The Impact of AI and Predictive Data Analytics in Transforming Customer Experience in Tourism and Hospitality Industry

Mohamed Shadih Shahid, Khant Su Latt, May Pwint Phyu Hlaing, Jiraphan Promyam, and Billel Arbaoui*

Rangsit University International College, Rangsit University, Pathum Thani, Thailand
*Corresponding author, Email: bill.a@rsu.ac.th

Abstract

The Tourism and Hospitality industry is currently experiencing a transformation in customer experience due to the implementation of AI and Predictive Data Analytics. This study assesses how these technologies are reshaping customer interactions by enhancing personalization and service efficiency. The main objective is to understand the impact of AI-driven problem resolution and customer retention strategies grounded in customer satisfaction. To address this, the research employed a quantitative approach using survey data from 111 international college students at Rangsit University. Statistical analysis, including linear regression and normal distribution, revealed a strong positive correlation (r = 0.86) between problem resolution speed through AI and customer satisfaction. Additionally, customer satisfaction showed a high correlation (r = 0.79) with customer retention, underscoring the influence of AI on loyalty. Notably, 97% of participants consented to data usage, indicating strong trust in the research context, though this may not reflect real-world privacy concerns. The findings also highlight the importance of transparent data practices and ethical considerations, especially in hospitality environments. In conclusion, the integration of AI and Predictive Data Analytics presents transformative potential for the industry, enabling highly tailored experiences. Future research should broaden demographic representation and explore long-term implications to ensure responsible and effective AI adoption.

Keywords**:** *Artificial Intelligence, Predictive Data Analytics, Customer Satisfaction, Problem Resolution Speed, Customer Retention*

1. Introduction

The Tourism and Hospitality industry has implemented AI and Predictive data analytics, which has changed the way that customer experience in the industry. AI technology has made customer interactions a lot better by offering help when needed and moreover creating personalised experiences just for the customers. This is possible with the AI tools such as virtual assistants, chatbots, and personalised recommendations, and businesses are able to interpret what the customer needs or wants by taking advantage of the predictive data analytics systems, which leads to an increase in customer satisfaction and services.

A study by (Shekhar et al., 2021) shows that AI has a big effect on tourism and hospitality. Their research points out how AI tools help customer service by giving tailored and useful answers, which makes customers happier. The study stresses that using AI tech is key to stay in the game as the market changes. Also, AI has moved into old-school hospitality aiming to boost hotel reputations, make more money, and improve what customers experience to meet the growing need for smart process automation, as noted by (Shekhar et al., 2021).

According to the research by (Kadagidze & Ugrelidze, 2023), which considers impact on revenue management, customer experience and hotel operations due to AI developments. The study further emphasizes how AI can streamline operations to make customer experience a more enjoyable one by utilising advanced data analytics as documented by (Kadagidze & Ugrelidze, 2023). Companies in any area, especially tourism and hospitality industry, through the help of AI and AI tools can improve customer experience and satisfaction, while reducing costs, and make workflows run better in favour of the business.

Proceedings of RSU International Research Conference (RSUCON-2025)

The research gap centres on the strategies to identify and address issues before it impacts the customer experience focusing on enhancing problem resolution speed. While AI and Predictive Data Analytics offer tools for decision making with relevant data, many organisations struggle to implement measures that anticipate customer needs and potential failure.

The research paper begins with an introduction which highlights the transformative impact of AI and Predictive Data Analytics about customer experience in the Tourism and Hospitality industry. Moreover, this will identify the gap related to solving the problems faster which is faced by customers before it changes the customer experience to a negative. The literature review explores the main areas such as AI powered language assistants, challenges in AI communication, and roles of data analytics in personalisation while highlighting ethical concerns. Henceforth, the research methodology part will be highlighting the purpose of the study, the data collection methods, the techniques that will be used to analyse the data, while ensuring a comprehensive understanding of customer satisfaction.

2. Objectives

This aim of this study is to evaluate the effectiveness of AI-powered customer service tools—such as chatbots and virtual agents—in enhancing problem resolution efficiency, customer satisfaction, and retention within the hospitality industry. It also seeks to explore customer perceptions and trust in AI-driven service recovery, assessing how these attitudes influence their willingness to engage with such technologies. Additionally, the research will examine the limitations and challenges of AI integration, including ethical concerns, customer skepticism, and the complexity of resolving nuanced service issues, more specifically, this study seeks to provide:

1. Evaluate the impact of AI-powered customer service tools on problem resolution efficiency, customer satisfaction, and retention.

2. Investigate customer perceptions, trust, and willingness to engage with AI-driven service recovery in the hospitality industry.

3. Examine the limitations and challenges of AI in service delivery, including ethical concerns, customer skepticism, and the complexity of issue resolution.

3. Materials and Methods

3.1 Literature Review

AI- Powered Language Assistants have transformed customer communication in hospitality & tourism with; multilingual support of 24/7 availability, real time learning, driving better experience for customers' (Ma, 2024). It has been noted that they guarantee successful customer interactions managing large numbers of inquiries by providing multilingual support (Morch, 2024).

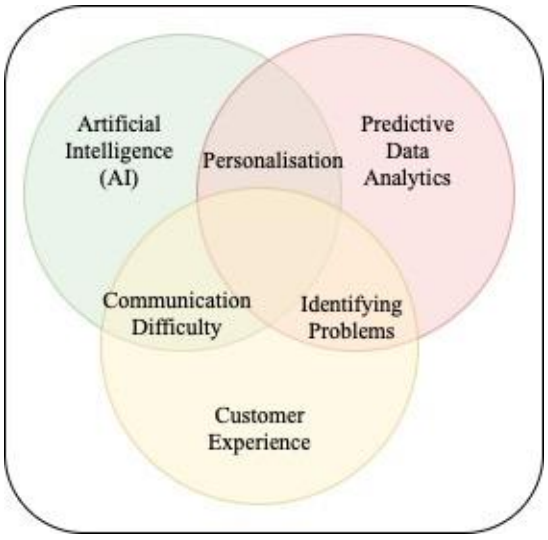


Figure 1 Circular Diagram of Factors

Although the deployment of chatbots empowered by AI has certainly been a game-changer, many communication-related problems remain major obstacles for the hospitality and tourism industry. An issue, perhaps more importantly, remains with emotional intelligence of such systems which are far from being able to grasp the intricate scope of human emotions and provide empathetic reactions that might leave the customer unhappy (Vicci, 2024).While the chatbot can effectively answer frequently asked questions and provides responses, they are still far from the level of nuanced and empathetic communication that a human staff can carry out. Emotional connections play a crucial role in hospitality because it goes beyond service delivery to how much the customer feels appreciated, understood, and valued (Roy and Pagaldiviti, 2023).

Furthermore, AI powered tools frequently encounter difficulties in grasping cultural details and everyday conversational lingo, leading to miscommunication, especially with non-native speakers which can cause the interactions to feel such as robotic and unsatisfying or unhuman like according to (Rayhan et al., 2023). These challenges highlight the need to continuously update or advance the natural language processing (NLP) to make an overall customer experience better. In order to reach a deeper understanding of the users, it is essential to keep advancing Natural Language Processing (NLP) technologies to make the AI assistant more culturally intelligent and context aware. Since tourism by nature is multicultural, the ability to adapt to conversational styles and languages will be important features in enhancing customer interaction (Roy and Pagaldiviti, 2023).

AI & Data Analytics is a core component of hospitality for guest personalisation towards a better customer experience. Data analytics processes customer information, uncovers patterns, and provides insights to AI algorithms so they could inform the company in terms of making calculated decisions. Moreover, customer preferences and service history, enable immediate personalization, while demographic or seasonal patterns, refine AI-driven recommendations and enable strategic planning (Lv et al., 2022). By having AI tools, it can deliver "highly tailored services" that meet guests' preferences in terms to increase customer satisfaction (Berman, 2023). For example, guest experience can be answered through real time responses from IoT platforms such as chatbots or recommend next activity that could be of interest to guests (food options and more) and most importantly make the room feel like home with the setting preference for individual guests for their next visit or stay (Chen et al. 2022).

The heavy reliance on AI and data analytics, personalized service presents various challenges, particularly concerning privacy and ethical boundaries. Customers may get uncomfortable with over-

personalization if they believe their privacy is being violated and recommendations seem intrusive or excessively personalized (Lv et al., 2022). For instance, while predictive behaviour tracking and continuous monitoring can be beneficial to creating a distinctive experience for visitors, they may consider it to be intrusive if not handled respectfully and transparently (Zarezadeh et al., 2022). It is important to balance the personalization efforts with compliance, ensuring that any personal data used to tailor customer experiences is handled with the utmost respect for privacy. Moreover, following the law and regulations for personal data protection. Implementing secure data handling practices while offering customers transparent information about how their data is used, hence implementing transparency, ultimately building trust and enhancing the guest experience (Fan et al., 2023).

It is important in providing customers with a better experience through diagnosing issues and fixing them by using Data analytics before the issue arises. Despite advancements in AI-powered solutions, there remains a significant gap in how organizations proactively address customer issues before they escalate into negative experiences. Studies have primarily focused on AI's ability to respond to customer inquiries, but fewer have explored its predictive capabilities in preempting service failures (Uzoka et al., 2024).

In the case of AI-powered customer service, data analytics can help businesses forecast which issues might arise, before they drive down customer satisfaction. The name of this approach is proactive problem-solving. Proactive issue resolution is critical, yet most AI implementations in hospitality and tourism focus on reactive problem-solving rather than predictive intervention. Research indicates that businesses that implement predictive analytics to forecast service disruptions see a marked improvement in customer satisfaction scores (Babadoğan, 2024)

Integrating real-time data analytics with AI technology is one of the toughest types of business problems to tackle when it comes to customer experience management. Predictive analytics coupled with machine learning algorithms help companies gain insights into client demands and behaviours, enabling them to offer custom experiences. Having said that, the problems start when such data is either not enough or the analysis of this poor leading towards inaccurate prediction and misfit with client expectations (Fan et al., 2023). While AI enhances efficiency, studies highlight that many organizations fail to leverage predictive models effectively, leading to delayed issue resolution (Shekhar et al., 2021). This gap underscores the necessity for research on optimizing AI-driven problem resolution strategies.

Looking at an example from the hospitality industry. (Zarezadeh et al., 2022) showed how big data analytics, and the study of content created by users, like online reviews, can reveal what guests don't like about their stays. By looking at this data, hotels can tackle problems related to service quality or environmental impact before guests start complaining about them.

What's more, AI-driven customer experience faces some roadblocks. For example, chatbots and other AI interfaces often can't handle complex talks with customers very well. This leads to frustration instead of better experiences. AI and data analysis together give us great tools to personalize things, as making sure AI is able to communicate with people is still something that needs to be worked on to make it better.

Companies are turning toward AI to monitor customer interactions and the way everything is functioning in real time. As a result, they can address problems before they spiral out of control. They can detect airline delays, store stock running low — before customers even know. Moreover, the downside is that these tools must be very accurate, and they must be fast. If in case, they may be slow or make mistakes and simply perpetuate what they aim to prevent (Zarezadeh et al. 2022).

Incorporating AI and predictive analytics not only boosts problem-solving speed but also enhances customer satisfaction by addressing issues before they impact the client experience. This proactive approach is shown to improve customer retention by aligning services more closely with customer needs and expectations (Zarezadeh et al., 2022).

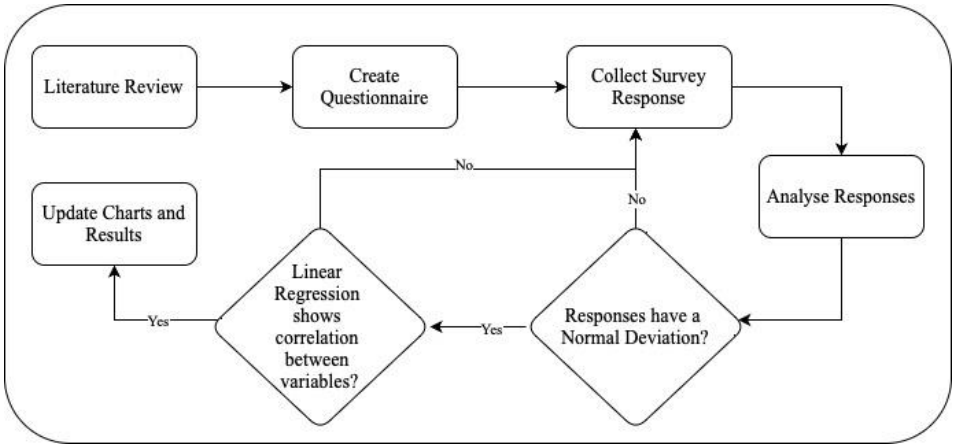
AI and predictive data analytics have brought a lot of developments and benefits to the tourism and hospitality industry, furthermore, there is a key research gap that needs to be addressed. Addressing the gap

requires a thorough analysis of potential problems and the implementation of mitigation mechanisms, ensuring that the use of AI and predictive analytics improves rather than degrades the customer experience. Future research should attempt to present a balanced perspective, showing both potential and complications, to help industry stakeholders make educated decisions.

3.2 Methodology

The advancement of technology, alongside the integration of AI and Predictive Data Analysis everywhere, has profoundly transformed consumer behaviour and customer experience in the tourism and hospitality industry. While both methods of traditional in-person and digital platforms are being used side by side it increases the potential to do more for the customers.

This research aims to examine the relationship between direct and indirect variables which influences customer satisfaction in the sector. The dependent variable, which is customer satisfaction, serves as the primary focus, meanwhile independent variables include problem resolution speed through AI and the customer retention rate.



Graph 1 Demographics

This study will investigate how AI integration can help to increase problem solving speed which impacts the customer satisfaction and experience by using a survey form to collect the data. The research will be done using quantitative data analysis where sampling will be done by data collection from international students at Rangsit University where population is set for 60, and see if the results get a normal bell curve in standard deviation and if not then would have to increase the sampling rate by 10 each time to get an equalised bell curve or a curve which represents near the middle. The survey was done about 3 times, with the increments, until it reached 114 respondents where only usable data was given by 111 respondents. Moreover, to check if dependent and independent variables relate to each other, there would be linear regression done and if it does not relate then the variables are subjected to change and sampling to be done again. For data collection Google forms would be used, and the form would have a part where it asks the population whether they consent for the data collected from them to be used or not in the research, which is known as informed consent, data privacy, transparency, data security, and participant rights. Furthermore, the analysis will be done using Microsoft Excel and Data Analytics tools, and the data will be shown using charts.

4. Results and Discussion

Table 1 Demographics

Description	**%**

Data Collection Consent		**100**
	Agree	97
	Disagree	3
Gender		**100**
	Male	41
	Female	59
Age Distribution		**100**
	18-24	91
	25-35	9
Faculty Participation		**100**
	International Business	43.24
	ICT	34.23
	Communication Arts	5.41
	Fashion Design	3.60
	Other departments <2% (Combined)	13.52
Nationality		**100**
	Myanmar	61.26
	Thailand	18.92
	Cambodia	4.50
	China	3.60
	Bhutan	2.70
	Japan	2.70
	Other countries <2% (combined)	6.32
Frequency of Hotel/Resort Visits		**100**
	Occasionally (1-3 times per year)	50.45
	Rarely (once a year or less)	34.23
	Regularly (4-6 times per year)	13.51
	Frequently (more than 7 times per year)	1.80

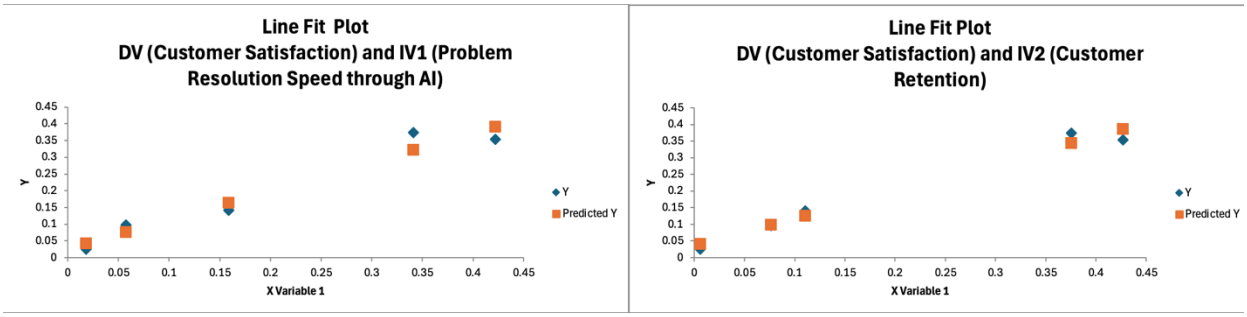
Out of all the respondents who participated in this research, the majority, 97 percent, agreed to let researchers collect their data for the study. Only 3 percent said no to the data collection process. This indicates that there is a very high level of willingness among the participants to volunteer, while ensuring a reliable and sufficient pool of data for analysis.

The sample distribution shows equal representation among participants, with 59% female and 41% male respondents. This balance reflects diverse perspectives. Most of the participants 91% belong to the 18–24 age group, with only 9% in the 25–35 range. This implies a younger demographic, which aligns with the average age of the student in a university.

The International Business faculty had the highest percentage of participation rate at 43.24%, followed by Information and Communications Technology at 34.23%. Other faculties, including Communication Arts 5.41% and Fashion Design 3.60%, had minimal representation. Faculties such as Biomedical Science and Engineering showed negligible or zero participation. This gives the impression that responses are focused on business and technology-oriented disciplines.

Majority of the participants are from Myanmar at 61.26%, followed by Thailand at 18.92%. In addition, other nationalities such as Cambodia with 4.50%, China 3.60%, Bhutan and Japan with 2.70% each which is shown as contributing a smaller proportion. This highlights the significant representation of Myanmar students in the sample, which may influence cultural perspectives within the data.

When asked how often they visit hotels or resorts, the majority of respondents of 50.45% stated that they visit occasionally (1–3 times per year). 34.23% of the participants stated they visit rarely (once a year or less). A smaller number of respondents 13.51% visit regularly (4–6 times per year), while only 1.80% reported frequent visits (7+ times annually). This data appears as though most participants have average to minimal exposure to hotel or resort stays, which could be classified as likely due to financial or lifestyle preferences amongst younger individuals.



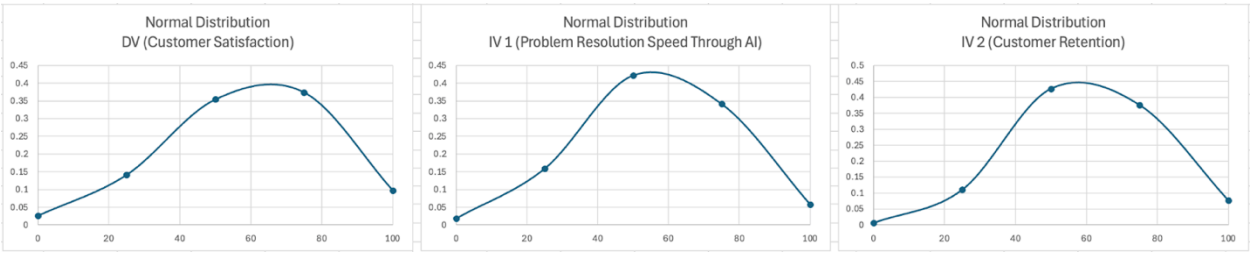
Graph 1 Linear Regression

Customer Satisfaction and Problem Resolution Speed through AI

The first graph shows the relationship between customer satisfaction (DV) and problem resolution speed through AI (IV1). The actual values (Y) and predicted values (Predicted Y) are closely aligned, which suggests a strong relationship between these variables. The graph shows an upward trend, meaning that as the problem resolution speed through AI improves, customer satisfaction also increases. The similarity between actual and predicted values indicates that the model used for prediction is accurate. This result emphasizes the importance of fast and effective AI-driven problem resolution in improving customer satisfaction.

Correlation between Customer Satisfaction and Customer Retention

The second graph illustrates the relationship between customer satisfaction (DV) and customer retention (IV2). Similar to the first graph, the actual and predicted values are closely matched, which shows a strong connection between these variables. The upward trend in the graph indicates that higher levels of customer satisfaction are linked to better customer retention. This demonstrates that customers who are more satisfied are more likely to stay loyal, showing the importance of satisfaction in retaining customers, especially with the use of AI-driven services.



Graph 2 Normal Distribution of Variables

Customer Satisfaction: As per the graph on customer satisfaction, it can be seen that the satisfaction level is normally distributed with a concentration towards the midrange (50–60) in broad terms. This means that the respondents who were surveyed generally had fair levels of satisfaction on average. The few extreme cases of either level of satisfaction or dissatisfaction that were recorded were relatively few, but the symmetry of the curve indicates balanced perceptions within the sample.

Problem Resolution Speed through AI: The distribution of responses regarding problem resolution speed through AI also aligns closely with a normal curve, indicating the AI perceiver needs to be consistent in their understanding of the situation. The peak responses near the midrange values suggest that AI-driven resolution processes are generally seen as moderately effective. Some points on the left end as well as the right end of the distribution indicate that a few customers may at times have different perspectives on their experience.

Customer Retention: The variable measuring customer retention also shows a perfect bell curve in its shape which is indicative of normal distribution in the responses. The mode of the concentration of the responses often lies in the mid ranging values (Approximately 50-60) which indicates there was an average level of retention towards AI assisted services. However, it has not reached maximum potential in solidifying customer loyalty.

The findings of this research align closely with the study's objectives by highlighting the complex interplay between customer trust, AI effectiveness, and ethical concerns in service delivery. Despite widespread concerns over digital privacy, an overwhelming majority of participants—primarily university students from business and technology disciplines—expressed a willingness to share personal data, suggesting either a strong trust in the research process or limited awareness of potential data misuse. This supports the objective of examining customer perceptions and trust in AI-driven service recovery. However, the finding also underscores a key limitation: in real-world hospitality settings, customers may be far more cautious about disclosing personal information due to fears of data breaches or misuse—illustrating the ethical challenges and skepticism central to the study's third objective. At the same time, the willingness to exchange data for more personalized and efficient AI-driven services reinforces the link between AI-enabled problem-solving speed and improved customer satisfaction and retention, directly supporting the study's first objective. These insights emphasize the need for transparent data practices and further exploration across broader, more diverse populations to generalize the results effectively.

5. Conclusion

This study has demonstrated that AI and predictive data analytics significantly influence customer experience in the tourism and hospitality industry by enhancing problem resolution speed, customer satisfaction, and retention. The willingness of participants—particularly from business and technology backgrounds—to share personal data suggests a promising level of trust in AI-driven services. However, this

trust may not be universal, especially in real-world settings where privacy concerns and ethical apprehensions are more prominent. The findings affirm that customers value efficiency and personalized service, which AI tools can provide, yet they also highlight the importance of data protection and transparent communication. These outcomes underscore the dual challenge facing the industry: to harness AI for superior customer service while addressing concerns around trust, fairness, and data privacy. Moving forward, more diverse demographic representation and qualitative feedback will be essential to build a broader understanding of how different customer segments engage with AI-based service solutions. Moreover, future research should explore the long-term effects of AI and predictive data analytics on customer experience and investigate potential challenges and opportunities which arise from developing technologies as well as use Krejcie and Morgan method afterwards by extending the population size from Rangsit University students to people in Thailand and more. By continuously cultivating AI and Predictive Data Analytics and addressing the gaps in problem solving, the tourism industry can remain a vanguard of delivering exceptional customer experience.

In conclusion, the integration of AI and Predictive Data Analytics offers a transformative prospective for the tourism and hospitality industry, paving the way for a future where customer experience are enhanced to seamlessly tailor for individual preferences and needs.

6. Acknowledgements

People who contributed to the work but do not fit the criteria for authorship should be listed in the Acknowledgments, along with their contributions. It is the authors' responsibility to ensure that anyone named in the acknowledgments agrees to be so named. The funding sources that have supported the work should be included in the acknowledgments.

7. References

Babadoğan, B. (2024). Harnessing AI and Predictive Analytics to Revolutionize Customer Retention Strategies. Next Frontier For Life Sciences and AI, 8(1), 65. https://doi.org/10.62802/k2a4gf39

Berman, D. (2023). Revolutionizing the hospitality industry with artificial intelligence. Forbes.

Chen, M., Jiang, Z., Xu, Z., Shi, A., Gu, M., & Li, Y. (2022). Overviews of Internet of Things Applications in China's Hospitality Industry. Processes, 10(7), 1256. https://doi.org/10.3390/pr10071256

Fan, Z., Yan, Z., & Wen, S. (2023). Deep Learning and Artificial Intelligence in Sustainability: A Review of SDGs, Renewable Energy, and Environmental Health. Sustainability, 15(18), 13493. https://doi.org/10.3390/su151813493

Kadagidze, L., & Ugrelidze, E. (2023). AI in hospitality industry: a comprehensive study on its impact on operations, customer experience, and revenue management. VII-International European Conference on Interdisciplinary Scientific Research. https://doi.org/https://doi.org/10.13140/RG.2.2.35476.99201

Lv, H., Shi, S., & Gursoy, D. (2022). A look back and a leap forward: a review and synthesis of big data and artificial intelligence literature in hospitality and tourism. Journal of Hospitality Marketing & Management, 31(2), 145–175. https://doi.org/10.1080/19368623.2021.1937434

Ma, S. (2024). Enhancing Tourists' Satisfaction: Leveraging Artificial Intelligence in the Tourism Sector. Pacific International Journal, 7(3), 89–98. https://doi.org/10.55014/pij.v7i3.624

Morch, A. (2024, September 20). Impact of AI on Hotels: A New Skill Set for the Future. HospitalityNet. https://www.hospitalitynet.org/opinion/4123766.html

Rayhan, A., Kinzler, R., & Rayhan, R. (2023). Natural language processing: transforming how machines understand human language. Conference: The Development of Artificial General Intelligence. https://doi.org/10.13140/RG.2.2.34900.99200

Roy, B. K., & Pagaldiviti, S. R. (2023). Advancements in arena technology: Enhancing customer experience and employee adaptation in the tourism and hospitality industry. Smart Tourism, 4(2), 2330. https://doi.org/10.54517/st.v4i2.2330

Shekhar, C., Chaplot, D., & Kumawat, H. (2021). Impact of AI in tourism and hospitality industry: an empirical study. Journal of the Asiatic society of Mumbai, XCIV(0972–0766), 48. https://doi.org/https://doi.org/10.13140/RG.2.2.16689.66400

Uzoka, A., Cadet, E., & Ojukwu, P. U. (2024). Leveraging AI-Powered chatbots to enhance customer service efficiency and future opportunities in automated support. Computer Science & IT Research Journal, 5(10), 2485–2510. https://doi.org/10.51594/csitrj.v5i10.1676

Vicci, Dr. H. (2024). Emotional Intelligence in Artificial Intelligence: A Review and Evaluation Study. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4818285

Zarezadeh, Z. Z., Rastegar, R., & Xiang, Z. (2022). Big data analytics and hotel guest experience: a critical analysis of the literature. International Journal of Contemporary Hospitality Management, 34(6), 2320–2336. https://doi.org/10.1108/IJCHM-10-2021-1293