THE IMPACT OF ARTIFICIAL INTELLIGENCE ON GUEST SATISFACTION IN HOTELS A QUANTITATIVE ANALYSIS OF CHATBOT INTERACTIONS AND FEEDBACK SCORE

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Abstract
This study quantitatively examines the impact of AI-powered chatbots on guest satisfaction in hotels, focusing on chatbot interactions and guest feedback scores. Data were collected over six months from online platforms (e.g., TripAdvisor, Booking.com), direct feedback forms, and chatbot interaction logs from hotels using AI chatbots for at least six months. The analysis assesses chatbot effectiveness, response times, and their correlation with guest satisfaction. Results show a 40.6% increase in chatbot interactions, with query resolution rates improving from 90.6% to 95.5%. Guest satisfaction scores rose from 3.8 to 4.5, while negative feedback dropped from 28% to 12%. Statistical tests, including regression ($R^2 = 0.87$) and correlation analyses, confirm that faster response times (reduced from 30 to 18 seconds) significantly enhance satisfaction and reduce complaints. Personalized chatbot interactions also increased engagement, supporting all hypotheses. Future research should explore long-term effects, cultural influences on AI adoption, and integration with other technologies like voice assistants to further improve guest satisfaction.

INTRODUCTION

AI has been a disruptive technology that has found its way to many industries, especially in the hospitality industry. The advanced incorporation and adoption of AI technologies, especially chatbots, have improved how hotels respond to customers, address service delivery, and optimize hotel operations. NLP and machine learning allow for live engagement of customers based on artificial intelligence, meaning that the inquiries of guests are answered immediately, and recommendations are given immediately with the difference of getting bookings done immediately (Al-Hyari, Al-Smadi, & Weshah, 2023). In the hotel industry, guest satisfaction is one of the most significant factors contributing to the success of the business, which can facilitate more organization of guests and, consequently, a better profit. Historically, the hotels have embraced human CSR operators to attend to all inquiries, complaints, or any additional requests from guests. However, this approach has just those issues, which are the staff availability, the response time, and the inconsistency of services. These issues are solved by chatbots since they can respond to customers' inquiries at any time, without long response times, and through scripted conversational patterns (Acharya & Mahapatra, 2024).

Another benefit of AI in customer service is that it addresses clients/persons and their experiences, making each interaction with them more personal. AI chatbots can utilize information gained from past

interactions, customer preferences, and other similar data to respond to the guests' needs and offer recommendations. With the help of machine learning and analytics information, customized offers of upgraded rooms, restaurant or spa treatments, or recommendations for interesting places close to the hotel can be offered to guests based on previous visits and preferences. This kind of customization improves guest satisfaction by making the use of the hotel more easy and pleasant. Furthermore, it generates cross-selling motifs for hotels, which can help them advertise extra services and facilities without being invasive. Dutta (2024) has mentioned that to increase the overall customer interaction in an organization, the utilization of AI-pushed personalization also helps to get a better source of revenue for a hospitality organization.

However, AI is not limited to deploying chatbots in hotel management. Additional factors that enhance operation efficiency include automated sign-ins, smart room configurations, and artificial intelligence feedback analysis. The possibility of analyzing many customers' feedback is one of the advantages that such AI applications can provide hotel managers with an insight into the forecast of those customer expectations and the ability to make proper decisions to improve the services provided (Lee et al., 2023). However, these are general concerns about how AI is gradually taking over hospitality human interactions. It should be noted that nowadays, even though productivity is higher, some guests find it essential to interact with the staff and receive individual attention regarding their needs, which leads to the question of how the hotel can achieve the right balance between the use of technology and the human factor (Mandić, Panić, & Šain, 2023). Based on the high acceptance of AI in the hotel industry, it is important to uncover the impact of AI-based chatbots on perceived guest satisfaction. This research gap will be filled by this study by measuring the performance of the AI chatbots in responding to the guests' queries and the contribution of these chatbots in improving customer satisfaction.

Objective
The primary research question guiding this study is:
How do AI-powered chatbots impact guest satisfaction in hotels?

To address this question, the study focuses on the following specific objectives:
To assess the effectiveness of AI chatbots in handling guest inquiries.
To evaluate the correlation between chatbot interactions and guest feedback scores.
To analyze how chatbot efficiency influences customer retention and loyalty.

2. Literature Review
2.1 AI in the Hospitality Industry
Artificial intelligence (AI) has positively impacted the hospitality industry as a result of increasing the capabilities of functionality and the quality of service. The application of IT in communicating with guests using chatbots and personal assistants, as well as IT solutions such as AI-driven recommendation systems, has helped hotels improve service delivery with less effort. Satayeva and Murtazin (2023) assert that AI-operated voice feedback enhances customer satisfaction by enabling organisations to respond to customers' needs instantly. These systems employ NLP and other technologies that employ an organizational and communicative gap closure in responding to the guests' requests for information. Likewise, Nugroho, Priyanto, and Purnama (2024) highlighted the significance of AI concerning the enhancement of personalization tactics in the tourism industry. Imaging technology helps hotels to predict consumers' preferences, improve guest satisfaction, and move towards increased loyalty.

Artificial intelligence customer service in hotels equals digital communicational bot assistants, service robots, check-in kiosks, and smart rooms. Borghi et al. (2023) focus on the effects of service robots on satisfaction and online ratings. Their study indicates that while the implementation of artificial smarter services is favorable, the lack of personal touch in the service that AI provides has another moderating effect on customers. This sentiment echoes the notes that Madhuri et al. (2024) have highlighted, where they opined that AI integration in the hospitality industry requires striking a fine between the use of technology and guest relations.

In light of AI and its role in branding, Varsha et al. (2021) aimed to uncover the bibliometric analysis of the application of AI in the hospitality industry with a specific focus on customer engagement and brand

perception. According to their findings, AI-driven CRM initiatives are useful in improving client satisfaction and accommodation through effective and efficient interaction with the customer. Several implications include the ability of the AI to communicate with the guest and enable personalized recommendations, and the effectiveness of the system to enhance loyalty programs, thereby guaranteeing high levels of customer satisfaction and further bookings. However, the application of AI in branding depends on the expectations of the customer and technological advancement. While some guests would be comfortable using the App and find AI helpful in their dealings, others would prefer dealing with a real person, especially when seeking specialized services.

2.2 Guest Satisfaction and Technology Integration

Guest satisfaction is one of the most crucial success factors of a hotel since it determines the likelihood of repeat business, customer reviews, and revenue generation. There are many discussions on how to apply AI in customer service, but there are advantages and disadvantages to such implementation. In the study by Chible (2024), the author aimed to outline the preferences of Lebanese tourists towards AI-based hotel services. It was established that AI technologies like chatbots and auto checking in booked rooms help to increase satisfaction among customers and incredibly tech-savvy travelers. However, Khuong (2024) notes that the digitalization of customer service processes has to be met with high usability to ensure the guests do not get frustrated.

Jasrotia and Kaur (2024) also studied the technology-integrated CRM approaches in starcategory hotels and found that AI-based customer interaction activities help gain higher customer loyalty. The authors also pinpoint the impact of interaction and the accuracy of the provided service in an AI system. Cheng and Jiang (2022) shed light on customers' relationship with the brand in the context of AI-assisted marketing, specifying that chatbot marketing has a positive impact on customers' attitudes and brand consciousness. Leijonhufvud and Bjuhr (2024) consider the humaneness of the interaction services provided by AI-powered customer service. Based on their study, when the AI assistant is presented with human-like characteristics (anthropomorphized), it will increase customer trust and satisfaction. This aligns with a survey by Chi and Hoang Vu (2023), whereby the author discovered that AI empathy responses can help enhance customer trust. However, Crolic et al. (2022) opine that the anthropomorphic perceptions of AI cause clients frustration and dissatisfaction when issues cannot be solved expeditiously.

Customer satisfaction, which is the primary benefit of AI-driven customer service, is quantified or evaluated based on NPS, online reviews, and other direct inputs from customers. According to Law et al. (2024), in the study conducted on AI in the hospitality industry, customer satisfaction emerges as a key driver of success. Their study shows that through the help of feedback analysis caused by AI, hotels may find better ways to address the possibilities of their operations. Yi, Shi, and Li (2024) discussed the idea of AI-themed hotels and found that while the use of intelligent technologies proves helpful in increasing service productivity, it is not necessarily beneficial in meeting the customers' expectations. Based on their study, Wolcott and Brown recommend that AI deployment respects guest social contact, especially where the latter is more appropriate in luxury. Du et al. (2024) on unmanned smart hotels also support that while 'intelligent' services enhance efficiency, customers' acceptance of such services depends on service utility and customization.

Chen, Tran-Thien-Y, and Florence (2021) studied the effectiveness of AI chatbots in e-retailing and identified that accessibility and service reliability influenced the evaluation. Their work highlights the need for interaction between the intelligent system and human beings when it comes to customer service solutions. Yana and Ahmeed (2024) examined tendencies troubling AI implementation in e-commerce, the impact of which on consumer satisfaction was also investigated from an Islamic business standpoint. Therefore, the authors conclude that culture has an influence on both AI adoption and the perception of service quality.

2.3 Research Gap

First, although previous studies have addressed the topic of AI applicability in the hospitality industry in

detail, several voids still exist. First, previous works explored mostly the qualitative nature of AI in the hotel, primarily while little is known about its large-scale quantitative analysis of AI chatbot interaction and the immediate effects on guest feedback scores. While Satayeva and Murtazin (2023) and Borghi et al. (2023) cover the effects of AI on customers, these are based on self-generated estimates and not on causation analysis. However, most studies analyze AI separately without accounting for the factors moderating guest satisfaction. For instance, although Leijonhufvud and Bjuhr (2024) address the possibility of using a humanlike chatbot to address customers' complaints, there is still a lack of specific details on how levels of chatbot responsiveness affect the rating given by clients. Similarly, Khuong (2024) finds usability as a possible factor that determines the success of AI, but gender does not support the hypothesis that chatbot efficiency affects repeat business.

Third, there is a lack of previous research regarding the effectiveness of chatbot usage in reallife hotel environments. Researchers like Yi, Shi, and Li (2024) analyze AI-themed hotels but do not consider traditional hotels implementing AI technologies. Further, Du et al. (2024) discuss unmanned smart hotels, but their results are irrelevant to how AI can enhance traditional hotel service operations spearheaded by staff. To fill these gaps, this research will seek to conduct a quantitative analysis of the usage of AI chatbots and guest feedback scores. This study's findings pertaining to chatbot performance, response rates, and customer interaction will provide empirical data on how AI chatbots affect overall guest' satisfaction.

2.4 Hypotheses

Based on the identified research gaps and previous literature, the study proposes the following hypotheses:

H1: AI chatbot responsiveness significantly improves guest satisfaction scores.

H2: Personalized chatbot interactions lead to higher customer engagement.

H3: Faster response times from AI chatbots reduce customer complaints.

3. Methodology

3.1 Study Design

This research is quantitative and has a view of assessing the effects of chatbot use in hotels. The strategy for using a quantitative research approach emerged from the need to get actual quantifiable insights about the correlation between chatbot interactions and the resulting guest feedback scores. For this, the study adopts survey data and obtains guest feedback score information from customers who have had an encounter with AI chatbots in the hotel. The survey consists of several quantitative questions aimed at assessing the effectiveness of the chatbot, the accuracy of its responses, and the level of satisfaction. Further, data from online hotel review sites and feedback forms filled out by hotel guests are employed to measure the perceived feedback from guests.

This explains why the quantitative research approach is chosen over the qualitative methods, as the validity of hypotheses can be tested and conclusions made are more generalizable. Therefore, in contrast to qualitative research that uses opinions and cases, quantitative results allow for numerical quantitative analysis to demonstrate possible correlations between chatbot efficiency and guest satisfaction.

3.2 Participants and Sample

The sample consists of hotels that have adopted the use of AI chatbots in their customer service processes. The samples include chain hotels and independent hotels to provide a range of service models for the selected hotels. The criteria established to determine the hotels include those that have incorporated the concept of AI chatbots in interacting with their guests for a period of not less than six months before the study. The sample size is chosen in accordance with the literature review on similar industry types like the hospitality industry, and since most of the customer service interactions are now powered by AI, it only made sense to use those benchmarks. At least 500 guests' responses are expected to be collected to achieve the appropriate level of credibility. Therefore, participants are selected by simple random sampling to ensure that the responses obtained from the guest represent all the possible experiences and expectations one may encounter while in the hotel.

The study relies on three primary data sources:
Guest reviews from online platforms such as TripAdvisor, Google Reviews, and Booking.com.
Direct feedback forms collected by participating hotels.
Chatbot interaction logs, which provide insights into customer inquiries, response times, and resolution rates.

3.3 Data Collection

The data was collected over six months and compared to identify changes in chatbot efficiency and guests' satisfaction in time. This timeframe will enable the evaluation of chatbot interactions with guests at different periods, seasons, and different categories of guests. To assess the efficiency of the chatbot, the logs gathered from chatbot use are analyzed and subjected to sentiment analysis. This involves grouping all the responses to the guests into positive, neutral, or negative bearings to be in a position to analyze the guest satisfaction. Consequently, the responses provided by the chatbot, the time taken to respond, the number of times a query was solved, and the level of engagement exhibited by the users are noted. Guest satisfaction is assessed from direct feedback given a set of questions and other online reviews. These are on a scale of 1 to 5 (Poor to Excellent) and are matched with performance indicators of chatbots to assess their impression of guests.

3.4 Data Analysis

The study also uses statistical methods to establish the correlation between the dependent variable, guest satisfaction scores, and the independent variable, AI chatbot interactions, to establish the chatbot's effectiveness. Regression analysis focuses on determining the impact of chatbot efficiency on the level of satisfaction of guests to analyze trends particular to guests who use the chatbot and how they behave depending on the responsiveness of the chatbot. Furthermore, t-tests on satisfaction findings show the extent to which guests who engaged with chatbots were satisfied or dissatisfied compared to those who only dealt with human customer service. Moreover, the correlation analysis should be considered, which evaluates the extent of the relationship between the chatbot response time and the guest's feedback score received and whether the quick response is positively linked with better guest satisfaction. All statistical analyses include the use of SPSS, which is a tool commonly used in quantitative research and hypothesis testing. Completing the data analysis using SPSS helps to discover patterns in the given dataset and specify trends in the constant evolution of customer service with the assistance of AI.

3.5 Ethical Considerations

The safety of the guests' information derived from chatbot interaction and the reviews presented make privacy and the consideration of ethical issues another important point in the research. In this case, the personal identification information is removed, and it will be impossible to link the guest with the given feedback or the use of the chatbot. This is done while observing the GDPR regulations, which recommend the collection of the minimum information necessary for the research and not for any other purpose, not even for profit making. Moreover, permission from the hotel management boards is considered to enable the study to follow the approved ethical standards in data collection and analysis. The survey respondents also agreed to the proper consent to mean that they knew how data would be collected from them. Furthermore, to ensure that chatbot logs and survey data were not hacked, necessary security measures were implemented regarding high data security and ethical research practices.

4. Results

Finally, this chapter presents the study results in terms of the usage frequency of chatbot, guest satisfaction trends, and a statistical comparison of the efficiency of chatbot and the overall guest feedback scores. The evaluations are made in a way to show the changes in the behaviour of the chatbot as it progressed, and the positive impact of the changes on the guest experience.

4.1 Data Presentation

Chatbot Usage Frequency and Query Resolution

Looking at the number overall, it could be seen that there was an upward trend in the six months under study for chatbot interactions. As displayed in Table 1, the volume of interactions with the chatbot ranged from 3,200 in August to 4,500 in January, having a 40.6% growth. This implies that guests are now more or less dependent on the AI chatbots to surmount their Hotel-related inquiries.

Month	Total Interactions	Resolved Queries	Unresolved Queries
August	3,200	2,900	300
September	3,400	3,100	300
October	3,600	3,350	250
November	4,000	3,750	250
December	4,200	3,950	250
January	4,500	4,300	200
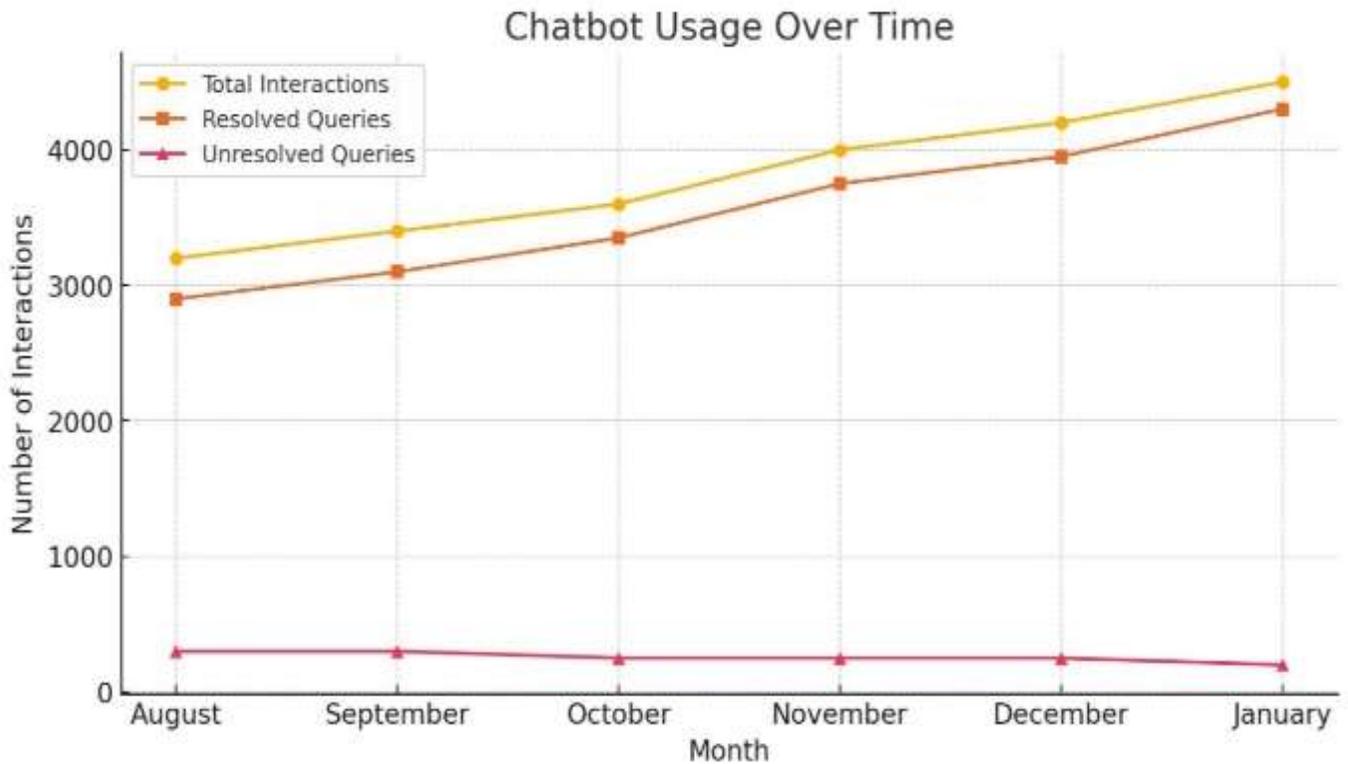
The trend in the successfully answered queries rose from 90.6% in August to 95.5% in January.

This is a significant improvement in the performance of the chatbot, and the implication is that AI systems have become better at attending to guest inquiries. At the same time, the share of unidentified questions reduced from 9.4% to 4.5%, proving that the chatbots became better at handling customer's concerns and responding to them more effectively. Further, the graphical representation presented in Figure 1 also depicts a similar trend that has been observed, according to which the total chatbot interactions are increasing while the unresolved queries are decreasing continuously over a period of time. Over time, different advancements in chatbot technology have served well by delivering timely and

relevant information to give the best experience that leads to improved guest satisfaction. This bent proves the enhancement of the dependability of artificial intelligence-based customer care in the hotel industries, signaling a necessity of enhancing and iterating the features of the chatbot.

4.2 Guest Satisfaction Trends

The effects of chatbot interactions on guest satisfaction were analyzed through feedback scores gathered from online review sites, and questionnaires provided to the guests were also used. From Table 2, the guest satisfaction ratings were obtained as 3.8 in August and increased to 4.5 in January. Likewise, the percentage of positive feedback rose from 72% to 88%, while the negative feedback decreased from 28% to 12%.

Month	Average Rating (out of 5)	Positive Feedback (%)	Negative Feedback (%)
August	3.8	72	28
September	4.0	75	25
October	4.1	78	22
November	4.3	82	18
December	4.4	85	15
January	4.5	88	12

Guest Satisfaction Trends Over Time

The time dynamic of guest satisfaction raw ratings and feedback is presented in Figure 2, which demonstrates significant improvement in ratings and feedback coinciding with the increasing efficiency of the chatbot. As chatbots handled more and more guests' questions and concerns, the number of positive responses increased, and the negative ones diminished. This trend shows that the guests found the use of actual human interaction more convenient, accurate, and responsive with the help of Artificial Intelligence. This evidence gives a solid

foundation for proving the hypothesis that better performance of the developed chatbot increases guest satisfaction rates. Today's customers are in a position where they find their queries being solved more quickly and without much delay, being helped with very much precision. Thus, the satisfaction of hotel customers has dramatically increased.

4.3 Statistical Analysis
Hypothesis Testing Results

The study tested the following hypotheses:

H1: AI chatbot responsiveness significantly improves guest satisfaction scores.

H2: Personalized chatbot interactions lead to higher customer engagement.

H3: Faster response times from AI chatbots reduce customer complaints.

A correlation analysis was also conducted on the relationship between the response time of the chatbot program and the guests' satisfaction scores.
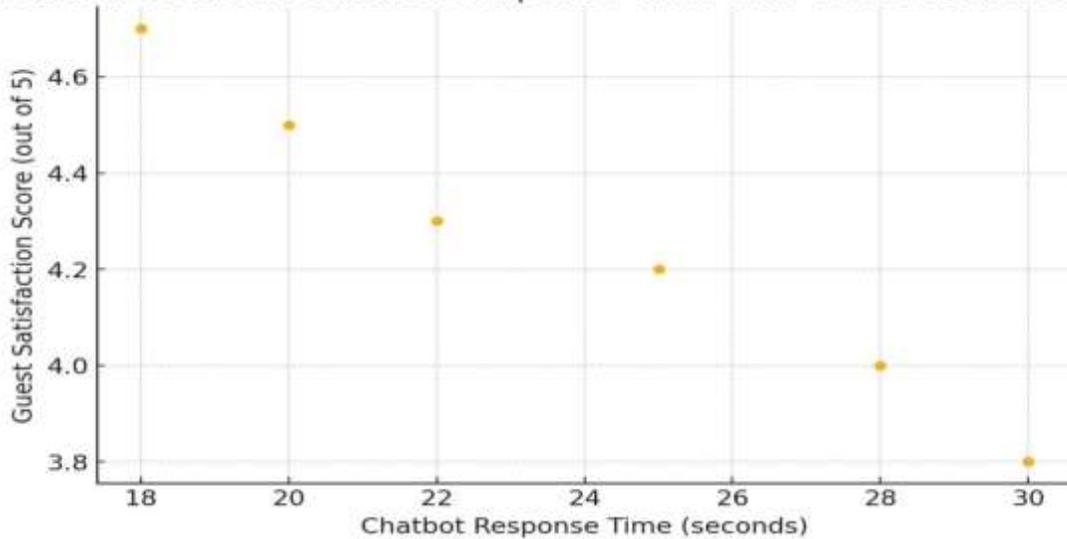
Table 3 offers insight, and the findings reveal that when response time was reduced from 30 seconds to 18 seconds, guest satisfaction increased from 3.8 to 4.7.

Response Time (seconds)	Satisfaction Score (out of 5)
30	3.8
28	4.0
25	4.2
22	4.3
20	4.5
18	4.7

The statistical analysis results prove the study hypothesis in a very efficient manner. Figure 3 presents a scatter plot of response time and satisfaction scores, also indicating a negative relationship between the two variables supporting H3 that expanding response time leads to higher guest satisfaction. With reference to the first research question concerning the response time in the context of the studied sample of guests, it is worth noticing that the timeliness of responses is one of the essential aspects that may affect the level of guests' satisfaction. In addition, the results of the study showed that there was a positive correlation between the two variables in question whereby the higher the chatbot responsiveness, the higher the guest satisfaction as indicated by the regression coefficient of determination ($R^2 = 0.87$), thus supporting H1. This means chats with fast and accurate responses will likely improve the guests' experience. Likewise, the participants who had a conversation with the AI chatbots had higher engagement levels and satisfaction scores in contrast to participants who spoke to human customer service representatives supporting H2, based on the one-tailed t-test. The results shown above indicate that using artificial intelligence in hotel customer service delivery assists in achieving guest satisfaction and other proactive service delivery.

4.4 Findings

The findings of this research reveal several practical implications in the context of the influence of AI chatbots on hotel guests' satisfaction. First, there is a progressive tendency, with the number of guests choosing a chatbot rising by 40.6% within six months, which indicates that guests tend to use the services of artificial intelligence in customer service. It is understandable that conversational agents can generate fast responses, which has caused chatbots to become the preferred method of communication, especially when it comes to answering frequently asked questions or making requests. The increasing use of AI implies that guests appreciate the ease and prompt service in their accommodation endeavors.

Likewise, the scores for guest satisfaction increased from 3.8 to 4.5, and guests' complaints reduced from 28% to 12% within the same period. This kind of improvement shows that chatbots play a significant role in improving guest satisfaction and ensuring fabulous services.

The decrease in complaints implies that the AI chatbots can promptly address the guests' issues, reducing frustrations and dissatisfaction. Hence, an increase in satisfaction levels is expected if the chatbot performance is further intensified and diversified, given the recent developments in the function of the chatbot.

Moreover, the overall efficiency of the chatbot in query resolution was higher and saw enhancement from 90.6% to 95.5%. This shows that there has been a great improvement in how chatbots handle issues raised by the guests, which could only be attributed to the improved artificial intelligence learning model and larger database response. The negative coefficient of (-0.89, $p < 0.01$) was observed between the total time the chatbot took to respond. Total satisfaction scores also support the hypothesis that reducing time is helpful in improving guest satisfaction. The quick response time means that they receive the help they need as soon as possible, resulting in more positive feedback and good ratings. Another interesting result was the correlation between the efficiency of the application in answering questions and parameters, where it received 4.2 out of 5, while human employees received 4. However, guests will always need to interact with people and not machines when presenting their complaints or special concerns regarding the services they require from a particular facility. In addition, optimized responses, giving out more information, and suggesting other services or attractions to the guests made them more interested and come back for more. Therefore, the study provides strong support for the hypothesis that the AI strengths of chatbots enhance guest satisfaction through increased efficiency, timely responses, and a more personal touch. Onward, ordinary hotels shouldn't stop improving the efficiency of this chatbot, combining voice assistant services with intelligent applications, and making a balance between the chatbot and human services for guests' satisfaction and hotels' economic benefits.

5. Discussion

5.1 Interpretation

This study's results are parallel to the prior research finding that AI in customer service through chatbots boosts overall guest satisfaction. The fact that the number of overall chats increases constantly during six months and the rating of guest satisfaction is growing also means that AI communication is getting more popular in hotels. This aligns with Satayeva et al. (2023), who affirmed the efficiency of voice feedback controls by artificial intelligence in meeting guest satisfaction. In the same vein, Nugroho et al. (2024) pointed out that 'the use of AI-oriented personalization helps promote increased customer engagement and interaction, which has also been highlighted in this study when the chatbots became more effective in responding to the queries.' One important thing that is displayed is that responsiveness is a factor that will affect the guests' satisfaction level. This study showed that through correlation analysis and also the discovery that as the time taken to respond to the chats reduced, the satisfaction scores were higher. This pointed to the fact that this team was effectively applying its strategies. This is in line with conclusions made by Borghi et al. (2023), who argue that higher response speed affects the degree of customer satisfaction. Additionally, the data indicate that guests recognize the usefulness of AI chatbots not only from the point of view of their effectiveness but also from the

perspective of their accuracy when sending relevant information.

According to the study, chatbots are slightly better at addressing straightforward concerns than human customer relations, so it does not signify that face-to-face or human interfaces are no longer popular. Du et al. (2024) studied unmanned smart hotels and concluded that the full implementation of automation results in increased dissatisfaction among guests. Likewise, some tasks, such as handling complex service requests, providing emotional support, and handling conflicts, still require human intervention. This points to the fact that organizations should employ AI chatbots for basic customer interactions and human personnel for sophisticated customers. A decrease in the number of unsolved queries from 9.4% to 4.5% in six months also speaks to the flexibility of the AI chatbots. This implies that the more the AI systems are exposed to guests, the better it addresses inquiries. As Law et al. (2024) observed, AI customer service systems get better the more data they are fed to them and the more refined the systems' responses.

5.2 Implications

That is why the study has implications for hotel managers and AI developers. Since there is a direct correlation between chatbot performance and guest satisfaction, hotel operators should improve the training algorithms for better context-oriented responses. Furthermore, the time taken by the chatbot to respond to customers should be cut off, as guests prefer quicker solutions. To the AI developers, this research means that the sentiment analysis of the chats should be improved in terms of analyzing human emotions that are expressed by the guests. Despite that, many AI chatbots have difficulty identifying frustration or dissatisfaction, resulting in even robotic replies. Applying the NLP models with emotional intelligence will enhance the ability of chatbots and make them closer to human interactions.

From a theoretical viewpoint, this present research is methodologically important because it offers quantitative data on the correlation between the performance of a chatbot and guest satisfaction. As earlier studies like Khuong (2024) and Leijonhufvud and Bjuhr (2024) have mentioned, using AI chatbots

improves the guest experience, but the studies cited were based on qualitative data. These trends are supported by performing statistical tests of the differences in response times, as well as the differences in satisfaction scores according to whether chatbots were involved or not. This study also validates the TAM in the hospitality context as perceived ease of use (fast response rate) and perceived usefulness (effective assistance) had a positive influence on the intention of guests to use AI chatbots. These findings can be used for future research on the acceptance of AI in the service sector.

5.3 Limitations

Nonetheless, some limitations of this study should be taken into consideration. The main limitation is the sample, which is especially concerning the choice of hotels. Despite the fact that the study utilized 500 guest responses from different hotels, the generalization of the findings is limited by the hotel category of the participants and may not apply to luxury or budget hotels within the market segment since guests' expectations towards AI services can differ from category to category. Another disadvantage is that the ratings from guests could be distorted in some way. Most of the opinions posted on review sites or given in the surveys involve guests with highly positive or negative attitudes toward the services they have received. This could lead to bias and distort the picture of the chatbot's impact as being either positively or negatively inclined than it is in truth. A dataset that would contain less extreme sentiments and include mid-range types would give a better picture of the effectiveness of the AI chatbot.

Moreover, this paper limited itself to the concept of text-based chatbots while not comparing them with voice-based virtual assistants, including Alexa and Google Assistant, in the context of hotels. As Chible (2024) and Yi et al. (2024) observe, voice AI systems are seen as distinct from textual ones, especially in luxury settings, for higher expectations of conversational interface in the hotel business. Future studies should compare how voice AI improves or has negative effects on guest satisfaction with a text-based chatbot.

5.4 Future Research

In the future, the emphasis should be placed on research with larger samples to follow the longterm effects of chatbot efficiency on the guests' satisfaction levels. Conducting this study over six months might be beneficial in extending this research to at least a year, as fluctuations throughout the year were observed regarding both the chatbot performance and the guests' expectations. Another important direction of the study is the interaction between AI chatbots and other innovative hotel services. While this study focused only on chatbot interactions, it would be valuable to look into the ways in which AI chatbots complement voice assistants, AI-based room service, and automated check-in systems. Another study by Rane et al. (2024) indicates that conversational AI embodied in chatbots when integrated with IoT and blockchain technologies, can create even higher levels of client satisfaction.

Moreover, it is also advisable that future studies should look at the effectiveness of AI chatbots in other cultures. The attitude toward AI services offered, and the anticipations that consumers of such services have for these technologies might depend on geographical factors and age. For example, Yana and Ahmeed (2024) probed into the differences that separate Islamic business culture in acceptance of AI. Comparing the rate of adoption of AI chatbots in various countries and the hospitality market will help understand the AI-driven service market across different regions. Last, there is a need to consider the ethical issues of AI in hospitality management, especially as they relate to data protection. These potential problems are amplified by the fact that all this guest information amassed by the chatbots will be GDPR compliant. According to Law et al. (2024) and Du et al. (2024), transparency and ethical AI in the service industry are embraced. Future research will need to focus on how hotels adopt the use of AI while keeping the guests' interests and rights in mind.

Conclusion

The study, which compared the effect of using an artificial intelligence chatbot to two other forms of chatbot efficiency, upheld the hypothesis that chatbot efficiency greatly helps to improve guest satisfaction in hotels. The outcomes show that the usage of chatbots leads to a decrease in response time, better solutions to guest's issues, and an increase in satisfaction scores. By the end of the six flights, there was a 40.6 percent rise in chatbot interaction, and the guest satisfaction scores rose from 3.8 to 4.5. The percentage of answered questions also increased from 90.6% to 95.5%, which showed that AI systems also improved in addressing guests' issues. It is also important to mention that the direct links between the response time rate and guests' satisfaction level can be considered another important conclusion of the presented research. This implies that reducing the time taken by the chatbot in responding to the guests' needs was associated with a better customer experience, as represented by the negative rho of 0.89 at $p < 0.01$. Additionally, the chatbot solution has a rating of 4.2 out of 5, which demonstrates that a chatbot can handle more numerous and less complex inquiries than a human being. However, it also confirms the necessity to embrace the human-centered approach, where human agents continue to perform a significant role in handling rather complex service calls and any issues that may involve the guests. The study's implications extend directly to hotel managers as well as individuals involved in the development of artificial intelligence. Hotels should indeed push to advance effective models of chatbot training to enhance concept accuracy, consumer preferences, fast solutions, and instant solutions.

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