

Exploring chatbot anthropomorphism as a driver of user satisfaction and purchase intention through perceived enjoyment and responsiveness

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Abstract

This research aims to investigate the role of chatbot anthropomorphism in enhancing user satisfaction and purchase intention, with enjoyment, social presence, and responsiveness serving as mediating factors. Partial Least Squares-Structural Equation Modeling (PLS-SEM) was adopted to evaluate 11 hypotheses by analyzing data from 390 customers of a local cellular operator using a chatbot for cellular data purchases over 6 months. The results show that anthropomorphism indirectly influences user satisfaction and purchase intent by improving a strong social presence and evoking enjoyment through relatable, human-like traits, such as empathy and conversational tone. Furthermore, responsiveness plays a critical dual role, where prompt and accurate replies fulfill functional needs for speed and satisfy psychological desires for user acknowledgment, enhancing overall communication effectiveness. Highly satisfied users exhibit a greater likelihood of following purchase recommendations, positioning chatbots as highly effective agents within the sales funnel. To optimize functionality and drive consumer conversions, developers must adopt a holistic design method that prioritizes anthropomorphic features, rapid responsiveness, and perceived enjoyment, ensuring a meaningful and satisfying user experience. These insights supported effective strategies in optimizing chatbot functionality and improving user experiences.

Keywords: Chatbot anthropomorphism, User satisfaction, Purchase intention using chatbot, Perceived enjoyment, Responsiveness, Social presence.

Introduction

The evolution of artificial intelligence (AI)-based technologies is enhancing interactive communication channels since timely feedback from customers and systems plays an important role in shaping value exchanges (Wang, 2021). In this context, the interactive dialogue between technology and users cultivates a conducive atmosphere for communication, enhancing engagement levels. Effective communication also depends on the ability to transmit human-like social presence, ensuring users perceive interactions similar to conversing with a human rather than a machine (Tsai et al., 2021). Chatbot plays a crucial role in achieving this objective (Feine et al., 2019) as software-based entities capable of text interaction. Crafting chatbot language to mirror typical human communication patterns is important in distorting the lines between human and machine interaction, enhancing user experience and purchase intention (Han, 2021). Moreover, lexical choices have been adjusted to show stronger consistency when interacting with a computer. The tendency to balance the concept with a perceived human interlocutor is influenced by social skills (Shen and Wang, 2023).

The emojis, humor, and proactive questioning in chatbot communication amplify social presence and user engagement (Tsai et al., 2021). Cartoon-like avatar images can effectively mitigate negative user sentiments using warm (Yao et al., 2023). Customized services, efficient issue resolution, and seamless access to information are hallmarks of innovative and responsive chatbots (Chen et al., 2021). In this context, chatbot forges stronger social bonds with users by facilitating anthropomorphism, enhancing utility as technological agents (Epley et al., 2007). Anthropomorphism significantly shapes behavioral intention toward voice assistants and should be considered since human-like qualities have the strongest effect on user-driven likeability (Wagner et al., n.d.). These anthropomorphized agents, characterized by strong social connections, exhibit increased efficacy in addressing user needs and meaningful interactions.

Han (2021) analyzed anthropomorphism of chatbot and the impact on social presence and perceived enjoyment, influencing purchase intention. The enhancement of user satisfaction with chatbot is important in fostering a shift from “customer-aware” to “customer-centred” behavior. Users engage with chatbot repeatedly when the concept is perceived as beneficial (Ashfaq et al., 2020). The provision of accurate and reliable responses enhances a comprehensive understanding of chatbot. The concept promotes transparency, prompting users to provide personal data willingly. This data enables chatbot to direct solutions and information based on user preferences and profiles (Baabdullah et al., 2022). Even though chatbot serves as an opportunity for product information, users may also obtain information from social media and other websites. Therefore, ease of information retrieval is not the sole determinant in the utilitarian aspect of chatbot usage (Mikalef et al., 2013). Marketers aiming to enhance user satisfaction with chatbot should focus on factors such as Discovery and Entertainment Benefit (DEB), which contribute to customer satisfaction and purchase enjoyment experience (Agarwal et al., 2022). Trust is essential for customer interactions, and enforcing a positive impression of chatbot can alleviate concerns when customers perceive the technology as trustworthy (Fu et al., 2023).

Responsiveness is important in driving retail sales to influence customer satisfaction

and purchase intention (Sharma et al., 2022). Users engaged more with chatbot when the response rate is fast. The achievement of fast and dependable responses necessitates continuous efforts to enhance chatbot capabilities in understanding inquiries and delivering appropriate responses to facilitate high-level interaction in two-way communication. Therefore, periodic content reviews must be consistent with consumer requirements and preferences (Baabdullah et al., 2022).

Allowing users to customize the appearance of AI enhances enjoyment and participation, rendering chatbot more human-like during social interactions (Hsieh and Lee, 2021). Trust becomes an important determinant when using chatbot with human-like capabilities, intentions, and cues, influencing user reliance on the agent (Chen and Park, 2021).

Future advancements in chatbot technology are crucial, particularly in refining communication skills such as comprehending user inquiries, expressing facial expressions, and understanding multiple languages. Emphasis should be placed on the design and implementation of robot agents to address evolving needs (Zhang et al., 2022). Marketers must also prioritize the provision of accurate, unbiased, high-quality information on marketing campaigns and user privacy. In addition, practitioners can implement various levels of protection to address concerns regarding the potential intrusion of AI assistants into user privacy (Hsieh and Lee, 2021).

The evolving landscape of chatbot technology presents different opportunities for enhancing customer engagement, satisfaction, and purchase intention in retail settings. As reported in the preceding discussions, responsiveness, customization, trust, and continuous technological advancement play a crucial role in shaping user interactions with chatbot. Responsiveness is related to the ability of providing timely and relevant answers, which significantly impacts user satisfaction. A responsive chatbot that addresses customer inquiries creates a seamless shopping experience to reduce frustration and promote customer return. Moreover, customization allows chatbot to direct interactions based on individual user preferences and behaviors. Trust is developed as another important element in the efficacy of interactions. Users are engaged with and rely on chatbot that exhibits trustworthy behavior, such as safeguarding personal data and providing accurate information. This trust requires robust security measures and transparency. Continuous technological advancements, such as improvements in Natural Language Processing and Machine Learning, enhance chatbot capabilities in understanding and responding to user queries with greater sophistication and accuracy. Recognizing the importance of the elements emphasizes the role of chatbot in modern retail environments.

Based on the description, this research analyzes the multifaceted aspects of chatbot interactions to examine the impact on consumer behavior and decision-making processes. In exploring the effect of different interaction styles on user engagement and satisfaction, the discussion offers valuable insights into optimizing chatbot effectiveness in the retail domain. A thorough understanding of the dynamics informs strategies that enhance customer experiences and drive higher purchase intention to make chatbot an integral component of contemporary retail strategies. This ongoing exploration contributes to a broader understanding of harnessing technology to create meaningful and effective interactions.

Literature Review

Service Robot in Marketing

A service robot functions as an autonomous and adaptive interface, engaging in interaction, communication, and service delivery with users to embody the interactive counterpart of customers (Wirtz et al., 2018). AI software operating autonomously and evolving also falls under the category of service robots. To direct services based on user characteristics, these robots need integration with Customer Relationship Management (CRM) systems to gather insights into usage patterns and feedback from previous interactions. Furthermore, the technology manifests as humanoid, mimicking human appearance, or non-humanoid forms (Wirtz et al., 2018). The increasing intelligence of service robots impacts employees' perceptions regarding the likelihood of being replaced (Tojib et al., 2023). Research suggests that robots exhibiting more human-like features and behaviors tend to be perceived as more sociable, communicative, and trustworthy (Araujo, 2018; Kim et al., 2019).

Chatbot is programmed with human-like dialogue capabilities using natural language processing to provide users with experiences similar to interacting with humans or anthropomorphic entities (Han, 2021). The primary function is responding to customer inquiries, facilitated by dynamic loop functionalities. These dialogic loops enable customers to pose queries and necessitate robot-responsive engagement with questions and concerns (Hinson et al., 2020). The provision of accurate and appropriate responses empowers companies to engage with users interactively and competitively through chatbots (Intelligence, 2016).

Chatbot Anthropomorphism

Research suggests that consumers perceive chatbot more favorably when human-like qualities are shown, promoting closer engagement and satisfaction (Araujo, 2018). Anthropomorphism enhances social presence, particularly evident in Responsiveness to user queries to strengthen the interaction dynamics (Han, 2021). Trust becomes crucial when non-human agents show human-like traits, emphasizing the importance of building rapport with users (Chen and Park, 2021). Therefore, this research proposes the following hypothesis.

H1 Chatbot anthropomorphism increases the social presence felt by the users.

Waytz et al. (2014) proposed that purposeful use of anthropomorphic-based technology engendered greater user trust than conventional counterparts. Enhanced trust in chatbot service correlates with increased enjoyment from improved communication (Elprama et al., 2016). In healthcare, a female anthropomorphic or a competent, non-anthropomorphic chatbot enhances source credibility in prevention-focused applications since the former combines warmth and competence through appearance and personality. A male anthropomorphic chatbot with a warm personality positively affects source credibility in therapy contexts, where empathy is crucial for patient support and treatment guidance (Schillaci et al., 2024). Therefore, this research proposes the following hypothesis.

H2 Chatbot anthropomorphism increases user-perceived enjoyment.

Zhang et al. (2022) reported an important connection between anthropomorphism and Responsiveness, stating the importance of swift responses in maintaining user satisfaction. A delayed response from chatbot can lead to customer disappointment and impatience. This connection shows the significance of anthropomorphism, particularly in service-oriented contexts, where prompt Responsiveness enhances user experiences. Roy and Naidoo (2021) and Tsai et al. (2021) reported the critical role of anthropomorphism in shaping user perceptions of Responsiveness in human-robot interactions. Therefore, this research proposes the following hypothesis.

H3 Chatbot anthropomorphism increases the perceived Responsiveness experienced by the users.

Social Presence

The inclusion of human language or names in chatbot enhances the perception of agents as human-like (Araujo, 2018; Warwick and Shah, 2016). Meanwhile, the use of human-like characters influences the social presence experienced by users. Social presence positively affects perceived enjoyment since interactions imbued with human warmth led to increased enjoyment and preference for technology (Elprama et al., 2016). Reduced social presence decreases user trust, affecting rapport-building without real seller representatives. Therefore, this research proposes the following hypothesis.

H4 Social presence felt by chatbot users increases perceived enjoyment.

Previous research has reported the significant impact of social presence on enhancing online experiences, including motivating users to shop online (Botha and Reyneke, 2016) and increasing emotional appeal and consumer trust in websites (Etemad-Sajadi and Ghachem, 2015). Strategies emphasizing high social presence enhance user engagement with company leaders on social media platforms (Men et al., 2018). Tsai et al. (2021) suggested that communication with high social presence shaped user satisfaction. Therefore, this research proposes the following hypothesis.

H5 Social presence felt by chatbot users increases User Satisfaction.

The negative impact of empathy on perceived authenticity in healthcare chatbot can be mitigated by adopting a more human-like appearance. These findings suggest that social presence may influence purchase intention indirectly, depending on contextual relevance and the presence of hedonic or functional mediators in commercial chatbot interactions. This is based on results regarding the impact of social presence on consumer purchase intention in live video marketing contexts (Huang et al., 2022), as well as the positive influence on perceived enjoyment and social learning processes (Liu et al., 2020; Li and Hua, 2022) and the association with increased purchase intention (Qin, 2020). Anthropomorphic design promotes human-like thinking and reduces perceived incongruence in empathic responses. Therefore, this research proposes the following hypothesis.

H6 Social presence felt by chatbot users positively influences the intention to purchase using chatbot.

Perceived Responsiveness

The swift response of chatbot to user inquiries creates a sense of attentiveness and makes customers feel acknowledged and valued (Chung et al., 2020; Zarouali et al., 2018). Additionally, responsiveness contributes to the enjoyment of interactions with chatbot since customers appreciate the efficiency and effectiveness of responses (Prentice et al., 2019; Roy et al., 2018). The availability of 24-hour service offers customers the convenience of posting requests outside of normal operating hours, enhancing satisfaction and overall experience (Adamopoulou and Moussiades, 2020). This relationship shows the importance of responsiveness as a crucial attribute in determining chatbot quality and the significant impact on enhancing customer usage and satisfaction in communication (Li et al., 2021).

Baabdullah et al. (2022) suggested that customers who perceived chatbot as effectively responding to questions and inquiries consciously focused on the conversations and enjoyed the interactions. Zarouali et al. (2018) stated that chatbot ability to respond quickly was valued by customers. Responsiveness plays a key role in shaping customers' perceptions and enjoyment of chatbot interactions. Therefore, this research proposes the following hypothesis.

H7 Chatbot responsiveness increases the perceived enjoyment felt by users.

Based on extensive research, service speed, measured as the time taken from request to solution, has been identified as a critical factor in customer-oriented quality (Sirdeshmukh et al., 2002). Response speed has been consistently recognized as a strong contributor to enhancing customer satisfaction across various contexts (Gong and Yi, 2018; Matthews and Mokoena, 2020). Furthermore, recent research has analyzed the effect of different dimensions of response speed on customer satisfaction (Sharma et al., 2022). In education, supporting preservice teachers in cultivating responsive teaching practices is crucial since evidence indicates frequent struggle to elicit student thinking (Son et al., 2024).

Jiang et al. (2022) reported the significance of dialogic chatbot communication, particularly responsiveness and conversational tone, in shaping positive brand experiences and facilitating the exchange of essential information for consumption purposes. This result suggests that responsiveness is crucial in determining the satisfaction gained from communication interactions. Therefore, this research proposes the following hypothesis.

H8 Chatbot responsiveness increases user satisfaction.

The company's focus on responsiveness (Thomas et al., 2010) leads to the development of sustainable customer relationships (Aflaki and Popescu, 2014; Sharma et al., 2020) and strengthens loyalty and purchase intention (Cheung et al., 2020). This customer engagement strategy directs the company toward enhancing satisfaction and promoting repeat purchase intention (Hosany et al., 2015). Sharma et al. (2022) confirmed the positive influence of Responsiveness on cross-buying behavior, where customer satisfaction directly impacted cross-buying behavior. Therefore, this research proposes the following hypothesis.

H9 Chatbot responsiveness increases purchase intention using chatbot.

Perceived Enjoyment, Satisfaction, and Purchase Intention Using Chatbot

The success of technology is determined by performance and user enjoyment during usage (Davis et al., 1992). Across various service sectors, perceived enjoyment is a crucial indicator of acceptance of new technology. Hwang et al. (2019) reported that the perception of enjoyment influenced consumer attitudes in contexts of drone delivery. Additionally, Hwang et al. (2020) suggested the significant impact of perceived enjoyment on customer attitudes towards robot services.

As emphasized by Akdim et al. (2022), practitioners should prioritize enhancing user-perceived enjoyment, particularly in hedonic applications, by incorporating more entertainment elements. Therefore, this research proposes the following hypothesis.

H10 Perceived enjoyment positively influences chatbot user satisfaction.

The integration of chatbot into digital commerce platforms has revolutionized customer experience. This concept has the potential to influence purchase intention significantly. The hypothesis that chatbot user satisfaction positively impacts purchase intention is well-supported. For instance, chatbot can shape the perceived value of products, impacting customer purchase intention (Ashfaq et al., 2020). Positive interactions with chatbot lead to a more favourable perception of a product's value to increase purchase. Furthermore, satisfaction derived from chatbot interactions has been correlated with continuous intention to use since satisfied users are more inclined to engage with chatbot repeatedly (Yun and Park, 2022). This sustained engagement serves as a precursor to purchase intention since repeated interactions strengthen the affinity towards chatbot.

Trust model for chatbot, including credibility and competence, has been found to influence consumer trust and purchase intention (Lee et al., 2021). Trust is an important component of customer satisfaction. Users consider purchasing when chatbot information and services are supported. Emotional and empathetic responses from chatbot have also been identified to facilitate affective attachment and purchase intention (Broeck et al., 2019). This emotional connection can serve as a potent driver of purchase decisions.

The results collectively support the hypothesis that chatbot user satisfaction positively influences purchase intention. Satisfaction includes trust, perceived value, and emotional connection, which are crucial determinants of a consumer's intention to purchase. Therefore, this research proposes the following hypothesis.

H11 Chatbot user satisfaction increases user intention to purchase using chatbot.

Methodology

Sampling and Data Collection

This research purposively sampled 390 Indonesian citizens aged 18 and above who

were customers of a local cellular operator and made cellular data purchases through WhatsApp chatbot. Approximately 58% of respondents were aged 26-35, comprising homemakers and private employees who showed loyalty by using the same operator for over five years. The demographic represented a valuable sample due to extensive experience and familiarity with chatbot interactions in routine operator communications to offer critical insights. The use of chatbot assessed aspects such as functionality, usability, and satisfaction, contributing meaningful data on the efficacy in customer service contexts. This sampling method ensures that respondents are familiar with chatbot interactions.

Data collection used an online survey administered through Google Forms. The survey was distributed through WhatsApp groups and promoted using Facebook Ads to reach a diverse audience of Indosat Ooredoo Hutchison (IOH) users. Screening questions were implemented at various points to minimize discrepancies in input data. Respondents were invited to voluntarily fill out the questionnaire, which assessed the perceptions of anthropomorphism, social presence, enjoyment, responsiveness, satisfaction, and purchase intention related to chatbot service. The questionnaire used a Likert scale with 7 points to measure respondents' agreement with statements regarding chatbot experiences, ranging from "Strongly Disagree" to "Strongly Agree" in capturing nuanced responses.

Measurements

Variables in this research included Anthropomorphism, Social Presence, Perceived Enjoyment, Responsiveness, Satisfaction with Chatbot Service, and Purchase Intention, reflecting diverse aspects of user interaction and satisfaction with chatbot service. The measurement items for the variables were sourced from scholarly works. Anthropomorphism (AN) items were validated by Nowak and Rauh (2008), Powers and Kiesler (2006), and Kim and McGill (2011), assessing the degree of human-like attributes. Social Presence (SP) measurement items, capturing the sense of social interaction and connectedness, were derived from the work of Pantano and Scarpi (2022).

Perceived Enjoyment (PE) items, focusing on user pleasure, were sourced from Mikalef et al. (2013) and El-Said and Al Hajri (2022). Responsiveness (RE) items, exploring user perceptions of promptness and effectiveness, were adapted from Jiang (2022) and Baabdullah et al. (2022).

Measurement items for Satisfaction of Chatbot Service (SC) were drawn from (2022), Anderson and Srinivasan (2003), and Saura et al. (2008), assessing user overall satisfaction with chatbot interactions. Lastly, Purchase Intention from Chatbot (PI) items, indicating inclination to make purchases through chatbot-mediated transactions, were derived from Lin and Lu (2011) and Jiang (2022).

Data Analysis

Data analysis was conducted using Partial Least Squares-Structural Equation Modeling (PLS-SEM) to handle complex relationships between variables. PLS-SEM was well-suited for examining the interplay between variables such as perceived enjoyment, social presence, and Responsiveness and the impact of user satisfaction and purchase

intention in chatbot interactions. This method allowed for a comprehensive understanding of direct and indirect effects in the theoretical model, reporting the immediate impact of variables and the underlying mechanisms influencing user behavior.

This research aimed to uncover insights into chatbot user behavior to inform marketing strategies by using PLS-SEM. The analysis focused on unravelling the pathways through which satisfaction and purchase intention are influenced, providing actionable recommendations for practitioners in chatbot-mediated commerce. Generally, PLS-SEM proved to be a valuable analytical tool, enabling the research to contribute practical insights and theoretical advancements to understanding user satisfaction and purchase intention.

Furthermore, the dataset includes 30 measurement items, which means the minimum recommended sample size of five respondents per indicator or 150 respondents (Hair et al., 2019). Nevertheless, the study utilized 390 respondents or more than twice the recommended minimum, thereby providing adequate statistical power and robustness for the factor analysis.

Results

Sample Description

This research targeted a sample of 390 Indonesian citizens aged 18 and above, focusing on PT Indosat Ooredoo Hutchison customers who engaged with chatbot for cellular data purchases through WhatsApp. To ensure the relevance of respondents, screening questions were used, verifying the status as PT Indosat Ooredoo Hutchison customers and history of using chatbot for product transactions. This research adopted a more direct method by engaging respondents with real-world experience using chatbot interactions to purchase products.

The recruitment of respondents included a multifaceted strategy, combining distribution through WhatsApp groups and targeted advertising using Facebook Ads. WhatsApp groups facilitated direct access to potential respondents within the Indosat Ooredoo Hutchison user community. Meanwhile, Facebook Ads allowed for broader outreach to individuals interested in topics related to telecommunications and technology. These methods aimed to attract a diverse pool of respondents, ensuring a comprehensive representation of chatbot users within the target demographic.

After accessing the survey, respondents were presented with questions designed to control the perceptions and experiences regarding anthropomorphism, social presence, enjoyment, Responsiveness, satisfaction, and purchase intention. The questionnaire was structured to show voluntary responses, allowing respondents to provide insights based on encounters with chatbot. This research captures authentic feedback from individuals exposed to the phenomenon under investigation.

Analysis of the collected data reported several insights regarding the respondents' demographic characteristics and behavioral patterns. Most respondents were within the 26 to 35 age bracket, indicating a predominant presence of Millennial respondents. In

the professions group, a significant proportion were identified as homemakers, suggesting a potential connection between household responsibilities and the management of telecommunication expenditures.

A considerable percentage of respondents allocated substantial monthly budgets exceeding Rp100,000 for telecommunication products, with a portion being longstanding PT Indosat Ooredoo Hutchison customers. These results show the importance of understanding user demographics and consumer behavior in the context of chatbot-mediated transactions.

Measurement Validation

The measurement validation process comprised the performance of validity and reliability tests using Confirmatory Factor Analysis (CFA) to assess the dimensionality of the model (Hair et al., 2010). Before measuring the model, validity and reliability assessments were conducted for the variables. This research used a reflective model that assessed Outer Loading values through convergent and discriminant validity checks. Furthermore, Composite Reliability (CR) and Cronbach's Alpha (CA) were used for latent variables.

The first step in validating the measurement model included checking Outer Loading and Average Variance Extract (AVE) statistically (Hair et al., 2010). This assessment observed Outer Loading and AVE values above 0.70.

Table 1: Measurement validation

Construct	Items	Outer Loading	AVE	CR	CA
Anthropomorphism (AN)	AN1	0.85	0.75	0.92	0.89
	AN2	0.89			
	AN3	0.90			
	AN4	0.82			
Felt Social Presence (SP)	SP1	0.76	0.80	0.92	0.89
	SP2	0.86			
	SP3	0.87			
	SP4	0.88			
	SP5	0.82			
Perceived Enjoyment (PE)	PE1	0.88	0.80	0.95	0.94
	PE2	0.88			
	PE3	0.88			
	PE4	0.92			
	PE5	0.90			
Perceived Responsiveness (RE)	RE1	0.87	0.80	0.95	0.94
	RE2	0.89			
	RE3	0.91			
	RE4	0.89			
	RE5	0.89			
Satisfaction with Chatbot Service	SC1	0.90	0.78	0.95	0.93
	SC2	0.89			

Construct	Items	Outer Loading	AVE	CR	CA
Intention to Purchase using Chatbot (PI)	SC3	0.90	0.70	0.95	0.94
	SC4	0.90			
	SC5	0.82			
	PI1	0.90			
	PI2	0.89			
	PI3	0.92			
	PI4	0.88			
	PI5	0.87			

These results indicated that all variables used in the model met the standard criteria, with Outer Loading and AVE values above 0.70. Additionally, Composite Reliability and Cronbach's Alpha values above 0.70 reported satisfactory reliability of the constructs. The validation process maintained operational variables with Cross Loadings >0.70, square root of AVE > other latent variable constructs, and Heterotrait-Monotrait Ratio (HTMT) <0.90 (Chin, 2010; Hair et al., 2012). Further assessment through the Fornell-Larcker Criterion and HTMT Ratio confirmed the validity of the measurement model. Finally, the reliability of the measurement model was evaluated through Composite Reliability and Cronbach's Alpha, with all constructs reporting values exceeding the recommended threshold of 0.70.

Model Fit Evaluation

The evaluation of model fit is crucial in determining effectiveness and validity. This section analyzed the goodness of fit indices and relevant statistics, particularly the explanatory power, predictive relevance, and effect size of the variables in the model. The evaluation included examining NFI, SRMR, Chi-square, and RMS theta values for the goodness of fit indices. The results showed that the saturated and estimated models had SRMR scores of 0.047 and 0.066, indicating a good fit (SRMR < 0.08). The Chi-square values were 1415.279 and 1403.186 for the saturated and estimated models, suggesting a satisfactory fit due to the non-significant difference. NFI values of 0.878 and 0.879 for the saturated and estimated models also supported the adequacy of the model fit. Finally, the RMS theta value of 0.127 confirmed the model's fit approaching zero.

The R-Square (R²) test examined the proportion of variance in the dependent variable explained. The constructs reported strong explanatory power, with R-squared values ranging from 0.613 to 0.713. Additionally, the adjusted R-Square values, which ranged from 0.612 to 0.711, confirmed the robustness of the model. These results showed that the variability in the dependent variable was effectively explained.

Table 2: R-Square, Adjusted R-Square, and Q-Square

Construct	R Square	Adjusted R Square	Q2 Predictive Relevance
Intention to Purchase using Chatbot	0.67	0.67	0.48
User Satisfaction	0.71	0.71	0.46
Perceived Enjoyment	0.69	0.69	0.53
Felt Social Presence	0.64	0.64	0.64

Construct	R Square	Adjusted R Square	Q2 Predictive Relevance
Perceived Responsiveness	0.61	0.61	0.61

Q2 Predictive Relevance test evaluates the ability to predict outcomes beyond chance. Positive Q2 values, ranging from 0.479 to 0.639, show that the model has predictive relevance. In this context, the model accurately predicts outcomes with significant impacts on the variables. The positive Q2 values validate the reliability and validity of the model, supporting the suitability for further analysis and interpretation. Table 2 presents the explanatory power and predictive relevance of the results.

The F-square test measures the effect size of each variable in the model. This test provides insights into the strength of the relationships between the independent and dependent variables. Based on the results, the variables exhibit varying levels of influence.

Strong Influence: Anthropomorphism reports a strong influence on Responsiveness and Social Presence, with f^2 values of 0.581 and 0.800, respectively. These results suggest substantial effects of anthropomorphism on the variables.

Moderate Influence: Perceived Enjoyment moderately influences Satisfaction with Chatbot Service. Similarly, Responsiveness influences Purchase Intention using Chatbot with f^2 values of 0.25 and 0.21, respectively. These results suggest moderate effects on the relationships.

Weak Influence: Anthropomorphism weakly influences Perceived Enjoyment. Social Presence shows a weak influence on Purchase Intention and Perceived Enjoyment. Responsiveness also exhibits a weak influence on Perceived Enjoyment and Satisfaction. Subsequently, Satisfaction affects Purchase Intention weakly. These relationships have f^2 values of 0.02 to 0.15, indicating a weak effect size.

Table 3: Effect Size (f^2) Statistics

Construct	PI	PE	RE	SC	SP
Anthropomorphism		0.02	0.58		0.80
Perceived Enjoyment				0.25	
Social Presence	0.02	0.12		0.01	
Responsiveness	0.21	0.15		0.14	
User Satisfaction	0.11				

Notes: f^2 (weak): 0.02-0.15; f^2 (moderate): 0.15-0.35; f^2 (strong) ≥ 0.35

The results show the varying degrees of impact within the research model, providing valuable insights into the relationships and contributions to the objectives.

The result of Harman's single-factor test indicates that a single factor explains 40.2% of the total variance. The variance is not a serious concern since the value is below the 50% threshold used to detect substantial common method bias (Podsakoff et al., 2003). This implies that the measurement items capture distinct constructs rather than being

dominated by a single underlying factor.

Hypotheses Testing

This research tests eleven hypotheses, each supported when the T-value is greater than 1.645, and the p-value is less than 0.05. The detailed exposition of the hypothesis testing is as follows.

The first hypothesis reports that anthropomorphism has a positive influence on social presence. The relationship between the variables has a T-value of 34.709, significantly surpassing the standard value of 1.645 and supporting H1. This value indicates that anthropomorphism significantly influences the presence of chatbot in social interactions with users. Therefore, there is a direct relationship between human-like attributes of chatbot and the engagement with users. This result is consistent with previous research by Han (2021).

The second hypothesis suggests that anthropomorphism indirectly influences perceived enjoyment. The relationship between the variables obtains a T Value of 2.081, exceeding the standard value of 1.645 and supporting H2. Anthropomorphism affects the perceived enjoyment when accessing chatbot. Therefore, the greater the human resemblance of chatbot, the more users perceive interactions as communication with real individuals, enhancing the sense of enjoyment. This result is consistent with previous research by Han (2021).

The third hypothesis proposes that anthropomorphism has a positive influence on responsiveness. The relationship between obtains a T Value of 28.118, significantly above the standard value of 1.645, and supports H3. This result indicates that anthropomorphism, associated with human-like responsiveness, influences the perceived speed of response when users access chatbot. The closer the response speed is to humans, the more satisfying users perceive the interaction. This result is in line with the research conducted by Zhang et al. (2022).

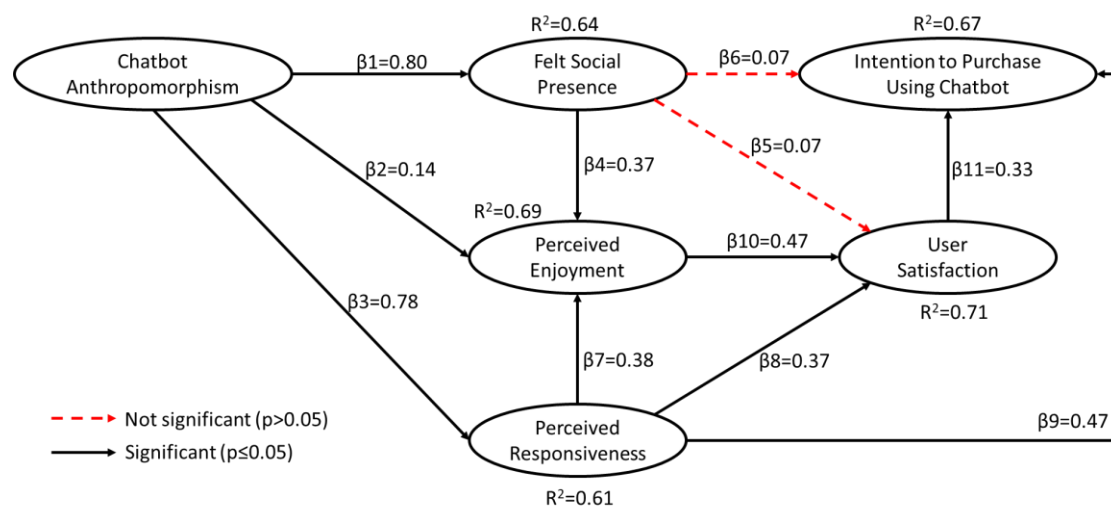
The fourth hypothesis suggests that social presence positively influences perceived enjoyment. The relationship obtains a T Value of 6.105, exceeding the value of 1.645 and supporting H4. In the context of social presence, chatbot provides a pleasurable interaction experience similar to communicating with real humans. This result is consistent with the previous research by Han (2021). The descriptive analysis shows a moderately high grand mean of 5.76 for Social Presence. Therefore, respondents believe the perceived social presence of chatbot influences the enjoyment experienced.

The fifth hypothesis proposes that social presence positively influences satisfaction with chatbot service. The relationship obtains a T Value of 1.171 below 1.645, not supporting H5. Social presence does not directly affect user satisfaction with chatbot service. This is consistent with the previous research by Tsai et al. (2021), where user behavior is not affected directly. Social presence does not have a positive impact on customer satisfaction. This can be improved by having concrete responses from chatbot to enhance customer satisfaction by reporting higher empathic accuracy compared to abstract responses. Even though chatbot may be perceived as less competent, the design can alleviate the negative impact on customer satisfaction resulting from the lack of empathic accuracy in abstract responses. This shows the importance of the response

style and design in chatbot interactions in line with Zhu et al. (2023).

The sixth hypothesis suggested that Social Presence positively influences Purchase Intention from Chatbot. The relationship obtains a T Value of 1.064, below the standard of 1.645, and H6 is not supported. Social Presence does not influence user decisions to purchase products directly. Therefore, the variable requires a mediator to trigger users to purchase products. This result is consistent with Huang et al. (2022), who used video marketing to stimulate user perceptions of the products to be purchased. The use of informal language in chatbot increases purchase intention among existing customers by promoting a warm, familiar interaction. Directing chatbot language to match each customer's relationship with the brand creates trust and increases the likelihood of purchases across different groups (Li and Wang, 2023).

Figure 1: Final research model



The seventh hypothesis proposes that Responsiveness has a positive influence on Perceived Enjoyment. The relationship obtains a T Value of 6.662, above the standard value of 1.645, supporting H7. This result suggests that the perceived responsiveness when using chatbot can provide enjoyment due to smooth running of two-way communication. The conclusion is consistent with Chen et al.'s (2021) research. Comparatively, the descriptive analysis shows a high grand mean of 6.02 for responsiveness since fast responses provided by chatbot strongly influence the enjoyment experienced.

The eighth hypothesis suggests that Responsiveness positively influences Satisfaction with Chatbot Service. The relationship obtains a T Value of 3.872, above the standard value of 1.645, supporting H8. Chatbot with fast and accurate responses increase user satisfaction. This result is consistent with previous research by Jiang et al. (2022).

The ninth hypothesis proposes that Responsiveness positively influences Purchase Intention from Chatbot. The relationship obtains a T Value of 4.080, above the standard value of 1.645, supporting H9. Chatbot with fast and accurate responses increases the desire to purchase products. This result is also consistent with research by Sharma et al.

(2022).

The tenth hypothesis suggests that Perceived Enjoyment positively influences Satisfaction with Chatbot Service. The relationship obtains a T-value of 7.330, above 1.645, supporting H10. This result suggests that Perceived Enjoyment positively impacts user satisfaction with chatbot service, as reported by Akdim et al. (2022). Comparatively, the descriptive analysis shows a moderately high grand mean of 5.87 for Perceived Enjoyment.

Table 4: Hypotheses test results

Hypotheses	Sample Mean (M)	Standard Deviation (STDEV)	T Values	P Values	Conclusion
H01	0.80	0.02	34.71	0.00	Supported
H02	0.14	0.07	2.08	0.02	Supported
H03	0.78	0.03	28.12	0.00	Supported
H04	0.37	0.06	6.11	0.00	Supported
H05	0.07	0.06	1.17	0.12	Rejected
H06	0.07	0.06	1.06	0.14	Rejected
H07	0.38	0.06	6.66	0.00	Supported
H08	0.37	0.09	3.87	0.00	Supported
H09	0.47	0.12	4.08	0.00	Supported
H10	0.47	0.06	7.33	0.00	Supported
H11	0.33	0.13	2.49	0.01	Supported

The eleventh hypothesis shows that Satisfaction with Chatbot Service positively influences Purchase Intention. The relationship obtains a T-value of 2.490, above 1.645, supporting H11. This result suggests that User Satisfaction with Chatbot Service positively impacts the desire to purchase products, as reported by Huong et al. (2023). Comparatively, the descriptive analysis reports a high grand mean of 6.20 for Satisfaction with Chatbot Service. The increase in chatbot user satisfaction can improve the desire to purchase products. Figure 1 and Table 4 summarize the eleven hypotheses tested in this research.

Discussion

Key Results

This research delves into the dynamics of user interactions with chatbot, uncovering several key results on the intricacies of digital interactions. Firstly, the significance of imbuing chatbot with anthropomorphic qualities, such as human-like attributes, was reported in enhancing user engagement and social presence during interactions. The results show that chatbot perceived to possess human-like traits enhances stronger connections with users, leading to more engaging and meaningful social interactions. Anthropomorphism is crucial in bridging the gap between humans and chatbot, enabling more natural and satisfying communication experiences. Moreover, the impact

of anthropomorphism on user perceptions of chatbot. The results report the importance of designing chatbot with anthropomorphic features to cultivate positive user experiences and deeper engagement in digital interactions.

Secondly, this research identifies the indirect effects of anthropomorphism on user enjoyment since chatbot with human-like attributes fulfil functional roles and evoke enjoyment in interactions. The results show that anthropomorphism significantly contributes to user-perceived enjoyment. This is because chatbot endowed with human-like attributes evoke more pleasurable communication experiences. The data reports that users derive more pleasure from interactions with chatbot possessing human-like qualities to emphasize the role of anthropomorphism in enhancing the enjoyment of digital communication. Designers can create natural and engaging experiences by embedding relatable characteristics, such as humor, empathy, and a conversational tone, into chatbot interactions.

Responsiveness is developed as another crucial factor influencing user perceptions of chatbot. Chatbot is perceived to respond promptly and contribute to smoother, uninterrupted interactions essential in maintaining user satisfaction and engagement. Responsiveness promotes a sense of reliability since queries are addressed in real time to improve the perceived quality of the interaction. Specifically, chatbot responsiveness, characterized by prompt and accurate responses, significantly influences user-perceived speed of response and overall satisfaction. This rapid response facilitates the practical aspects of the conversation and nurtures a positive emotional experience since users feel acknowledged and valued. Therefore, responsiveness plays a dual role of satisfying the functional need for quick information and contributing to the psychological desire for acknowledgement.

Lastly, this research explores the relationship between user satisfaction with chatbot service and purchase intention. The results show a positive correlation between these variables, suggesting that satisfied users are expected to consider purchasing products from chatbot. The correlation positions chatbot as effective agent for driving consumer transactions, specifically when satisfaction is prioritized in the design. Satisfied users are more open to following purchase recommendations from chatbot, showing the importance of building a reliable, enjoyable experience. By leveraging user satisfaction, chatbot serves as highly effective channels for promoting conversions, extending beyond customer service roles to become integral components of the sales funnel. Moreover, this research suggests the importance of user satisfaction as a key determinant of behavioral intention in digital environments, emphasizing the need for chatbot developers and marketers to prioritize satisfaction. A comprehensive understanding of the factors driving user engagement and behavioral outcomes is also provided in chatbot interactions. Anthropomorphism, responsiveness, enjoyment, and satisfaction are reported as key elements required to shape the success of chatbot in digital environments. The insights show the need for a holistic approach to chatbot design that considers the emotional and functional aspects of user interaction. This creates a foundation for meaningful engagement and measurable outcomes such as purchase intention and brand loyalty.

Theoretical Implications

This research advances the theoretical understanding of user-chatbot interactions,

concerning anthropomorphic design, responsiveness, and the combined effects on user satisfaction and behavioral outcomes. Firstly, the positive and significant relationship between anthropomorphism and social presence reports the importance of imbuing chatbot with human-like characteristics to enhance user engagement and social interactions. Han (2021) is consistent with the theoretical framework of Social Presence Theory, where users experience a deeper and engaging connection with interfaces required to emulate human characteristics. The data shows that anthropomorphism influences user perceptions of responsiveness, stating the impact of human-like traits in shaping expectations and experiences. Anthropomorphic elements, such as friendly language, personalized responses, and lifelike visual cues, promote the perception that chatbot is a relatable entity rather than an impersonal tool. These perceptions enhance social presence, leading to more engaging, interactive experiences to mimic human social interactions. According to Zhang et al. (2022), the greater the human-like responsiveness of chatbot, the more users perceive their responses as satisfying. This relationship suggests that human-like traits amplify user expectations of responsive behavior and increase satisfaction when expectations are met. The result is consistent with Computational Empathy Theory, where human-like interfaces capable of interpreting and responding to user cues promote stronger interactions. These insights show the important role of anthropomorphism in shaping user experiences and perceptions of chatbot interactions, emphasizing the importance of designing technology with human-like qualities to enhance engagement and satisfaction. Secondly, the results suggest the differential impact of anthropomorphism and responsiveness on perceived enjoyment and social presence in chatbot. The data indicate that anthropomorphism exerts a stronger influence on social presence than Responsiveness. Meanwhile, responsiveness significantly contributes to perceived enjoyment through accurate, prompt feedback. Anthropomorphism exerts a stronger influence on social presence since emotional and relational aspects are critical in shaping positive user experiences with chatbot. This distinction is consistent with Self-determination Theory in human-computer interaction, where enjoyable, fulfilling interactions are often driven by relational and hedonic elements. Users derive greater satisfaction and enjoyment from social interactions with chatbot that exhibits human-like traits, showing the significance of incorporating anthropomorphic features in chatbot design. Additionally, perceived enjoyment fully mediates the relationship between social presence and purchase intention, indicating that satisfying social interactions with chatbot can effectively stimulate purchasing behavior. Users are more inclined to engage in purchase-related behaviors, underscoring a key behavioral pathway from social interaction to transactional engagement. Chatbot can effectively drive consumer behavior and facilitate e-commerce transactions by fulfilling relational and experiential expectations through anthropomorphic design and responsiveness. This result contributes to the Theories of Digital Consumer Behavior by empirically supporting the importance of user satisfaction as a determinant of purchase intention. The significant relationship between chatbot responsiveness and perceived enjoyment emphasizes the importance of prompt and accurate responses in enhancing positive user experiences, despite the indirect effects on satisfaction and purchase intention. The results contribute to the understanding of the underlying mechanisms driving user behaviors in chatbot interactions, reporting the importance of hedonic values and user satisfaction in shaping perceptions and behaviors. Generally, the multifaceted nature of user interactions with chatbot and the critical role of anthropomorphism, responsiveness, and perceived enjoyment in shaping experiences and behaviors. The results provide valuable insights for chatbot developers and marketers to enhance

engagement and satisfaction and drive desired outcomes by reporting the complex relationships between the variables. These insights present actionable implications for HCI designers, chatbot developers, and digital marketers in optimizing chatbot effectiveness for engagement and purchase outcomes. Furthermore, the results have broader implications for human-computer interaction and user experience design by showing the importance of integrating human-like features and responsive capabilities to facilitate satisfying, effective digital interactions. This contributes to the knowledge advocating for the inclusion of hedonic values and relational dynamics in interface design, enhancing the effectiveness of digital communication across varied sectors, including e-commerce, customer service, and healthcare. The theoretical implications extend beyond chatbot design and marketing to broader discussions on human-computer interaction and integrating human-like features in digital interfaces. This implication suggests the importance of considering hedonic values and user satisfaction in designing and implementing chatbot as effective communication and transactional channels in various domains.

Limitations and Future Research

Several limitations should be acknowledged to interpret the results accurately and guide future investigations, even though the research provides valuable insights into the impact of anthropomorphism on chatbot user experiences. Firstly, the sample consisted of subscribers from the largest telecommunication companies, recruited through Facebook Ads with matching profiles. The dominance of female respondents may also influence the generalizability of the results. However, efforts were made to ensure typical chatbot users are represented. Focusing solely on users of a telecom operator limits the generalizability of the results to other operators, and future research should consider a more diverse sample to account for potential variations in user experiences across different platforms. Secondly, this research primarily focused on the utilitarian value of enjoyment, neglecting other factors such as ease of use and perceived usefulness of chatbot. Future research should incorporate a broader range of cognitive factors to assess chatbot anthropomorphism impact, concerning perceived usefulness in various daily usage contexts. Additionally, exploring other values inherent in chatbot, such as security and strength factors, can provide insights into the role in shaping user perceptions and behaviors.

The results are based on telecommunication companies providing services, limiting the generalizability to other industries and product categories. Future research should explore the satisfaction of chatbot in communicating product details and handling complaints across diverse types and industries to gain a more comprehensive understanding of the effectiveness in different contexts. Similarly, comparative research across different markets and product offerings can elucidate the influence of market differences on consumer responses to chatbot, providing valuable insights for companies operating in various environments.

Lastly, future research should delve into first impressions when using chatbot as a channel for product purchases or obtaining detailed information. Understanding the initial user experience can provide valuable insights into the factors influencing adoption and engagement with chatbot platforms, informing strategies for improving interactions and overall satisfaction. Even though this research contributes valuable insights into the role of anthropomorphism in chatbot user experiences, addressing the

limitations enhances the robustness and applicability of future research.

Practical Implications for Asian Business

In the current evolving digital landscape, Asian companies are increasingly recognizing the important role of chatbot in enhancing customer experiences and driving engagement. This research shows several practical implications for companies aiming to optimize chatbot communication channels and elevate customer satisfaction. A crucial implication lies in the incorporation of Anthropomorphic elements into chatbot to enhance user engagement and satisfaction. Anthropomorphism includes attributing human-like characteristics to non-human entities, such as chatbot. Companies promote deeper connections with users by infusing chatbot with natural language processing and empathetic responses, enabling sustained engagement with chatbot services. In Asian cultures, where interpersonal relationships and human connections hold significant value, the integration of anthropomorphic elements into chatbot is effective in resonating with users. In Japan and South Korea, with a strong emphasis on social harmony and interpersonal communication, chatbot that exhibits empathy and understanding can help companies build trust and rapport with customers.

Asian companies leverage cultural nuances and preferences to direct the anthropomorphic characteristics of chatbot in line with local audiences. For example, in China and India, where hierarchical relationships and respect for authority are important cultural values, chatbot that exudes professionalism and respectfulness in the interactions with users may be more well-received. Another practical implication is the importance of prioritizing responsiveness and perceived enjoyment in driving user satisfaction and purchase intention. Responsiveness refers to the ability of chatbot to promptly and accurately address inquiries and needs, while perceived enjoyment relates to the degree to which users find interacting with chatbot enjoyable and rewarding.

In Asian markets, where consumers place a high value on efficiency and convenience, chatbot provides timely assistance for maintaining customer satisfaction. Asian companies should prioritize enhancing the responsiveness of chatbot by improving response speed and accuracy, as well as implementing features such as automated systems and real-time support options. The provision of users with enjoyable and engaging chatbot interactions creates positive associations with brands and improves customer loyalty. This can be achieved through various methods, such as incorporating gamification elements into chatbot interactions, offering personalized recommendations based on preferences, and providing entertaining content that adds value to the user experience.

This research reports on the importance of optimizing textual communication in chatbot to mimic human-like interactions effectively. In Asian cultures, where nuances of language and communication styles play a significant role in interpersonal interactions, companies must ensure that chatbot is capable of communicating in line with local users. For example, polite language and respectful tone are used to help companies adhere to cultural norms and expectations in Japan and South Korea, where indirect communication styles are prevalent. Chatbot capable of understanding and responding to different dialects and languages caters to a broader audience in China and India, where linguistic diversity is a key consideration. Textual communication is optimized

to create more engaging and immersive experiences for customers by implementing strategies using written intonations, providing auto-response waiting texts to simulate human-like pauses in conversation, and incorporating localized expressions and idioms. Even though this investigation was conducted in Indonesia, further research is needed to validate the results in other similar countries, emphasizing the importance of cross-cultural analyses in understanding and implementing effective chatbot communication strategies.

References

- Adamopoulou, E. and Moussiades, L., (2020), "Chatbots: history, technology, and applications", *Machine Learning with Applications*, vol. 2, pp. 100006.
- Aflaki, S. and Popescu, I., (2014), "Managing retention in service relationships", *Management Science*, vol. 60, no. 2, pp. 415-433.
- Agarwal, R., Mehrotra, A. and Misra, D., (2022), "Customer happiness as a function of perceived loyalty program benefits, a quantile regression approach", *Journal of Retailing and Consumer Services*, vol. 64, pp. 102770.
- Akdim, K., Casaló, L.V. and Flavián, C., (2022), "The role of utilitarian and hedonic aspects in the continuance intention to use social mobile apps", *Journal of Retailing and Consumer Services*, vol. 66, pp. 102888.
- Anderson, R.E. and Srinivasan, S.S., (2003), "E-satisfaction and e-loyalty: a contingency framework", *Psychology & Marketing*, vol. 20, no. 2, pp. 123-138.
- Araujo, T., (2018), "Living up to the chatbot hype: the influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions", *Computers in Human Behavior*, vol. 85, pp. 183-189.
- Ashfaq, M., Yun, J., Yu, S. and Loureiro, S., (2020), "I, Chatbot: modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents", *Telematics and Informatics*, vol. 54, pp. 101473.
- Baabdullah, A.M., Alalwan, A.A., Algharabat, R.S., Metri, B. and Rana, N.P., (2022), "Virtual agents and flow experience: an empirical examination of AI-powered chatbots", *Technological Forecasting and Social Change*, vol. 181.
- Botha, E. and Reyneke, M., (2016), "The influence of social presence on online purchase intention: an experiment with different product types", in *Looking Forward, Looking Back: Drawing on the Past to Shape the Future of Marketing: Proceedings of the 2013 World Marketing Congress*, Springer International Publishing, pp. 180-183.
- Broeck, E., Zarouali, B. and Poels, K., (2019), "Chatbot advertising effectiveness: when does the message get through?", *Computers in Human Behavior*, vol. 98, pp. 150-157.
- Chen, J.S., Le, T.T.Y. and Florence, D., (2021), "Usability and responsiveness of artificial intelligence chatbot on online customer experience in e-retailing", *International Journal of Retail and Distribution Management*, vol. 49, no. 11, pp. 1512-1531.
- Chen, Q.Q. and Park, H.J., (2021), "How anthropomorphism affects trust in intelligent personal assistants", *Industrial Management and Data Systems*, vol. 121, no. 12, pp. 2722-2737.
- Cheung, M.L., Ting, H., Cheah, J. and Sharipudin, M.-N.S., (2020), "Examining the role of social media-based destination brand community in evoking tourists' emotions and intention to co-create and visit", *Journal of Product & Brand*

Management.

- Chung, M., Ko, E., Joung, H. and Kim, S.J., (2020), "Chatbot e-service and customer satisfaction regarding luxury brands", *Journal of Business Research*, vol. 117, pp. 587-595.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R., (1992), "Extrinsic and intrinsic motivation to use computers in the workplace", *Journal of Applied Social Psychology*, vol. 22, no. 14, pp. 1111-1132.
- El-Said, O. and Al Hajri, S., (2022), "Are customers happy with robot service? Investigating satisfaction with robot service restaurants during the COVID-19 pandemic", *Heliyon*, vol. 8, no. 3.
- Elprama, S., El Makrini, I., Vanderborght, B. and Jacobs, A., (2016), "Acceptance of collaborative robots by factory workers: a pilot study on the role of social cues of anthropomorphic robots", in *IEEE RO-MAN 2016: IEEE International Symposium on Robot and Human Interactive Communication*, pp. 919-919.
- Epley, N., Waytz, A. and Cacioppo, J.T., (2007), "On seeing human: a three-factor theory of anthropomorphism", *Psychological Review*, vol. 114, no. 4, pp. 864-886.
- Etemad-Sajadi, R. and Ghachem, L., (2015), "The impact of hedonic and utilitarian value of online avatars on e-service quality", *Computers in Human Behavior*, vol. 52, pp. 81-86.
- Feine, J., Morana, S. and Gnewuch, U., (2019), "Measuring service encounter satisfaction with customer service chatbots using sentiment analysis".
- Fu, J., Mouakket, S. and Sun, Y., (2023), "The role of chatbots' human-like characteristics in online shopping", *Electronic Commerce Research and Applications*, vol. 61.
- Go, E. and Sundar, S.S., (2019), "Humanizing chatbots: the effects of visual, identity, and conversational cues on humanness perceptions", *Computers in Human Behavior*, vol. 97, pp. 304-316.
- Gong, T. and Yi, Y., (2018), "The effect of service quality on customer satisfaction, loyalty, and happiness in five Asian countries", *Psychology & Marketing*, vol. 35, no. 6, pp. 427-442.
- Hair, J.F. Jr., Black, W.C., Babin, B.J. and Anderson, R.E., (2010), *Multivariate data analysis*, Pearson, Nueva Jersey.
- Hair, J.F., Black, W.C., Babin, B.J. and Anderson, R.E., (2019), *Multivariate data analysis*, 8th ed., Cengage Learning.
- Han, M.C., (2021), "The impact of anthropomorphism on consumers' purchase decision in chatbot commerce", *Journal of Internet Commerce*, vol. 20, no. 1, pp. 46-65.
- Hinson, R.E., Osabutey, E.L.C. and Kosiba, J.P., (2020), "Exploring the dialogic communication potential of selected African destinations' place websites", *Journal of Business Research*, vol. 116, pp. 690-698.
- Hosany, S., Prayag, G., Deesilatham, S., Caušević, S. and Odeh, K., (2015), "Measuring tourists' emotional experiences", *Journal of Travel Research*, vol. 54, no. 4, pp. 482-495.
- Hsieh, S.H. and Lee, C.T., (2021), "Hey Alexa: examining the effect of perceived socialness in usage intentions of AI assistant-enabled smart speaker", *Journal of Research in Interactive Marketing*, vol. 15, no. 2, pp. 267-294.
- Huang, Z., Zhu, Y., Hao, A. and Deng, J., (2022), "How social presence influences consumer purchase intention in live video commerce: the mediating role of immersive experience and the moderating role of positive emotions", *Journal*

- of *Research in Interactive Marketing*, pp. 1-17.
- Huong, Q., Kim, T.Y. and Wang, X., (2023), "Effects of logistics service quality and price fairness on customer repurchase intention: the moderating role of cross-border e-commerce experiences", *Journal of Retailing and Consumer Services*, vol. 70.
- Hwang, J., Kim, H. and Kim, W., (2019), "Investigating motivated consumer innovativeness in the context of drone food delivery services", *Journal of Hospitality and Tourism Management*, vol. 38, pp. 102-110.
- Hwang, J., Park, S. and Kim, I., (2020), "Understanding motivated consumer innovativeness in the context of a robotic restaurant: the moderating role of product knowledge", *Journal of Hospitality and Tourism Management*, vol. 44, pp. 272-282.
- Intelligence, I., (2016), "Twitter has introduced a chatbot to direct messages", *Insider*, available at: <https://www.businessinsider.com/twitter-has-introduced-a-chatbot-to-direct-messages-2016-11> (accessed 21 March 2026).
- Jiang, H., Cheng, Y., Yang, J. and Gao, S., (2022), "AI-powered chatbot communication with customers: dialogic interactions, satisfaction, engagement, and customer behaviour", *Computers in Human Behavior*, vol. 134.
- Kim, S. and McGill, A.L., (2011), "Gaming with Mr. Slot or gaming the slot machine? Power, anthropomorphism, and risk perception", *Journal of Consumer Research*, vol. 38, no. 1, pp. 94-107.
- Kim, S.Y., Schmitt, B.H. and Thalmann, N.M., (2019), "Eliza in the uncanny valley: anthropomorphizing consumer robots increases their perceived warmth but decreases liking", *Marketing Letters*.
- Lee, C., Pan, L. and Hsieh, S., (2021), "Artificial intelligence chatbots as brand promoters: a two-stage structural equation modeling-artificial neural network approach", *Internet Research*, vol. 32, pp. 1329-1356.
- Li, L., Lee, K.Y., Emokpae, E. and Yang, S.-B., (2021), "What makes you continuously use chatbot services? Evidence from Chinese online travel agencies", *Electronic Markets*, vol. 31, no. 3, pp. 575-599.
- Li, M. and Hua, Y., (2022), "Integrating social presence with social learning to promote purchase intention: based on social cognitive theory", *Frontiers in Psychology*, vol. 12.
- Li, M. and Wang, R., (2023), "Chatbots in e-commerce: the effect of chatbot language style on customers' continuance usage intention and attitude toward brand", *Journal of Retailing and Consumer Services*, vol. 71.
- Lin, K.-Y. and Lu, H.-P., (2011), "Why people use social networking sites: an empirical study integrating network externalities and motivation theory", *Computers in Human Behavior*, vol. 27, no. 3, pp. 1152-1161.
- Matthews, M. and Mokoena, B.A., (2020), "The influence of service quality dimensions on customer satisfaction within visa facilitation centres in South Africa", *International Journal of EBusiness and eGovernment Studies*, vol. 12, no. 2, pp. 122-135.
- Men, L.R., Tsai, W.-H.S., Chen, Z.F. and Ji, Y.G., (2018), "Social presence and digital dialogic communication: engagement lessons from top social CEOs", *Journal of Public Relations Research*, vol. 30, no. 3, pp. 83-99.
- Mikalef, P., Giannakos, M. and Pateli, A., (2013), "Shopping and word-of-mouth intentions on social media", *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 8, no. 1, pp. 17-34.
- Nowak, K.L. and Rauh, C., (2008), "Choose your 'buddy icon' carefully: the influence

- of avatar androgyny, anthropomorphism, and credibility in online interactions”, *Computers in Human Behavior*, vol. 24, no. 4, pp. 1473-1493.
- Pantano, E. and Scarpi, D., (2022), “I, Robot, You, Consumer: measuring artificial intelligence types and their effect on consumers’ emotions in service”, *Journal of Service Research*, vol. 25, no. 4, pp. 583-600.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y. and Podsakoff, N.P., (2003), “Common method biases in behavioral research: a critical review of the literature and recommended remedies”, *Journal of Applied Psychology*, vol. 88, no. 5, pp. 879-903.
- Powers, A. and Kiesler, S., (2006), “The advisor robot”, in *Proceedings of the 1st ACM SIGCHI/SIGART Conference on Human-Robot Interaction*, pp. 218-225.
- Prentice, C., Han, X.Y., Hua, L.-L. and Hu, L., (2019), “The influence of identity-driven customer engagement on purchase intention”, *Journal of Retailing and Consumer Services*, vol. 47, pp. 339-347.
- Qin, Y.S., (2020), “Fostering brand-consumer interactions in social media: the role of social media uses and gratifications”, *Journal of Research in Interactive Marketing*, vol. 14, no. 3, pp. 337-354.
- Roy, S.K., Shekhar, V., Lassar, W.M. and Chen, T., (2018), “Customer engagement behaviors: the role of service convenience, fairness, and quality”, *Journal of Retailing and Consumer Services*, vol. 44, pp. 293-304.
- Roy, R. and Naidoo, V., (2021), “Enhancing chatbot effectiveness: the role of anthropomorphic conversational styles and time orientation”, *Journal of Business Research*, vol. 126, pp. 23-34.
- Saura, I.G. and Blasco, M., (2008), “Logistics service quality: a new way to loyalty”, *Industrial Management and Data Systems*, vol. 108, no. 5, pp. 650-668.
- Schillaci, C.E., de Cosmo, L.M., Piper, L., Nicotra, M. and Guido, G., (2024), “Anthropomorphic chatbots for future healthcare services: effects of personality, gender, and roles on source credibility, user satisfaction, and intention to use”, *Technological Forecasting and Social Change*, vol. 199.
- Sharma, D., Khoa, T.T., Dhir, S., Taggar, R. and Bindra, S., (2020), “Mapping responsive retailing to identify future research trajectories”, *Journal for Global Business Advancement*, vol. 13, no. 5, pp. 584.
- Sharma, D., Paul, J., Dhir, S. and Taggar, R., (2022), “Deciphering the impact of responsiveness on customer satisfaction, cross-buying behaviour, revisit intention, and referral behaviour”, *Asia Pacific Journal of Marketing and Logistics*, vol. 34, no. 10, pp. 2052-2072.
- Shen, H. and Wang, M., (2023), “Effects of social skills on lexical alignment in human-human interaction and human-computer interaction”, *Computers in Human Behavior*, vol. 143.
- Sirdeshmukh, D., Singh, J. and Sabol, B., (2002), “Consumer trust, value, and loyalty in relational exchanges”, *Journal of Marketing*, vol. 66, no. 1, pp. 15-37.
- Son, T., Yeo, S. and Lee, D., (2024), “Exploring elementary preservice teachers’ responsive teaching in mathematics through an artificial intelligence-based chatbot”, *Teaching and Teacher Education*, vol. 146.
- Thomas, R.W., Esper, T.L. and Stank, T.P., (2010), “Testing the negative effects of time pressure in retail supply chain relationships”, *Journal of Retailing*, vol. 86, no. 4, pp. 386-400.
- Tojib, D., Sujana, R., Ma, J. and Tsarenko, Y., (2023), “How does service robot anthropomorphism affect human co-workers?”, *Journal of Service Management*.
- Tsai, W.H.S., Liu, Y. and Chuan, C.H., (2021), “How chatbots’ social presence

- communication enhances consumer engagement: the mediating role of parasocial interaction and dialogue”, *Journal of Research in Interactive Marketing*, vol. 15, no. 3, pp. 460-482.
- Wagner, K., Nimmermann, F. and Schramm-Klein, H., (n.d.), “Is it human? The role of anthropomorphism as a driver for the successful acceptance of digital voice assistants”, available at: <https://hdl.handle.net/10125/59579> (accessed 21 March 2026).
- Wang, C.L., (2021), “New frontiers and future directions in interactive marketing: inaugural editorial”, *Journal of Research in Interactive Marketing*, vol. 15, no. 1, pp. 1-9.
- Warwick, K. and Shah, H., (2016), “The importance of a human viewpoint on computer natural language capabilities: a Turing test perspective”, *AI and Society*, vol. 31, no. 2, pp. 207-221.
- Waytz, A., Heafner, J. and Epley, N., (2014), “The mind in the machine: anthropomorphism increases trust in an autonomous vehicle”, *Journal of Experimental Social Psychology*, vol. 52, pp. 113-117.
- Wirtz, J., Patterson, P.G., Kunz, W.H., Gruber, T., Lu, V.N., Paluch, S. and Martins, A., (2018), “Brave new world: service robots in the frontline”, *Journal of Service Management*, vol. 29, no. 5, pp. 907-931.
- Yao, Q., Kuai, L. and Jiang, L., (2023), “Effects of the anthropomorphic image of intelligent customer service avatars on consumers’ willingness to interact after service failures”, *Journal of Research in Interactive Marketing*.
- Yun, J. and 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*, vol. 13.
- Zarouali, B., den Broeck, E., Walrave, M. and Poels, K., (2018), “Predicting consumer responses to a chatbot on Facebook”, *Cyberpsychology, Behavior, and Social Networking*, vol. 21, no. 8, pp. 491-497.
- Zhang, S., Lin, X., Li, X. and Ren, A., (2022), “Service robots’ anthropomorphism: dimensions, factors, and internal relationships”, *Electronic Markets*, vol. 32, no. 1, pp. 277-295.
- Zhu, Y., Zhang, J. and Liang, J., (2023), “Concrete or abstract: how chatbot response styles influence customer satisfaction”, *Electronic Commerce Research and Applications*, vol. 62.



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