Relationship of AI-powered Robot Servers on Brand Trust: The Mediating Role of Service Reliability and Moderating Effect of Technological Readiness

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ABSTRACT

This study explores how AI-powered robot servers affect brand trust with the mediation role of service reliability and moderating effect of technological readiness. The study aims to identify whether using AI-powered robot servers can improve service reliability and increase trust in the brand. Aiming to provide valuable insights for restaurant owners, AI developers, and future scholars on how technology can be used to improve service quality while maintaining customer trust and satisfaction. A quantitative research method was used, where survey questionnaires were distributed to customers who experienced AI-powered robot servers. The collected data were analyzed using Weighted mean, Pearson correlation, Mediation analysis, and Moderation analysis. The effect for AI-powered robot servers on brand trust (Path C), implies that the entire influence of AI-powered robot servers on brand trust is being channeled based on the improvement of service reliability. With the strong moderation effect of technological readiness, it implies that the level of technological readiness of a customer change on how the consumers interact and perceive the AI-powered robot servers in QSR. This means that when restaurants use AI-powered robot servers, customers see their services as more reliable and trustworthy especially when their technological readiness is high.

Keywords AI-powered robot servers, Brand trust, Service reliability, Technological readiness, Pearson Correlation Coefficient, Mediation Analysis, Moderation Analysis

INTRODUCTION

The Quick-Service Restaurant (QSR) industry is highly competitive, requiring businesses to continuously improve service efficiency, consistency, and customer experience to attract and retain customers. In response to the growing demand for fast and reliable service, restaurants worldwide have begun adopting automation and artificial intelligence (AI), including AI-powered service robots, to support frontline service operations. Research suggests that robotic service can improve functional aspects of restaurant experiences, particularly efficiency and convenience, while also creating opportunities for customer engagement and differentiation [1], [2]. However, the effectiveness of these technologies depends largely on how customers perceive and respond to robot-delivered services.

The use of AI-powered robot servers is particularly relevant to the foodservice industry because service encounters directly influence customers' perceptions of service quality and their subsequent behavioral intentions. Studies have

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found that customers evaluate robotic restaurant services based on functional factors such as usefulness, efficiency, service quality, and interaction quality, as well as emotional factors such as enjoyment, novelty, and friendliness [3], [4]. Research comparing robotic and human service providers also indicates that robots may provide advantages in utilitarian value and efficiency, while human employees can provide stronger emotional and social value. This suggests that the role of robots in restaurant service should be carefully aligned with customer expectations and the specific service context [5].

Customer acceptance of AI-powered robot servers is also influenced by perceptions of safety, ease of use, usefulness, and human-like characteristics. Research on restaurant service robots has shown that perceived safety, interaction quality, hedonic perceptions, and anthropomorphism can influence customers' willingness to use and recommend robotic services [6]. Similarly, a meta-analysis of service robot research found that anthropomorphism, usefulness, and customer characteristics can influence customers' responses to service robots, although the effects vary depending on the type of robot and service context [7]. These findings indicate that customers do not evaluate robot servers solely according to their technological capabilities; rather, their perceptions of the technology and the quality of the service encounter jointly shape their overall experience.

Trust is another important consideration in the adoption of AI-powered service robots. Because customers may perceive robots as unfamiliar or less predictable than human employees, their confidence in the technology can influence their willingness to accept robotic service. Research has demonstrated that anthropomorphic characteristics can increase consumers' trust in service robots, while customers' technology readiness can moderate how these characteristics affect trust-related perceptions [8]. Furthermore, perceived robot performance and innovative service environments have been shown to contribute to customer experiential value, with technology trust serving as an important mechanism linking customer experience to behavioral intentions [9]. Thus, understanding brand trust in the context of robotic service is important because positive technological experiences may contribute to customers' confidence not only in the robot but also in the restaurant brand providing the service.

Service reliability may provide an important link between the use of AI-powered robot servers and brand trust. In a QSR environment, reliability involves delivering service accurately, consistently, and within the expected time. Existing research indicates that service quality in robotic restaurants is associated with perceived value, restaurant image, satisfaction, and revisit intention [10]. Similarly, studies of AI-supported foodservice have found that responsiveness and anthropomorphism can influence perceived AI service quality and subsequently affect customer engagement and satisfaction [11]. These findings suggest that customers may be more likely to develop favorable evaluations of a restaurant when robotic technology performs service tasks accurately, consistently, and efficiently.

Despite the growing international literature on service robots in hospitality and restaurants, a gap remains in understanding these relationships within the Philippine QSR context. Existing research has largely focused on countries

such as South Korea, China, India, Türkiye, and other emerging or technologically developed markets, while relatively limited empirical attention has been given to how Filipino QSR customers perceive AI-powered robot servers [1], [6], [12]. In particular, there is a need to examine whether service reliability mediates the relationship between AI-powered robot servers and brand trust and whether customers' technological readiness moderates these relationships. Addressing this gap can provide a more comprehensive understanding of how technological characteristics and service performance interact to influence customer perceptions of QSR brands.

Therefore, this study aims to examine how AI-powered robot servers influence customer experience and brand trust in Philippine QSRs. Specifically, it assesses customers' perceptions of AI-powered robot servers in terms of usefulness, ease of use, human-like qualities, safety, and perceived risk; evaluates the level of brand trust developed after interacting with robot servers; examines service reliability in terms of timeliness, accuracy, and consistency; determines customers' technological readiness and openness toward new technologies; and analyzes the relationships among AI-powered robot servers, service reliability, and brand trust. In particular, the study investigates the mediating role of service reliability and the moderating role of technological readiness in these relationships.

Literature Review and Hypothesis Development

AI-powered Robot Servers Significantly Affect Brand Trust

AI-powered robot servers have increasingly become part of restaurant service environments, with their impact extending beyond operational efficiency to customer satisfaction, trust, and behavioral intentions. Novelty, perceived enjoyment, and service speed have been identified as important drivers of customer satisfaction in service-robot restaurants, while trust can mediate the relationship between customer satisfaction and customers' intentions to return [13]. Similarly, research on trust in social robots indicates that brand-related and relationship-related factors are important in shaping consumers' trust toward social robots and service providers [14].

The integration of artificial intelligence (AI) into restaurant services can also enhance convenience, strengthen customer relationships, and reduce operational costs [15]. Emotional trust may further influence how customers evaluate different forms of service innovation, particularly among customers with greater service expertise [15]. In addition, AI-powered service quality, customization, and convenience can positively influence customer responses when accompanied by trust and perceived value [16]. Customers have also reported greater satisfaction when robot servers provide reliable, responsive, safe, and fast services [13]. Moreover, technologically experienced customers tend to respond more positively to service innovations because they are more likely to perceive new technologies as useful and trustworthy [17].

These findings suggest that AI-powered robot servers can influence how customers evaluate the restaurant and its brand. When customers perceive robot-delivered services as useful, safe, reliable, and enjoyable, they may develop greater confidence in the technology and the brand associated with it. Therefore, this study proposes the following hypothesis:

H1: AI-powered robot servers significantly affect brand trust.

Service Reliability Significantly Affects Brand Trust

Service reliability is an important component of customers' evaluations of service providers because consistent and dependable service can strengthen customer confidence in a brand. Prameka et al. [18] examined the relationships among perceived value, service quality, customer satisfaction, and brand trust and found that customer satisfaction partially mediated the relationship between perceived value and brand trust, while service quality had a stronger relationship with brand trust through customer satisfaction. Similarly, Azzam et al. [19] found that service quality and brand trust significantly influence consumers' purchase decisions, with customer satisfaction serving as an important connecting mechanism.

The development of trust is also strongly associated with the quality of the relationship between customers and brands. Perceived value, satisfaction, customer service, and brand image have been found to positively influence consumer trust in brands [20]. In the airline industry, service quality has also been associated with corporate image, customer trust, and corporate reputation [21]. Furthermore, service quality has been found to influence brand trust, which subsequently contributes to brand loyalty [22].

Taken together, these findings indicate that reliable service can strengthen customers' confidence in a brand. In the context of QSRs, reliability can be reflected through timely service, accurate order fulfillment, and consistent service performance. When customers experience dependable service from an AI-powered robot server, they may perceive the restaurant as more capable and trustworthy. Therefore, this study proposes:

H2: Service reliability significantly affects brand trust.

Significant Relationship Between AI-powered Robot Servers and Brand Trust

The relationship between AI-powered robot servers and brand trust can also be understood through customers' perceptions of risk, usefulness, consistency, and technological familiarity. Research examining robot services in restaurants found that trust reduces customers' perceived risk, while satisfaction is associated with customers' intentions to revisit the restaurant [23]. This suggests that trust is an important psychological mechanism through which customers evaluate robotic service experiences.

Service robots can also transform service delivery by performing repetitive tasks consistently and maintaining standardized service performance [24]. Consistency is particularly relevant to trust because customers may become more confident in robotic service when they perceive that the technology can deliver predictable outcomes [25]. In addition, customers who are familiar with technology tend to evaluate service robots more positively because they perceive them as useful and trustworthy [17].

Cultural and individual differences may also influence customers' willingness to trust and adopt AI-powered service robots. Trust has been identified as an essential factor in customers' acceptance of AI service robots, although its

influence may vary across cultural contexts [26]. These findings demonstrate that trust is not simply an outcome of technological adoption but also an important factor shaping customers' responses to robotic service.

Therefore, the following hypothesis is proposed:

H3: There is a significant relationship between AI-powered robot servers and brand trust.

Service Reliability Mediates the Relationship Between AI-powered Robot Servers and Brand Trust

Service reliability may function as an important mechanism linking AI-powered robot servers to brand trust. Customers do not necessarily develop trust solely because a restaurant uses AI technology; rather, trust may develop when the technology consistently delivers satisfactory service. Research on service robots in hospitality and tourism found that customers generally reported positive experiences and recognized the functional and emotional value provided by robots, although improvements in social interaction remain necessary [27].

More recent evidence indicates that AI-enabled restaurant services can influence customer satisfaction and subsequent behavioral intentions, including revisit intentions, suggesting that reliable technological performance can contribute to continued customer engagement [28]. Research on AI service robots has likewise demonstrated relationships among AI service quality, customer engagement, trust, and loyalty, indicating that service performance and customer perceptions can work together in developing longer-term relationships [29].

Trust is also central to customers' adoption of AI-enabled services. Research on AI social-care robots in hospitality and tourism identified trust perceptions as a key component of the adoption process [30]. These findings support the possibility that customers first evaluate the reliability of the service encounter before developing stronger trust toward the brand providing the technology.

In the QSR context, AI-powered robot servers that consistently deliver timely, accurate, and dependable service may therefore strengthen customers' perceptions of the restaurant and subsequently increase brand trust. Accordingly, this study proposes:

H4: Service reliability mediates the relationship between AI-powered robot servers and brand trust.

Technological Readiness Moderates the Relationship Between AI-powered Robot Servers and Brand Trust

Technological readiness may influence how customers perceive and respond to AI-powered robot servers. The Artificially Intelligent Device Use Acceptance (AIDUA) framework suggests that customers' intention to engage with AI devices is influenced by factors such as social influence, motivation, performance expectancy, effort expectancy, and emotional responses toward AI technology [31]. This indicates that customers' existing attitudes and readiness toward technology can affect their evaluation of AI-enabled services.

Service quality delivered by AI and human employees can also influence customers' overall service evaluations and satisfaction, although the importance of specific service-quality dimensions may differ depending on the service context [32]. Furthermore, human-like characteristics of robots, physical cues, and customers' psychological responses can contribute to perceived trust in AI technologies [33]. These effects may be stronger or weaker depending on customers' familiarity and readiness to interact with emerging technologies.

Technological readiness therefore represents an important individual characteristic that may explain differences in customers' responses to AI-powered robot servers. Customers who are more technologically ready may be more open to robotic service, perceive the technology as less risky, and be more likely to trust brands that implement AI-based service technologies. In contrast, customers with lower technological readiness may be more cautious or uncertain when interacting with robot servers.

Thus, technological readiness may strengthen or weaken the relationship between AI-powered robot servers and brand trust. Based on this reasoning, the following hypothesis is proposed:

H5: Technological readiness moderates the relationship between AI-powered robot servers and brand trust.

Methodology

This study employed a causal-explanatory quantitative research design to examine the relationships among AI-powered robot servers, service reliability, technological readiness, and brand trust. Specifically, the study investigated the effect of AI-powered robot servers on brand trust, the mediating role of service reliability, and the moderating effect of technological readiness. A total of 300 out of 300 targeted respondents participated in the study, resulting in a 100% response rate.

The respondents were customers who had dined at Quick-Service Restaurants (QSRs) and had experienced services provided by AI-powered robot servers. Since the exact population of customers who had experienced AI-powered robot servers in QSRs could not be determined, the study employed a non-probability convenience sampling technique. For an undefined population, a sample size of 385 respondents is commonly recommended based on a 95% confidence level and a 5% margin of error [1]. However, based on the recommendation of a professional statistician, the study used 300 respondents, which was considered sufficient for the statistical analyses employed in the study.

The researchers developed a Modified Structured Questionnaire based on instruments from relevant previous studies and adapted the items to fit the context and objectives of the present study. The questionnaire consisted of closed-ended questions with standardized wording and a predetermined sequence, requiring participants to select their responses from established options.

To ensure the reliability and validity of the adapted questionnaire, the researchers reviewed the reliability results of the constructs reported in relevant previous studies and assessed their internal consistency using Cronbach's alpha. The reliability results reported by Davis [2] for perceived usefulness and

perceived ease of use demonstrated high internal consistency, with Cronbach's alpha values of 0.97 and 0.91, respectively.

For the constructs related to service reliability, Cronbach's alpha values of 0.914, 0.823, and 0.830 were reported, indicating internal consistency ranging from very good to excellent [3], [4]. Similarly, the constructs related to responsiveness demonstrated Cronbach's alpha values of 0.823, 0.956, and 0.91, indicating very good to excellent internal consistency [3]–[5]. The assurance construct recorded a Cronbach's alpha value of 0.84, indicating very good internal consistency [6]. The tangibles construct demonstrated Cronbach's alpha values of 0.72 and 0.875, indicating good to very good internal consistency [6]. Meanwhile, the empathy construct recorded a Cronbach's alpha value of 0.816, indicating very good internal consistency [3]. Finally, the brand trust construct demonstrated a Cronbach's alpha value of 0.977, indicating excellent internal consistency [7].

The reliability results from these previous studies provide support for the internal consistency of the constructs adapted for the present study. The use of established measurement instruments also strengthens the methodological basis for assessing customers' perceptions of AI-powered robot servers, service reliability, and brand trust.

The data analysis procedures were conducted with the guidance of a professional statistician. Weighted mean was used to determine the level of respondents' perceptions of the study variables. The Pearson correlation coefficient was employed to determine the strength and direction of the relationships among the variables. Mediation analysis was conducted to determine whether service reliability mediates the relationship between AI-powered robot servers and brand trust. Moderation analysis was performed to determine whether technological readiness moderates the relationship between AI-powered robot servers and brand trust. These statistical procedures were selected to address the research objectives and test the hypotheses of the study.

Result and Discussion

Table 1 presents the summarized responses of participants concerning technological readiness and service reliability, evaluated using a 5-point Liker scale (1.00 = Strongly Disagree to 5.00 = Strongly Agree). With regard to technological readiness, Perceived Usefulness obtained a weighted mean score of 4.07, interpreted as "Agree," whereas Perceived Ease of Use recorded a mean of 3.46, corresponding to "Neither Agree nor Disagree." In terms of service reliability, Tangibles yielded the highest weighted mean of 4.23 ("Agree"). Similarly, the dimensions of Reliability (3.84), Assurance (3.89), and Responsiveness (3.69) were also interpreted as "Agree." Among the assessed variables, Empathy registered the lowest mean score of 3.47, interpreted as "Neither Agree nor Disagree." Moreover, the distinct dimension of Brand Trust received a relatively high mean score of 4.12, likewise interpreted as "Agree." Overall, the findings reveal varying degrees of respondent agreement across the variable, with Tangibles demonstrating the highest level of agreement and Empathy reflecting the lowest.

Table 1 Summary of Weighted Mean Scores and Interpretation

Variables	Weighted Mean	Remarks
Perceived Usefulness	4.07	Agree
Perceived Ease of Use	3.46	Neither Agree nor Disagree
Reliability	3.84	Agree
Responsiveness	3.69	Agree
Assurance	3.89	Agree
Tangibles	4.23	Agree
Empathy	3.47	Neither Agree nor Disagree
Brand Trust	4.12	Agree

If 1.00 to 1.50= Strongly Disagree, 1.51 to 2.50 = Disagree, 2.5 to 3.50=Neither Agree nor Disagree, 3.51 to 4.50 = Agree, 4.51 to 5.00 = Strongly Agree

Table 2 presents the Summary of Correlational Results derived from the bivariate Pearson correlation analysis, testing the hypothesized relationships (H1, H2, and H3) between the constructs: AI-Powered Robot Servers (AI-PRS), Service Reliability (SR), and Brand Trust (BT).

Table 2 Summary of Correlational Results

Hypothesis	Path	r-value	p-value	Remarks
H1	AI-PRS → SR	0.743	0.000	Highly Significant and Strong Positive Relationship
H2	SR → BT	0.607	0.000	Highly Significant and Positive Relationship
H3	AI-PRS → BT	0.462	0.000	Highly Significant and Moderate Positive Relationship

H1: AI-Powered Robot Servers and Service Reliability

The bivariate Pearson correlation analysis reveals a highly significant and strong positive relationship between Artificial Intelligence-Powered Robot Servers and Service Reliability. The Pearson correlation coefficient is r=0.743, which indicates a substantial, direct linear association between the two variables. The two-tailed significance value is p=0.000. Since this p-value is less than the conventional significance level of alpha 0.05, the relationship is confirmed as statistically highly significant, providing strong support for H1. This suggests that an increase in the implementation or perceived quality of Artificial Intelligence-Powered Robot Servers is strongly associated with an increase in perceived Service Reliability.

H2: Service Reliability and Brand Trust

For the relationship between Service Reliability and Brand Trust, the bivariate Pearson correlation analysis also demonstrates a highly significant and strong positive relationship. The calculated Pearson correlation coefficient is r=0.607, which suggests a substantial, direct linear association. The two-tailed significance value is p=0.000. Since this p-value falls below the specified significance level of alpha 0.05, the relationship is statistically confirmed as

highly significant, thus supporting H2. This finding implies that greater perceived Service Reliability is substantially associated with higher levels of Brand Trust.

H3: AI-Powered Robot Servers and Brand Trust

The bivariate Pearson correlation analysis examining the direct relationship between Artificial Intelligence-Powered Robot Servers and Brand Trust indicates a highly significant and moderate positive relationship. The Pearson correlation coefficient is r=0.462, which suggests a moderate, direct linear association between these constructs. The two-tailed significance value is p=0.000. Given that this p-value is below the 0.05 threshold, the relationship is established as statistically highly significant, lending support to H3. This result signifies that the deployment of AI-Powered Robot Servers is moderately associated with increased Brand Trust. Table 3 presents the results of a mediation analysis conducted to test Hypothesis 4 (H4), which proposed that Service Reliability (SR) mediates the relationship between AI-Powered Robots (AI-PRS) and Brand Trust (BT). This analysis followed the framework of a single mediator model, where AI-PRS acts as the independent variable (X), BT as the dependent variable (Y), and SR as the proposed mediator (M).

Table 3 Results of the Mediation Analysis

Hypothesis		β	SE	P-value	Remarks
H4	Total Effect (C)	0.059	0.169	>0.05	Non-significant
	Direct Effect (C) AI-PRS → BT	0.059	0.169	>0.05	Non-significant
	Path A: AI-PRS → SR	1.004	0.022	<0.001	Highly Significant
	Path B: SR→ BT	0.687	0.157	<0.001	Significant
	Indirect Effect (A*B): AI-PRS → SR → BT	0.690	0.045	<0.001	Highly Significant

The total effect of AI-Powered Robots on Brand Trust (Path C) was found to be non-significant, with a standardized coefficient of 0.059 and a standard error of 0.169 ($p > 0.05$). In contrast, the indirect pathway through Service Reliability demonstrated a highly significant mediation effect. Path A ($\beta = 1.004$, SE = 0.022, $p < 0.001$) indicated a strong positive influence of AI-Powered Robots on Service Reliability, while Path B ($\beta = 0.687$, SE = 0.157, $p < 0.001$) showed a significant positive effect of Service Reliability on Brand Trust. The direct effect (Path C) remained non-significant, whereas the indirect effect (Path A × Path B; $\beta = 0.690$, SE = 0.045, $p < 0.001$) was substantial and highly significant. These findings provide robust evidence of full mediation, indicating that the influence of AI-Powered Robots on Brand Trust is fully transmitted through improvements in Service Reliability. With the Moderation Analysis, table 4 presents the moderation effect of Technological Readiness (TR) between the AI-powered robot servers (AI-PRS) and Brand Trust (BT) which tested the Hypothesis 5 (H5), which proposes that the Technological Readiness moderates on the relationship between AI-powered Robot Servers and Brand Trust.

Table 4 Results of the Moderation Analysis

Hypothesis	Model	Predictors	β	R^2	R^2 Change
H5	1			.879	0.879
		AI - Powered Robot Servers	.995		
		Brand Trust	-.108		
	2			1.000	0.121
		AI - Powered Robot Servers	1.873		
		Brand Trust	.000		
		Service Reliability	-1.007		

The Moderation Analysis suggested a strong moderation effect is present and statistically significant between the relationship of AI-powered Robot Servers and Brand Trust. With the addition of an interaction term (Service Reliability, as suggested in Model 2's predictors) to the base model (AI-powered Robot Servers and Brand Trust), the power of Technological Readiness increased substantially, a value changed by 0.121 in the R2 which concludes that with the addition of a new variable increases the variance with an additional of 12.1% towards the Technological Readiness. With a large and substantial increase, it explains that the relationship between the base model and Technological Readiness is not simple or direct, but is instead conditional upon the level of moderator variable that was introduced in Model 2.

The results of the study revealed that AI-powered robot servers have a strong and significant effect on service reliability ($r = 0.743$, $p = 0.000$), indicating that customers consider robot servers dependable and consistent. This finding supports previous studies [1], [2], which stated that customers experience greater satisfaction when services are timely, responsive, accurate, and pleasant, but differs from another study [32], which observed that only specific dimensions of service quality had a significant impact. Service reliability also showed a significant effect on brand trust ($r = 0.607$, $p = 0.000$), supporting previous research [3], [6], which emphasized that dependable service strengthens customer satisfaction and trust.

The study further showed a significant relationship between AI-powered robot servers and brand trust ($r = 0.462$, $p = 0.000$), consistent with previous findings [14], which indicated that trust in robots can extend to the brand itself, but differs from research [4], which pointed out that some customers may be skeptical about a brand's intentions when replacing human employees with technology. Mediation analysis established that service reliability completely mediates the relationship between AI-powered robot servers and brand trust, as both Path A and Path B were significant while Path C was not. This finding aligns with previous research [3], [5], which found that reliability, usefulness, and service speed can contribute to customer satisfaction and trust.

Lastly, technological readiness was found to moderate the relationship between AI-powered robot servers and brand trust, resulting in a 12.1% increase in explained variance. This finding supports previous research [31], which proposed that customers' willingness to engage with AI technologies is

influenced by social influence, motivation, performance and effort expectations, and emotional responses [34], [35]. It also supports previous findings [26], which emphasized the importance of trust in customers' acceptance of AI service robots.

In conclusion, these findings imply that AI-powered robot servers primarily strengthen brand trust through reliable and consistent service performance, while technological readiness influences how customers perceive and develop trust toward AI-powered services.

Conclusion

The outcome revealed that APRS improves customers' perceptions regarding the SR of a QSR, and improving SR increases their BT. Although utilizing this advanced technology moderately increases BT, the results showed that it is not the sole factor affecting customers' trust towards a QSR. The study also highlighted the significant indirect effect among APRS, SR, and BT, which is important for understanding customer perception in QSRs. This implies that if APRS delivers a reliable service in a QSR, customers' BT will increase. Moreover, customers' perception and interaction with APRS in a QSR depends on their TR level. Based on these inferences, customers may benefit from interacting with APRS and actively provide insights to enhance its service. QSRs may invest in and implement APRS to achieve operational efficiency, and manufacturers may improve its design features to appear empathetic and easy to use. Additionally, it is considered significant and informative for future researchers to conduct studies focusing on the moderating effect of demographic profile between TR and BT, comparing APRS usage across various QSR, and testing more mediators and moderators affecting perceptions and APRS' effectiveness.

Declarations

Author Contributions

Conceptualization: J.G.A., A.M.V.A., R.A.A., M.A.S.A., A.L.F.B., and J.O.G.; Methodology: A.M.V.A.; Software: J.G.A.; Validation: J.G.A., A.M.V.A., R.A.A., M.A.S.A., A.L.F.B., and J.O.G.; Formal Analysis: J.G.A., A.M.V.A., R.A.A., M.A.S.A., A.L.F.B., and J.O.G.; Investigation: J.G.A.; Resources: A.M.V.A.; Data Curation: A.M.V.A.; Writing Original Draft Preparation: J.G.A., A.M.V.A., R.A.A., M.A.S.A., A.L.F.B., and J.O.G.; Writing Review and Editing: A.M.V.A., J.G.A., R.A.A., M.A.S.A., A.L.F.B., and J.O.G.; Visualization: J.G.A.; All authors have read and agreed to the published version of the manuscript.

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The data presented in this study are available on request from the corresponding author.

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Declaration of Competing Interest

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References

[1] A. Alejandro, M. C. Villanueva, D. M. Colasito, and M. C. Tuante, "The emergence of service robots at selected quick service restaurants: Impact on customer experience and satisfaction," *Journal of Interdisciplinary Perspectives*, vol. 3, no. 2, pp. 220–228, 2025.

[2] N. Ameen, A. Tarhini, A. Reppel, and A. Anand, "Customer experiences in the age of artificial intelligence," *Computers in Human Behavior*, vol. 114, Art. no. 106548, 2021.

[3] F. R. Azzam, A. Widodo, A. Silvianita, and N. Rubiyanti, "The service quality and brand trust toward purchase decisions: The mediating role of customer satisfaction: A conceptual paper," *International Journal of Integrative Sciences*, vol. 3, no. 5, pp. 391–402, 2024.

[4] G. Campagna and M. Rehm, "A systematic review of trust assessments in human–robot interaction," *ACM Transactions on Human-Robot Interaction*, vol. 14, no. 2, pp. 1–35, 2025.

[5] N. Castelo, J. Boegershausen, C. Hildebrand, and A. P. Henkel, "Understanding and improving consumer reactions to service bots," *Journal of Consumer Research*, vol. 50, no. 4, pp. 848–863, 2023, doi: 10.1093/jcr/ucad023.

[6] Y. Chen, C. Prentice, S. Weaven, and A. Hisao, "The influence of customer trust and artificial intelligence on customer engagement and loyalty—The case of the home-sharing industry," *Frontiers in Psychology*, vol. 13, Art. no. 912339, 2022.

[7] O. H. Chi, C. G. Chi, D. Gursoy, and R. Nunkoo, "Customers' acceptance of artificially intelligent service robots: The influence of trust and culture," *International Journal of Information Management*, vol. 70, Art. no. 102623, 2023, doi: 10.1016/j.ijinfomgt.2023.102623.

[8] O. H. Chi, S. Jia, Y. Li, and D. Gursoy, "Developing a formative scale to measure consumers' trust toward interaction with artificially intelligent (AI) social robots in service delivery," *Computers in Human Behavior*, vol. 118, Art. no. 106700, 2021.

[9] A. H. Chiang and S. Trimi, "Impacts of service robots on service quality," *Service Business*, vol. 14, no. 3, pp. 439–459, 2020, doi: 10.1007/s11628-020-00423-8.

[10] F. D. Davis, "Technology acceptance model: TAM," in *Information Seeking Behavior and Technology Adoption*, M. N. Al-Suqri and A. S. Al-Aufi, Eds. Hershey, PA, USA: IGI Global, 1989, pp. 205–219.

[11] V. Della Corte, F. Sepe, D. Gursoy, and A. Prisco, "Role of trust in customer attitude and behaviour formation towards social service robots," *International Journal of Hospitality Management*, vol. 114, Art. no. 103587, 2023.

[12] O. El-Said and S. Al Hajri, "Are customers happy with robot service? Investigating satisfaction with robot service restaurants during the COVID-19 pandemic," *Heliyon*, vol. 8, no. 3, 2022.

[13] I. G. Figueiredo, P. F. Moutinho, P. O. Duarte, and A. C. Macedo, "Customers' intentions to use restaurants with robot waiters: An extension of the Technology Acceptance Model," *Journal of the Knowledge Economy*, 2025, advance online publication, doi: 10.1007/s13132-025-02827-1.

[14] Food & Wine, "Restaurants are turning to robot servers—here's what to know," *Food & Wine*, Apr. 6, 2023.

[15] D. Huang, Q. Chen, J. Huang, S. Kong, and Z. Li, "Customer-robot interactions: Understanding customer experience with service robots," *International Journal of Hospitality Management*, vol. 99, Art. no. 103078, 2021.

[16] J. Hwang, J. Y. Choe, K. H. Joo, and J. J. Kim, "Which has a greater impact on brand satisfaction, human service or robot service as a waiter/waitress in the restaurant industry?" *Technology Analysis & Strategic Management*, pp. 1–15, 2024, doi: 10.1080/09537325.2024.2408734.

[17] Z. R. Khavas, S. R. Ahmadzadeh, and P. Robinette, "Modeling trust in human-robot interaction: A survey," in *Proc. Int. Conf. Social Robotics*, 2020, pp. 529–541.

[18] H. Lin, O. H. Chi, and D. Gursoy, "Antecedents of customers' acceptance of artificially intelligent robotic device use in hospitality services," *Journal of Hospitality Marketing & Management*, vol. 29, no. 5, pp. 530–549, 2020, doi: 10.1080/19368623.2020.1685053.

[19] A. Mariana, B. Hadianto, and C. Suyanto, "Service quality, brand trust, and brand loyalty," *Jurnal Manajemen Terapan dan Keuangan*, vol. 10, no. 2, pp. 183–193, 2021.

[20] A. Monfort, B. López-Vázquez, and A. Sebastián-Morillas, "Building trust in sustainable brands: Revisiting perceived value, satisfaction, customer service, and brand image," *Sustainable Technology and Entrepreneurship*, Art. no. 100105, 2025.

[21] C. B. Oribhabor and C. A. Anyanwu, "Research sampling and sample size determination: A practical application," *Journal of Educational Research (Fudjer)*, vol. 2, no. 1, pp. 47–57, 2019.

[22] A. Parasuraman, V. A. Zeithaml, and L. L. Berry, "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality," *Journal of Retailing*, vol. 64, no. 1, pp. 12–40, 1988.

[23] A. S. Prameka, B. R. Do, and A. Rofiq, "How brand trust is influenced by perceived value and service quality: Mediated by hotel customer satisfaction," *APMBA (Asia Pacific Management and Business Application)*, vol. 5, no. 2, pp. 73–88, 2016.

[24] C. Prentice, S. Dominique Lopes, and X. Wang, "The impact of artificial intelligence and employee service quality on customer satisfaction and loyalty," *Journal of Hospitality Marketing & Management*, vol. 29, no. 7, pp. 739–756, 2020, doi: 10.1080/19368623.2020.1722304.

[25] S. K. Roy, G. Singh, S. Sadeque, and R. L. Gruner, "Customer experience quality with social robots: Does trust matter?" *Technological Forecasting and Social Change*, vol. 198, Art. no. 123032, 2024, doi: 10.1016/j.techfore.2023.123032.

[26] K. H. Seo and J. H. Lee, "The emergence of service robots at restaurants: Integrating trust, perceived risk, and satisfaction," *Sustainability*, vol. 13, no. 8, Art. no. 4431, 2021, doi: 10.3390/su13084431.

[27] K. H. Seo and J. H. Lee, "The impact of service quality on perceived value, image, satisfaction, and revisit intention in robotic restaurants for sustainability," *Sustainability*, vol. 17, no. 16, Art. no. 7422, 2025, doi: 10.3390/su17167422.

[28] T. R. Shah, P. Kautish, and K. Mehmood, "Influence of robots service quality on customers' acceptance in restaurants," *Asia Pacific Journal of Marketing and Logistics*, vol. 35, no. 12, pp. 3117–3137, 2023.

[29] V. Sharma, M. Kapse, J. Poulose, and Y. Mahajan, "Robotic dining delight: Unravelling the key factors driving customer satisfaction in service robot restaurants using PLS-SEM and ML," *Cogent Business & Management*, vol. 10, no. 3, Art. no. 2281053, 2023, doi: 10.1080/23311975.2023.2281053.

[30] H. Song, W. Ruan, and Y. Park, "Effects of service quality, corporate image, and customer trust on the corporate reputation of airlines," *Sustainability*, vol. 11, no. 12, Art. no. 3302, 2019.

[31] "The effects of service quality on customer satisfaction in the 3 stars' hotels in Arusha City," *The Open University of Tanzania Institutional Repository*, n.d.

[32] V. Uren and J. S. Edwards, "Technology readiness and the organizational journey towards AI adoption: An empirical study," *International Journal of Information Management*, vol. 68, Art. no. 102588, 2023.

[33] Y. Wei and A. E. Simay, "AI adoption in the Chinese food and beverage industry: An exploratory study," *FIRM Journal of Management Studies*, vol. 8, no. 2, pp. 145–160, 2023.

[34] U. Wistedt, "Consumer purchase intention toward POI-retailers in cross-border E-commerce: An integration of technology acceptance model and commitment-trust theory," *Journal of Retailing and Consumer Services*, vol. 81, Art. no. 104015, 2024.

[35] X. Zheng, Y. C. Wang, W. Wei, L. Zhang, and D. Huo, "The impact of service robots on consumer response: Examining the roles of consumers' service expertise and technology expertise," *Psychology & Marketing*, vol. 40, no. 11, pp. 2341–2354, 2023.