

Evaluation of the Role of Artificial Intelligence on Customer Satisfaction as a Competitive Advantage in the Hospitality Industry in the United States

Muntathir Abufawr*, Ashraf Alawami, Meshari Attar, Ahmad Ghazi Obaid, Majed Alharbi, Mohammed Alawami, Hashimyah Alawami, Boudjedra Baha Eddine, Boudjedra Mohammed Lamine, Haidar Alzoori, Sajjad Abosaif, Ghassan Bahir, Hassan Alfahke

Business Department, Virginia Tech University, Blacksburg, Virginia, USA

Email: *muntathiralis.abufawr@wmich.edu

How to cite this paper: Abufawr, M., Alawami, A., Attar, M., Obaid, A. G., Alharbi, M., Alawami, M., Alawami, H., Eddine, B. B., Lamine, B. M., Alzoori, H., Abosaif, S., Bahir, G., & Alfahke, H. (2024). Evaluation of the Role of Artificial Intelligence on Customer Satisfaction as a Competitive Advantage in the Hospitality Industry in the United States. *Technology and Investment*, 15, 135-144.

<https://doi.org/10.4236/ti.2024.153008>

Received: April 27, 2024

Accepted: July 6, 2024

Published: July 9, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The hotel sector is experiencing a radical change due to technology interaction in the service responsibilities. Due to this transformation, the pattern of service delivery according to human interaction changed to digital interaction such as artificial intelligence (AI). It brings out the opportunity for players in the hotel sector to consolidate their competitive advantage. Understanding how artificial intelligence impacts guest satisfaction in the attainment of competitive advantage in the hotel sector guides the business on how it would carry out its operations to ensure maximum satisfaction among the guests. The aim of the paper is to examine the artificial intelligence on customer satisfaction as a competitive advantage in the hospitality industry in the US. The study used a qualitative approach to collect information from 60 students from the Virginia Technical University who had visited the following luxury hotels: The Westin Georgetown, Washington D.C., Canopy by Hilton, Washington D.C., and InterContinental, Washington D.C.—The Wharf an IHG Hotel. From the study results, it was found that there is a positive significant relation between AI technologies (virtual reality, in-person customer experiences, business intelligence tools powered by machine learning, and chatbots and messaging tools) and customer satisfaction (customer patronage, expectations, perceived value, and perceived quality of the service). Businesses in the hotel industry can use AI to enhance guest experience and escalate their satisfaction and loyalty to the hotel making it to remain highly competitive in the sector.

Keywords

Artificial Intelligence, Competitive Advantage, Customer Satisfaction, US, Hotel Industry

1. Introduction

In the current digital age, technology has become a crucial component of our lives and the hospitality sector is no exception (Nozawa et al., 2022). Hotels are constantly looking for avenues to improve customer experience and improve satisfaction. Technology has proven to be a valuable tool in attaining these objectives. From the instance the customer checks in a hotel to the point they leave, there are instances where they interact with technology. According to Jabeen et al. (2022), the luxury hotels use technology in order to streamline hotel operations, personalize customer experience, and offer a seamless experience that supersedes customer expectations.

The use of AI in the hotel and tourism sector is still at their infancy stages. However, there are various examples of hotels in the US that have adopted these technologies successfully. Researchers have identified various concerns among guests about the implementation of AI in the hospitality sector including job displacement, loss of human interaction, and data privacy issues (Nozawa et al., 2022; Roy et al., 2020). In spite of these concerns, hotels continue to adopt the use of AI in their operations.

In the US, the hotel sector has been affected by these advancements in AI technology. AI is changing the operational functions of the tourist destinations and organizations. The AI systems encourage personalization, conversational systems (voice assistants and chatbots), smart travel systems, and smart destination systems (Dwivedi et al., 2023). The US hotel industry has adopted the use of technology in order to increase the guest experience.

With increased adoption of technology in hotel operations, companies can take this opportunity to consolidate their competitive advantage by adoption of AI. Understanding gap still exists in its practical implementation. Excluding the studies by Grundner and Neuhofer (2021) and Saydam et al. (2022), who studied tourism destinations and hospitality respectively, few studies explain how AI can affect certain sectors or business functions. This entails that there is inadequate empirical backing for the relationship between the use of artificial intelligence in improving customer satisfaction as a way of gaining competitiveness in hotel performance in the US, even though artificial intelligence techniques are popularly implemented by hotels around the world. Therefore, there is a need for empirical studies to statistically demonstrate the extent to which the application of artificial intelligence to increase guest satisfaction to gain competitive advantage in luxury hotels in the US. It is against this backdrop that the research study carried out to establish the effects of:

- 1) Virtual assistant/reality on customer satisfaction to gain competitive advantage on the US hotel sector.
- 2) Chat box and messaging tools on customer satisfaction.
- 3) Personalized experience on customer satisfaction to gain competitive advantage on the US hotel sector.
- 4) Business intelligence tools powered by machine learning (digital concierges, customer loyalty systems, voice-based digital assistance, and AI sentiment analysis) on customer satisfaction to gain competitive advantage on the US hotel sector.

Conceptual Framework

The study examined the role of AI on customer satisfaction as a competitive advantage in the hospitality industry in the US. Its specific aim was to determine the effect of the independent variables (artificial intelligence and competitive advantage) on the dependent variable (guest satisfaction). To that end, the independent variable (AI) was decomposed into following specific indicators: virtual reality, in-person customer experiences, and business intelligence tools powered by machine learning, and chatbots and messaging tools; whereas, the indicators of the dependent variable (customer satisfaction) included: customer patronage, expectations, perceived value, and perceived quality of the service.

Informed by existing empirical research work, this study hypothesized that through these specific indicators, guest satisfaction has some form of associations with the performance of hotels due to satisfied customers. Consequently, a conceptual model has been developed to visually portray the relationship between AI techniques and customer satisfaction in the hotel industry as hypothesized in the study as shown in **Figure 1** below.

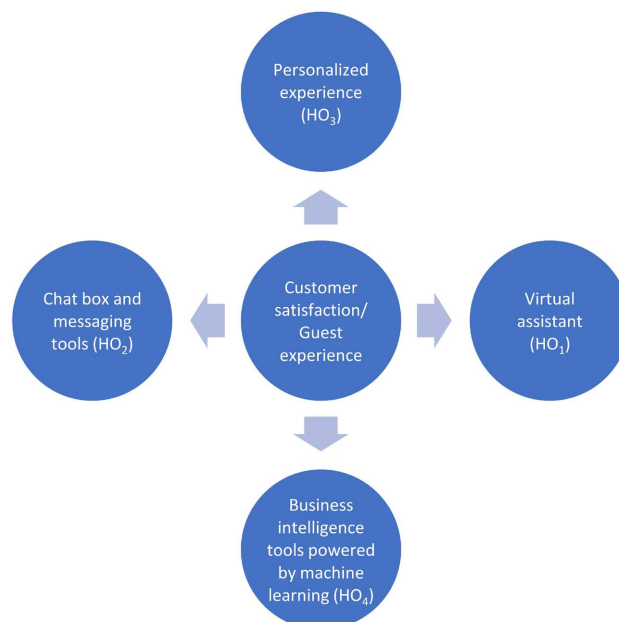


Figure 1. Conceptual model of the study, which is adapted from Al-Qeedaa (2019).

2. Materials and Methods

For this study, a descriptive research design was adopted as it appeared to be most suitable for collecting primary data. The study used a judgmental sampling method to include 60 student customers in Virginia Tech hotels in the Washington Metropolis into the sampling frame. The hotels included The Westin Georgetown, Washington D.C., Canopy by Hilton, Washington D.C., and InterContinental, Washington D.C.—The Wharf an IHG Hotel. The primary data was collected from student hotel customers with the aid of a five-point Likert scale questionnaire. The instrument consisted of two distinct sections, namely: Section A (which elicited respondents' demographic information such as age, gender and educational level) and Section B (contained statements drawn from the study variables: guest satisfaction and artificial intelligence). Statements 1 - 5 measured artificial intelligence (virtual reality, in-person customer experiences, and business intelligence tools powered by machine learning, and chatbots and messaging tools); whereas, the statements 4 - 19 that measured guest satisfaction (customer patronage, expectations, perceived value, and perceived quality of the service as well as customer retention). The Likert scales adopted included the following: Strongly Agree (5 points); Agree (4 points); Neither (3 points); Disagree (2 points); and Strongly Disagree (1 point). Content validity was adopted to validate the instrument, while it was checked for internal consistency and confirmed using Cronbach's alpha coefficients. As a result, all measurement scales on the questionnaire recorded the Cronbach's alpha coefficients of 0.7 and above (Table 1), thus showing that the instrument was reliable. As a consequence, the data collected in the study was analyzed using descriptive statistics and Person's Correlation whereas the study hypotheses were tested with the assistance of the IBM SPSS 23.

Table 1. Cronbach's alpha.

Variables	Number of items	Cronbach's alpha
Virtual assistant	3	0.712
Personalized experience	3	0.818
Chatbox and messaging tools	4	0.752
Business intelligence tools powered by machine learning	4	0.771
	14	0.804

3. Results

The study examined the relationship between AI technologies as an innovation to gain competitive advantage and consumer satisfaction within the hotel sector in the US. It was found that the majority of the respondents 38 were male (63%) with remaining 22 (37%) being female as shown in Figure 2 below.

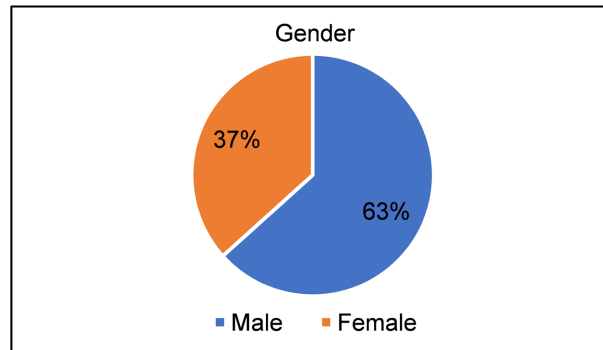


Figure 2. Gender.

The mean age of the participants was 22 years. Besides, most of the study participants (67%) were aged between 19 and 23 years. The rest comprised 33% of the total population as shown in **Table 2**.

Table 2. Age of respondents.

Age	Percentage	Frequency (f)	Mid-point (x)	Mid-point * frequency (fx)
15 - 18	8%	5	16.5	82.5
19 - 23	67%	40	21	840
24 - 27	17%	10	25.5	255
28 - 31	5%	3	29.5	88.5
32 - 35	3%	2	33.5	71.0
Totals		60		1337
Mean				1337/60 = 22.28

Based on the above correlation analysis results in **Table 3**, there is a positive correlation ($r = 0.103$) between use of AI and customer satisfaction. In the same way, there is a significant relationship (<0.042) between the use of artificial intelligence technologies and customer satisfaction in the US hotel sector.

Table 3. Correlation between AI and guest satisfaction.

		Correlations	
		AI	Guest satisfaction
AI	Pearson Correlation	1	0.103
	Sig. (2-tailed)		0.043
	N	60	60
Guest satisfaction	Pearson Correlation	0.103	1
	Sig. (2-tailed)	0.043	
	N	60	60

Table 4. Correlation analysis between guest satisfaction and AI technologies (virtual assistant, business intelligence tools powered by machine learning, personalized experience and chatbox).

		Correlations				
		Guest satisfaction	Chatbots	Personal experience	Business intelligence tools	Virtual assistant
Guest satisfaction	Pearson Correlation	1	0.239	0.170	0.100	0.011
	Sig. (2-tailed)		0.036	0.009	0.044	0.032
	N	60	60	60	60	60
Chat bots	Pearson Correlation	0.239	1	0.114	0.111	0.104
	Sig. (2-tailed)	0.036		0.038	0.040	0.043
	N	60	60	60	60	60
Personal experience	Pearson Correlation	0.170	0.114	1	0.217	0.106
	Sig. (2-tailed)	0.009	0.038		0.021	0.024
	N	60	60	60	60	60
Business intelligence tools	Pearson Correlation	0.100	0.111	0.217	1	0.050
	Sig. (2-tailed)	0.044	0.040	0.046		0.053
	N	60	60	60	60	60
Virtual assistant	Pearson Correlation	0.011	0.104	0.106	0.050	1
	Sig. (2-tailed)	0.032	0.043	0.042	0.003	
	N	60	60	60	60	60

From **Table 4**, it can be seen that there is a positive significant relationship between the use of chatbots and messaging tools, virtual assistant, business intelligence tools powered by machine learning, and personalized experience and customer satisfaction levels.

To what extent do respondents agree to the following statements:

Table 5. Agreement statements.

	SD	D	N	A	SA
The use of chat box and messaging tools improves guest satisfaction within hotels	0	3	5	25	10
The use of virtual assistants facilitates better customer satisfaction	2	1	6	12	39
Personalized customer experience enhances guest satisfaction within hotels	2	5	6	24	23

Continued

The business intelligence tools powered by machine learning improve customer satisfaction within hotels as a competitive advantage innovation	1	2	3	30	25
The use of AI in hotels helps them to gain competitive advantage; the AI innovation is major driver in building the hotel's industry competitive advantage	0	5	5	30	20
The AI technologies have a positive effect on hotel operations	1	1	7	21	30
The use of AI technologies can improve service quality and operational efficiency to meet the guest expectations in both price and quality making them satisfied	1	0	1	24	34
The AI improves host-guest relationship leading to the hotel facility gaining competitive advantage					
The AI technologies is a disruptive technology that affects customer experience	26	13	8	7	6
Artificial intelligence and human intelligence complement best as collaborative teams for a hotel to gain competitive advantage	3	6	10	29	11

4. Discussion

The data presentation strategies included measures of central tendency and parametric testing such as Pearson correlation. Based on the study outcomes, AI plays an important part in enhancing customer satisfaction as a way for the organization to gain a competitive advantage in the sector. Learners aged more than 15 years have the ability to use devices that use AI. Based on the study, the majority (67%) were aged between 19 and 22 years. These groups of people are more likely to have visited luxury hotel facilities. The sector can focus on this customer segment because they are conversant with using the AI technologies.

Based on the correlation analysis results in **Table 3**, there is a positive correlation ($r = 0.103$) between use of AI and customer satisfaction. It implies that with the increased use of AI technologies, there was a proportionate increase in the levels of customer satisfaction. Similarly, the study is backed by the study of **Pizam et al. (2022)**, which revealed that AI technologies are increasingly crucial for hotel management, enabling hotels to improve guest experience and enhance operational efficiency. The adoption of AI enables the hotel to remain competitive in the market. Through artificial intelligence, businesses in the hospitality and tourism sector can provide round-the-clock assistance to customers, addressing their needs and even suggesting personalized recommendations. This finding implies that the study has generated significant empirical evidence that

confirms the capacity of AI to significantly enhance guest satisfaction in the hotel sector.

The majority of the respondents strongly agreed that the use of chat box and messaging tools improves guest satisfaction within hotels as shown in **Table 5**. Use of chatbots leads to improved guest experience because there is a significant positive correlation (<0.036 , $r = 0.239$) between chatbot and messaging tools and customer satisfaction (**Table 4**). AI-powered chatbots may give faster and more accurate responses to guests' questions, providing them with more effective and tailored communication. This outcome is supported by the study by *Al-Hayri et al. (2023)*, which found that chatbots have a greater influence on customer satisfaction. Chatbots can be used to handle the customer inquiries, requests and complaints. They are increasingly being used to complete automated tasks such as check-ins and check-outs. The customers can use the chatbots to order food, ask questions, request additional amenities, receive assistance from hotel workers, and book reservations as well as receive recommendations for local activities and attractions. These play a crucial part in improving the overall guest experience.

Furthermore, the test of hypothesis revealed that there is a positive correlation (<0.170 , $r = 0.009$) between guest satisfaction and personalized experiences. There was a significant relationship between using AI for personalized user experience and guest satisfaction (**Table 4**). A huge percentage of the study subjects strongly agreed that personalized customer experience enhances guest satisfaction within hotels. AI systems can evaluate customer information to anticipate their preferences and deliver personalized services accordingly. *Citak et al. (2021)* reported respondents had a positive perception of in-person customer services provided by AI, which agrees with our study results.

Most of the study participants strongly agreed that the business intelligence tools powered by machine learning improve customer satisfaction within hotels as a competitive advantage innovation. The study further revealed that there is a significant positive correlation (<0.044 , $r = 0.100$) between guest satisfaction and business intelligence tools powered by machine learning (**Table 4**). This implies that as a popular growth strategy, the use of business intelligence tools has been confirmed through substantive empirical evidence to significantly enhance the guest satisfaction levels of hotels. The study outcomes are supported by *Citak et al. (2021)* who reported that the customers had a positive attitude about the business intelligence tools improving the guest satisfaction. The study outcomes agree with what *Wu et al. (2023)* found. They reported that robots, artificial intelligence, and service automation increased customer satisfaction.

There is a significant positive correlation (<0.032 , $r = 0.011$) between customer satisfaction and the use of virtual assistant in the hotel environment (**Table 4**). The majority of study participants strongly agreed that the use of virtual assistants facilitates better customer satisfaction (**Table 5**). This outcome is reinforced by the study results by *Al-Hayri et al. (2023)* who found that virtual assistants have a greater influence on guest satisfaction in the selected five start hotels

in Amman, Jordan.

It was found that the use of AI technologies rekindles consumer demand and helps the hotel firm regain a competitive edge in the competitive hospitality industry. The study that the majority of the participants strongly agreed that the use of AI in hotels helps them to gain a competitive advantage; the AI innovation is a major driver in building the hotel's industry competitive advantage, the AI technologies have a positive effect on hotel operations, use of AI technologies can improve service quality and operational efficiency to meet the guest expectations in both price and quality making them satisfied, AI and human intelligence complement best as collaborative teams for a hotel to gain competitive advantage and AI improves host-guest relationship leading to the hotel facility gaining competitive advantage. However, they strongly disagreed that AI technology is a disruptive technology that affects customer experience. The least who agreed that AI is a disrupted technology cited it causing job displacement and reducing the human interaction, which is key in the hospitality sector. This is reinforced by [Buhalis et al. \(2019\)](#), which found job displacement as a major disruption of technology in the hospitality sector. Chatbots and robots are currently starting to substitute human interactions, replacing host and taking over the human workers' duties.

5. Conclusion

AI has revolutionized the hospitality sector in the US, creating exceptional customer experiences and promoting business growth and development. AI influences the overall travel and tourism sector and different elements of the hotel industry including communication, guest preferences, hotel optimization and increasing user experience in order to gain competitive advantage. The findings of the study revealed that the use of AI technologies enhances guest satisfaction levels within hotels as a way of gaining a competitive advantage in the tourism and hospitality sectors. It is crucial to maintain a balance between AI and HI, but AI has the ability to revolutionize the hospitality sector in the US and offer customers a more seamless and customized experience.

Acknowledgements

I would like to thank the Department of Business for giving us permission to carry out this study within the institution. I would like to appreciate the efforts of every co-author in the researcher for their valuable input to come up with this document. I wish to thank my peers for encouraging me to pursue this journey without giving up. In general, the research was made possible by the equal scientific participation of all the concerned authors. No funding was provided for the study.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Al-Hayri, S., Al-Smadi, M., & Weshah, R. (2023). The Impact of Artificial Intelligence (AI) on Guest Satisfaction in Hotel Management: An Empirical Study of Luxury Hotels. *Geo-Journal of Tourism and Geosites*, *48*, 810-819. <https://doi.org/10.30892/gtg.482spl15-1081>
- Al-Qeada, M. A. (2019). Impact of Integrated Marketing Communications (IMCs) on Hotels' Marketing Performance. *International Journal of Innovation, Creativity and Change*, *8*, 304-323.
- Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C. (2019). Technological Disruptions in Services: Lessons from Tourism and Hospitality. *Journal of Service Management*, *30*, 484-506. <https://doi.org/10.1108/JOSM-12-2018-0398>
- Citak, J., Owoc, M., & Weichbroth, P. (2021). A Note on the Applications of Artificial Intelligence in the Hospitality Industry: Preliminary Results of a Survey. *Procedia Computer Science*, *192*, 4552-4559. <https://doi.org/10.1016/j.procs.2021.09.233>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. M., Koohang, A., Raghavan, V., Ahuja, M., & Albanna, H. (2023). Opinion Paper: "So What If ChatGPT Wrote It?" Multidisciplinary Perspectives on Opportunities, Challenges and Implications of Generative Conversational AI for Research, Practice and Policy. *International Journal of Information Management*, *71*, Article ID: 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Grundner, L., & Neuhofer, B. (2021). The Bright and Dark Sides of Artificial Intelligence: A Futures Perspective on Tourist Destination Experiences. *Journal of Destination Marketing & Management*, *19*, Article ID: 100511. <https://doi.org/10.1016/j.jdmm.2020.100511>
- Jabeen, F., Al Zaidi, S., & Al Dhaheri, H. (2022). Automation and Artificial Intelligence in Hospitality and Tourism. *Tourism Review*, *77*, 1043-1061. <https://doi.org/10.1108/TR-09-2019-0360>
- Nozawa, C., Togawa, T., Velasco, C., & Motoki, K. (2022). Consumer Responses to the Use of Artificial Intelligence in Luxury and Non-Luxury Restaurants. *Food Quality and Preference*, *96*, Article ID: 104436. <https://doi.org/10.1016/j.foodqual.2021.104436>
- Pizam, A., Ozturk, A., Balderas-Cejudo, A., Buhalis, D., Fuchs, G., Hara, T., Meira, J., Revilla, M., Sethi, D., Shen, Y., State, O., Hacikara, A., & Chaulagain, S. (2022). Factors Affecting Hotel Managers' Intentions to Adopt Robotic Technologies: A Global Study. *International Journal of Hospitality Management*, *102*, 1-12. <https://doi.org/10.1016/j.ijhm.2022.103139>
- Roy, P., Ramaprasad, S., Chakraborty, M., Prabhu, N., & Rao, S. (2020). Customer Acceptance of Use of Artificial Intelligence in Hospitality Services: An Indian Hospitality Sector Perspective. *Global Business Review*, *25*, 832-851. <https://doi.org/10.1177/0972150920939753>
- Saydam, M. B., Arici, H. E., & Koseoglu, M. A. (2022). How Does the Tourism and Hospitality Industry Use Artificial Intelligence? A Review of Empirical Studies and Future Research Agenda. *Journal of Hospitality Marketing & Management*, *31*, 908-936. <https://doi.org/10.1080/19368623.2022.2118923>
- Wu, F., Sorokina, N., & Putra, E. (2023). Customers Satisfaction on Robots, Artificial Intelligence, and Service Automation (RAISA) in the Hotel Industry: A Comprehensive Review. *Open Journal of Business and Management*, *11*, 1227-1247. <https://doi.org/10.4236/ojbm.2023.113069>