

Technology and Stereotype Mitigation: The Role of Artificial Intelligence and Machine Learning in Personalizing Hotel Service Encounters

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Abstract

Delivering equitable, tailored, and high-quality services has historically been a major challenge for the hospitality industry, with human staff relying on subjective judgment and limited foresight to anticipate guest needs. The emergence of artificial intelligence (AI) and machine learning (ML) technologies is transforming this landscape by enabling hotels to provide personalized, bias-mitigating services at scale. This article examines the potential of AI- and ML-driven tools—including chatbots, virtual assistants, and fair algorithmic systems—to enhance customer interactions, improve operational efficiency, and dismantle long-standing stereotypes embedded in traditional hospitality practices. Drawing upon recent studies, it explores how transparent and ethically designed AI systems can rival or surpass human-delivered services by predicting guest preferences with greater accuracy, facilitating real-time personalization, and promoting inclusivity across diverse customer segments. Furthermore, the paper investigates consumers' perceptions of trust, privacy, and autonomy when interacting with automated services compared to human staff, emphasizing the importance of ethical governance, data security, and robust countermeasures to prevent unintended discrimination. By balancing technological innovation with strong ethical frameworks, hotels can redefine industry benchmarks, foster socially responsible and guest-centric service models, and contribute to the creation of a fairer, more adaptive, and customer-oriented hospitality environment.

INTRODUCTION

Historically, delivering tailored and fair services in different segments for individual customers has been an ongoing issue with the hospitality industry. Gone are the days, when hotel staffs have to rely on their keen foresight in understanding what guests may like and never get a forward-facing experience from customers as well. But now, with the help of faster and rapidly growing Artificial intelligence (AI) & Machine learning technologies to handle this age-old problem that are much easy-to-scale and adjust. (Shafiloo et al., 2021).

Recent findings and studies that have been coming to light showed that some of the regular stereotypes, as well as highly personalized service solutions in 5-star rated hotel environments, could be easily carried out by AI-empowered Chatbots as well as virtual assistants (Voronova et al., 2020). Previously, it was one of the most significant challenges faced due to the bias in training data, which means old models retain whatever stereotypes existed; yet, with fair and transparent machine learning algorithms now being incorporated, banks can deliver personalized end-customer interactions without discrimination. (Feldman & Peake, 2021)

This study investigates the potential applications of AI and machine learning to mitigate bias in hotel service encounters, the impact of AI-driven personalization on customer interactions compared to human-to-human interactions, and consumers' perceptions of trust towards automated intelligent services versus those provided by human staff (LU et al., 2021). With the struggle to provide excellent, equal service in the hospitality industry, a continuous one then, maybe incorporating cutting-edge artificial intelligence (AI) and machine learning technology, was destined ever to change guest experiences. Hotels can deliver custom, non-discriminatory service to every guest using personalized and

bias-mitigating AI systems developments. (Zhu et al., 2023). The model of hospitality service changes is transformative and can shape industry standards, improve customer satisfaction, and revert a truly superior benchmark for unprecedented and binary versioned equal rights among all walks of human experiences related to customer services. (Heymann, 2019) . It ultimately contributes to creating a hotel domain that is not only open and just for guests, but also more adaptive – from optimizing operational efficiency in hotels by being able to predict guest behavior with higher degree of certainty; offering an unprecedented level of bespoke service; or shattering the historical stereotypes which have so far prevented mankind from experiencing truly inclusive and connected hospitality. Integration of such innovative technologies is an important step towards achieving a fair and guest-friendly hospitality landscape. (Torres & Sipe, 2020)

The judicious use of AI and ML-powered applications allows hotels to predict guest requests more accurately, deliver service better tailored to their guests' needs through personalization, and avoid the inherent preconceptions that have - until now – hampered genuine inclusive personalized hospitality. Hotels can use personalized, bias-mitigating AI platforms to deliver customer service that is both highly individualized and non-discriminatory (for those who support good intentions on the part of hoteliers) – catering specifically to every guest's unique needs, personal preferences, proclivities or expectations. (Marković & Gjurašić, 2020). This reinvention of hospitality service has the potential to bring industry norms to new heights, improve customer satisfaction and establish a model for superior, fair services. (Crick & Spencer, 2011)

The potential of customer experience in the hospitality industry will be revolutionized by integrating these advanced AI and machine learning technologies. Because so many early AI systems were used in contexts where training data was flawed, they often reproduce biases already present. However, the rise of machine learning solutions that are fair and transparent has galvanized a leap into new non-discriminatory models for personalized customer engagements. (Mujtaba & Mahapatra, 2019) . More recent studies have demonstrated that automated systems, such as chatbots and virtual assistants using AI, can bypass preconceptions in 5-star hotel-like settings. (Grundner & Neuhofer, 2020)

This article narrates the possible benefits of AI/ML to alleviate bias in hotel service encounters, how artificial intelligence (AI)-driven personalization can enhance customer interactions and analyze end-users and staff's perceptions, particularly regarding improving quality level. (Ruël & Njoku, 2020) . The adoption of modern technologies including AI and ML is vital in creating an equitable, customer-oriented environment that caters to the interests and demands of clients as well as customers. Using these solutions, hotels will be able to improve personalization, better anticipate guest needs and reduce traditional prejudices resulting in a higher level of service quality and providing real inclusive hospitality. The strategic use of AI and ML-driven solutions thus enables hotels to anticipate better the needs of their guests, making them able to personalize, improve service quality, and do away with biases, among other salient activities, in order not just to redefine industry norms but delivering levels higher than the norm resulting customer more satisfaction leading establishing a whole new standard for excellent equalized quality customers experience. (Huang, 2013)

Optimistic visions of a more level, less transactional and – ultimately – customer-centric hospitality industry constitute the exciting potential benefits of adopting leading AI and ML technology. However, some legitimate concerns exist, too. The ability of hotels to predict their guest needs better helps improve the quality of service through personalization, which may risk an individual's privacy and autonomy as they may feel that their information is used without their consent. (Zhu et al., 2023)

AI-driven solutions, while removing these biases could impose the problem of just treating extremely complex social dynamics back to this space where for years we have seen failure disadvantaging minority groups. It needs to be done with some serious checks and balances in place, maintaining a controlled code of conduct that will enrich the outcome for both as we shift from fewer winners take more; this would at least put us on track towards risk reduction. (Kansakar et al., 2019)

For the hotel industry, integrating such AI is only possible when equal emphasis on guarding human rights and privacy as well as promoting real diversity & inclusion. It is fundamental to delivering a customer-centric, personalized hospitality experience. The sector must use strong countermeasures, create a significantly extended ethical code, and prevent the utilization of this technology effectively. It is only by striking this balance that the industry can make the best use of these innovations and at the same time continue to meet high standards in terms of customer-centricity and social responsibility. (Gehrels & Suleri, 2016)

LITERATURE REVIEW

The hospitality sector has continuously struggled in recent years to provide personalized and equitable service to a single client. To address those challenges, artificial intelligence (AI) and machine learning (ML) provide scalable and adjustable methodologies to assist the end user in implementing an optimal patient-centered strategy for disease identification (Shafiloo et al., 2021) where traditional methods mostly depend on intuition provided by staff. AI-powered chatbots and virtual assistants are coming into play by enhancing service personalization within luxury hotel environments. They have tackled the biases from training data which used to reinforce stereotypes, allowing the hospitality sector to give tailored interaction without any biases (Feldman & Peake, 2021).

Research also emphasizes the role of AI and ML in addressing bias in hotel service encounters. As compared to conventional human interactions, AI-driven personalization can bring considerable changes to customer relations, with new dynamics (LU et al., 2021). Hotels envision using these virtualization technologies to create inclusive and adaptive guest experiences by predicting guest behavior more accurately, and providing tailored services (Zhu et al., 2023). These innovations can potentially make the guest experiences more equitable (Heymann, 2019; Torres & Sipe, 2020), which can elevate customer satisfaction and create whole new standards of the industry.

AI and ML are not just a another set of technologies to speed up processes in the hospitality sector; it is the reengineered approach for customer service and removed all prejudices from hospitality wherein every customer is unique and special in their own way and to be treated as such. The improvements serve different guest behaviours and therefore expectations, bringing together service delivery to a higher level than conventional (Marković & Gjurašić, 2020). This yields better customer experiences for hotels and important standards for equitable service, essentials in a diverse and ever-changing market (Crick & Spencer, 2011).

While this is a general overview of recent developments in the field, there are many other advancements that are occurring; however, the march towards AI-driven hospitality services is not without its obstacles, and a lot of it will come down to the issues of data bias and privacy. While initial AI systems embodied many of the existing prejudices present in society, creating fairer ML algorithms will lead to fairer personalized customer engagement (Mujtaba & Mahapatra, 2019; Grundner & Neuhofer, 2020). Such systems like automated chatbots can transcend deep-rooted prejudices, especially in the context of luxury hotels (Ruël & Njoku, 2020).

When the hospitality sector adopts AI and ML tech, the ethical needs such as privacy, autonomy, and the possibility of infiltrating personalized services should be taken into consideration. Data use without consent is a legitimate concern and this requires robust safeguards; Zhu et al., 2023. Third, although these technologies provide the ability to serve unconflicted [9] (i.e., with no bias), they also pose the threat of oversimplifying intricate social systems of hierarchy and power and, thereby, creating a state of oppression for minorities unless these principles of design and application take place with tight regulation and an ethical code of conduct (Kansakar et al., 2019).

With changing trends in hospitality, there is a need to understand the changing facets of AI and ML that can be best used to cater to different customer requirements. With an ability to sift through enormous volumes of information, these technologies will help hotel operators predict requests and customize services. This shift towards predictive service models may reflect the growing demand among consumers for personalized experiences, as that expectation is becoming essential to customer satisfaction in the industry (Huang, 2013).

Indeed, the research has highlighted the need to develop an element of trust between consumers and deals that are automated. Acceptance of AI-driven applications by consumers is mainly contingent on with the perceived trust and transparency of data processing (LU et al., 2021). Good Relationships with AIs: Ensuring Customers are at Ease on How their Information is Used As a result, hospitality should drive up data privacy communication, bringing customers into the dialogue around personalization of service delivery.

In addition, if AI learns from customer feedback and interactions, we have never had such a continuous opportunity for service quality improvement. However, this can still be improved and machine learning algorithms can improve the personalization process dynamically, based on real-time data and guest interactions (Marković & Gjurašić, 2020). This versatility enhances guest engagement and allows the hotels to remain relevant in an ever changing market, with diverse consumer interest.

Still, the advantages that AI and ML can deliver are evident, but organizations should stay cautious of the human and environmental harm of using this kind of technology. When unchecked, this can lead to

algorithms making decisions based on biased data which can only serve to strengthen existing divides in service delivery (Kansakar et al., 2019). The decisive method of AI deployment entails streamlining training data sets to decrease bias and incorporating equity and inclusivity into the decision-making process (Feldman & Peake, 2021).

In addition, the relationship between humans workers and AI system in hospitality leads to several considerations for managing the workforce. Training may also be needed for staff to complement the AI delivered service – retaining the human touch. Such a blended method improves the bespoke nature of services while also allowing workers to engage in roles that require intricate emotional cognition and subtle decision-making, capabilities that artificial intelligence is presently incapable of (Torres & Sipe, 2020).

Next, with AI becoming prevalent in nearly every industry, stakeholders must assess the implications for employment and skills necessary for the future. While it is true that AI will threaten some jobs, we can counter that with deliberate, strategic workforce development to ensure that people in the workforce have the skills to succeed in a workplace that contains AI (and ultimately, a workplace where AI)/. These initiatives are essential in making sure that humans remain an essential part of providing quality customer oriented hospitality experiences for the future (Gehrels & Suleri, 2016).

As a result, the adoption of AI and ML technologies in hospitality is a major step in the industry in delivery of services. Focusing on ethics and transparency in AI use can help hotels elevate customer experience and re-invent service excellence. Nonetheless, while we chase these developments, we need to be cautious about the opportunity born out of the challenges that lie ahead, especially regarding concerns about data privacy, bias, and workers. In such a fast-moving ecosystem, a balanced approach that emphasizes technological innovation alongside a service framework that retains the human element will be crucial to enable sustained success for the hospitality business.

Even though it is an era of digitization and new devices, the never-die spirit of hospitality lies in the pure art of hospitality – to the personalized experience rendered to all of guests coming to hotels without any bias and delighting them at the fullest. The more the researchers and practitioners delve into technology and hospitality, the more will the need for equitable service drive them to go deep into the chasm of human-technology service seamlessly integrated yet simply can be. As the integration of AI and ML in hospitality continues to develop, the potential to amplify efficiency and guest interaction will be realized but so will the opportunity that lies in finally being functional toward creating a more inclusive and responsive service environment. The potential for positive impact is massive, and so stakeholders need to keep navigating this transformation appropriately and responsibly.

Development of Hypotheses

Personalized Service through AI-Powered Technology (H01 and H11)

Hypotheses H01 and H11 have been used to investigate the aspect, understand the basic issues in the customized facilities using AI-based techniques, and analyze the gaps between loyalty program members and non-members in 5-star hotel chains. The concept has been drawn based on Service-Dominant Logic (Vargo & Lusch, 2004), which mainly focuses on the fact that the facts are gathered via interaction with customers with various services involving AI to give a personalized touch

Perception of Technology for Personalization (H02 and H12)

Hypotheses H02 and H12 are mainly to investigate if there is a difference in perceiving personalization using technology between the members of the loyalty program and non-members. The conception of this construct is based on the model- Technology Acceptance Model (TAM) (Davis, 1989), which elaborates on the perceived effectiveness and convenience of usage use as the main focus in terms of technology and its incorporation.

Technology and Stereotype Mitigation (H03 and H13)

Hypotheses H03 and H13 will be used to understand and examine bifurcation in the perception to understand technology mitigation and the various other stereotypes that can be there for members vs non-members. The Hypothesis construct is in line with the “theory of Algorithmic Fairness” (Mehrabani et al., 2021), which talks about the role technology plays and helps reduce service biases. Using the tools of advanced AI in the industry of hospitality is helping to navigate customer needs and also reduce biases in terms of engagement (Huang & Rust, 2021).

Choosing Hotels Using Advanced Technology (H04 and H14)

Hypotheses H04 and H14 are to discover how frequently the user is using the hotel app to select a stay which can be trained using AL and ML. Based on The Theory of Diffusion of Innovation (Rogers,

2003), this particular construct has underscored the way technology has impacted the decision-making for customers.

RESEARCH METHODOLOGY

The Current research uses the quantitative approach to investigate how technology such as AI and Machine Learning is used in 5-star hotels to personalize Hotel Service Encounters. Since the determination of the sampling frame was difficult, we followed a non-probability judgmental sampling to test the formulated set of research hypotheses. A self-administered questionnaire survey was used to collect the data from the respondents. In the first stage, the pilot version of the questionnaire was validated by a sample of fifteen respondents. Then, the final version of the questionnaire was based on the results of this pre-test validation of the questionnaire. The sampled population was 150 customers. The questionnaires were collected by 150 people from Pan-India. Out of 150 questionnaires, 24 questionnaires were excluded due to incomplete responses. Questions were divided into 4 sections namely Interaction with AI and Technology, Perception of Technology for personalization, Technology, and Stereotype Mitigation, and Future Expectations. Data was analyzed using SPSS, and tests such as the t-test, chi-square test, and Kruskal Wallis test were applied.

Objectives of the Study

- Explore AI tools adoption in 5 star hotels for customer interaction.
- Examine Employees and Customer's Views on usage of AI and ML technology for enhancement services.
- To study challenges of AI implementation in 5-star hotels.

Data Analysis

The sample observation indicates that 75% have stayed in 5-star hotel in past year.

The sample observation indicates that 47% have stayed in 5-star hotel more than a year ago, 21% have stayed within past 3 months.

The sample observation indicates that 22% of the sample are a member of loyalty program whereas 78% are not a part of any loyalty program offered by 5-star hotel chains.

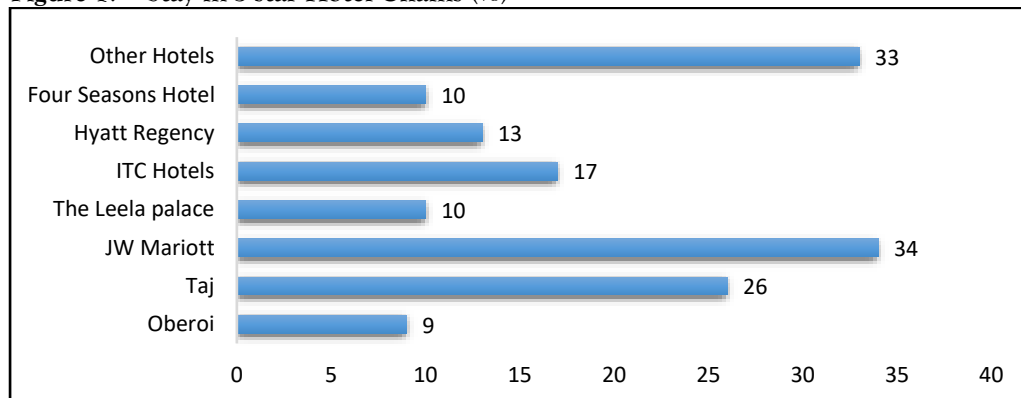
The sample observation indicates that 18% of sample have hotel's mobile application installed for loyalty program and 48% indicates that they are not a member of any loyalty program, hence mobile application is not installed.

The sample observation indicates that 31% have interacted with any AI-powered technology during hotel stay.

41% of the sample have experienced technology in hotels providing real time responses that reflect individual's preference such as past booking history, food preferences or room choices.

27% of the sample have experienced service encounters where technology helped providing an individualized, non- stereotypical response.

Figure 1: Stay in 5-star Hotel Chains (%)



The Figure 1 indicates that 34% of the sample have stayed in JW Marriott, followed by 33% of sample have stayed in other hotels. 26% of the sample have stayed in Taj Hotels.

The Figure 2 indicates that among favourite 5-star hotel chains, 33% of the sample prefer Taj hotels

followed by 29% preferring JW Marriott.

Figure 2: Favourite 5-star hotel chain (%)

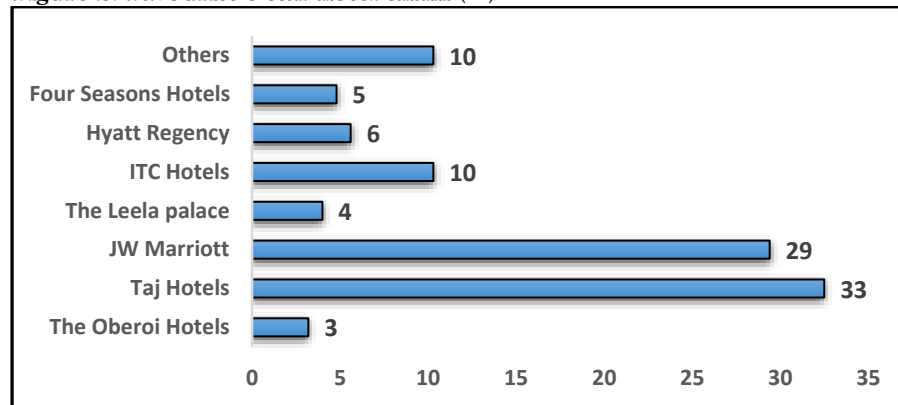
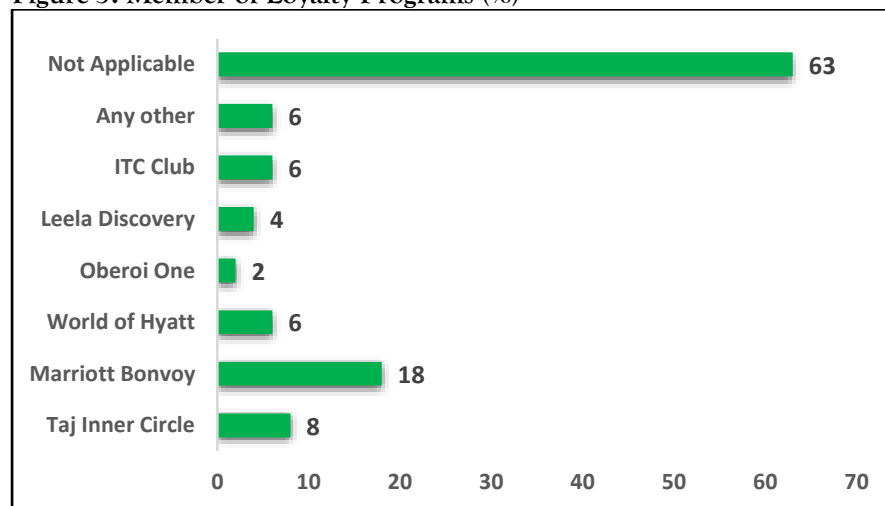
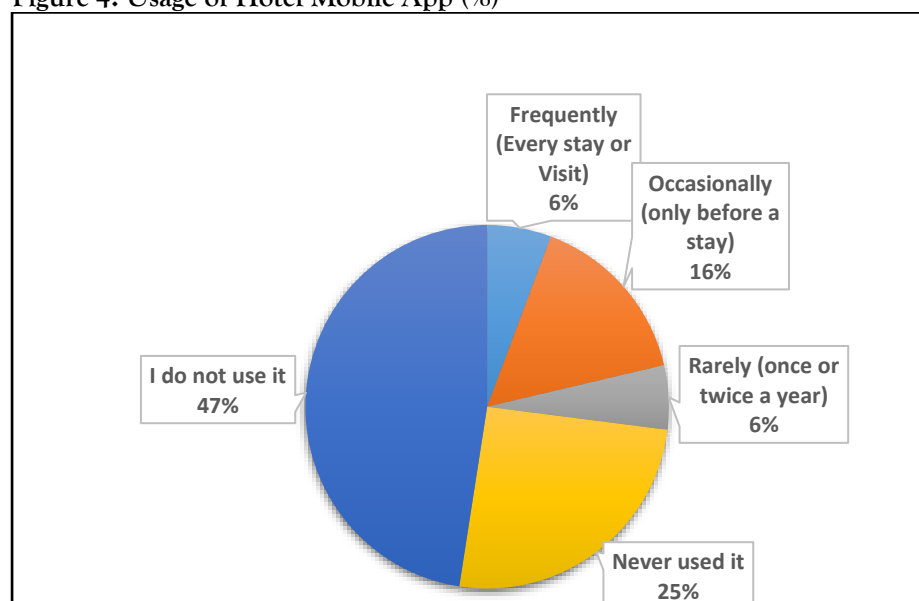


Figure 3: Member of Loyalty Programs (%)



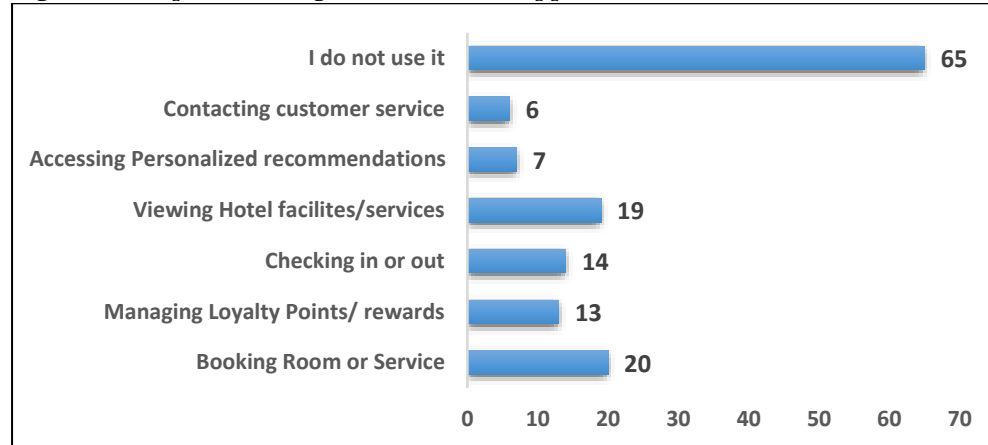
The Figure 3 indicates that 63% of the sample are not a member of any loyalty program and 18% of sample have Marriott Bonvoy loyalty program.

Figure 4: Usage of Hotel Mobile App (%)



The figure 4 indicates usage of Hotel Mobile app indicating that 47% do not use the app, followed by 25% of sample stating of never used the Hotel Mobile app.

Figure 5: Purpose of using Hotel's Mobile Application (%)



The Figure 5 indicates purpose of using hotel Mobile Application of which that 65% of respondents do not use it, followed by 20% using the app for Booking room service and 19% use it to view Hotel's Facilities and services.

Hypothesis Testing

HO1: The mean score of personalised service through AI-powered Technology is same to members and non-members of loyalty program offered by 5-star hotel Chain.

H11: The mean score of personalised service through AI-powered Technology is different to members and non-members of loyalty program offered by 5-star hotel Chain.

Based on the table 1 we observe that p value is 0.011 indicating that the mean score of personalised service through AI-powered Technology is different to members and non-members of loyalty program offered by 5-star hotel Chain.

Table 1: Hypothesis Test (Personalised AI-powered technology)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means			t-test for Equality of Means		t-test for Equality of Means	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
If yes, how personalized did you feel the service was through the AI-powered technology	Equal variances assumed	0.253	0.616	2.588	112	0.011	-0.717	0.277	-1.265	-0.168
	Equal variances not assumed			2.696	38.355	0.01	-0.717	0.266	-1.255	-0.179

HO2: The mean score of perception of technology for personalisation is same to members and non-members of loyalty program offered by 5-star hotel Chain.

H12: The mean score of perception of technology for personalisation is different to members and non-members of loyalty program offered by 5-star hotel Chain. Based on the table 2 we observe that p value is 0.072 indicating that the mean score of perception of technology for personalisation is same to members and non-members of loyalty program offered by 5-star hotel Chain.

Table 2: Hypothesis Test (Perception of Technology for Personalisation)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means			t-test for Equality of Means		t-test for Equality of Means	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Meanscoretechnology	Equal variances assumed	0.071	0.791	1.816	124	0.072	-0.21896	0.1206	-0.45766	0.01973
	Equal variances not assumed			1.877	45.865	0.067	-0.21896	0.11663	-0.45374	0.01582

HO3: The mean score of technology and stereotype mitigation is same to members and non-members of loyalty program offered by 5-star hotel Chain.

H13: The mean score of technology and stereotype mitigation is different to members and non-members of loyalty program offered by 5-star hotel Chain.

Based on the table 3 we observe that p value is 0.773 indicating that the mean score of technology and stereotype mitigation is same to members and non-members of loyalty program offered by 5-star hotel Chain.

Table 3: Hypothesis Test (Perception of Technology and Sterotype Mitigation)

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means				t-test for Equality of Means		
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
meanmitigation	Equal variances assumed	3.615	0.06	0.29	124	0.773	0.03912	0.13511	-0.22831	0.30654
	Equal variances not assumed			0.257	37.64	0.798	0.03912	0.1521	-0.2689	0.34713

HO4: The mean score of choosing hotel using advanced technology like AI and machine learning is same across groups of people using hotel's mobile app frequently. H14: The mean score of choosing hotel using advanced technology like AI and machine learning is different across groups of people using hotel's mobile app frequently.

Based on the table 4 we observe that p value= 0.404 indicating that: the mean score of choosing hotel using advanced technology like AI and machine learning is same across groups of people using hotel's mobile app frequently.

Table 4: Hypothesis Test (Future Expectations)

ANOVA					
How likely are you to choose a hotel that uses advanced technology like AI and machine learning to enhance your experience?					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.154	4	.788	1.012	.404
Within Groups	91.141	117	.779		
Total	94.295	121			

HO5: Recommending a 5-star hotel that uses AI-driven personalized services is independent of last stay in 5-star hotel.H15: Recommending a 5-star hotel that uses AI-driven personalized services is dependent of last stay in 5-star hotel.

Based on the table 5 we observe that p value is 0.666 indicating that recommending a 5-star hotel that uses AI-driven personalized services is independent of last stay in 5-star hotel.

Table 5: Hypothesis Test (Recommending personalised service)

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.082 ^a	6	.666
Likelihood Ratio	4.050	6	.670
Linear-by-Linear Association	1.236	1	.266
N of Valid Cases	126		

a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is 2.57.

HO6: There is no significant association between the frequency of staying in 5-star hotels and the likelihood of interacting with AI-powered technologies.

H16: There is a significant association between the frequency of staying in 5-star hotels and the likelihood of interacting with AI-powered technologies.

Based on the table 6 we observe that p value is 0.206 indicating that there is no significant association between the frequency of staying in 5-star hotels and the likelihood of interacting with AI-powered technologies.

Table 6: Hypothesis Test (interaction with AI Technology

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.573 ^a	3	.206
Likelihood Ratio	4.594	3	.204
Linear-by-Linear Association	2.547	1	.110
N of Valid Cases	126		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.57.

HO7: Perceived personalization does not significantly influence comfort with hotels accessing past booking data.

H17: Perceived personalization significantly influences comfort with hotels accessing past booking data.

Based on the table 7 we observe that p value is 0.024 indicating that Perceived personalization significantly influences comfort with hotels accessing past booking data.

Table 7: Hypothesis Test (Personalised service and Comfort

Correlations			
		If yes, how personalized did you feel the service was through the AI-powered technology?	How comfortable are you with hotels using AI to access your past booking data or profile to create a more tailored experience?
If yes, how personalized did you feel the service was through the AI-powered technology?	Pearson Correlation	1	.212*
	Sig. (2-tailed)		.024
	N	114	114
How comfortable are you with hotels using AI to access your past booking data or profile to create a more tailored experience?	Pearson Correlation	.212*	1
	Sig. (2-tailed)	.024	
	N	114	126
*. Correlation is significant at the 0.05 level (2-tailed).			

HO8: There is no significant difference in perception of technology for personalisation and stereotype mitigation for users' frequency usage on hotel's mobile application.

H18: There is significant difference in perception of technology for personalisation and stereotype mitigation for users' frequency usage on hotel's mobile application.

Based on the table 8 we observe that p value is 0.177 which indicates that there is no significant difference in perception of technology for personalisation for users' frequency usage on hotel's mobile application. Observation also shows that p value is 0.382 indicating that there is no significant difference in stereotype mitigation for users' frequency usage on hotel's mobile application.

Table 8: Hypothesis Test (Technology perception and Stereotype mitigation)

Test Statistics ^{a,b}		
	Meanscoretechnology	meanmitigation
Chi-Square	6.310	4.179
df	4	4
Asymp. Sig.	.177	.382
a. Kruskal Wallis Test		
b. Grouping Variable: If yes, how frequently do you use the hotel's mobile app?		

Managerial Implications

The research work focuses on using AI and ML technologies to improve personalized guest service in five-star hotels. Decision makers will have to invest in AI-driven systems that analyze customer data to provide individualized services to minimize the effect of stereotyping in hospitality. Training staff to work with these technologies is just as critical in ensuring that machine-driven insights are coupled with great human interaction. In addition, hotel managers must regularly assess the effectiveness of these technologies in ameliorating stereotype-based biases to make all guests feel valued and respected.

Implement AI-Based Personalization Systems

AI-driven systems are invaluable in processing guest data (preferences, past behavior, booking patterns) that drive personalized experiences (room recommendations, product offerings, customized amenities, etc.), for hotels. The application of AI can alleviate the danger of stereotyping by allowing hoteliers to draw personalized guest profiles. For instance, instead of clustering guests into boxes like their nationality or packaging heuristics, AI allows for more seamless and fair personalization—meaning guests receive the relevant services appropriate for them individually.

Educate Employees on AI Integration and Bias Awareness

Staff should receive training in how to use AI systems engagement while being aware of bias in their interaction and how they could use the data based on this interaction to provide personalized services. AI can alleviate many stereotypes, but in-person interaction is still important in most service offerings.

Strategies for Communicating One-on-One

Use AI-based chatbots and messaging systems to provide tailored messages and responses based on a guest's history and preferences, ensuring that interactions are inclusive (for example, avoiding guest behaviour that is potentially disrespectful, such as addressing them by a wrong gender). This is where AI-powered communication tools can help supplement language in personal and culturally aware (and appropriate) ways. It reduces the chances of issuing unsolicited ideas that inadvertently enforces stereotypes in areas that are communicated by hiring human staff, allowing them to provide their guests with a more customized and respectful service.

CONCLUSION

This research illustrates how artificial intelligence (AI) and machine learning (ML) has the potential to change the face of service delivery in hospitality by attenuating stereotypes and improving personalized guest experiences. The results corroborate the expected outcomes, suggesting that AI tools can help minimize biases, promote inclusivity, and provide low-cost highly personalized services. Through the utilization of these cutting-edge tools like chatbots and recommendation systems, hotels can overcome the conventional restraints of human biases and foster fair and personalized engagements for all guests. Yet the study also underlines a more nuanced perspective of AI, emphasising that privacy and bias in training data remain pressing concerns. Developing, implementing, and deploying AI-driven systems raises ethical issues requiring strong oversight, transparency, and monitoring to ensure fairness and minimize bias in the outcomes produced by such systems. Notably, the research emphasizes the importance of a harmonious blend of AI and human interactions to preserve the critical human element in guest engagement. The combination of both allows hotel services to provide a better quality service to their guests as it merges technical efficiency with emotional intelligence, thereby, meeting satisfaction levels of any guest. Thus, by considering the above facets, the study provides important scientific contributions, offering empirical evidence that enrich theoretical underpinnings on stereotype attenuation, personalization and technology-enhanced service innovation. Also, the paper discusses AI relevance associated with health crises like COVID-19, and highlights how AI has provided continuing standards of service under safe conditions. These results are a crucial stride toward grasping AI's potential to transform the hospitality sector, paving the way for future research on its ethical uses, cultural impact, and long-term consequences for labor relations. In summary, this research position AI as a foundation for innovation in hospitality with implications for academia and practitioners to enhance inclusivity, efficiency, and guest-centric service excellence.

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