Influence of AI Chatbot Communication Features and AI Service Agent Marketing Effort on Customer Satisfaction in Online Car Rental Platform

Kok Hao Yuan[1], Aini Khalida Muslim[1*], Muhamad Izaidi Ishak[2], Athirah Mohd Tan[1], Naveed Ahmad[3], Vimala Govinda Raj[4]

[1] Fakulti Pengurusan Teknologi dan Teknousahawanan, Universiti Teknikal Malaysia Melaka, Malaysia

[2]Faculty of Business and Communication, Universiti Malaysia Perlis, Malaysia

[3] Faculty of Business Education, Social Science and Humanities, Department of Management Science, Isra University, Hyderabad, Pakistan

[4]GV Universal Resources, Malaysia

Corresponding Author*

DOI: https://doi.org/10.47772/IJRISS.2026.10100390

Received: 17 January 2026; Accepted: 22 January 2026; Published: 08 February 2026

ABSTRACT

This paper discusses how AI chatbot communication features and AI service agent marketing activities affect customer satisfaction in online car rental websites in Malaysia, as a response to the industry deterioration due to the inability to access customer support, complicated booking processes, and the obsolete systems. Based on the service, quality measurement (SERVQUAL) model, the research is centered on the responsiveness and emotional expression of AI chatbots, the interaction and problem-solving ability of AI service agents, as important factors of customer satisfaction. A cross-sectional research design that was quantitative was adopted, and the data was gathered using an online survey with a convenience sample of 384 Malaysian users above the age of 18 years with prior experience of interacting with AI chatbots on online car rental sites. ANOVA was used to analyse the observed data through SPSS version 27.0. The results indicate that the features of chatbots communication with customers and marketing activities by the AI service agents positively influence customer satisfaction significantly, which is why the combination of an efficient and emotionally responsive AI communication with efficient service interaction and problem-solving is essential. The findings indicate that the properly developed AI chatbots can increase the rate of service and user experience, whereas marketing-oriented AI service agents can further improve customer trust and satisfaction. Future studies are advised to use methodologies of longitudinal studies, use of probability sampling and cross industry or cross-country comparisons. In practice, the research suggests that online car rental services and tourism-related companies should invest in emotionally intelligent and responsive AI chatbot systems with strong AI-assisted service agent abilities that would enhance customer satisfaction and maintain competitiveness.

Keywords— Artificial Intelligence Chatbot, Communication Features, Service Agent Marketing Effort, Customer Satisfaction

INTRODUCTION

The quick development of digital technologies has changed considerably the service delivery in the sphere of mobility and transportation, especially on the platforms of online car rental. Car rental services, which are automobiles hired at a fee within a given time (Thakur, 2021), have gained popularity amongst Malaysians due to economic factors, change of lifestyle, and constraints of the public transport systems. Acquiring a personal car is financially inaccessible to a lot of low-income citizens, including college students, and the services provided to cover the needs of users may not be always applicable (Morris et al., 2020). Moreover, increasing

ride-hailing rates and the inability to rely on the buses have also deterred the use of public transport in Malaysia, which solidifies the need to rely on the flexibility of the car-renting service (Rosni et al., 2025).

To support this increasing requirement, over the decades since the 1990s, car rental businesses have been evolving their technologies significantly, developing digital booking tools, online reservations, and fleet management technologies, which simplify the work and make the services more accessible to customers (Ukandu & Kalesanwo, 2025). Previous research points to the fact that AI chatbots have gained an even greater role in marketing communication and especially in service industries because of the possibility of providing real-time feedback and customized interaction (Jiang et al., 2022).

The quality of information, the quality of the service, the perceived usefulness, and ease of use play a significant role in customer satisfaction and retention in online platforms (Ashfaq et al., 2020; Chen et al., 2022). Nevertheless, online car rental business has special service challenges because customer support is sometimes needed outside the normal operating hours, particularly during weekends and during the public holidays when the business is most in demand. This notwithstanding, most car rental businesses still operate with the use of the few human resources that are only accessible during normal working hours, which are between 9 AM and 6 PM (Acquaah, 2024). The customers of a digital-first economy are becoming more demanding in terms of immediate responses, especially when it comes to making time-sensitive, e.g., last-minute reservations, itinerary adjustments, or problems with payments (Zygiaris et al., 2022). As a result, AI chatbots and AI-assisted service agents have been identified as potential remedies to improve the responsiveness of the services and customer satisfaction of online car rental websites (Almansoori et al., 2024).

Problem Statement

However, despite the intensive use of digital booking systems, online car rental platforms in Malaysia still must face the problem of service inefficiency, especially the ability to respond to customers in a timely manner and maintain the services during the periods beyond the normal business hours (Zygiaris et al., 2022). Due to the longer waiting time to receive help related to urgent issues like booking changes, cars on hand, and payment issues, customers tend to have a negative impression of the whole service process. These operational constraints deter customer satisfaction and compromise on competitiveness in a service world that is more technologically driven (Acquaah, 2024).

The role of specific AI chatbot communication features in shaping customer satisfaction remains underexplored (Almansoori et al., 2024). Furthermore, most of the research is directed more to chatbot functionality rather than the supplementary position of AI service agent marketing activities, such as quality of interaction and problem-solving capabilities (Jiang et al., 2022; Huang et al., 2023). There is limited empirical research addressing AI chatbot communication features and AI service agent in one research design especially in the Malaysian online car rental market (Chen et al., 2022).

Artificial intelligence (AI) technologies have increasingly transformed service delivery in digital platforms, including online car rental services. In response to rising customer expectations for timely support and efficient problem resolution, many service providers have adopted AI chatbots and AI-assisted service agents to enhance customer experience. Despite their growing adoption, empirical evidence remains limited on how specific AI communication features and AI-assisted service capabilities influence customer satisfaction in the Malaysian online car rental context. This study addresses this gap by examining the effects of AI chatbot communication features and AI-assisted service agent marketing efforts on customer satisfaction, grounded in the SERVQUAL framework.

Research Objectives

This study was conducted based on the following research objectives:

1. To examine the influence of AI chatbot responsiveness on customer satisfaction in online car rental platforms in Malaysia.

2. To investigate the effect of AI chatbot emotional expression on customer satisfaction in online car rental platforms in Malaysia.

3. To analyse the relationship between AI service agent interaction and customer satisfaction in online car rental platforms in Malaysia.

4. To determine the impact of AI service agent problem-solving skills on customer satisfaction in online car rental platforms in Malaysia.

5. To extend the application of SERVQUAL theory to AI-driven service environments by empirically validating service quality dimensions within AI chatbot and AI-assisted service agent contexts.

Research Questions

The research questions constructed based on the proposed research objectives are as follows:

1. Does AI chatbot responsiveness significantly influence customer satisfaction in online car rental platforms in Malaysia?

2. Does AI chatbot emotional expression significantly influence customer satisfaction in online car rental platforms in Malaysia?

3. Does AI service agent interaction significantly influence customer satisfaction in online car rental platforms in Malaysia?

4. Do AI service agent problem-solving skills significantly influence customer satisfaction in online car rental platforms in Malaysia?

5. How can SERVQUAL dimensions be extended to explain customer satisfaction in AI-driven online car rental service environments?

Scope of Study

The present study aims at analyzing how the quality of online car rental services affected by AI impacts customer satisfaction in online car rental sites in Malaysia. Namely, the space is limited to AI chatbot communication capabilities, that is, responsiveness and emotional expression, and AI service agent marketing activities, such as quality of interactions and problem-solving capabilities, as antecedent to customer satisfaction. The research paper uses the SERVQUAL theory as a theoretical framework, which expands several dimensions of service quality to an AI-mediated service environment. The target group consists of Malaysian users aged 18 and older who have already had some contacts with AI chatbots in online car rental systems.

The research design is quantitative and cross-sectional in which data is obtained with the help of online surveys and offline methods. The convenience sampling technique was used as a non-probability sampling approach. SPSS version 27.0 is used to analyze the results to determine the relationships among the proposed constructs. This research is also constrained to customer satisfaction as the major outcome variable and does not focus on behavioral outcomes like customer loyalty, repurchase intention and word-of-mouth. Furthermore, the range of the research is also limited to online car rental service providers working in Malaysia and thus the results cannot be applied to other countries or service sectors. The paper also only addresses the perception of the customers and not organizational attitudes or system performance indicators. In general, the breadth of this research is intended to offer both empirical and theoretical data about how the dimensions of SERVQUAL can be implemented in AI-based service settings, specifically in the online car rental industry, but considering both situational and research limitations.

Limitations/ Study Constraints

There are a few limitations that are to be considered in this study. To begin with, the study focuses on customer

satisfaction in the context of online and face-to-face service interaction, but the data are gathered via cross sectional research design, which scrutinizes the perceptions of respondents at one point in the time. The study therefore cannot make causal relationships, nor can it capture what changes in customer perceptions in successive service encounters or with time. Longitudinal designs that are used in the future would give more information on how customer experience can evolve across service channels.

Second, the research employs convenience sampling, a non-probability sampling technique, and this could narrow down the level of generalizability of the results. Although the respondents are Malaysian customers who have been having experience both in dealing with the AI chatbots on the online car rental sites and in dealing with the service agents in the real-world scenarios, the sample is not necessarily representative of the different profiles of car rental customers in Malaysia.

Third, the use of self-reported data gathered using an online questionnaire is likely to create common method bias and response bias. The ratings of online AI chatbot experiences and face to face service experiences present the responses by respondents that rely solely on personal perceptions and memory, which could be subjective to recent experiences or personal assessment and not necessarily objective service delivery.

Fourth, the study does not provide a comparative analysis of the two service modes even though it takes into consideration both the AI-mediated online interactions and the face-to-face encounters with service agents. The variation in customer expectations, perception of quality of service, and their satisfaction between online and physical interactions is not explicitly studied as well.

Lastly, the research is restricted in its area of study, which is customer satisfaction as the outcome variable and the study is confined to Malaysian online car rental environment. The other outcomes of behavior like trust, loyalty or continuance intention and the indicators of the organizational performance are not in scope of this research and they should be investigated further.

Accordingly, the literature review focuses specifically on the service quality constructs incorporated in the proposed research model, namely AI chatbot responsiveness, emotional expression, AI service agent interaction, problem-solving skills, and customer satisfaction.

LITERATURE REVIEW

Service Quality and SERVQUAL in AI-Enabled Services

The SERVQUAL model conceptualizes service quality through dimensions such as responsiveness, empathy, assurance, and reliability (Parasuraman et al., 1988). While originally developed for traditional service settings, recent studies suggest that these dimensions remain relevant in technology-mediated and AI-enabled service environments (Ashfaq et al., 2020; Chen et al., 2022). In AI-driven services, responsiveness and empathy are often manifested through chatbot communication features, whereas assurance and reliability are reflected in the performance of AI-assisted service agents.

Customer Satisfaction

Customer satisfaction can be explained as the overall judgment of a service experience by a customer in terms of the expectations and performance perceived. In the service environment, satisfaction indicates the degree to which a service is better or worse than what was originally expected by the customer to the future behavioral intentions like loyalty and subsequent use. Customer satisfaction in digital and AI-facilitated services is determined by the quality of the service, the responsiveness of the system, and the efficiency of addressing issues (Oliver, 1997; Chen et al., 2022). In this paper, customer satisfaction will be the total satisfaction of users with both AI chatbot and face-to-face service experiences in online car rental websites.

AI Chatbot Responsiveness

AI chatbot responsiveness refers to users perceived ability of a chatbot to provide prompt, timely, and relevant

responses during service interactions. Consistent with the SERVQUAL responsiveness dimension, this construct emphasizes speed and efficiency rather than user expectations (Parasuraman et al., 1988; Ashfaq et al., 2020).

AI Chatbot Emotional Expression

The emotional expression of an AI chatbot is the ability of an AI chatbot to express empathy, friendliness, and human-like emotional expressions when interacting. Chatbots that are displayed in a friendly way can decrease the user frustration, increase the interaction, and build trust as they can replicate the communication with humans (Jiang et al., 2022; Huang et al., 2023). Emotional expression in this study symbolizes the capacity of the chatbot to talk in friendly, caring and emotionally suitable way.

AI Service Agent Interaction

AI service agent interaction can be described as the quality of communication and interaction between customers and AI-assisted service agents in service encounters, as well as face-to-face interactions assisted by AI systems. Previous studies indicate that the quality-of-service interaction has a positive impact on customer satisfaction and service appraisals in the technology-mediated service setting (Chen et al., 2022). In the present research, AI service agent interaction is the concept that captures the perceptions of customers about clarity, helpfulness and professionalism in service interactions.

AI Service Agent Problem-Solving Skills

The problem-solving skills of AI service agents are the skills in which AI-assisted service agents are capable of being accurate, addressing and resolving the customer problems within the required time. Problem solving is a positive contributor to service recovery, perceived service failure reduction, and customer satisfaction whether online or on-site (Acquaah, 2024; Parasuraman et al., 2005). Problem-solving skills in this study indicate the perceived efficiency of service agents when solving booking problems, payment issues, and service-related problems.

Framework of Study

The conceptual framework of the study is presented in Fig. 1 and based on the SERVQUAL theory. The framework is that customer satisfaction in online car rental platforms depends on two key antecedents, namely, AI chatbot communication capabilities and AI service agent promotional activities.

The aspects of AI chatbot communication include responsiveness and emotional expression, which are the dimensions of SERVQUAL responsiveness and empathy in online communication being mediated by AI.

The marketing activities of AI service agents include the quality of interaction and ability to solve a problem, which is associated with the SERVQUAL dimensions of assurance, empathy, and reliability. These constructs demonstrate the efficiency of AI-assisted service agents in attracting customers, providing explicit information, and finding solutions to service-related problems during online and face-to-face service interactions.

Customer satisfaction is placed as the dependent variable which is captured by the overall assessment of customers of their service experience with online car rental services. The hypothesis of the framework is that AI chatbot responsiveness and emotional expression and stronger AI service agent interaction and problem-solving skills are related to customer satisfaction.

Combining the AI-initiated online interactions with AI-enhanced face-to-face services experiences, the framework can be seen as the extension of the SERVQUAL theory to the modern AI-based service environments and emphasizing the hybridity of service delivery in the online car rental sector.

Consistent with this distinction, the proposed framework differentiates between AI chatbot communication features and AI-assisted human service agent capabilities as separate antecedents of customer satisfaction.

Independent Variables **Dependent Variable**

AI Chatbot Communication Features

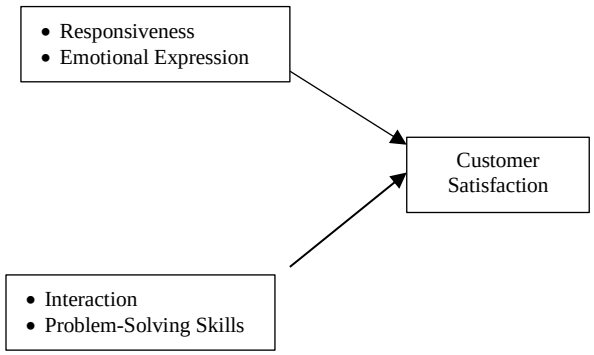

Fig. 1 Research Framework

AI Service Agent Marketing Efforts

Theoretical Background

The service model (SERVQUAL Model) (Alluhaymid & Alabdarabalnabi, 2023)

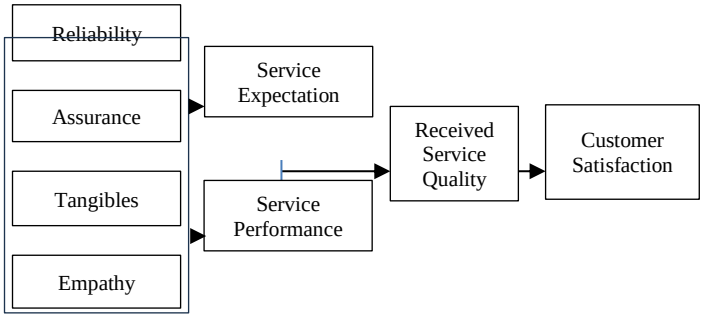

Fig. 2 The Seervice Model (SERVQUAL model) (Alluhaymid & Alabdrabalnabi, 2023)

Customer satisfaction in the traditional and digital service setting depends on the quality of services as a fundamental variable. The conceptualization of service quality described in the SERVQUAL model focuses on the perceptions of the customers concerning the quality of the provided service in comparison with the expectations and the dimension of responsiveness, empathy, reliability, and assurance are the key dimensions considered in the conceptualisation (Parasuraman et al., 1988; Parasuraman et al., 2005). These dimensions have been applied in the digital realm to measure online service experiences, and their use in AI-mediated interactions is yet to be established.

Chatbots and artificial intelligence (AI) service agents are also being implemented into online service platforms to serve as live support and improve customer experience. The responsiveness dimension of service quality is chatbot responsiveness, which can be characterized by timely and correct service response, and it has been demonstrated to positively impact the user satisfaction of digital service (Ashfaq et al., 2020; Chen et al., 2022). Moreover, the perceived empathy and user experience can be boosted by emotionally expressive AI chatbots, which can imitate the interactions between humans (Jiang et al., 2022). Perceived reliability and assurance, which are essential to positive service judgments, are also ensured through AI service agents who can interact and solve problems of customers effectively (Huang et al., 2023).

Customer satisfaction as a general assessment of service encounter based on expectations is an important result of service quality and is associated with subsequent behavioral intentions and loyalty (Oliver, 1997; Chen et al., 2022). Applying the theory of service quality extensions to AI-enabled spaces assists in understanding how the

conventional service quality constructs work in the context of service delivery mediated by a smart system. The paper thus incorporates the aspects of AI chatbot communication and AI service agent marketing under a single framework based on SERVQUAL in considering the interaction of both variables on customer satisfaction in internet-based car rental website (Yahaya et al., 2025).

Empirical Research

Relationship between responsiveness and customer satisfaction

Tables I, II, III, and IV are as in Appendix 1. Over the last five years, empirical research has consistently shown AI chatbot responsiveness as a key factor leading to customer satisfaction within the digital service context. Experimental and survey research indicates that increased response rates have a strong negative impact on perceived waiting time and positively increase satisfaction in task focused services like online booking and reservations (Ruan, 2022; Ashfaq et al., 2020). It was demonstrated that immediate response of the chatbot in e-commerce and digital-first scenarios positively impacts perceived service efficiency and trust that directly affect the satisfaction, especially in time-sensitive decision-making scenarios (Cheng et al., 2021; Zygiaris et al., 2022). The latest results also prove responsiveness as a fundamental AI service quality feature that has a robust positive impact on customer satisfaction in AI-enabled platforms (Sao et al., 2025). Therefore, the current study proposed that:

H1: There is positive relationship between AI chatbot responsiveness on customer satisfaction in online car rental platforms in Malaysia.

Relationship between emotional experience and customer satisfaction

The emotional experience is also demonstrated in recent empirical research as one of the factors that positively affect customer satisfaction when using an AI chatbot in service interactions. The finding of emotionally expressive chatbots to alleviate the adverse customer responses to unmet expectations and enhance satisfaction is explained by the degree of empathy and warmness voiced upon meeting the customers (Zhang et al., 2024). It can be supported by the fact that previous studies indicate that chatbots that are able to demonstrate emotional intelligence reinforce the quality of relations, trust, and perceived empathy, which result in more positive customer experiences (Jiang et al., 2022; Huang et al., 2023). Empirical studies also indicate that human-like emotional cues are specifically effective in complex or stressful service scenarios when customers need comfort and support (Crolic et al., 2022; Wang et al., 2021). Thus, this study proposed that:

H2: There is positive effect of AI chatbot emotional expression on customer satisfaction in online car rental platforms in Malaysia.

Relationship between interaction and customer satisfaction

Moreover, interaction of AI service agents is also an important factor influencing customer satisfaction in AI-enabled and hybrid service platforms. According to empirical evidence, transparent, interactive, and supportive interactions with AI-assisted service agents can improve the level of perceived service quality and customer satisfaction, particularly when customers seek guidance or clarification when using services (Chen et al., 2022; Chau et al., 2025). Regarding hybrid service, the quality of the interaction between customers and AI-assisted agents enhances the assurance and trust which are crucial antecedents of satisfaction in service-based technological settings (Huang and Rust, 2021). Such results confirm the presence of interaction quality as an important service dimension which is consistent with SERVQUAL dimensions. Therefore, it can be concluded that:

H3: There is positive relationship between AI service agent interaction and customer satisfaction in online car rental platforms in Malaysia.

Relationship between problem-solving and customer satisfaction

Lastly, problem-solving capabilities of AI service agents have consistently found their place as a key factor of customers satisfaction with AI-enabled service environments. Empirical research proves that AI agents with the ability to diagnose and solve service problems positively affect satisfaction through service expectations confirmation, as well as better service recovery outcomes (Gao et al., 2025; Chen et al., 2022). Problem-solving skills are also advanced and enhance customer trust and satisfaction when encountering complex services especially when there is a service failure or when experiencing a high involvement situation (Huang et al., 2023; Ameen et al., 2021). The recent indicators also support the idea that problem-solving ability is a fundamental aspect of AI service quality that has a great positive effect on customer satisfaction in the technological services industry (Sao et al., 2025). Thus, the current study proposed that:

H4: There is positive impact of AI service agent problem-solving skills on customer satisfaction in online car rental platforms in Malaysia.

METHODOLOGY

Research Design

The research design adopted in this study is the quantitative research design based on the cross-sectional study to analyze the relationships between the features of AI chatbot communication, AI service agent marketing efforts, and customer satisfaction online car rental platforms in Malaysia. The structured online questionnaire will be used to collect data via online surveys that will be distributed to Malaysian users who are at least 18 years old and who have received prior experience in interacting with AI chatbots and AI-assisted service agents when using online and face-to-face car rental services. The method used to retrieve the responses is a non-probability sampling method which is convenience sampling and will have a target sample population of 384 respondents. The data obtained are evaluated with SPSS version 27.0, with descriptive statistics and inferential statistics to verify the suggested hypotheses and evaluate the impact of the independent variables on customer satisfaction.

Population

The sample population of this research is the Malaysian customers aged 18 years and above who experienced the use of online car rental sites and experienced the use of AI chatbots and/or AI-assisted service agents when renting cars. It comprises customers who have used these platforms to do some activities like vehicle booking, to make changes in the booking, to make payments or make service requests, both on-line and in-person service interaction. The population is determined to make sure that respondents have had adequate exposure to interactions with AI-enabled services to give informed assessments of AI chatbot communication capabilities, AI service agent promotion activities, and how satisfied they are with the service. In accordance with the country demographic data, the adult population of Malaysia is estimated to be 24 million of the population above 18 years of age, meaning the total target population in this study is N=24 million (Department of Statistics Malaysia [DOSM], 2023).

Sampling

The researcher uses a convenience sampling method, which is a non-probability sampling method, to choose the target population respondents. The given method is suitable because the target population of the study is Malaysian customers aged 18 years and older who have the previous experience of using online car rental services and communicating with AI chatbots and/or AI-guided service agents. Convenience sampling allows the collection of the data most conveniently and that is easily available and fits the inclusion criteria of the study especially the online survey design. Even though such a sampling method could impair the external validity of the results, it is extensive in research to explore and understand technologies and is appropriate in investigating consumer attitudes and experiences related to AI-driven services.

Data Collection Methods

The variables used in this research are obtained using both online and offline research techniques to include customer experience in the digital and physical service interactions. In the case of the online approach, the structured questionnaire is delivered electronically via web-based survey systems, and the respondent is free to take part at the convenience of the act of dealing with AI chatbots of online car rental sites. In the case of the offline approach, the identical survey will be conducted in paper format to clients in the specific car rental stores or customer service desks and aims at the respondents who have employed AI-assisted service agents in person. The adoption of both online and offline data collection techniques ensures the increase in diversity of responses, the decrease of coverage prejudice, and the presentation of a more thorough image of perception of customers under the influence of various service channels.

Questionnaire Design

Respondent profiles were being conducted based on demographic analysis such as gender, age and educational background. Respondent has been screened based on three (3) questions, such as must be Malaysian citizens, 18 years and above, and have experienced in using Ai Chatbot in any car rental platform. The items being used in the questionnaire to analyze the relationship between independent variables and the dependent variable were as Table 5 below:

Table 5 QUESTIONNAIRE DESIGN

Code	Content	Authors
Responsiveness (R)		
R1	Chatbot service agent provides prompt feedback to customers' comments.	(Jiang et al., 2022); (Huang et al., 2023)
R2	Chatbot service agent makes an adequate change based on customers' feedback.	
R3	Chatbot service agent addresses customers' complaints promptly.	
R4	Chatbot service agent is sensitive to customers' needs at the moment.	
R5	Chatbot service agent addresses customers' complaints positively.	
Emotional Experience (E)		
1	The chatbot be sensitive to my emotions and feelings.	(Zhang et al., 2023)
2	The chatbot understands my emotions during the interaction.	
3	The chatbot understands my emotional state.	
4	The chatbot expressed appropriate emotions during the interaction	
5	The chatbot shows emotions that conform to the norms of expression.	

Interaction (I)		
1	The chatbot service agent is currently sensitive to customers' needs.	(Jansom et al., 2022); (Song et al., 2022)
2	The chatbot service agent has the knowledge to answer customers' questions.	
3	The chatbot service agent gives customers individual attention.	
4	I'm willing to continue to interact with this kind of customer service.	
5	Interacting with a robot service agent bothers me more than human service agent.	
Problem-Solving (PS)		
PS1	This customer service system fully understands my problems.	(Xu et al., 2020); (Jansom et al., 2022)
PS2	This customer service system can respond to the questions I ask.	
PS3	This customer service system can provide useful answers for me.	
PS4	I have confidence in the service agent's ability to do the task.	
Customer Satisfaction		
CS1	I am satisfied with the chatbot service agent.	(Jiang et al., 2022); (Ruan & Mezei, 2022)
CS2	My satisfaction level with the performance of the service agent is quite close to my ideal online car rental assistance service.	
CS3	The chatbot service agent did what I expected	
CS4	I am happy with the chatbot service agent.	
CS5	The chatbot service agent did a good job.	

Common Method Bias and Multicollinearity

To reduce potential common method bias, procedural remedies were applied, including respondent anonymity, neutral item wording, and separation of construct measurements within the questionnaire.

Additionally, multicollinearity was assessed using Variance Inflation Factor (VIF) values. The results indicate that all VIF values ranged between 1.52 and 4.18, which are below the recommended threshold of 5, suggesting that multicollinearity is not a serious concern in this study.

This indicates that although the service quality dimensions are conceptually related, they capture distinct aspects of AI-enabled service performance.

FINDINGS AND DISCUSSIONS

Respondent Profiles

Table 6 Respondent Profiles

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	306	79.7
	Female	78	20.3
	Total	**384**	**100**
Age	18–25 years	141	36.7
	26–35 years	131	34.1
	36–45 years	94	25.0
	45 years and above	16	4.2
	Total	**384**	**100**
Education Level	SPM	46	12.0
	STPM/Matriculation	39	10.2
	Bachelor's Degree	277	72.1
	Master's/PhD	22	5.7
	Total	**384**	**100**

The respondent profile as per Table 6 shows that there is a high percentage of male respondents, making 79.7 percent of the sample male, which implies that males are the ones who are more actively engaged in the use of online car rental in Malaysia. Such a pattern can be associated with the increase in frequency of driving, the necessity of movements associated with work, or the increased interaction with car-focused online platforms. The gender balance will be a true representation of the car rental client group and will present significant information on customer satisfaction in AI-based service interactions.

Age wise, the respondents are mostly young adults with 70.8 percent of the respondents in the age group of 18-35 years. It means that online car rental services and online AI chatbots are more commonly used by younger and more digitally apt users, who are more susceptible to automated and AI-mediated communication. The comparatively low percentage of the older customers (45 and older) (4.2) indicates a low adoption or use of AI-enabled services by older ones, which could be explained by the familiarity with technologies or by the desire to interact with a human.

In terms of education, the sample is highly educational with 72.1 percent having attained their bachelor's degree, and the remaining 5.7 percent having postgraduate education. This implies that most of the respondents are sufficiently digitally literate and cognitively capable of assessing AI chatbot responsiveness, emotional expression, and performance of AI service agents (Muslim, 2024). The high level of education of the users increases the credibility of the results since the respondents are expected to offer informed and stable judgments of the quality of services and customer satisfaction (Muslim et al., 2025).

In general, the demographic approach shows that the study predominantly covers the impressions of educated and young and technologically advanced users, which is the correct audience when analyzing the quality of AI-enhanced services and customer satisfaction regarding the car rental service quality in online and hybrid settings.

Correlations						
		R	EE	I	PS	CS
Responsiveness	Pearson Correlation	1	0.571**	0.845**	0.859**	0.848**
	Sig.(1-tailed)		< 0.001	< 0.001	< 0.001	< 0.001
	N	384	384	384	384	384
Emotional expression	Pearson Correlation	0.571**	1	0.592**	0.555**	0.530**
	Sig.(1-tailed)	< 0.001		< 0.001	< 0.001	< 0.001
	N	384	384	384	384	384
Interaction	Pearson Correlation	0.845**	0.592**	1	0.839**	0.847**
	Sig.(1-tailed)	< 0.001	< 0.001		< 0.001	< 0.001
	N	384	384	384	384	384
Problem-solving	Pearson Correlation	0.859**	0.555**	0.839**	1	0.915**
	Sig.(1-tailed)	< 0.001	< 0.001	< 0.001		< 0.001
	N	384	384	384	384	384
Customer satisfaction	Pearson Correlation	0.848**	0.530**	00.847**	0.915**	1
	Sig.(1-tailed)	< 0.001	< 0.001	< 0.001	< 0.001	
	N	384	384	384	384	384
**. Correlation is significant at the 0.01 level (1-tailed).						

Table 7 Pearson Correlation Analysis

Pearson Correlation Analysis

Pearson correlation analysis as per Table 7 was used to test the quality and the direction of the relationships between AI chatbot communication features, AI service agent marketing efforts, and customer satisfaction. According to Table 6, it can be observed that the responsiveness of AI chatbots is positively correlated with customer satisfaction ($r = 0.848$, $p < 0.001$), which means that the greater the responsiveness of AI chatbots is quicker and more responsive, the higher the level of customer satisfaction. Responsiveness also exhibits good positive correlations with interaction ($r = 0.845$, $p < 0.001$) and problem-solving skills ($r = 0.859$, $p < 0.001$), which mean that responsive AI systems would be perceived as more interactive and useful in addressing

customer problems.

The emotional expression in AI chatbot is positively correlated with customer satisfaction with the medium value ($r = 0.530$, $p < 0.001$). The implication of this finding is that chatbot communication, which emotionally expresses itself leads to increased satisfaction, but its effect is not as powerful as that of functional service attributes. The interaction as well as the problem-solving skills are also moderately correlated with emotional expression ($r = 0.592$, $p < 0.001$) and ($r = 0.555$, $p < 0.001$), which implies that the empathy-related features are complementary to, though not dominating, the technical service performance.

Coefficients[a]						
Model		Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	0.003	0.089		0.035	0.972
	R	0.152	0.045	0.140	3.343	<0.001
	EE	-0.023	0.021	-0.026	-1.094	<0.274
	I	0.230	0.042	0.219	5.474	<0.001
	PS	0.637	0.042	0.626	15.304	<0.001
a. Dependent Variable: CS						

Table 8 Multiple Regression Analysis

As far as the interaction between AI service agents is concerned, the findings show that it is strongly correlated with customer satisfaction ($r = 0.847$, $p < 0.001$). It implies that straightforward, interesting, and help-seeking conversations with the assistance of AI-supported service agents play a great role in ensuring positive customer review. Interaction demonstrates close correlations with responsiveness ($r = 0.845$, $p < 0.001$) and problem-solving skills as well ($r = 0.839$, $p < 0.001$), which are the dimensions of a service quality that are interconnected.

It is worth noting that the skills of AI service agents in solving problems are the most correlated with customer satisfaction ($r = 0.915$, $p < 0.001$), which proves the effectiveness of problem-solving as the most influential factor related to customer satisfaction in the AI-enabled service setting. The close correlations between problem-solving and the other variables of service quality also indicate that the customers view problem settlement as a primary element of service efficiency.

Multiple Regression Analysis

The findings in Table 8 show that AI chatbot responsiveness has a significant positive effect on customer satisfaction ($\beta = 0.140$, $t = 3.343$, $p < 0.001$). The significant effect of chatbot responsiveness highlights the importance of timely responses in online car rental services, supporting earlier Pearson correlation results that indicated a strong positive association between responsiveness and satisfaction. Responsiveness therefore remains an important functional service quality dimension in AI-enabled service environments.

In contrast, AI chatbot emotional expression does not have a significant effect on customer satisfaction ($\beta = -0.026$, $t = -1.094$, $p = 0.274$). Although emotional expression demonstrated a moderate and significant correlation with customer satisfaction in the Pearson correlation analysis, its effect becomes insignificant when analysed together with other service quality variables in the regression model. This suggests that emotional expression alone may not be a dominant predictor of satisfaction when functional service attributes, such as interaction and problem-solving, are simultaneously considered.

The results further reveal that AI service agent interaction has a significant positive influence on customer satisfaction ($\beta = 0.219$, $t = 5.474$, $p < 0.001$). This indicates that clear, engaging, and supportive interactions facilitated by AI-assisted service agents play an important role in shaping positive customer evaluations. This finding is consistent with the strong correlations observed earlier and reinforces the relevance of interaction quality as a key service quality dimension aligned with assurance and empathy.

Most notably, AI service agent problem-solving skills emerge as the strongest predictor of customer satisfaction ($\beta = 0.626$, $t = 15.304$, $p < 0.001$). This result confirms that customers place the greatest value on the ability of AI-assisted service agents to effectively resolve issues, such as booking errors, payment problems, or service disruptions. The dominance of problem-solving skills is consistent with the Pearson correlation analysis, which also showed the strongest association between problem-solving and customer satisfaction.

Overall, the regression findings indicate that while all independent variables exhibit positive correlations with customer satisfaction, only responsiveness, interaction, and problem-solving skills significantly predict customer satisfaction in the presence of other variables. These results highlight the greater importance of functional and outcome-oriented service quality dimensions over affective features in AI-enabled online and hybrid car rental service contexts.

ANOVA Analysis

An analysis of variance (ANOVA) as per Table 9 was conducted to assess the overall significance and explanatory power of the multiple regression model examining the effects of AI chatbot responsiveness, emotional expression, AI service agent interaction, and problem-solving skills on customer satisfaction. As shown in Table X, the regression model is statistically significant with an F-value of 595.729 ($df = 4, 379$, $p < 0.001$), indicating that the set of independent variables collectively explains a significant proportion of variance in customer satisfaction.

The regression sum of squares ($SS = 374.335$) is substantially higher than the residual sum of squares ($SS = 59.538$), suggesting that the model accounts for most of the variability in customer satisfaction. The mean square regression ($MS = 93.584$) compared to the relatively small mean square residual ($MS = 0.157$) further confirms the strong predictive capability of the model.

These results demonstrate that the combined effects of AI chatbot communication features and AI service agent marketing efforts significantly influence customer satisfaction in online car rental platforms. The significant ANOVA outcome provides strong empirical support for the suitability of the regression model and justifies further interpretation of the individual regression coefficients. Overall, the findings confirm that responsiveness, emotional expression, interaction, and problem-solving skills, when considered together, form a robust explanatory framework for understanding customer satisfaction in AI-enabled and hybrid service environments.

Table 9 Anova Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	374.335	4	93.584	595.729	< 0.001[b]
	Residual	59.538	379	0.157		
	Total	433.872	383			

Dependent Variable: Customer satisfaction

(Constant), Responsiveness, Emotional expression, Interaction, Problem-solving

DISCUSSION OF KEY FINDINGS

This study has looked at how AI chatbot communication features and AI service agent marketing activities affect the customer satisfaction levels within online car rental sites in Malaysia. The results of the ANOVA prove that the independent variables are statistically significant ($F = 595.729$, $p < 0.001$) to explain a significant percentage of the variance in customer satisfaction by the independent variables. This observation serves as strong empirical evidence of implementing the service quality theory, especially SERVQUAL, to AI-enabled and hybrid service settings.

About the initial research objective, the results show that AI chatbot responsiveness positively, largely, positively influences customer satisfaction. A strong positive correlated result between responsiveness and customer satisfaction ($r = 0.848$, $p < 0.001$) is observed with the Pearson correlation analysis and confirmed by the results of the regression analysis ($\beta = 0.140$, $p < 0.001$). It shows that quick and immediate reaction is still a determining factor of contentment in online services. The given finding correlates with the previous research that highlights responsiveness as a fundamental service quality dimension in AI-mediated interactions, especially in the context of time-sensitive interactions (online booking and reservations) (Ruan, 2022; Ashfaq et al., 2020). The outcome supports the SERVQUAL responsiveness aspect and proves its further applicability in the services based on AI.

The second question of the investigation was the significance of AI chatbot emotional expression. Even though Pearson correlation analysis shows that there is a moderate positive relationship between emotional expression and customer satisfaction ($r = 0.530$, $p < 0.001$), the regression analysis results that emotional expression is not a significant predictor of customer satisfaction in the presence of other service quality variables ($\beta = -0.026$, $p = 0.274$). This implies that although emotional expression increases user experience, its effect is not superior to functional service features of utilitarian service environments like car rental platforms. The observation is consistent with previous studies that suggest the emotional intelligence of chatbots is indirectly related to satisfaction via empathy and quality of relationships but potentially in the background of satisfaction outcomes when task performance and problem solving are paramount (Jiang et al., 2022; Zhang et al., 2024).

On the third research objective, the findings reveal that interaction between AI service agents and customers plays a significant role in customer satisfaction. High Pearson correlation ($r = 0.847$, $p < 0.001$) and high regression coefficient ($\beta = 0.219$, $p < 0.001$) show that clear, engaging, and supportive interactions with the help of AI-assisted service agents positively contribute to the service evaluations of customers. Such a result confirms the SERVQUAL dimensions of assurance and empathy and aligns with the empirical evidence that the development of trust and confidence during the interaction between humans and AI is the prerequisite of customer satisfaction in a hybrid service setting (Chen et al., 2022; Huang and Rust, 2021).

Lastly, the fourth research objective was problem-solving skills of AI service agents that proved to have the most powerful impact on customer satisfaction. The Pearson correlation analysis shows that problem-solving skills and customer satisfaction have an exceptionally high relationship ($r = 0.915$, $p < 0.001$), and regression outcomes verify that this construct is the strongest predictor ($\beta = 0.626$, $p < 0.001$). This result indicates the high propensity of customers towards the outcome-oriented service quality, especially effective issue resolution and service recovery. The previous research also highlights that the perceived reliability and satisfaction with AI-enabled services revolve around problem-solving ability, particularly when customers experience problems with booking, payment processing, or service failures (Gao et al., 2025; Ameen et al., 2021). The prevalence of this variable is a solid indicator of the SERVQUAL reliability dimension when using AI in mediating service situations.

All in all, the results can be considered to show that affective aspects of the service like emotional expression add to the service experience, whereas functional and performance-oriented aspects of service quality, such as responsiveness and problem-solving ability, are more conclusive in influencing customer satisfaction. The high significance of the correlation coefficient and the significant regression coefficients, as well as the highly significant ANOVA results, will all prove the strength of the proposed model and can be applied to AI-enabled and hybrid service settings in the online car rental industry to the theory of SERVQUAL.

Contributions of the Study

Academicians

This paper has several significant impacts on the scholarly literature on service quality, artificial intelligence, and customer satisfaction. To start with, this work extrapolates the SERVQUAL theory into the AI-driven and hybrid service-provisioning by empirically testing the classical dimensions of service quality as responsiveness, empathy, assurance, and reliability on the AI chatbot communication capabilities and AI-mediated interactions between service agents and clients. The study will add value to the theoretical knowledge regarding service quality in modern digital service environments by showing that SERVQUAL can be applied in service encounters involving AI.

Second, the results provide AI and service marketing literature with a distinction between the relative impact of affective and functional AI attributes on customer satisfaction. Though there was a significant relationship between emotional expression and customer satisfaction, the regression findings showed that emotional expression was not an important predictor of customer satisfaction when the functional attributes were considered. This difference offers empirical evidence that outcome-focused service quality dimensions, especially the responsiveness and problem-solving skills, are more explanatory in utilitarian service settings like online car rental websites. This understanding contributes to intellectual discussions as it illuminates on the boundary conditions in which emotional AI features have a stronger or weaker impact.

Third, this research has a methodological contribution as it provides a solid empirical validation based on a variety of analytical methods, such as Pearson correlation, multiple regression, and ANOVA. The overall relevance of all these analyses reinforces the validity of the proposed model and offers a methodological framework that can be followed by other researchers in the future that would study the topic of AI-enabled service quality. The high number of samples also raises the statistical validity of the findings.

Lastly, the analysis offers context-specific academic knowledge of an emerging market, which concerns the relative lack of empirical studies on AI-enabled service quality in the Malaysian and overall Southeast Asian contexts. By placing the research on AI chatbot and AI service agent in an emerging economy, the study extends the geographical horizon of the current body of research as well as provides the basis of comparative and cross-cultural research in AI-based service research.

Practitioners

This current study presents various practical implications to practitioners, especially managers and decision-makers in online car rental services and AI-based service sectors. First, the results also draw attention to the fact that AI chatbot responsiveness and AI service agent problem-solving ability are the most significant customer satisfaction factors. It is thus recommended that practitioners focus on investments in AI systems that can provide quick response and solutions of issues especially to time sensitive service requests like booking changes, payment problems and vehicle location enquiries. The improvement of these functional capabilities can contribute greatly to customer satisfaction and the overall performance of the company in terms of service.

Second, the findings reveal that the quality of interaction between the AI service agents is a key factor in influencing customer satisfaction. Easy approachable and helpful communication supported by AI-assisted service agents increases customer trust and service quality perception. The practitioners are advised to prioritize the training of the service agents to be able to work with AI tools to maintain smooth interaction between online and offline service experiences. This comprises the development of AI systems to assist the agents with correct information, decision support, and real-time customer insights.

Third, the idea of AI chatbot emotional expression has a positive correlation with customer satisfaction at the correlational level because despite having a positive predictive value at the regression analysis, it is less predictive of the core services and can be classified as value-enhancing drivers. It is described that practitioners should introduce emotionally expressive chatbot components, including polite language and empathetic feedback, as complimentary attributes (Ishak et al., 2025) that do not affect the operational efficiency of the

chatbots.

Lastly, the high overall model importance as shown by the ANOVA value shows that an integrated AI service model, which incorporates the chatbot communication features with AI-enhanced service agent capacity, brings about the best effects on customer satisfaction. The implementation of AI should focus on the comprehensive approach that will involve consistency between digital and physical service channels by practitioners. This would help build the reliability of the service, boost the confidence of the customers as well as competitive positioning in the ever-growing technology-oriented service markets.

ACKNOWLEDGMENT

The authors would like to acknowledge and extend special gratitude to the Fakulti Pengurusan Teknologi dan Teknousahawanan, Universiti Teknikal Malaysia Melaka for the support.

REFERENCES

1. Acquaah, M. (2024). Service availability and customer responsiveness in digital service platforms. Journal of Service Management, 35(2), 245–260.
2. Alluhaymid, Y., & Alabdrabalnabi, A. (2023). Quality and Performance of Public Hospital Services in Saudi Arabia: A Systematic review. Archives of Internal Medicine Research, 06(04).
3. Almansoori, L., Albreiki, H., Almehairi, S., & Shuhaiber, A. (2024). “V - Renter”: An AI-Driven C2C Platform for Renting Vehicles in the UAE. Proceedings of the 15th Annual Undergraduate Research Conference on Applied Computing on "AI for a Sustainable Economy.” URC 2024.
4. Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. Computers in Human Behavior, 114, 106548.
5. Ashfaq, M., Yun, J., Yu, S., & Loureiro, S. M. C. (2020). I, Chatbot: Modeling The Determinants of Users’ Satisfaction and Continuance Intention of AI-Powered Service Agents. Telematics and Informatics, 54.
6. Chau, H. K. L., Ngo, T. T. A., Bui, C. T., & Tran, N. P. N. (2025). Human–AI interaction in e-commerce: The impact of AI-powered customer service on user experience and decision-making. Computers in Human Behavior Reports, 19, 100725.
7. Chen, Q., Gong, Y., Lu, Y., & Tang, J. (2022). Classifying and Measuring The Service Quality of AI Chatbot In Frontline Service. Journal of Business Research, 145, 552-568.
8. Crolic, C., Thomaz, F., Hadi, R., & Stephen, A. T. (2022). Blame the bot: Anthropomorphism and anger in customer–chatbot interactions. Journal of Marketing, 86(1), 132–148.
9. Gao, J., Opute, A. P., Jawad, C., & Zhan, M. (2025). The influence of artificial intelligence chatbot problem solving on customers’ continued usage intention in e-commerce platforms: An expectation-confirmation model approach. Journal of Business Research, 200, 115661.
10. Huang, D., Markovitch, D. G., & Stough, R. A. (2023). Can Chatbot Customer Service Match Human Service Agents on Customer Satisfaction? An Investigation in The Role of Trust. Journal of Retailing and Consumer Services, 76, 103600.
11. Huang, M. H., & Rust, R. T. (2021). Engaged to a robot? The role of AI in service. Journal of Service Research, 24(1), 30–41.
12. Huang, M. H., Rust, R. T., & Maksimovic, V. (2023). The role of artificial intelligence in customer–firm interactions. Journal of the Academy of Marketing Science, 51(1), 1–20.
13. Ishak, M. I., Harun, A., Ahmad, N., & Muslim, A. K. (2025). Exploring Key Industry Attributes from Online Customer Reviews: A Systematic Literature Review and Network Analysis. PaperASIA, 41(4b), 152-180.
14. Jansom, A., Srisangkhajorn, T., & Limarunothai, W. (2022). How Chatbot E-Services Motivate Communication Credibility and Lead to Customer Satisfaction: The Perspective of Thai Consumers in The Apparel Retailing Context. Innovative Marketing, 18(3), 15–27.
15. Jiang, H., Cheng, Y., Yang, J., & Gao, S. (2022). AI-Powered Chatbot Communication with Customers: Dialogic Interactions, Satisfaction, Engagement, and Customer Behavior. Computers in Human Behavior, 134, 107329.
16. Morris, E. A., Blumenberg, E., & Guerra, E. (2020). Does Lacking A Car Put The Brakes on Activity Participation? Private Vehicle Access and Access to Opportunities Among Low-Income Adults.

Transportation Research Part A: Policy and Practice, 136.
17. Muslim, A. K. (2024). Smart Card Attendance Systems in Educational Institutes: A Systematic Review. Journal of Technology Management and Technopreneurship (JTMT), 12(2).
18. Muslim, A. K., Muslim, F., Ishak, M. I., Tan, A. M., & Ahmad, N. (2025). The effectiveness of Classroom-Based Assessment implementation by teachers at secondary schools in Johor. International Journal of Research and Innovation in Social Science, IX(IIIS), 5756–5773. https://doi.org/10.47772/ijriss.2025.903sedu0418
19. Oliver, R. L. (1997). Satisfaction: A behavioral perspective on the consumer. McGraw-Hill Education.
20. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 64(1), 12–40.
21. Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A multiple-item scale for assessing electronic service quality. Journal of Service Research, 7(3), 213–233.
22. Rosni, N. A., Qi, T. S., & Nor, M. M. (2025). University Students' Perceptions of Public Bus Service Efficiency and Effectiveness in Influencing Ridership Centre for Sustainable Urban Planning & Real Estate (SUPRE), Faculty of Built Environment, UNIVERSITI MALAYA. In PLANNING MALAYSIA Journal of the Malaysia Institute of Planners (Vol. 23).
23. Ruan, Y. (2022). When do AI chatbots lead to higher customer satisfaction? Experimental evidence on information quality, perceived waiting time, and product type. Journal of Retailing and Consumer Services, 67, 102967. https://doi.org/10.1016/j.jretconser.2022.102967
24. Ruan, Y., & Mezei, J. (2022). When Do AI Chatbots Lead to Higher Customer Satisfaction than Human Frontline Employees in Online Shopping Assistance? Considering Product Attribute Type. Journal of Retailing and Consumer Services, 68, 103059.
25. Sao, A., Pathak, D., Vijh, G., Saxena, S., & Deogaonkar, A. (2025). Analyzing the impact of AI-enabled chatbot on service quality in the real estate sector: An empirical study in NCR. Procedia Computer Science, 259, 1198–1207. https://doi.org/10.1016/j.procs.2025.04.075
26. Song, M., Xing, X., Duan, Y., Cohen, J., & Mou, J. (2022). Will Artificial Intelligence Replace Human Customer Service? The Impact of Communication Quality and Privacy Risks on Adoption Intention. Journal of Retailing and Consumer Services, 66, 102900.
27. Wang, W., Qiu, L., Kim, D., & Benbasat, I. (2021). Effects of emotional responses of chatbots on customer satisfaction. MIS Quarterly, 45(3), 1441–1468.
28. Thakur, A. (2021). Car Rental System. International Journal for Research in Applied Science and Engineering Technology, 9(VII), 402–412.
29. Ukandu, O., & Kalesanwo, O. (2025). Leveraging Artificial Intelligence for Customer Segmentation and Demand Forecasting in The Car Rental Industry.
30. Xu, Y., Shieh, C., Van Esch, P., & Ling, I. (2020). AI Customer Service: Task Complexity, Problem-Solving Ability, and Usage Intention. Australasian Marketing Journal (AMJ), 28(4), 189–199.
31. Yahaya, S., Tan, A. M., Islam, M. S. U., Muslim, A. K., & Salleh, N. N. M. (2025). The Influence of Fashion Consciousness, Perceived Security, and Customer Service on Satisfaction and Repurchase Intentions among Malaysian Millennial Online Clothing Consumers. International Journal of Research and Innovation in Social Science, 292–306. https://doi.org/10.47772/ijriss.2025.909000026
32. Zhang, J., Chen, Q., Lu, J., Wang, X., Liu, L., & Feng, Y. (2024). Emotional expression by artificial intelligence chatbots to improve customer satisfaction: Underlying mechanism and boundary conditions. Tourism Management, 100, 104835. https://doi.org/10.1016/j.tourman.2023.104835
33. Zygiaris, S., Hameed, Z., Ayidh Alsubaie, M., & Ur Rehman, S. (2022). Service Quality and Customer Satisfaction in the Post Pandemic World: A Study of Saudi Auto Care Industry. Frontiers in Psychology, 13.

APPENDIX

TABLE I THE RELATIONSHIP BETWEEN AI CHATBOT RESPONSIVENESS AND CUSTOMER SATISFACTION

No.	Author(s) & Year	Context	Methodology	Findings
1.	Ruan (2022)	Scenario experiment (n=567 respondents)	Scenario experiment; regression analysis/ SEM	Positive
2.	Zhang et al., (2024)	Tourism (3 experiments through online (tourists)	Causal analysis	Positive
3.	Chau et al. (2025)	E-commerce survey (n=552 experienced consumers)	Cross-sectional Questionnaire	Positive
4.	Gao et al., (2025)	E-commerce (n= 315 respondents	Cross sectional questionnaire; SEM (Expectation – Confirmation model)	Positive
5.	Sao et al., (2025)	Real-estate (NCR, India; n=234 chatbot users)	Cross-sectional questionnaire, PLS-SEM)	Positive

TABLE II THE RELATIONSHIP BETWEEN AI CHATBOT EMOTIONAL EXPERIENCE AND CUSTOMER SATISFACTION

TABLE III THE RELATIONSHIP BETWEEN AI SERVICE AGENT INTERACTION AND CUSTOMER SATISFACTION

No.	Author(s) & Year	Context	Methodology	Findings
1.	Zhang et al. (2024)	Tourism service platform	Three online experiments	Positive
2.	Jiang et al. (2022)	Online customer service	Survey-based empirical study	Positive
3.	Huang et al. (2023)	AI-enabled service interactions	Conceptual + empirical synthesis	Positive
4.	Crolic et al. (2022)	Human- AI interaction experiments	Controlled laboratory experiments	Positive
5.	Wang et al. (2021)	Online service platforms	Survey, structural equation modeling	Positive

TABLE IV THE RELATIONSHIP BETWEEN AI SERVICE AGENT PROBLEM-SOLVING SKILLS AND CUSTOMER SATISFACTION

No.	Author(s) & Year	Context	Methodology	Findings
1.	Chen et al. (2022)	AI-enabled online service platforms	Survey, SEM	Positive
2.	Chau et al. (2025)	E-commerce customer service	Survey (n=552); PLS-SEM	Positive
3.	Huang & Rust (2021)	Human- AI hybrid service environments	Conceptual + empirical synthesis	Positive
4.	Belanche et al. (2020)	Online Customer Service Chatbots	Experimental design	Positive
5.	Sao et al. (2025)	AI-based service platforms	Survey, PLS-SEM	Positive

No.	Author(s) & Year	Context	Methodology	Findings
1.	Gao et al. (2025)	E-commerce platforms	Survey, SEM (Expectation-confirmation model)	Positive
2.	Chen et al. (2022)	AI-enabled online service platforms	Survey-SEM	Positive
3.	Huang et al. (2023)	AI-mediated customer-firm interactions	Empirical synthesis	Positive
4.	Ameen et al. (2021)	Online customer support services	Survey-based empirical study	Positive
5.	Wang et al. (2021)	AI-enabled service platforms	Survey, PLS-SEM	Positive