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The Effect of AI-Based Hotel Services on Customer Experience and Customer Retention in Five-Star Hotels: The Moderating Role of Perceived Service Quality

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Abstract
Purpose: The study seeks to investigate the influence of AI-Based Hotel Services on Customer Experience and Customer Retention in five-star hotels and to analyze the moderating role of Perceived Service Quality in these relationships.
Methodology: A quantitative research approach with an explanatory research design is adopted. The study is conducted among customers of five-star hotels in the National Capital Region (NCR) of India who have experienced AI-based hotel services. Primary data are collected using a structured questionnaire through purposive sampling. The final analysis is based on "415 valid responses". Statistical analysis is performed using "SPSS, Microsoft Excel, and PROCESS Macro". The techniques employed include "reliability and validity testing, descriptive statistics, regression analysis, and moderation analysis".
Findings: These findings imply that AI-Based Hotel Services have a positive significant effect on Customer Experience and Customer Retention. Moreover, Perceived Service Quality has a significant effect on both relationships, indicating its crucial moderating effect on AI-based hotel services.
Conclusion: The findings indicate that there is a positive relationship between AI-Based Hotel Services, Customer Experience and Customer Retention in five-star hotels. In addition, high levels of Perceived Service Quality strengthen such relationships. The findings illustrate the need to integrate artificial intelligence (AI) technology with service quality to positively influence the customer experience and customer retention of hotels.

Keywords: AI-Based Hotel Services; Customer Experience; Customer Retention; Perceived Service Quality; Five-Star Hotels.

1. Introduction

The adoption of digital transformation in the hospitality sector has emerged as an important source of change for hotels through the adoption of advanced technologies in hotel operations and service delivery. Some of the technologies used in the hospitality sector include Artificial Intelligence (AI), Internet of Things (IoT), cloud computing, mobile applications, and data analytics (Peng et al., 2024). Through the use of these digital technologies, hotels can redesign business operations, provide better customer experiences, innovate and boost organizational performance and competitiveness (Mavitha & Kushe Shekhar, 2025). Increasing expectations of customers, technology advancements and the growing need for efficiency have led to the rapid adoption of digital transformation in the hotel industry, resulting in better service delivery and increased competitiveness (Nikopoulou et al., 2023; Ye & Chen, 2024). As an integral part of this transformation, the use of AI in five-star hotels, such as chatbots, face recognition, voice assistants, and smart rooms, is rapidly expanding to improve operational efficiency and provide a better guest experience (Nam et al., 2021). Furthermore, technologies such as augmented reality have been put into practice to boost employee engagement and training, adding to the innovation and service quality within the luxury hospitality sector (Stankova & Kaleychev, 2023).
Artificial Intelligence (AI) is one of the revolutionary technologies used in the hospitality industry through which hotels can provide efficient and technologically driven services to guests. The use of AI in hotel services

improves the delivery of services through automation of routine operations, interactions with customers and making data-driven decisions (Al-Hyari et al., 2023; Makivić et al., 2024). AI has several advantages in hotel management and customer service. For example, AI enables hotels to provide customized services, respond quickly, optimize resource utilization, and make decisions that maximize customer satisfaction (Makivić et al., 2024). AI-based service encounters also facilitate seamless and contactless interactions, improving service convenience while supporting health, safety, and operational efficiency (Li et al., 2021). Furthermore, AI is responsible for lowering costs, improving service consistency and engaging customers, allowing luxury hotels to gain a competitive advantage. However, proper implementation of artificial intelligence also requires addressing concerns related to data privacy, security, reducing human interaction, and employee's adaption (Al-Hyari et al., 2023).

Customer experience (CE) has emerged as an important aspect in the field of luxury hotels, with offering outstanding service being the key to satisfying guest expectations. With changing expectations in the digital age, hotels are increasingly leveraging advanced technologies to enhance service interactions, improve customer satisfaction, and create long-term value (Makudza, 2021). Positive customer experiences foster trust, satisfaction, and emotional connection, which encourage repeat visits, positive word-of-mouth, and long-term customer retention. AI-enabled services employ businesses to engage with their customers through efficient and personalized interactions, thereby enhancing customer satisfaction and supporting retention strategies (Nguyen et al., 2026). Thus, CR become an essential approach for gaining a sustained competitive advantage because retaining existing customers is less expensive than acquiring new ones. It should be highlighted that CR strategies must continue to enhance consumer experiences through creative service delivery and customer relationship management (Ascarza et al., 2018; Larsson & Broström, 2020).

Perceived service quality (PSQ) plays an important role in shaping customers' evaluations of service performance and influencing their behavioral intentions. It reflects customers' overall assessment of the excellence, reliability, and effectiveness of the services provided, thereby affecting their satisfaction, trust, and loyalty. In technology-enabled service environments, high perceived service quality enhances customers' confidence in using digital services and strengthens their intention to continue using these services (Tian et al., 2023). In addition, PSQ positively affects customer satisfaction and intention to purchase through formation of positive service perception and development of customer relationships (Liao et al., 2022). In relation to the moderating effect, PSQ may enhance the connection between technology innovations and customer performance. Specifically, customers will be highly responsive to the use of artificial intelligence in hotel service if their PSQ is high (Qalati et al., 2021). Thus, PSQ is predicted to have an important impact on customer performance at AI-enabled five-star hotels.

The fast integration of Artificial Intelligence (AI) technology has revolutionized the way services are provided in the hospitality industry, particularly in five-star hotels where AI-driven services are now increasingly applied to improve efficiency and guest experience. However, while such services have been widely adopted, there is a lack of empirical data on how they effect customer experience and retention in luxury hotels. Moreover, existing studies have largely examined AI adoption or customer satisfaction independently, with insufficient attention given to the moderating role of PSQ in strengthening these relationships. The present study investigates the effect of AI-Based Hotel Services on CE and CR, while examining the moderating role of PSQ. It is predicted that the findings of this study will contribute to the literature by expanding knowledge about AI-powered service delivery in the hospitality industry and providing beneficial recommendations to hotel management for implementing customer-oriented AI initiatives.

Excluding the introduction, the remainder of the paper is organized as follows: "Section 2 reviews various authors' perspectives from previous studies; Section 3 delineates the conceptual framework, Section 4 delineates the study's objectives; Section 5 outlines the research methodologies employed; Section 6 analyzes the results and findings; Section 7 articulates the discussion; and Section 8 presents the conclusions, implications, limitations, and recommendations for future research". Ultimately, references are provided.

2. Literature Review

2.1 Theoretical Framework

- **Technology Acceptance Model (TAM)**

"The technology acceptance model (TAM) developed by Davis (1989) explained the determinants of computer acceptance and user behavior. The theory originally believed that TRA (Theory of Reasoned Action) discusses various elements that impact how and when individuals decide to adopt new types of technology when offered. Perceived usefulness refers to the extent to which an individual believes that using technology will enhance performance, while perceived ease of use reflects the degree to which the technology is perceived as effortless to use. These factors shape users' attitudes toward technology, which subsequently influence their behavioral intention and actual usage behavior (Naseri et al., 2023)". TAM offers the theoretical framework that supports

the study of the effect of acceptance of AI-Based Hotel Services on CE and CR in five-star hotels through the customers' acceptance. The model also supports the examination of Perceived Service Quality as a moderating factor that strengthens these relationships.

- **SERVQUAL Theory**

"SERVQUAL Theory was proposed by Parasuraman, Zeithaml, and Berry (1988) to measure customers' perceptions of service quality". This theory proposes that consumers assess service quality through comparison of their expectations prior to service consumption against their perception after service experience. A small difference between expectation and perception implies high PSQ. "The model measures service quality through five dimensions: Tangibles, Reliability, Responsiveness, Assurance, and Empathy" (Shi & Shang, 2020). In the present study, SERVQUAL Theory provides the theoretical foundation for PSQ as the moderating variable. The theory suggests that high PSQ increases the positive influence of AI-Based Hotel Services on Customer Experience and CR in five-star hotels.

2.2Previous Studies

- **Review related to AI-Based Hotel Services in the Hospitality Industry**

The development of AI-based services for hotels is an essential innovation that can be observed in the hospitality industry, which allows hotels to use technologies like service robots, AI-based concierge systems, chatbots, and automatic check-in systems in order to increase their operational efficiency, enhance their quality of service, and improve customer experience. Choi et al. (2020) stated that while human workers are more competent at providing better-quality interactions, the AI system is equally proficient in accomplishing the results of the service, and hence, the AI system should support rather than substitute human workers. Similarly, Mariani and Borghi (2021) discovered that guests who engaged with service robots were more likely to leave positive online evaluations and rate higher, especially if the robots had human-like names. When investigating customer acceptance, Zhong et al. (2021) discovered that the most relevant elements influencing customers' decisions to use AI hotel services are perceived usefulness, attitude, and perceived value. However, Filimonau et al. (2025) demonstrated that the functioning of AI and its successful integration with human service had a greater influence on customer experience over time than the novelty of the service robots. Similarly, Begum et al. (2025) identified and conducted research that revealed performance expectancy and customer attitude were the primary predictors of service robot adoption in hotels. Overall, the studies conclude that AI-based hotel services enhance operational efficiency, customer satisfaction, and service innovation. However, successful implementation depends on balancing AI capabilities with human interaction to deliver superior hospitality experiences.

- **Review related to Customer Experience and Customer Retention in AI-Enabled Hospitality**

The integration of AI-driven technologies has transformed customer experience in the hospitality sector by increasing efficiency, personalization, and operational convenience. AI-powered service robots facilitate successful service delivery by automating processes and personalizing interactions, allowing hotels to make an impression on their customers (Gupta et al., 2022). Hlee et al. (2023) discovered that meaningful engagement of AI-based service robots through functional and affective exchanges improves customer experience. According to this study, positive interactions between customers and robots increase customer satisfaction and foster positive behavioral intentions toward AI-powered hotel services. Furthermore, Suganthi and Jasim (2024) showed that customer experience is a major predictor of consumer revisit intentions in luxury hotels that provide robot-assisted services. While customer emotions may not have a direct impact on revisit intentions, the great experience given by AI-based services encourages customers to return. Although customer emotions alone do not directly influence revisit intention, a positive AI-enabled service experience encourages repeat visits, thereby contributing to CR. Similarly, Han et al. (2025) discovered that innovativeness, confidence in robot performance, and positive attitude toward AI technologies all influence customers' long-term adoption of AI technology in hotels. All of these factors contribute to increased consumer acceptance, which in turn increases CR and usage intentions. Finally, Rana et al. (2025) found that the sustainability of customer experience in hotels using AI technology is defined not only by the novelty of the technology, but also by its functionality, dependability, and integration with human employees. The study emphasizes that balancing AI capabilities with human interaction is essential for improving customer satisfaction, loyalty, and long-term customer retention.

- **Review related to the moderating role of Perceived Service Quality in the relationship between the adoption of AI-Based Hotel Services and Customer Experience**

Perceived service quality is a crucial component that plays an important role in making AI-based hotel services effective in improving customer experience and customer loyalty. The perception of customers about AI services depends on certain components of service quality like reliability, responsiveness, accuracy, and performance. Nguyen et al. (2022) identified the significant contribution of AI quality dimensions such as information accuracy, flexibility of the system, speed, and reliability in creating a better customer experience

and brand relationship. Similarly, Tung and Au (2018) identified that AI hotel robots help in improving customer experience by providing personal and effective service delivery due to their reliability and value. Weimann and Schönlein (2026) illustrated that the quality of digital services has a positive effect on the quality of service, customer experience, and customers' recommendation intentions. Similarly, Sandunima (2026) discovered that the quality of service has a positive effect on experiential value, customer satisfaction, and customer loyalty in artificial intelligence-based service settings.

Furthermore, Zhou et al. (2026) illustrated that the quality of service has a positive impact on customer experience and intention to revisit through improved service interactions. Similarly, Solanas et al. (2026) identified service competence, trust, reliability, and human–robot interaction as key determinants of successful AI implementation. Overall, the literature indicates that PSQ strengthens the positive effect of AI-based hotel services on customer experience and customer retention, thereby acting as an important moderating variable in AI-enabled hospitality.

- **Research Gap**

Existing studies have shown that AI-enabled hotel services increase efficiency, customer satisfaction, and innovations in the services provided by using technology like service robots, chatbots, and AI-driven concierge services (Choi et al., 2020; Mariani & Borghi, 2021; Zhong et al., 2021; Rana et al., 2025; Begum et al., 2025). "Moreover, earlier studies have proved that services using artificial intelligence have a positive effect on customer experience and foster customer retention through higher levels of satisfaction and intentions to revisit (Gupta et al., 2022; Hlee et al., 2023; Suganthi & Jasim, 2024; Han et al., 2025). Although PSQ has been recognized as an important factor influencing AI-enabled service outcomes (Nguyen et al., 2022; Weimann & Schönlein, 2026; Li et al., 2026; Zhou et al., 2026; Solanas et al., 2026), limited studies have examined its moderating role in the relationship between AI-based hotel services and customer experience". Furthermore, very limited studies have been conducted on the relationships between AI-based hotel services and customer experience with respect to five-star hotels. Therefore, this study addresses these gaps by examining the effect of AI-based hotel services on customer experience and customer retention while investigating the moderating role of PSQ.

H1 "The adoption of AI-Based Hotel Services has a significant effect on Customer Experience in five-star hotels".
H2 "The adoption of AI-Based Hotel Services has a significant effect on Customer Retention in five-star hotels".
H3 "Perceived Service Quality significantly moderates the relationship between the adoption of AI-Based Hotel Services and Customer Experience in five-star hotels".
H4 "Perceived Service Quality significantly moderates the relationship between the adoption of AI-Based Hotel Services and Customer Retention in five-star hotels".

3. Conceptual Framework

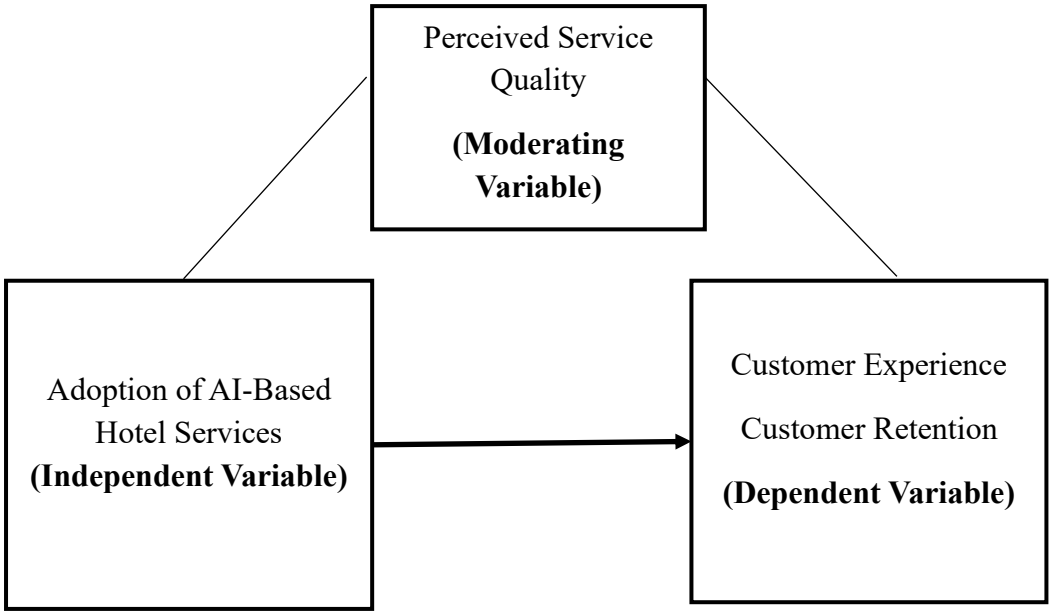

Figure 1: Conceptual Framework
(Source: Self-prepared By Researcher)

A conceptual framework (Figure 1) "provides a visual and theoretical representation of the relationships among the key variables of a study (Leshem & Trafford, 2007). It helps explain how the independent variable influences the dependent variable, either directly or through an intervening factor. In the present study, Adoption of AI-Based Hotel Services serves as the independent variable, while Customer Experience and Customer Retention are the dependent variables. Perceived Service Quality acts as a moderating variable, influencing the relationship between Adoption of AI-Based Hotel Services, Customer Experience and Customer Retention".

4. Research Objectives

Obj1 To examine the effect of the adoption of AI-Based Hotel Services on Customer Experience in five-star hotels.

Obj2 To examine the effect of the adoption of AI-Based Hotel Services on Customer Retention in five-star hotels.

Obj3 To examine the moderating role of Perceived Service Quality in the relationship between the adoption of AI-Based Hotel Services and Customer Experience.

Obj4 To examine the moderating role of Perceived Service Quality in the relationship between the adoption of AI-Based Hotel Services and Customer Retention.

5. Research Methodology

5.1Research Approach and Design

This study adopts a "quantitative research approach using an explanatory research design" to examine the effect of AI-Based Hotel Services on Customer Experience and Customer Retention in five-star hotels, while investigating the moderating role of Perceived Service Quality. A quantitative approach is appropriate because the study aims to test the hypotheses and examine the relationships among the variables.

5.2Data Collection

Primary data collection is employed in the study. The primary data is gathered by developing a self-structured questionnaire from customers who have stayed in five-star hotels and have experienced AI-based services such as smart room technologies, automated check-in/check-out systems, and personalized recommendations.

5.3Study Area

The study is conducted in the "National Capital Region (NCR)" of India. NCR of India has a high concentration of nationally and internationally recognized five-star hotels, including luxury hotel chains that have extensively adopted AI-based services such as AI-powered chatbots, self-service check-in/check-out systems, robotic concierge services, smart room technologies, and personalized digital guest services. The region attracts both domestic and international business and leisure travelers, making it an appropriate setting to examine the effect of AI-based hotel services on customer experience and customer retention, as well as the moderating role of perceived service quality.

5.4Population and Sampling

The target population comprises of customers who have stayed in five-star hotels and have experienced AI-based services such as smart room technologies, automated check-in/check-out systems, and personalized recommendation systems. "A purposive sampling technique is employed to select respondents who have directly interacted with AI-based hotel services during their stay. The minimum required sample size is 385 respondents, determined using the Cochran (1977) sample size formula. To account for incomplete and unusable responses, 500 questionnaires are distributed among customers. After data screening, 415 valid questionnaires are retained for analysis. The final sample size of the study is 415 respondents".

5.5Validity and Reliability Testing

A pilot study is "conducted on 25% of the respondents, which is 104 of the final sample size, to assess the reliability and validity of the measurement tool. A construct is considered reliable when Cronbach's Alpha and KMO are ≥ 0.70".

5.6Tools and Techniques

The study employs "SPSS, Microsoft Excel, and PROCESS macro" for data processing and analysis. Data analysis techniques employ quantitative techniques such as "regression analysis and mediation analysis to determine the variability of responses". These tools and techniques are provided for strict statistical evaluation and extensive regulatory evaluation.

5.7Ethical Considerations

All ethical considerations will be addressed throughout the course of the research. Participants receive adequate briefings on the aims and methods of the study, after which they give their informed consent before participating in the study. Participants choose whether they want to be involved in the research; they have the right to quit the study at any time without suffering any repercussions. The privacy of the participants is guaranteed while also maintaining their anonymity. Considering the highly sensitive nature of the topic being

discussed here, all due care is taken to ensure that no one experiences any emotional stress (Kaewkungwal & Adams, 2019).

6. Results

This section presents the findings and interpretations derived from data analysis. The results have been organized according to the demographic characteristics of the respondents, the study objectives, and the hypotheses. Each hypothesis is supported by corresponding statistical evidence, which displays results in tables that researchers explain in detailed interpretations. The use of tables improves understanding of the content, whereas the narrative description shows how important the study results are to the research findings.

6.1Reliability and Validity Testing

Table 1: Reliability and Validity Test Table

Constructs	Kaiser-Meyer-Olkin	Cronbach's Alpha	Significance Value
Adoption of AI-Based Hotel Services	0.881	0.850	0.000
Perceived Service Quality	0.900	0.889	0.000
Customer Experience	0.881	0.887	0.000
Customer Retention	0.814	0.796	0.000

Table 1 displays the "results of the KMO, Cronbach's Alpha, and tests. Based on these results, it can be stated that all constructs have adequate sampling adequacy and reliability. Adoption of AI-Based Hotel Services (KMO = 0.881, α = 0.850), Perceived Service Quality (KMO = 0.900, α = 0.889), Customer Experience (KMO = 0.881, α = 0.887), and Customer Retention (KMO = 0.814, α = 0.796) all exceed the recommended thresholds of 0.60 for KMO and 0.70 for Cronbach's Alpha. Furthermore, the significant value of all constructs is 0.000 ($p < 0.001$)". These findings demonstrate that the data is appropriate for analysis. Overall, these findings indicate that the scales generated are reliable and valid, providing a strong foundation for subsequent analyses.

6.2Results Based on the Demographic Profile

Table 1: Demographic Characteristics of the Respondents

Sr. No.	Demographic characteristics	Category	N	%
1.	Gender	Male	221	53.3%
		Female	194	46.7%
2.	Age	Below 25 years	89	21.4%
		25–34 years	154	37.1%
		35–44 years	110	26.5%
		45 years and above	62	14.9%
3.	Educational Qualification	Secondary	61	14.7%
		Higher Secondary	82	19.8%
		Graduate	153	36.9%
		Postgraduate	94	22.7%
		Doctorate	25	6.0%
4.	Occupation	Private Employee	181	43.6%
		Government Employee	76	18.3%
		Business Owner	92	22.2%
		Self-employed	66	15.9%
5.	Monthly Income	Below ₹50,000	176	42.4%
		₹50,001–₹75,000	118	28.4%
		₹75,001–₹100,000	74	17.8%
		Above ₹100,000	47	11.3%
6.	Marital Status	Married	252	60.7%
		Unmarried	163	39.3%

Table 2 presents the demographic profile of "the 415 respondents included in the study. Among these, 53.3% (221) are male, and 46.7% (194) are female. The majority of respondents (37.1%, n = 154) are between the ages of 25–34 years, followed by 35–44 years (26.5%, n = 110). In terms of education, the majority of respondents (36.9%, n = 153) are graduates, followed by postgraduates (22.7%, n = 94). Based on occupation, the majority (43.6%, n = 181) are private employees, with 22.2% (n = 92) constituting business owners. The majority of respondents (42.4%, n = 176) have a monthly income below ₹50,000, while 28.4% (n = 118) have an income between ₹50,001 and ₹75,000". Furthermore, 60.7% (n = 252) of respondents are married, while 39.3% (n = 163) are unmarried. Overall, the demographic profile indicates that the sample comprised respondents from diverse backgrounds, making it appropriate for examining the effects of AI-based hotel services on customer experience and customer retention.

6.3Results Based on Hypothesis

H1: The adoption of AI-Based Hotel Services has a significant effect on Customer Experience in five-star hotels.

Table 3: Regression Table

Model	Sum of Squares	df	Mean Square	F	R	R-Square	Adjusted R-Square	Standardized Coefficient Beta	t	Significance Value
Regression	9987.53	1	9987.53	200.471	0.572	0.327	0.325			.000
Residual	20575.78	413	49.820							
(Constant)									5.623	.000
Adoption of AI-Based Hotel Services								0.572	14.159	.000
Dependent Variable: Customer Experience										
Predictors: A**doption of AI-Based Hotel Services**										

Table 3 demonstrates that the regression model is statistically significant ($F = 200.471$, $p < 0.001$), indicating that it accurately identifies the link between the variables. The correlation value ($R = 0.572$) indicates that there is a moderately positive association between the use of AI-based hotel services and customer experience. The "coefficient of determination ($R^2 = 0.327$) indicates that the adoption of AI-Based Hotel Services accounts for 32.7% of the variance in Customer Experience, while the remaining 67.3% is attributed to non-model factors". Additionally, the improved R^2 (0.325) verifies the model's robustness and explanatory capabilities. The "standardized regression coefficient ($\beta = 0.572$) is positive and statistically significant ($t = 14.159$, $p < 0.001$), indicating that implementing AI-based hotel services has a considerable positive impact on customer experience". In particular, the usage of AI-based hotel services improves consumer experience. Hence, the hypothesis (H1) is accepted.

H2: The adoption of AI-Based Hotel Services has a significant effect on Customer Retention in five-star hotels.

Table 4: Regression Table

Model	Sum of Squares	Df	Mean Square	F	R	R-Square	Adjusted R-Square	Standardized Coefficient Beta	t	Significance Value
Regression	5209.619	1	5209.619	203.321	0.574	0.330	0.328			.000

Residual	10582.140	413	25.623							.000
(Constant)									11.268	.000
Adoption of AI-Based Hotel Services								0.574	14.259	.000
Dependent Variable: Customer Retention										
Predictors: (Constant), Adoption of AI-Based Hotel Services										

Table 4 represents the impact of adopting AI-based hotel services on customer retention. The regression model is statistically significant (F = 203.321, p < 0.001), indicating its validity in explaining the relationship between the variables. The "Correlation Coefficient (R = 0.574) reveals a moderately good association between the use of AI-based hotel services and customer retention. According to the coefficient of determination (R^2 = 0.330), the adoption of AI-based hotel services accounts for 33.0% of the variation in customer retention, whereas other factors (67.0%) are unaccounted for by the regression model". The regression model is robust and accurate, as evidenced by the corrected R^2 value of 0.328. Furthermore, the "Standardized Regression Coefficient (β = 0.574) is positive and statistically significant (t = 14.259, p < 0.001), indicating a favorable influence of AI-Based Hotel Services on customer retention". Hence, the hypothesis (H2) is accepted.

H3: Perceived Service Quality significantly moderates the relationship between the adoption of AI-Based Hotel Services and Customer Experience in five-star hotels.

Table 5: Moderation Analysis Table

Predictor	**β**	**SE (HC3)**	**t**	**p**
Constant	6.446	1.838	3.507	0.000
Adoption of AI-Based Hotel Services (AAHS)	0.245	0.061	4.016	0.000
Perceived Service Quality (PSQ)	0.388	0.134	2.890	0.004
AAHS × PSQ	0.016	0.005	3.20	0.001
R= 0.745, R^2= 0.555, ΔR^2 (Interaction)= 0.007				

Table 5 indicates that "the overall model is significant (R = 0.745, R^2 = 0.555). This means that AAHS, PSQ, and the interaction can explain 55.5% of the total variation in CE. The results show that AAHS has a significant beneficial effect on customer experience (β = 0.245, p < 0.001). Thus, expanding AAHS has a beneficial impact on CE since using AI-based hotel services improves customer experience. PSQ improves customer experience (β = 0.388, p = 0.004). Customers who perceive superior service quality are more satisfied with their experiences. Furthermore, the interaction between AAHS and PSQ is positive and significant (β = 0.016, p = 0.001)". Hence, H3 is supported, indicating that hotels can improve customer experience more effectively by combining AI-based services with high service quality.

H4: **Perceived Service Quality significantly moderates the relationship between the adoption of AI-Based Hotel Services and Customer Retention in five-star hotels.**

Table 5: Moderation Analysis Table

Predictor	**β**	**SE (HC3)**	**t**	**p**
Constant	1.052	1.601	0.657	0.000
Adoption of AI-Based Hotel Services (AAHS)	0.465	0.083	5.619	0.000

Perceived Service Quality (PSQ)	0.765	0.086	8.905	0.000
AAHS × PSQ	0.013	0.004	3.309	0.001
$R = 0.726$, $R^2 = 0.527$, ΔR^2 (Interaction) = 0.009				

Table 6 depicts the moderation analysis in which the role of PSQ is investigated in relation to its moderating effect on the association between Adoption of AI-Based Hotel Services (AAHS) and CR. "Adopting AI-based hotel services leads to significantly higher customer retention ($\beta = 0.465$, $t = 5.619$, $p < 0.001$). Customers who perceive great service quality are more likely to remain loyal ($\beta = 0.765$, $t = 8.905$, $p < 0.001$). Furthermore, the interaction impact between AAHS and PSQ is highly positive ($\beta = 0.013$, $t = 3.309$, $p = 0.001$), indicating that perceived service quality enhances the influence of AI-based hotel services on customer retention. The analysis explains 52.7% of the variance in customer retention ($R^2 = 0.527$), with the interaction accounting for 0.9% ($\Delta R^2 = 0.009$)". Thus, the hypothesis (H4) is accepted.

7. Discussion

The findings of the present study indicate that the integration of AI-driven hotel services significantly enhances customer experience and retention in five-star hotels, while the influence of AI is further shaped by perceived service quality. These findings align with the growing literature on artificial intelligence as a crucial factor for enhancing service delivery, operational efficiency, and customer relationship management in the hospitality sector. The findings correspond with the claims made by Nam et al. (2021), who observed that artificial intelligence instruments such as service robots, intelligent automation, and virtual assistants enhance service efficiency and provide benefits to both customers and hospitality enterprises. Furthermore, Li et al. (2021) asserted that AI-driven service interactions enhance customer experiences by providing immediate, personalized and standardized services.

The findings are also consistent with TAM, which suggested that users are more likely to accept AI-based hotel services if they find these services beneficial and easy to use (Naseri et al., 2023). Similarly, the SERVQUAL model shows that the importance of such service quality characteristics as reliability, responsiveness, assurance, empathy and tangibles remains important in determining the level of customer satisfaction and loyalty. This indicates that the performance of standard AI technologies depends on both their technical performance and the quality of their service (Shi & Shang, 2020).

The positive effect of AI-based services for hotels on CE and CR is consistent with the findings of Nguyen et al. (2022), who stated that high-quality AI services have a positive impact on customer experience and help to develop relationships between customers and brands. Similarly, Mariani and Borghi (2021) found that customers have a positive perception of AI-powered hospitality services when these technologies are utilized to improve the efficiency and reliability of services. Furthermore, the present study indicates the impact of the perception of service quality on the effectiveness of AI services in hotels. This finding is supported by Liao et al. (2022), who concluded that service quality perception remains an essential factor for consumer intentions and enhances the effectiveness of technology-enabled services. Similarly, Qalati et al. (2021) argued that superior service quality strengthens customer trust and purchase intentions, even in technology-driven service environments. These studies reinforce the importance of maintaining high service standards alongside digital transformation initiatives.

The findings for moderation also indicate that perceived service quality strengthens the association between AI adoption, customer experience, and customer retention. This finding suggests that while customers appreciate AI-enabled services, exceptional service quality may reduce their dependence on AI technologies when making repeat visitation decisions. Such findings are consistent with Zhong et al. (2021), who found that the acceptability of service robots by customers is based on both technological characteristics and service quality. In addition, Nikopoulou et al. (2023) emphasized that successful digital transformation in hospitality requires integrating advanced technologies with superior service quality and organizational capabilities rather than relying solely on technological adoption.

Overall, the use of artificial intelligence technology plays a significant role in assuring customer experience and retention. However, their effectiveness is maximized when they complement high-quality service delivery. This implies that hotel managers need to consider adopting a comprehensive strategy that integrates the use of AI technology with the delivery of great service quality to achieve sustainable competitive advantage.

8. Conclusion

In conclusion, the present research confirms that the application of AI-based services in the hospitality industry can significantly improve customer experience and customer retention in five-star hotels. Furthermore, the

findings of the current study confirm the "growing significance of artificial intelligence in improving the service delivery process. Moreover, perceived service quality has a substantial moderating effect on the relationship between AI implementation, customer experience and customer retention". However, there are certain limitations in the present study. First, "the study sample is limited to customers of five-star hotels and is based on an explanatory research design with self-reporting data. Second, the study solely addresses the moderating influence of perceived service quality and does not consider other factors that may affect customer satisfaction with AI-based hotel services".

Future studies may extend the suggested conceptual framework by examining different types of hotels, different geographical and cultural contexts, as well as applying longitudinal research methodologies to investigate changes in customer perceptions over time. Future researchers may also consider adding additional relevant variables such as consumer trust, value perception, technology readiness, customer engagement, intelligence perception and privacy concerns to gain a deeper understanding of AI utilization in the hospitality business. Based on the above findings of the study, it is recommended that "hotel managers should invest in AI-based technologies such as smart check-in, service robots, AI chatbots and virtual concierge services and also provide high quality service through personal interaction, staff training and continual improvements in service delivery". Such an integrated approach will enable hospitality organizations to maximize customer experience, improve customer retention, and achieve sustainable competitive advantage in an increasingly technology-driven business environment.

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