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Young Travellers' Engagement and Satisfaction with Online Travel Agency's (OTA) Chatbot Troubleshooting Services

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Abstract: This study examines the effects of online travel agency's (OTA) chatbot troubleshooting services quality on young travellers' satisfaction via four dimensions of chatbot e-service quality: interactivity, reliability, assurance, and responsiveness. The study population includes Malaysian Gen Z respondents who have used chatbot services in online travel agencies (OTAs) for troubleshooting purposes. A total of 302 responses were gathered. The study hypotheses were examined using the Covariance-based Structural Equation Modelling (CB-SEM) analysis. The results indicate that interactivity, reliability, assurance and responsiveness significantly influence user's satisfaction with OTAs' chatbot troubleshooting services. In addition, the study reveals that responsiveness was the most crucial element influencing user satisfaction with chatbot troubleshooting services. The study findings can assist tourism businesses in understanding user perspectives of chatbot troubleshooting service quality in OTAs. The study findings also encourage industry players to shift towards chatbot assistance in the troubleshooting context, especially catering to the Gen Z market. The study proves that customers react differently to chatbot troubleshooting services depending on the chatbot's e-service attributes, ability and settings. Above all, this study contributes original insights into the intersection of chatbot technology, e-service quality and user satisfaction within the context of online travel agencies, particularly for a younger generation who are tech-oriented.

Keywords: Chatbot, online travel agencies (OTAs), e-service quality, user satisfaction

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Introduction

In recent years, the tourism industry has witnessed substantial growth, emerging as a crucial economic sector globally. The positive situation of the tourism industry is evident as World Tourism Organization (UNWTO) (2024) reported that outbound tourism reached about 88% of pre-pandemic levels with an estimated 1.3 billion international arrivals by the end of 2023. With the rising demand for tourism, travellers increasingly seek expedited access to information while desiring personalised insights from digital platforms (Kim et al., 2020; Kozak & Correia, 2025). The World Travel and Tourism Council (WTTC) (2020) notes the prevalence of mobile devices among travellers, serving various purposes such as ground arrangements, flight check-ins, destination information searches, and sharing experiences online. Besides that, Majid et al. (2024) stated that the swift advancement of artificial intelligence (AI) technologies provides the potential for tourism providers to revolutionise ways in which tourists experience their travels. Consequently, the shift of tourism businesses to digital platforms has become imperative for promoting and endorsing tourism products and destinations.

Talwar et al. (2020) defined OTAs as travel aggregators utilising the internet to engage potential travellers, offering tourism products like hotel accommodations, holiday packages, flights, and cruises. Notably, Booking.com leads the online travel market, followed by Airbnb, Trip.com, and Expedia, with a global market cap of approximately USD 146 billion in 2025 (Statista, 2025). The widespread use of OTAs, particularly Agoda and Booking.com is evident in Malaysia, where more than 73% of respondents have engaged with these platforms (Mordor Intelligence, n.d.). A noteworthy trend in traveller's behaviour is the increasing acceptance of artificial intelligence (AI), including chatbots, for various travel-related activities (Azdel et al., 2023; Li et al., 2023; Um et al., 2020).

Chatbots, coined from "chat" and "robot," represent AI-based communication software facilitating conversations through messaging applications, websites, or mobile applications (Kim & Chang, 2020). Industries, including tourism, have embraced chatbots, with over 85% of customer interactions being handled by these AI-driven assistants in 2020 (Ashfaq et al., 2020; Li et al., 2021). Specifically, within the context of OTAs, chatbots play a crucial role in assisting customers with questions, FAQs, and troubleshooting, redirecting them to human experts when necessary (Mei et al., 2024; Oosthuizen et al., 2021). Despite the market's projected growth, comprehensive reviews of chatbots' electronic service quality, particularly their troubleshooting capabilities are limited (Li et al., 2021). Recent studies claimed that chatbots of OTAs offer generic, pre-scripted responses that do not cater to the individual needs or preferences of users (Calvaresi et al., 2023; Zhu et al., 2023). On that note, consumer reluctance to interact with chatbots persists due to concerns

about personal contact, empathy, and the ambiguity of their performance (Li et al., 2023). Challenges related to the integration of application programming interface (APIs) and troubleshooting technical errors pose additional hurdles, especially for new businesses (Ashfaq et al., 2020).

Based on literature, Kong et al. (2023) found that research on AI shows a growing trend since 1991 with an increasing number of publications and citations. Li et al. (2021) added that previous studies on chatbot have focused primarily on technical aspects, human-chatbot interactions, customer satisfaction and customer services in various industries such as healthcare, finance and social media platforms (Yao et al., 2024). As technology integration becomes integral to daily life, the younger generations have become techno-savvy by embracing chatbots for real-time customer support, particularly for travel information purposes (Behera et al., 2021). Hence, this study is original in its exploration of the intersection between chatbot e-service quality that focuses on four main dimensions: interactivity, reliability, assurance, and responsiveness and user satisfaction within the context of popular online travel agencies (OTAs) such as Agoda, Booking.com and Expedia. The results are anticipated to offer valuable insights for tourism stakeholders, aiding travel businesses and policymakers in enhancing their online visibility. Additionally, the study provides recommendations for OTAs to improve their chatbot's interface service quality, particularly in troubleshooting, filling a gap in the understanding of young consumers' interactions with these AI-driven systems.

Literature Review

Chatbot Services

A growing number of organisations are integrating artificial intelligence (AI) and service robots, particularly chatbots into their customer support systems (António & Sá, 2021). de Cosmo et al. (2021) defined technological tools equipped with AI, chatbots, as "AI-based communication software" that engage in conversations with users providing relevant information and answers to queries. Travel chatbots in OTAs play an important role in assisting travellers and providing suggestions according to their needs that suit with travel provider offers such as hotel accommodation, transportation, flights and restaurants (Ahmad et al., 2024; Yan et al., 2025). Moreover, chatbots offer practical advantages including reduced waiting and visit times for service users, enabling efficient interactions across diverse locations (Kim et al., 2020). Chatbots also play an important role as agents that could interact with potential customers via natural languages that are powered by AI (Majid et al., 2024). The interactions are supposed to elicit natural feelings in conversation, so that users feel as though they are having conversations with human agents, instead of machines (Li et al., 2021).

There is no doubt that consumers can rely on this emerging interactive technology, chatbots for seeking information, building social relationship, make purchases and request after-sales services through their computers or mobile devices. However, the varied social cues employed by chatbots encompassing verbal, visual, and auditory elements can elicit either positive or negative reactions from users (Feine et al., 2019). Consequently, investing in the advancement of chatbot interfaces and functions become imperative for certain organisations like OTAs. In this study context, the researchers postulate that chatbot services provide various benefits to the tourism industry as people nowadays are using OTAs for certain needs and wants.

User Satisfaction

E-commerce is a new trend where businesses are leveraging the provision of a service business model (Faccia et al., 2023; Mohammed et al., 2016). To ensure the success and effectiveness of online travel agencies (OTAs), they need to meet or exceed user satisfaction. This is because measuring the level of user satisfaction could explain customer's feelings and perceptions toward the services offered (Hanafiah et al., 2024; Nunkoo et al., 2019). In fact, customer satisfaction becomes another benchmark for businesses to measure their marketing initiative effectiveness which leads to positive behavioural intentions (Asyraff et al., 2024; Kumar & Shankar, 2023; Yan et al., 2024).

Research indicates that in the context of chatbot services, customer satisfaction is positively influenced in diverse scenarios (Calvaresi et al., 2023). By aiding consumers in complex daily tasks (Ashfaq et al., 2020; Hsu et al., 2023), chatbots contribute to enhanced customer satisfaction. This is particularly pertinent in the tourism industry, where travel chatbots play a pivotal role by offering reservation assistance, customer support, expense management, local insights, and services through OTAs. Taking these views and relating them to e-services implies that satisfaction reflects the extent users perceive the tasks done by chatbot-based OTAs, based on their positive experience evaluation (Kim & Chang, 2020; Li et al. 2021). Thus, if users feel that the chatbot service in OTAs has met their initial expectations, they will be satisfied with the services.

E-Service Quality of Chatbots

Acknowledged as a key determinant for success in e-business, electronic service or e-service is defined as the delivery of interactive services via the internet utilising advanced information and communication multimedia (Rust, 2001). Notably, the online environment differs significantly from traditional retail settings, encompassing distinctions in ease, efficiency, safety, and co-production of service quality that offers seamless travel experience to their potential customers (Nguyen

& Nguyen, 2022; Paiva et al., 2021). Recognised as a prime element of competitive advantage, e-service contributes to superior services at lower costs, emphasising its pivotal role in achieving excellence in service quality (Rahahleh et al., 2020).

Scholars have extensively examined the dimensions of e-service quality since 1996, emphasising its critical role in determining e-commerce success (Mamakou et al., 2024; Mohammed et al., 2016). The evaluation of e-service quality, particularly in the online platform, has been recognised as a necessity due to the rapid evolution of e-commerce applications. However, scholars have addressed issues of poor service quality delivery via the internet, emphasising the need to modify SERVQUAL measures to suit the context of web-based services (Al-dweeri et al., 2017). The concept of e-service quality lacks a common agreement as researchers apply evaluations in various settings such as online retailing, resort websites, online shopping, hotel websites, and OTAs (Sharma et al., 2022).

Precisely, E-SERVQUAL has been applied to measure e-service quality with the former focusing on core and recovery e-service quality scales and the latter emphasising efficiency, compliance, system availability, and data protection (Omar et al., 2021; Yun & Park, 2022). In the tourism and hospitality realm, dimensions of e-service quality include responsiveness, reliability, ease of use, privacy, customer service, fulfilment, website design, and information quality (Mohammed et al., 2016; Rahahleh et al., 2020; Rita et al., 2019; Vo et al., 2024). Specifically within the chatbot context, previous studies have highlighted dimensions such as process quality, outcome quality, and servicescape quality, as well as interfaces, communication, prompt response, and individual attention (Ashfaq et al., 2020; Kim & Chang, 2020). Furthermore, the quality of chatbot e-services has been analysed through dimensions of interactivity, reliability, assurance, responsiveness, and understandability (Li et al., 2023).

Drawing from the extensive literature on e-service quality, this study focused on four relevant dimensions of chatbot e-services which were adapted to suit the specific context. Cho et al. (2019) postulated that interactivity is deemed paramount in capturing users' attention and influencing positive reactions. Additionally, interactivity is also suggested as a final service quality dimension for chatbot that enhances communication or engagement with online users by providing personalised services (Li et al., 2021). Reliability, as highlighted by Kalia et al. (2017) and Sensuse et al. (2019), is contingent upon the trustworthiness of chatbots, influencing job performance and further development. Meanwhile, quality assurance revolves around establishing trust and ensuring users feel secure in their online conversations (Pereira & Daz, 2018). Lastly, responsiveness, as posited by Meerschman and Verkeyn (2019) as well as Nguyen et al. (2021) is integral to customer support in chatbot systems, requiring a 24/7 commitment to prompt service.

Based on past literature, a comprehensive understanding of these dimensions is crucial for online travel agencies to strategically plan and enhance customer satisfaction with chatbot services. Despite the abundance of literature on e-service quality, the study identified a gap in knowledge concerning young consumers' preferences and satisfaction with chatbot of OTAs, specifically within the millennial demographic (De Cicco et al., 2020). Therefore, an in-depth investigation into the millennial-chatbot interaction and its impact on satisfaction was deemed imperative for advancing scholarly discourse in this evolving field.

Study Hypotheses

In the context of chatbot services, user satisfaction is a critical aspect closely tied to the perceived value of the provided service. Talwar et al. (2020) emphasised that satisfaction is an immediate response to the perceived quality of service delivery through online platforms or technological applications. This is particularly relevant for chatbot-based OTAs, where user satisfaction is contingent upon positive experiential evaluations (Kim & Chang, 2020; Li et al., 2021). The users' satisfaction hinges on their perception that the chatbot services within OTAs have met their initial expectations.

Interactivity, defined as the level of response generated by users during interactions with websites or chatbot services, plays a pivotal role in shaping user satisfaction (Li et al., 2021; Mohammed et al., 2016). Users develop personal responses based on their experiences and the characteristics offered by the chatbot services (Mohammed et al., 2016). Communication competence as an integral part of interactivity, significantly influences user satisfaction with chatbots on luxury brand websites (Chung et al., 2020). The effectiveness of chatbot interface communication is demonstrated as providing users with higher satisfaction (Ashfaq et al., 2020). However, the process quality of chatbots, particularly the interpersonal relationship with the service provider, is found to have no significant effect on user satisfaction (Kim & Chang, 2020).

In the landscape of chatbot e-service quality, reliability emerges as a cornerstone, with a primary focus on delivering accurate information and expected services (Asyraff et al., 2023; Rahahleh et al., 2020). Li et al. (2021) underscored the profound impact of reliability on users' post-use confirmation and overall satisfaction within the realm of chatbot services. Despite the mechanistic nature often attributed to chatbots, the reliability dimension takes on a significant role as an integral part of the broader process quality framework, actively shaping and influencing user satisfaction. Within the context of chatbot of OTAs, users commonly treat chatbots as digital assistants, and inherently seek reliability in the form of accurate responses and dependable service delivery. Recognising this dimension as a vital component of

the overall service quality, the reliability of chatbots becomes intertwined with user satisfaction, showcasing the intricate interplay between technological functionality and user-centric outcomes. In essence, the reliability dimension serves as a linchpin, anchoring the foundation of user experience and satisfaction in the dynamic landscape of chatbot interactions.

Assurance also emerges as a pivotal element in the delivery of exemplary chatbot services, wielding a substantial impact on user satisfaction and contentment (Dey et al., 2021; Li et al., 2021). Notably, security assurance stands out as a critical determinant in augmenting web user satisfaction, particularly evident in the landscape of online shopping experiences (Pham & Ahammad, 2017). In the dynamic realm of chatbot services within online travel platforms, the dimensions of safety and privacy emerge as integral components of overall e-service quality, exerting a profound influence on users' satisfaction levels. Users, in their engagement with chatbots, seek assurance in terms of the security and privacy safeguards implemented, contributing significantly to their overall contentment with the service. This multifaceted assurance framework encapsulates not only the technological robustness of the chatbot, but also the broader commitment to ensuring a secure and private environment for users. As users increasingly prioritise trust and confidence in their online interactions, the assurance dimension becomes a cornerstone for fostering positive user experiences and satisfaction in the ever-evolving landscape of chatbot troubleshooting services.

Next, the dimension of responsiveness, which gauges the promptness of service delivery, holds paramount significance in the evaluation of chatbot e-service quality (Rahahleh et al., 2020). The expectations of tourists, who anticipate quick and accurate feedback, contribute significantly to the enhancement of satisfaction within the customer care system (Li et al., 2021; Meerschman & Verkeyn, 2019). This concept is not exclusive to chatbot services but extends to various domains, as observed in the context of online shopping where responsiveness has been identified as a critical factor impacting customer satisfaction (Pham & Ahammad, 2017). Therefore, as the literature suggests, prioritising and optimising the responsiveness dimension is fundamental in establishing a robust foundation for user satisfaction in the dynamic landscape of chatbot troubleshooting services within OTAs.

Within the literature, the proposed hypotheses underscore the interconnected relationship between chatbot e-service quality within OTAs and user satisfaction, particularly in the domain of troubleshooting services. As such, four hypotheses were developed:-

H1: The better the chatbot's interactivity quality, the higher the user satisfaction.
H2: The better the chatbot's reliability quality, the higher the user satisfaction.
H3: The better the chatbot's assurance quality, the higher the user satisfaction.
H4: The better the chatbot's responsiveness quality, the higher the user satisfaction.

The research model of this study (Figure 1) was developed based on literature review and hypotheses propositions. As this study focuses only on users' experience from their initial expectations interacting with OTA chatbots, the literature on information systems (IS) and service quality was reviewed to propose appropriate quality dimensions relevant to chatbot services in OTAs. Based on the literature review, the expectation-confirmation model (ECM) is a proven model for explaining users' intention towards technology adoption and usage (Dhiman & Jamwal, 2023; Rahi et al., 2023).

In the context of this research, ECM is particularly relevant as it provides a structured approach to understanding how users' expectations about chatbot services (in terms of interactivity, reliability, assurance, and responsiveness) align with their actual experiences. The model suggests that if the chatbot services of OTAs meet or exceed users' initial expectations, this positive confirmation will lead to higher user satisfaction. For instance, when chatbots provide interactive, reliable, assured, and responsive service, users' expectations are confirmed, leading to greater satisfaction. By extending the ECM with these specific dimensions of chatbot e-service quality, the research can systematically assess how each aspect contributes to overall satisfaction, supporting the proposed hypotheses. This theoretical framework also allows for a deeper exploration of how initial user expectations influence their post-usage perceptions, ultimately providing a robust basis for understanding user satisfaction in the context of chatbot interactions within OTAs.

This study extends ECM with key chatbot quality dimensions. This study follows past research that extended ECM by adding key antecedents for the theoretical loop experience and satisfaction. This study treated four variables (interactivity, reliability, assurance and responsiveness) as independent variables, and user satisfaction with chatbot e-service quality as the dependent variable. Essentially, user experiences are the key antecedents of satisfaction and future behaviour (Bhattacherjee, 2001). As such, we expect that interactivity, reliability, assurance and responsiveness are crucial determinants of user satisfaction related to OTAs' chatbot e-service. Figure 1 depicts the research framework.

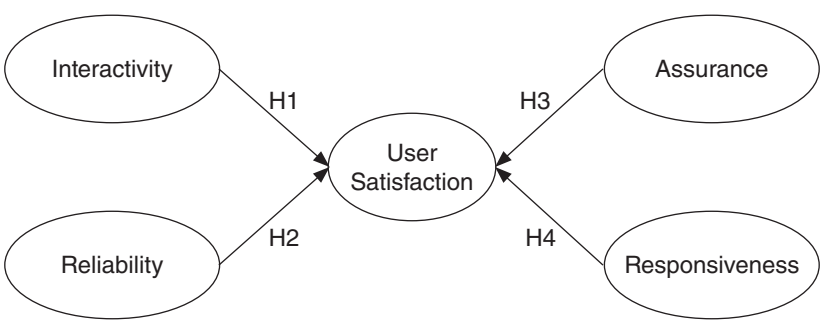


Figure 1. Research framework

Methodology

This study is a cross-sectional study based on the positivism paradigm. Data were collected through online surveys via Google Forms. The survey links were shared through social media via the snowball approach to ensure respondents' strong distribution and participation. Conducting the survey online via Google Forms allowed respondents to complete the survey at their own convenience, increasing the likelihood of participation. This approach allowed this study to reach a diverse population and it eliminated the need for face-to-face interactions or physical distribution of questionnaires. Given that this study examines digital behaviours (e.g., interaction with chatbot services on OTAs), recruiting respondents via digital platforms aligns well with the context of the research.

The study population included young Malaysians who have experienced using chatbot services in OTAs. This study employed a purposive sampling methodology, where respondents were carefully selected based on specific inclusion criteria to ensure their eligibility for the survey. To qualify, respondents had to meet the following conditions: (i) they were Malaysian citizens born in 1997 or later, and (ii) they had prior experience using chatbots on OTA platforms such as Agoda, Booking.com, Kayak.com, and Trivago for inquiries and obtaining travel-related information. These OTAs are the most widely used platforms in Malaysia. Many Malaysian travellers rely on these platforms for booking accommodations, flights, and other travel-related services (Shanmugam et al., 2024). Screening questions were utilised at the beginning of the survey to confirm that all respondents met these criteria. Based on the G*Power analysis that focuses in testing multiple linear regression, the minimum sample size of this study was determined at 138 respondents.

The research instruments were adopted from Li et al. (2021) and Nguyen et al. (2021) that suit this study context. The 20 survey items were paraphrased in English as clearly as possible with simple words and language to reduce potential ambiguities. The survey instrumentation was divided into four (4) parts: the first part, part A contained screening questions. Secondly, part B collected information about respondent's demographic profile. Next, part C looked at OTA's chatbot service quality which covered four dimensions: i) interactivity, ii) reliability, iii) assurance and (iv) responsiveness. Lastly, part D related to user satisfaction based on their chatbot usage experience. All items were measured using a 5-point Likert scale as per employed by previous studies, with values from 1 reflecting strongly disagree to 5 which depicts strongly agree.

The variable's reliability and internal consistency were tested to check that all instrument parts were reliable and understandable. First, several research methodology experts were involved during the pretesting stage and served as assessors to ensure the face and content validity of the items. Next, a pilot study was conducted on a small sample of 30 respondents to identify problems or deficiencies in the instruments.

Based on the reliability assessment, we found that each construct's Cronbach's alpha value exceeded the minimum value (0.70) without item deletion, which can be considered reliable. The results of Cronbach's alpha reliability test is shown in Table 1.

Table 1. Results of Cronbach's alpha reliability test

Variables	Number of items	Cronbach's alpha value
Interactivity	4	0.79
Reliability	4	0.82
Assurance	4	0.88
Responsiveness	4	0.87
Satisfaction	4	0.88

Data collection took two months, with 302 respondents participating in this study. The majority of the respondent were females (76.2%). Most of them were bachelor degree holders (61.8%), single (44.8%) and possessed numerous experiences using chatbots in OTAs for travel bookings (77.2%). Most respondents (84.3%) utilised OTAs to book for their hotel accommodations. The result also found that 61.8% of the respondents used chatbots via OTAs to make a reservation or purchase tourism products or services.

Next, this study applied a cross-validation method to test the study framework's predictive using the Confirmatory Factor Analysis (CFA) through covariance-based structural equation modelling (CB-SEM) based on the AMOS software output. Before the SEM analysis, the variance inflation factor (VIF) was examined to check for multicollinearity issues. Hair et al. (2017) stated that a VIF value above 5.0 is problematic, indicating multicollinearity issues. Our results show that the values of VIF for this study's measurement indicators were below this value, confirming that the model is free from multicollinearity. Besides, the common method bias (CMB) assessment results indicated that the percent of the variance of a single construct was below 50%, indicating no CMB issues in regard to this study model (Huang et al., 2019).

Data Analysis and Discussion

The demographic profile reveals a large portion of these respondents were well-educated with 36.2% holding a bachelor degree reflecting a high level of educational attainment. The result also indicates that well-educated young Malaysians nowadays are exposed to technology early that makes them tech-savvy and able to navigate digital platforms such as Booking.com, Agoda, Trivago and Kayak.com easily. Moreover,

a significant number of the respondents have extensive experience using chatbots in OTAs for travel bookings, particularly on transportation, accommodation and entertainment, which reflects their familiarity and comfort with digital interactions in the travel industry. This demographic insight is crucial for understanding the preferences and satisfaction levels of young Malaysians in the context of chatbot technology in travel services.

The study model was assessed using confirmatory factor analysis (CFA) (Hair et al., 2014). The measurement model assessment confirmed that the factor loadings of the survey items are higher than 0.70, which indicates that convergent validity was obtained. The Cronbach's alpha (α) value is also above the threshold level of acceptance reliability (>.70). Besides, the AVE values were greater than 0.5 for each dimension, suggesting that convergent validity exists (Hair et al., 2014). The chi-square degree of freedom (χ^2/df) recorded a value of 3.114. The GFI (0.911), IFI (0.953) and CFI (0.947) values suggest that the proposed research framework has a satisfactory fit even though the value of the goodness of fit index (GFI) is below 0.900. Meanwhile, the value of the root mean square residual (RMR) was recorded at 0.044. Next, the root mean square error of approximation (RMSEA) (0.059) falls within the recommended threshold for a good model fit (Diamantopoulos et al., 2008). Thus, the study model is fit to qualify for the next crucial step in SEM: the structural model evaluation.

The study hypotheses were tested using the path analysis (Anderson & Gerbing, 1988) via the SPSS Amos 20 software. Table 2 reports the direct path analysis.

Table 2. Path analysis output

Hypotheses	Std. β	S.E.	T-statistics	Result
H_1: Interactivity → User Satisfaction	.164***	1.454	2.116	Accepted
H_2: Reliability → User Satisfaction	.145***	1.283	4.282	Accepted
H_3: Assurance → User Satisfaction	.236***	1.753	4.192	Accepted
H_4: Responsiveness → User Satisfaction	.287***	2.632	2.245	Accepted

Note: R^2= .551; F-change: 29.703***; p<0.05**; p<0.001***

Based on Table 2, the first hypothesis posited that the interactivity of chatbots in OTAs positively and significantly affects user satisfaction. The regression beta coefficient of the interactivity shows a positive and significant value (β=.164**). The result aligns with Mohammed et al. (2016) and Ashfaq et al. (2020), where interactivity is perceived as an important dimension in enhancing the humanness and communication of chatbots. This indicates that interactivity of chatbot positively and significantly influences user satisfaction of chatbot in OTAs. Therefore, the first hypothesis (H_1) is supported.

The second hypothesis proposed that the chatbot's reliability significantly influences user satisfaction of chatbot in OTAs. The reliability regression beta coefficient reported a positive and significant value (β=.145**). Similarly, the finding is consistent with Li et al. (2021) as they discover the reliability of chatbots in China OTAs significantly influences users' post-usage consumption and satisfaction. Hence, this indicates the reliability of the chatbot has a positive relationship with Malaysian user satisfaction with the chatbot in OTAs. Therefore, the second hypothesis (H_2) is supported.

Meanwhile, the third hypothesis posited that the assurance of the chatbot significantly influences user satisfaction. The regression beta coefficient shows a positive and significant value (β=.236**). This indicates that assurance as part of e-service quality positively and significantly influences user satisfaction with chatbot services in OTAs. The result of this study is in line with previous studies conducted by Al-dweeri et al. (2017) and Rita et al. (2019) from an online shopping perspective. They specifically mentioned assurance was one of the key drivers of user satisfaction. Thus, the third hypothesis (H_3) is supported.

Next, the fourth hypothesis posited that the responsiveness of chatbots in OTAs positively and significantly influences user satisfaction. The regression beta coefficient reported a positive and significant value (β=.287**). This indicates that responsiveness positively and substantially influences Malaysian user satisfaction with chatbots in OTAs. Therefore, the fourth hypothesis (H_4) is supported.

Overall, the study found that interactivity, reliability, assurance and responsiveness can explain 55.1% of the variances in user satisfaction. The four independent variables can reliably predict user satisfaction (F-change=29.703**). These significant findings indicate that the four main dimensions of service quality are substantial predictors of OTA's chatbot user satisfaction. Notably, respondents agreed that the chatbot's responsiveness in OTAs is the highest predictor in influencing their satisfaction while using the services. Similarly, the result obtained is supported by previous studies that found responsiveness influences user satisfaction from OTAs (Li et al., 2021; Meerschman & Verkeyn, 2019) and online shopping settings (Pham & Ahammad, 2017). The faster the chatbot's response and feedback, the higher the user satisfaction.

Implications of the Study

This study makes a significant contribution by offering valuable insights into the specific dimensions of e-service quality in OTA chatbots and their direct impact on user satisfaction, particularly among young travellers. The findings emphasise the crucial role of interactivity in enhancing user satisfaction within the context of OTA chatbot services. However, the challenge posed by the inherently non-face-to-face nature of chatbot interactions is noteworthy, as it can impede the development of

meaningful interpersonal relationships, a concern echoed in previous studies (Ashfaq et al., 2020; Chung et al., 2020). To address this, OTAs like Agoda, Booking.com, Kayak, and Trivago should focus on increasing the interactivity of their chatbot services. Integrating multimedia elements such as images, videos, and interactive guides could enhance the user experience, aligning with the needs of tech-savvy young travellers in Malaysia (Li et al., 2021; Majid et al., 2024).

The study also underscores the importance of reliability in OTA chatbot services, identifying the provision of accurate information and consistency in service delivery as essential to user satisfaction, particularly for younger users. This finding is consistent with previous research that highlights the critical role of reliability in e-service quality (Kim & Chang, 2020; Rahahleh et al., 2020). To enhance reliability, OTAs should implement rigorous testing protocols and regular updates, ensuring that their chatbots provide precise information across multiple languages, such as Malay, Tamil, Mandarin, and English. This multilingual capability is particularly relevant in the Malaysian context and is vital for maintaining reliable service performance (Dey et al., 2021; Omar et al., 2021).

Furthermore, the study highlights the significance of assurance in chatbot services, where the perception of safety and trust in online interactions is paramount. This aligns with existing literature that emphasises the importance of security features in fostering user trust in digital environments (de Cosmo et al., 2021; Nguyen et al., 2021). Young and first-time travellers, in particular, may perceive the protection of personal information and secure financial transactions as essential. OTAs should, therefore, prioritise incorporating robust security measures such as encryption, user authentication, and clearly communicated privacy policies within the chatbot interface, thereby enhancing user satisfaction by building trust (Vo et al., 2024; Yun & Park, 2022).

Among the dimensions of chatbot service quality examined, responsiveness emerged as the most significant factor influencing user satisfaction. The study's findings are in agreement with previous research, which has also identified responsiveness as a critical determinant of customer satisfaction in e-service environments (Sensuse et al., 2019; Taherdoost, 2018). To align with the expectations of technologically adept young travellers, OTAs like Agoda, Booking.com, Kayak, and Trivago should strategically prioritise the enhancement of chatbot responsiveness. Reducing response times to less than five minutes could significantly improve the troubleshooting process and overall user satisfaction (Pereira & Díaz, 2018; Pham & Ahammad, 2017).

In theoretical term, this study adds new literature resources of e-service quality influences on satisfaction from the chatbot in the OTA and Malaysian context. Overall, interactivity, reliability, assurance and responsiveness of e-service quality significantly influence young Malaysian user's satisfaction of chatbot in OTAs.

Based on the analysis, the results indicate responsiveness gives a huge impact on user satisfaction. A prompt or quick react is required in answering question and solving customers problem. OTAs could improve the chatbot services since interactivity perceived as the lowest rank in e-service quality. Interactivity of chatbot is an important element as the service resembles the user's communication with human agents to increase engagement.

Numerous practical and managerial insights come to light. With the rapid evolving of digital world, traditional travel agencies or tour operators should consider to shift their nature of businesses into OTA which is in line with the current demand, particularly from the young travellers. Chatbots in online platforms are able to assist traditional travel companies in decreasing waiting time and provide accurate information on tourism products or destinations anytime and anywhere. Moreover, relevant policy makers and destination management organisations (DMOs) should first recognise the importance of chatbot services in formulating user satisfaction on OTA platforms. In fact, ensuring high quality of chatbot services would also improve the reputation of OTAs and presumably affect on user's usage and travel intention in the future.

Conclusion

The tourism industry has witnessed a paradigm shift towards digital platforms, with mobile devices becoming integral to travellers' experiences. OTAs such as Agoda, Booking.com and Trivago have emerged as key players by incorporating Artificial Intelligence (AI) in the form of chatbots to enhance customer interactions. This study aimed to shed light on the dimensions of chatbot service quality, including interactivity, reliability, assurance, and responsiveness, and their impact on user satisfaction within the context of OTAs. Besides that, this study addressed the dearth of comprehensive reviews on chatbots' e-service quality, particularly in the OTA realm, and aimed to contribute valuable insights into the young travellers' perspective. The research model, grounded in the Expectation-Confirmation Model (ECM), identified and tested four critical dimensions; interactivity, reliability, assurance, and responsiveness as determinants of user satisfaction. The findings support the hypotheses revealing that each dimension significantly influences user satisfaction. Interactivity, the ability to engage users effectively, positively impacted satisfaction. Similarly, reliability, assurance, and responsiveness were identified as crucial factors, influencing users' post-use confirmation and satisfaction with chatbot services.

This study has certain limitations. The researchers planned to survey over a more extended period and face-to-face as the online survey platform. It is challenging to acquire an ample number of responses since it is tough to persuade responses online. The correctness and trustworthiness of the collected data were entirely dependent

on the online survey attributes. It is suggested that future research should collect a larger sample and test the study framework using structural equation modelling, including the model fit and effect size. Future research could make several extensions of the current study. Firstly, this study only considered four dimensions of e-service quality. Other dimensions such as efficiency, customer service, information quality, entertainment and understandability are recommended to be assessed as the chatbot e-service quality dimensions. Besides, future studies could analyse chatbot e-service quality influence on behavioural intentions. Perhaps, the revisit intention and spreading Word of Mouth (WOM) are better indicators to determine the effectiveness of chatbot e-service quality in OTAs.

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References

Ahmad, M., Naeem, M. K. H., Mobo, F. D., Tahir, M. W., & Akram, M. (2024). Navigating the journey: How chatbots are transforming tourism and hospitality. In D. Darwish (Ed), *Design and development of emerging chatbot technology* (pp. 236–255). IGI Global.

Al-dweeri, R. M., Obeidat, Z. M., Al-dwiry, M. A., Alshurideh, M. T., & Alhorani, A. M. (2017). The impact of e-service quality and e-loyalty on online shopping: Moderating effect of e-satisfaction and e-trust. *International Journal of Marketing Studies, 9*(2), 92–103. https://doi.org/10.5539/ijms.v9n2p92

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411–423.

António, N., & Sá, G. (2021). Mapping information systems maturity: The case of the Portuguese hospitality industry. *Tourism & Management Studies, 17*(4), 7–21.

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*, 101473. https://doi.org/10.1016/j.tele.2020.101473

Asyraff, M. A., Hanafiah, M. H., & Md Zain, N. A. (2024). Travelling during travel bubble: Assessing the interrelationship between cognitive, affective, unique image, and future revisit intention. *Journal of Tourism and Services, 15*(28), 39–60.

Asyraff, M. A., Hanafiah, M. H., Md Zain, N. A., & Hariani, D. (2023). Unboxing the paradox of social media user-generated content (UGC) information qualities and tourist behaviour: Moderating effect of perceived travel risk. *Journal of Hospitality and Tourism Insights, 7*(4), 1809–1830.

Azdel, A. A., Awang, K. W., Yusof, R. N. R., & Hanafiah, M. H. (2023). Navigating the digital travel landscape: Understanding the role of technology readiness in OTAs acceptance and usage for hotel bookings. *Asia Pacific Journal of Marketing and Logistics, 36*(6), 1393–1408.

Behera, R. K., Bala, P. K., & Ray, A. (2021). Cognitive Chatbot for personalised contextual customer service: Behind the scene and beyond the hype. *Information Systems Frontiers, 26*(3), 1–21.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly, 25*(3), 351–370. https://doi.org/10.2307/3250921

Calvaresi, D., Ibrahim, A., Calbimonte, J. P., Fragniere, E., Schegg, R., & Schumacher, M. I. (2023). Leveraging inter-tourist interactions via chatbots to bridge academia, tourism industries and future societies. *Journal of Tourism Futures, 9*(3), 311–337.

Cho, W. C., Lee, K. Y., & Yang, S. B. (2019). What makes you feel attached to smartwatches? The stimulus–organism–response (S–O–R) perspectives. *Information Technology and People, 32*(2), 319–343. https://doi.org/10.1108/ITP-05-2017-0152

Chung, M., Ko, E., Joung, H., & Kim, S. J. (2020). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research, 117*, 587–595. https://doi.org/10.1016/j.jbusres.2018.10.004

De Cicco, R., Silva, S. C., & Alparone, F. R. (2020). Millennials' attitude toward chatbots: An experimental study in a social relationship perspective. *International Journal of Retail & Distribution Management, 48*(11), 1213–1233.

de Cosmo, L. M., Piper, L., & Di Vittorio, A. (2021). The role of attitude toward chatbots and privacy concern on the relationship between attitude toward mobile advertising and behavioral intent to use chatbots. *Italian Journal of Marketing*, 83–102. https://doi.org/10.1007/s43039-021-00020-1

Dey, T., Salam, M. A., & Saha, T. (2021). Evaluation and analysis of user satisfaction of ride-sharing service: an assurance and empathy in Bangladesh perspective. *Canadian Journal of Business and Information Studies, 3*(2), 22–28.

Dhiman, N., & Jamwal, M. (2023). Tourists' post-adoption continuance intentions of chatbots: Integrating task–technology fit model and expectation–confirmation theory. *Foresight, 25*(2), 209–224.

Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of Business Research, 61*(12), 1203–1218.

Faccia, A., Le Roux, C. L., & Pandey, V. (2023). Innovation and E-commerce models, the technology catalysts for sustainable development: The emirate of Dubai case study. *Sustainability, 15*(4), 3419.

Feine, J., Morana, S., & Gnewuch, U. (2019). Measuring service encounter satisfaction with customer service Chatbots using sentiment analysis. In *Proceedings of the 14th international conference on Wirtschaftsinformatik (WI2019)*. Institute of Information Systems and Marketing (IISM) and Karlsruhe Service Research Institute (KSRI).

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications.

Hair, J. F., Gabriel, M., & Patel, V. (2014). AMOS covariance-based structural equation modeling (CB-SEM): Guidelines on its application as a marketing research tool. *Brazilian Journal of Marketing, 13*(2), 1–21.

Hanafiah, M. H., Asyraff, M. A., Ismail, M. N. I., & Sjukriana, J. (2024). Understanding the key drivers in using mobile payment (M-Payment) among Generation Z travellers. *Young Consumers, 25*(5), 645–664.

Hsu, P. F., Nguyen, T., Wang, C. Y., & Huang, P. J. (2023). Chatbot commerce—How contextual factors affect Chatbot effectiveness. *Electronic Markets, 33*(1), 1–22.

Huang, Y. C., Chang, L. L., & Backman, K. F. (2019). Detecting common method bias in predicting creative tourists behavioural intention with an illustration of theory of planned behaviour. *Current Issues in Tourism, 22*(3), 307–329.

Kalia, A. K., Telang, P. R., Xiao, J., & Vukovic, M. (2017, November). Quark: A methodology to transform people-driven processes to chatbot services. In *International Conference on Service-Oriented Computing* (pp. 53–61). Springer. https://doi.org/10.1007/978-3-319-69035-3_4

Kim, M., & Chang, B. (2020). The effect of service quality on the reuse intention of a chatbot: Focusing on user satisfaction, reliability, and immersion. *International Journal of Contents, 16*(4), 1–15. https://doi.org/10.1177/0047287518818915

Kim, S., Eun, J., Oh, C., Suh, B., & Lee, J. (2020, April). Bot in the bunch: Facilitating group chat discussion by improving efficiency and participation with a chatbot. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–13). https://doi.org/10.1145/3313831.3376785

Kong, H., Wang, K., Qiu, X., Cheung, C., & Bu, N. (2023). 30 years of artificial intelligence (AI) research relating to the hospitality and tourism industry. *International Journal of Contemporary Hospitality Management, 35*(6), 2157–2177. https://doi.org/10.1108/IJCHM-03-2022-0354

Kozak, M., & Correia, A. (2025). From mass marketing to personalized digital marketing in tourism: A 2050 horizon paper. *Tourism Review, 80*(1), 373–391. https://doi.org/10.1108/TR-03-2024-0169

Kumar, A., & Shankar, A. (2023). Why do consumers forgive online travel agencies? A multi-study approach. *Australasian Marketing Journal, 32*(4), 323–328. https://doi.org/10.1177/14413582231194071

Li, L., Lee, K. Y., Emokpae, E., & Yang, S. B. (2021). What makes you continuously use chatbot services? Evidence from Chinese online travel agencies. *Electronic Markets, 31*, 575–599. https://doi.org/10.1007/s12525-020-00454-z

Li, X., Cui, W., & Chee, W. M. (2023). Investigating tourism experiences and attention allocation of outbound tourists through the lens of the two-factor theory: A grounded theory analysis of Chinese tourists' travelogues in Malaysia. *Heliyon, 9*(7), e17896. https://doi.org/10.1016/j.heliyon.2023.e17896

Majid, G. M., Tussyadiah, I., & Kim, Y. R. (2024). Exploring the potential of chatbots in extending tourists' sustainable travel practices. *Journal of Travel Research, 64*(6), 1292–1317. doi: 10.1177/00472875241247316

Mamakou, X. J., Zaharias, P., & Milesi, M. (2024). Measuring customer satisfaction in electronic commerce: The impact of e-service quality and user experience. *International Journal of Quality & Reliability Management, 41*(3), 915–943. https://doi.org/10.1108/IJQRM-07-2021-0215

Meerschman, H., & Verkeyn, J. (2019). *Towards a better understanding of service quality attributes of a chatbot* [Unpublished doctoral dissertation]. Ghent University, Belgium.

Mei, C. W., Konar, R., & Kumar, J. (2024). The role of AI chatbots in transforming guest engagement and marketing in hospitality. In V. Nadda, P. Tyagi, A. Singh, & V. Singh (Eds.), *Integrating AI-driven technologies into service marketing* (pp. 595–620). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-7122-0.ch029

Mohammed, M. E., Wafik, G. M., Jalil, S. G. A., & El Hassan, Y. A. (2016). The effects of e-service quality dimensions on tourist's e-satisfaction. *International Journal of Hospitality & Tourism Systems, 9*(1).

Mordor Intelligence. (n.d.). *ASEAN online accommodation market – share & trends analysis*. Retrieved June 12, 2025 from https://www.mordorintelligence.com/industry-reports/asean-online-accommodation-market?utm_source=chatgpt.com

Nguyen, D. M., Chiu, Y. T. H., & Le, H. D. (2021). Determinants of continuance intention towards banks' chatbot services in Vietnam: A necessity for sustainable development. *Sustainability, 13*(14), 7625. doi: https://doi.org/10.3390/su13147625

Nguyen Phu, T., & Nguyen Thi Thu, H. (2022). Assessment of tourism service quality for traditional craft villages in Da Nang city, Vietnam. *Cogent Social Sciences, 8*(1), 2108636.

Nunkoo, R., Teeroovengadum, V., Ringle, C. M., & Sunnassee, V. (2020). Service quality and customer satisfaction: The moderating effects of hotel star rating. *International Journal of Hospitality Management, 91*, 102414. https://doi.org/10.1016/j.ijhm.2019.102414

Omar, S., Mohsen, K., Tsimonis, G., Oozeerally, A., & Hsu, J. H. (2021). M-commerce: The nexus between mobile shopping service quality and loyalty. *Journal of Retailing and Consumer Services, 60*, 102468. https://doi.org/10.1016/j.jretconser.2021.102468

Oosthuizen, K., Botha, E., Robertson, J., & Montecchi, M. (2021). Artificial intelligence in retail: The AI-enabled value chain. *Australasian Marketing Journal, 29*(3), 264–273.

Paiva, S., Ahad, M. A., Tripathi, G., Feroz, N., & Casalino, G. (2021). Enabling technologies for urban smart mobility: Recent trends, opportunities and challenges. *Sensors, 21*(6), 2143.

Pereira, J., & Díaz, Ó. (2018, June). Chatbot dimensions that matter: Lessons from the trenches. In *International Conference on Web Engineering* (pp. 129–135). Springer. https://doi.org/10.1007/978-3-319-91662-0_9

Pham, T. S. H., & Ahammad, M. F. (2017). Antecedents and consequences of online customer satisfaction: A holistic process perspective. *Technological Forecasting and Social Change, 124*, 332–342. https://doi.org/10.1016/j.techfore.2017.04.003

Rahahleh, A., Al-Nsour, S., Moflih, M., Alabaddi, Z., Al-Nassar, B., & Al-Nsour, N. (2020). The influence of electronic service quality on relationship quality: Evidence from tourism industry. *Management Science Letters, 10*(12), 2759–2768. https://doi.org/10.5267/j.msl.2020.4.034

Rahi, S., Alghizzawi, M., & Ngah, A. H. (2023). Factors influence user's intention to continue use of e-banking during COVID-19 pandemic: The nexus between self-determination and expectation confirmation model. *EuroMed Journal of Business, 18*(3), 380–396.

Rita, P., Oliveira, T., & Farisa, A. (2019). The impact of e-service quality and customer satisfaction on customer behavior in online shopping. *Heliyon, 5*(10), e02690. https://doi.org/10.1016/j.heliyon.2019.e02690

Rust, R. (2001). The rise of e-service. *Journal of Service Research, 3*(4), 283–284.

Sensuse, D. I., Dhevanty, V., Rahmanasari, E., Permatasari, D., Putra, B. E., Lusa, J. S., Misbah, M., & Prima, P. (2019, October). Chatbot evaluation as knowledge application: A case study of PT ABC. In *2019 11th International Conference on Information Technology and Electrical Engineering (ICITEE)* (pp. 1–6). IEEE. https://doi.org/10.1109/ICITEED.2019.8929967

Shanmugam, K., Rana, M. E., & Kong, Z. Y. (2024, January). A comprehensive analysis of technological advancements and smart tourism strategies in Malaysia's post-pandemic tourism industry. In *2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)* (pp. 909–916). IEEE.

Sharma, M., Antony, R., Sehrawat, R., Cruz, A. C., & Daim, T. U. (2022). Exploring post-adoption behaviors of e-service users: Evidence from the hospitality sector/online travel services. *Technology in Society, 68*, 101781. https://doi.org/10.1016/j.techsoc.2021.101781

Statista. (2025, March 12). *Market cap of leading online travel companies worldwide 2025*. https://www.statista.com/statistics/1039616/leading-online-travel-companies-by-market-cap/

Taherdoost, H. (2018). Development of an adoption model to assess user acceptance of e-service technology: E-Service Technology Acceptance Model. *Behaviour & Information Technology, 37*(2), 173–197.

Talwar, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2020). Why do people purchase from online travel agencies (OTAs)? A consumption values perspective. *International Journal of Hospitality Management, 88*, 102534. https://doi.org/10.1016/j.ijhm.2020.102534

Um, T., Kim, T., & Chung, N. (2020). How does an intelligence chatbot affect customers compared with self-service technology for sustainable services? *Sustainability, 12*(12), 5119. https://doi.org/10.3390/su12125119

Vo, D. T., Nguyen, L. T. V., Dang-Pham, D., & Hoang, A. P. (2024). When young customers co-create value of AI-powered branded app: The mediating role of perceived authenticity. *Young Consumers, 25*(5), 557–578. https://doi.org/10.1108/YC-06-2023-1759

World Tourism Organization (UNWTO). (2024). *UN tourism: Bringing the world closer. International Tourism to Reach Pre-Pandemic Levels in 2024*. https://www.unwto.org/news/international-tourism-to-reach-pre-pandemic-levels-in-2024

World Travel & Tourism Council. (2020, September). *To recovery & Beyond: Future of travel & Tourism: World Travel & Tourism Council (WTTC)*. World Travel & Tourism Council.

Yan, Z., Konar, R., Sthapit, E., Balasubramanian, K., Chen, L., & Prentice, C. (2025). Opting for smart hotels: Do digital immigrants perceive differently than digital natives do? *Journal of Hospitality and Tourism Insights*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/JHTI-08-2024-0785

Yan, Z., Balasubramanian, K., Konar, R., Chen, L., & Wei, Y. (2024). Smart hotel in the eyes of the silver: developing and testing the silver tourists' behavioural intention scale. *Current Issues in Tourism*, 1–20. https://doi.org/10.1080/13683500.2024.2381249

Yao, S., Konar, R., & Wei, C. K. (2024). How hospitality employees turn into brand advocates: an integrative examination of employee advocacy. *Journal of Innovation in Hospitality and Tourism, 13*(1), 91–108.

Yun, J., & Park, J. (2022). The effects of chatbot service recovery with emotion words on customer satisfaction, repurchase intention, and positive word-of-mouth. *Frontiers in Psychology, 13*, 922503. https://doi.org/10.3389/fpsyg.2022.922503

Zhu, Y., Zhang, R., Zou, Y., & Jin, D. (2023). Investigating customers' responses to artificial intelligence chatbots in online travel agencies: The moderating role of product familiarity. *Journal of Hospitality and Tourism Technology, 14*(2), 208–224.