and Technology Feature Availability collectively explained 68% of the variance in SE, which reflects substantial predictive accuracy. For the Perception construct, the R-square value was 0.342, indicating moderate explanatory power, with System Efficiency and Security & Privacy explaining 34.2% of the variance in customer perception. Effect size (f-square) values further supported the structural model's predictive relevance. Quality of Technology-Based Services showed the largest effect on System Efficiency, followed by Technology Feature Availability and Ease of Use. System Efficiency demonstrated a medium-to-large effect size on Perception, confirming its importance as a key driver of customer evaluation in digital hotel services. Meanwhile, Security & Privacy showed a small effect size on Perception.

Hypothesis Testing (Path Coefficients)

The bootstrapping procedure was used to determine the statistical significance of each structural path. The results show that:

Table 6. The hypotheses result

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
EU -> SE	0.287	0.291	0.084	3.398	0.001
QT -> SE	0.199	0.204	0.076	2.606	0.009
SE -> P	0.486	0.487	0.063	7.657	0.000
SP -> P	0.294	0.299	0.071	4.148	0.000
TF -> SE	0.363	0.362	0.093	3.893	0.000

Source: Data analysis by SmartPLS 4

These results indicate that all direct hypotheses were statistically supported, with three technological variables (EU, QT, TF) significantly enhanced system efficiency, and system efficiency significantly improved customer perception. Security and Privacy also showed a significant direct effect on customer perception, suggesting that security and privacy considerations remain relevant for digital service users at the Hotels in Central Bangka Regency.

Mediation Analysis

The mediation tests showed that System Efficiency significantly mediated the effects of all three technological variables on customer perception:

Table 7. Mediation Analysis

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
TF -> SE -> P	0.176	0.178	0.056	3.152	0.002
EU -> SE -> P	0.139	0.141	0.042	3.322	0.001
QT -> SE -> P	0.097	0.099	0.040	2.418	0.016

Source: Data analysis by SmartPLS 4

These findings indicate that digital technology utilization improves customer perception primarily through its influence on system efficiency. In other words, customer evaluations improve when technology enhances the hotel's ability to deliver efficient, responsive, and reliable service operations. This confirms system efficiency as a key mechanism translating digital service attributes into customer-perceived value.

Moderating Effect Testing

The moderating effect of Security & Privacy on the relationship between System Efficiency and Perception was found to be not statistically significant:

Table 8. Moderating Effect Analysis

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
SP x SE -> P	0.097	0.100	0.068	1.438	0.151

Source: Data analysis by SmartPLS 4

SE × SP → Perception (β = 0.097, p = 0.151)

Although the coefficient was positive, the p-value exceeded the 0.05 threshold, indicating that Security & Privacy does not significantly strengthen or weaken the influence of System Efficiency on customer perception. This suggests that while security and privacy contribute directly to customer perception, they do not interact with system efficiency to create a compounded effect in the context of hotel digital services.

Overall, the results demonstrate that digital technology utilization positively impacts hotel service operations and customer perception at the Hotels in Central Bangka Regency. Ease of Use, Quality of Technology-Based Services, and Feature Availability significantly enhance system efficiency, which in turn strongly influences customer perception. Security and Privacy provide an additional direct contribution to customer perception, although they

do not significantly moderate the relationship between system efficiency and customer perception. The strong mediation effects highlight the central role of operational efficiency in determining how digital technologies translate into customer value.

4.2. Discussion

The findings of this study offer important insights into how digital technology utilization affects hotel service operations and customer perception in a regional hospitality context. The results indicate that ease of use, technology-based service quality, and feature availability significantly enhance system efficiency, which subsequently plays a central role in shaping customer perception. This demonstrates that digital technologies contribute meaningfully to operational improvements when they are user-friendly, reliable, and aligned with service needs. The strong mediating effect of system efficiency further highlights its importance as the mechanism through which digital tools translate into positive customer experiences. Meanwhile, security and privacy were found to directly influence customer perception, although they did not moderate the relationship between efficiency and perception. These findings reflect the multifaceted nature of digital adoption in regional hotel environments, where variations in digital literacy and infrastructure can influence technology outcomes. Overall, the results emphasize the need to strengthen operational capabilities to ensure that digital transformation efforts produce tangible benefits for customers.

Effects of EU, QT, TF on System Efficiency

The significant influence of ease of use, technology-based service quality, and feature availability on system efficiency suggests that both customers and employees place high value on digital tools that are intuitive, reliable, and sufficiently equipped to support service activities. These results are consistent with established technology acceptance frameworks, which emphasize that perceived ease of use and system quality are key determinants of user effectiveness (Davis, 1989; Venkatesh et al., 2012). In the context of the sampled hotels in Central Bangka Regency, where digital systems are still being integrated, ensuring that users can navigate these tools smoothly is essential for optimizing operational outcomes. The strong impact of service quality highlights the importance of system stability, speed, and accuracy in shaping positive user experiences. Additionally, feature availability supports greater operational versatility, enabling digital tools to facilitate a wider range of service functions. Collectively, these attributes significantly enhance system efficiency, indicating that digital technologies must be both well-designed and fully functional to deliver operational improvements.

Mediating Role of System Efficiency

The results also demonstrate that system efficiency mediates the relationship between digital technology utilization and customer perception. This finding reinforces the view that operational performance is a critical pathway through which digital tools influence customer evaluations. Enhancing customer perception therefore requires not only the availability of digital services but also their ability to improve operational speed, accuracy, and reliability. When digital systems function efficiently, customers encounter smoother transactions and more responsive service, contributing to more favorable perceptions of the hotel. This mediating role aligns with previous research showing that the benefits of digital technologies emerge when they effectively support both back-end operations and customer-facing processes. In the context of the sampled hotels, the mediation effect suggests that digital

investments must be paired with strong operational integration to generate meaningful improvements in customer satisfaction.

Role of Security and Privacy

Security and privacy were found to have a positive and significant direct effect on customer perception, indicating that customers value hotels that safeguard personal data and mitigate digital risks. This finding aligns with prior studies highlighting the increasing importance of data protection in digital service environments (Sharma, 2023). However, security and privacy did not moderate the relationship between system efficiency and customer perception, suggesting that customers view security as an independent evaluative factor rather than one that enhances or diminishes the impact of operational performance. In the context of hotels in Central Bangka Regency, where the adoption of new digital technology is still maturing, customers appear to prioritize the speed, convenience, and reliability of transactions (System Efficiency) as the primary drivers of perceived value, leading to the strong mediation effect. Security is thus considered a basic expectation or "hygiene factor", essential for establishing trust, but not significantly interacting with efficient performance to amplify satisfaction. For the sampled hotels, this implies that while strengthening digital security remains essential for maintaining customer trust, it may not directly amplify the operational benefits perceived by customers.

Theoretical Implications

The findings of this study offer several theoretical contributions. First, they demonstrate that digital technology utilization affects customer perception primarily through operational mechanisms, as indicated by the strong mediating effect of system efficiency. This underscores the need for hospitality digitalization research to consider internal operational processes rather than focusing solely on direct technology-customer relationships. Second, the insignificant moderating effect of security and privacy suggests that these factors operate as independent evaluative dimensions rather than contextual modifiers of operational performance. This adds nuance to existing discussions on how technological attributes interact with service quality perceptions. Third, by examining these relationships in a regional Indonesian hotel, the study expands the literature by providing empirical evidence from a context where digital infrastructure and adoption rates differ from those in metropolitan or international settings. This contributes to a broader understanding of how digital transformation unfolds across diverse hospitality environments. Future research should consider comparative studies in metropolitan areas to validate whether system efficiency maintains its central mediating role across different levels of digital maturity.

Practical and Contextual Implications

Practically, the findings provide several implications for hotel managers in Central Bangka Regency and similar regional settings. First, enhancing customer perception requires prioritizing digital systems that effectively improve operational efficiency-particularly those that are easy to use, feature-complete, and supported by strong automation service quality (Gretzel et al., 2015; Ivanov & Webster, 2019). This calls for continuous investment in system maintenance, employee training, and customer assistance to maximize the benefits of digital tools. Second, although security and privacy do not moderate operational outcomes, their direct effect on customer perception highlights the importance of maintaining transparent and responsible data management practices. Third, the results underscore the need

for a holistic approach to digitalization, where technological adoption is aligned with operational workflows and customer expectations (Lemon & Verhoef, 2016). For the sampled hotels, strengthening internal processes and ensuring consistent system performance will be essential to enhancing both operational excellence and customer satisfaction in the evolving digital hospitality landscape of Central Bangka Regency.

5. Conclusion

This study examined the effect of digital technology utilization on hotel service operations and customer perception in a regional hotel located in Central Bangka Regency, Provinsi Kepulauan Bangka Belitung. The findings show that ease of use, technology-based service quality, and feature availability significantly improve system efficiency, indicating that digital tools generate operational benefits when they are intuitive, reliable, and equipped with appropriate functionalities. System efficiency was also found to strongly influence customer perception, confirming its role as a key mechanism that links digital technology adoption to customer evaluations. Security and privacy contribute positively to customer perception, although they do not moderate the effect of system efficiency, suggesting that customers regard data protection as a basic expectation rather than a factor that strengthens operational outcomes.

The results further indicate that digital transformation in hospitality yields meaningful benefits only when technologies are effectively integrated into operational workflows. Customers evaluate digital services largely based on convenience, responsiveness, and reliability factors that depend on system efficiency. Therefore, the introduction of digital tools must be supported by proper system integration, regular maintenance, and sufficient employee training to ensure optimal performance. The significant mediation effect reinforces that the value of digital technologies emerges primarily through their capacity to streamline internal processes, while the insignificant moderation effect of security and privacy suggests that these factors operate as independent dimensions of customer evaluation.

The study contributes to hospitality literature by demonstrating the central role of system efficiency in shaping customer perception and by integrating multiple digital service attributes ease of use, service quality, and feature availability into a unified model tested within an Indonesian regional hotel context. This provides empirical insight into how digitalization functions in medium-scale hotels beyond major metropolitan areas, addressing a gap in existing research that often focuses on larger or technologically advanced hotel environments. However, the main limitation is that the findings are based on guests from hotels in Central Bangka Regency, which may not fully represent the Indonesian hospitality sector as a whole. In addition, the respondents were mostly young adults (aged 20-30), which may be associated with higher levels of digital literacy compared to older demographic groups.

Practically, the findings suggest that hotels in Central Bangka Regency and similar regions can improve customer perception by prioritizing digital technologies that enhance operational speed, accuracy, and reliability. Hotel managers should ensure that digital tools are user-friendly, consistently maintained, and aligned with core service tasks, while also strengthening employee training to maximize system efficiency. Although security and privacy do not moderate operational effects, they remain essential for maintaining customer trust and must be supported by transparent data management and secure digital infrastructures. Overall, successful digital transformation in regional hotels depends on

strategically aligning technological features with operational capabilities to deliver seamless, efficient, and trustworthy service experiences.

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