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From Interaction to Satisfaction : The Role of AI-Powered Chatbots in Enhancing Customer Experience in E-Commerce Sector

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Abstract:

This study examines the impact of AI-powered chatbots on customer experience in the Algerian e-commerce sector. It explores how key chatbot dimensions—ease of use, real-time responsiveness, emotional intelligence, and customer trust—enhance customer satisfaction and engagement.

A quantitative approach was applied using a structured questionnaire distributed to 164 online shoppers (Respondents), and data were analyzed with SPSS v25. Findings indicate that all chatbot dimensions positively influence customer experience, with emotional intelligence and trust emerging as the strongest predictors. The study highlights the strategic role of AI chatbots in improving service quality and building long-term customer relationships. It also provides managerial implications and recommendations for future research on cross-sector and longitudinal applications.

Keywords: *AI-powered Chatbots; Customer Experience (CX); E-Commerce; Trust; Emotional Intelligence.*

Jel Classification Codes : *L81, M31, O33*

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1. INTRODUCTION:

In recent years, the global economy has witnessed a profound digital transformation, reshaping how businesses interact with their customers. Among the most influential developments in this transformation is the emergence of AI technologies, particularly AI-powered chatbots, which are increasingly being adopted in the e-commerce sector. These intelligent systems are designed to simulate human-like conversations, offering instant responses, personalized assistance, and round-the-clock support—characteristics that align with the evolving expectations of modern consumers.

As e-commerce platforms continue to expand and competition intensifies, companies are no longer focusing solely on offering competitive prices or diverse product assortments. Instead, they are placing growing emphasis on delivering superior CX as a strategic differentiator. In this context, AI-powered chatbots have emerged as a key tool in enhancing CX by enabling seamless, fast, and emotionally intelligent interactions between brands and customers.

Despite the growing implementation of chatbots technology in digital commerce, there remains a need to investigate how specific chatbot characteristic (such as ease of use, real time responsiveness, emotionally intelligence, and trustworthiness) contribute to enhancing the overall CX. Moreover, it is crucial to understand how these effects vary among different demographic segments of customers.

This study, therefore, aims to explore the role of AI- powered chatbots in enhancing the CX within the e-commerce sector. By examining the impact of specific chatbot dimensions on CX, the study seeks to offer insights that can guide digital marketers, platform designers, and business decision-makers in optimizing chatbot design and implementation.

1.2. Research Problem and Questions:

Amid the rapid advancements in AI technologies, AI- powered chatbots have emerged as one of the most transformative tools in the e-commerce sector, playing a pivotal role in enhancing CX by delivering intelligent, fast, and personalized interactions. With the increasing reliance of digital shoppers on e-commerce platforms, there is a growing need to gain deeper insights into how these technologies contribute to improving their experiences. From the above, the research problem can be presented in the following main question:

How does the use of AI-powered chatbots enhance customer experience in the e-commerce sector?

From the main question the following sub-questions emerge:

1- How does the ease of use of AI-powered chatbots enhance customer experience in the e-commerce sector?

2- How does the real-time response of AI-powered chatbots enhance customer experience in the e-commerce sector?

3- How does the emotional intelligence of AI-powered chatbots enhance customer experience in the e-commerce sector?

4- How does customer trust in AI-powered chatbots enhance customer experience in the e-commerce sector?

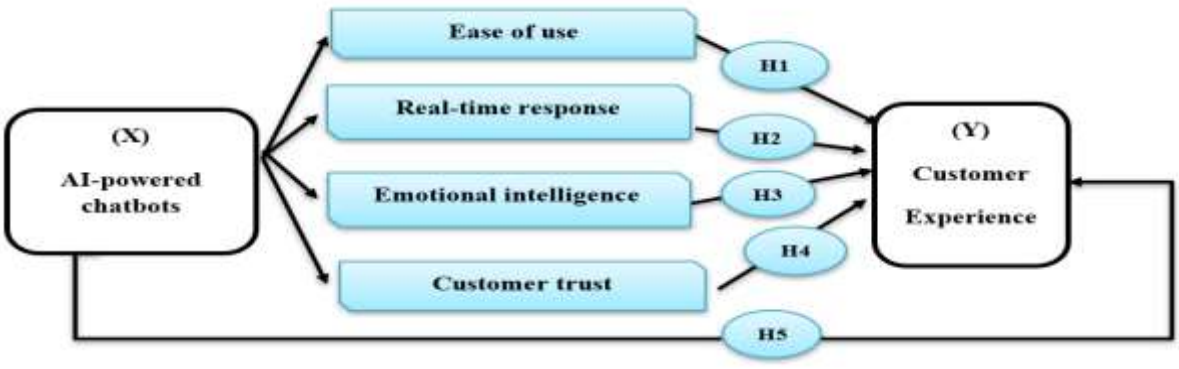
1.3. Research Hypotheses: To answer the research question these are the suggested hypotheses:

- There is a statistically significant relationship between the use of AI-powered chatbots and the enhancement of customer experience in the e-commerce sector.
- There is a statistically significant relationship between the Ease of use of AI-powered chatbots and the enhancement of customer experience in the e-commerce sector.
- There is a statistically significant relationship between the real-time response capability of AI-powered chatbots and the enhancement of customer experience in the e-commerce sector.
- There is a statistically significant relationship between the Emotional intelligence of AI-powered chatbots and the enhancement of customer experience in the e-commerce sector.
- There is a statistically significant relationship between customer trust in AI-powered chatbots and the enhancement of customer experience in the e-commerce sector.

1.4. Study Objectives

- To explore the key concepts and theoretical foundations related to the study variables, with a focus on understanding the fundamentals of AI-powered chatbots and customer experience (CX).
- To assess the impact of AI-powered chatbots on enhancing customer experience within the e-commerce sector.
- To determine the extent to which customers benefit from chatbot functionalities in addressing inquiries and resolving service-related issues.
- To investigate the underlying motivations and factors that encourage customers to engage with chatbots during their interactions on digital platforms.

Fig.1. The Conceptual Model



Source: Prepared By the Researcher

The conceptual model illustrates the hypothesized relationships between **AI-powered chatbots** (independent variable) and **customer experience** (dependent variable) in the e-commerce sector.

- The model identifies **four key dimensions** through which AI-powered chatbots influence customer experience:

1. **Ease of Use (H1):** Refers to how simple and intuitive the chatbot interface is for users. A higher level of ease of use is expected to enhance the overall customer experience.
2. **Real-time Response (H2):** Represents the chatbot's ability to provide immediate and accurate responses, which contributes to faster service and higher satisfaction.
3. **Emotional Intelligence (H3):** Captures the chatbot's capability to recognize user emotions and respond empathetically, thus improving emotional engagement.
4. **Customer Trust (H4):** Relates to the confidence users have in chatbot reliability, privacy, and information security — a critical determinant of positive experience.

- The fifth hypothesis (**H5**) examines whether the **overall use of AI-powered chatbots** significantly affects customer experience, considering the combined influence of all four dimensions.
- The **arrows** indicate the direction of influence, showing that each dimension of chatbot interaction contributes directly to improving the **customer experience (Y)**.

2. LITERATURE REVIEW:

2.1. Definition of Chatbots:

A chatbot is a computer program designed to simulate human conversation through text or voice interactions. When enhanced AI capabilities such as NLP, ML, and sentiment analysis (SA), chatbots can understand, Interpret, and respond to user inputs more intelligently and contextually (Radziwill & Benton, 2017).

Chatbot (or Chatterbot): It is described as a software (machine) that interacts with a user (human) by talking. Essentially, it serves as a virtual assistant capable of answering a variety of user questions and providing correct responses (Colace, Santo, Lombardi, Pascale, & Pietrosanto , 2018).

Chatbot is an AI tool and computer program powered by techniques such as NLP, ML, and SA. It is designed to simulate human conversation through text or voice interactions. A chatbot functions as a virtual assistant that understands user inputs, interprets them accurately, and generates contextually relevant and intelligent responses. Within e-commerce platforms, it is integrated to provide real-time support, respond to customer inquiries, deliver personalized product recommendations, and enhance the overall CX.

2.2. Some of the social characteristics of chatbots include:

2.2.1. Emotional Intelligence:

Emotional intelligence (EI) refers to skills like self-awareness, impulse control, empathy, and social competence. EI impacts success in both personal and professional life, as well as relationships and health. Empathic chatbots are particularly important in mental healthcare, where understanding users' emotional states is crucial (Devaram, 2020).

2.2.2. Thoroughness:

Chatbot thoroughness is a critical characteristic that enhances customer interaction and satisfaction. This quality encompasses the chatbot's ability to understand user inquiries deeply, provide comprehensive responses, and adapt various contexts.

Thoroughness refers to chatbot's ability to use language accurately, coherently, and in a style appropriate to the interaction context. It involves consistent grammar, vocabulary, and tone to make conversations feel natural, human-like, and believable (Chaves & Gerosa, 2021).

2.2.3. Personalization:

Recent studies highlight the significant of AI-powered chatbot personalization on enhancing CX across various industries. Personalization has been shown to positively influence customer satisfaction, intention to use, and overall experience (Park, Kim, Jiang, & Kim, 2024). In retail, hospitality, and finance sectors, AI-driven personalization can improve virtual shopping assistance, booking experiences, and financial advice (Bhuiyan, 2024).

2.3.4. Identity:

Chatbots are being used more often to represent organizations online and offer emotional support. They build trust with users by communicating in a personalized manner and by utilizing both individual and group identities to foster empathy. Studies of government chatbots indicate that factors such as emotional intelligence, proactivity, and conscientiousness are associated with citizen preferences, whereas identity consistency tends to have a negative association. The interaction between humans and chatbots leads to the emergence of new social identities, which drive the interaction and determine social presence (Angeli , 2005).

2.2.5. Conversational intelligence:

Conversational intelligence refers to a chatbot's ability to actively engage in dialogue by demonstrating awareness of the conversation's topic, context, and flow. It goes beyond merely achieving a technical conversational goal, encompassing social characteristics such as proactivity, conscientiousness, and communicability to create more natural, meaningful, and contextual aware interactions (Chaves & Gerosa, 2020).

2.3.6. Conscientiousness:

Conscientiousness is consistently identified as an important trait influencing chatbot interactions (Block, 2024) (Hume, Cernuzzi, Zarza, Bison, & Gática-Pérez, 2022). Government chatbots benefit from EI, proactivity, and conscientiousness, while identify consistency

negatively affects user preferences (Ju, Meng, Sun, Liu, & Singh, 2023). The chatbot charactristic "conscientiousness" is reflected in its ability to provide quick and accurate responses, offer useful assistance, handle sensitive information responsibly, and facilitate a smooth checkout experience, all of which contribute to a positive CX (Gesty Ernestivita, 2024).

2.1.7. Ease of use:

The Ease of use of chatbots is characterized by their responsiveness and accuracy in providing quick answers and useful assistance in site navigating. Respondents found them easy to interact with, emphasizing the importance of an intuitive and responsive user interface. Chatbots facilitate a smooth checkout experience, reducing cart abandonment, indicating they are designed to be user-friendly (Ernestivita, Subagyo, & Laras, 2024).

2.1.8. Real-time response:

Chatbots provide real-time responses by describing them as computer programs that can take user input in natural language (NL) and return text or rich media (Ladour, 2024). Chatbots use NLP algorithms to conduct conversations with users through audio or text, providing real-time responses to user queries and feedback. They are classified as cognitive activities for repetitive tasks, indicating their ability to handle routine inquiries efficiently in real-time (Hoye, Kroschke, Schmitt, Kraume, & Shankar, 2020). The real-time response of chatbots is characterized by quick and accurate responses to customer questions, providing real-time assistance during the shopping process, and facilitating a smooth checkout experience (Ernestivita, Subagyo, & Laras, 2024).

2.2.9. Customer Trust in chatbots:

Chatbots are increasingly used for customer service, and user trust is crucial for their adoption. Factors influencing trust in chatbots include perceived expertise, responsiveness, human-likeness, and professional appearance (Følstad, Nordheim, & Alexander, 2018). Environmental factors such as brand perception and risk, as well as user-related factors like propensity to trust technology, also play a role (Nordheim, Følstad, & Bjørkli, 2019). Chatbots can enhance CX through real-time interactions in e-commerce. Brain imaging studies have shown that the dorsolateral prefrontal cortex and superior temporal gyrus associated building trust in chatbots (Yen & Chiang, 2021).

2.3. Customer experience:

CX serves as a key indicator of the impact and effectiveness of chatbot interactions within digital service environments. Given its multidimensional nature and its pivotal role in enhancing customer satisfaction and loyalty, as well as its contribution to long-term business success, it is essential to shed light on this concept in terms of its theoretical definitions and core dimensions. Accordingly, this section examines the conceptual aspects of CX, with an emphasis on its strategic importance, particularly in digital marketing environments.

2.3.1. An overview and definition of customer experience:

CX is a key marketing concept that covers how customers react to all company

interactions, both direct and indirect. It includes all parts of the company's offerings and is shaped by customers' expectations from prior experiences. It includes both direct contacts, such as purchases and service interactions, and indirect contacts, like advertising and word-of-mouth, which shape CX (Das & Hota, 2014). Managing CX requires a cross-functional approach, involving monitoring past, present, and potential patterns through various data collection methods.

The CX concept is dynamic, varying according to the company's offerings, the evolving environment, and changes in consumer behavior. It is also multidimensional, involving cognitive, emotional, behavioral, sensory, and social responses throughout the customer's journey (Barbu, Florea, Dabija, & Răzvan Barbu, 2021).

Core Dimensions of CX: The elements that constitute CX include interactions, practices, and the entire consumption process. (Becker & Jaakkola, 2020)

Key elements influencing positive CX include discounts, product quality, user interface, and customer support (Felix & Rembulan, 2023).

CX refers to the sum of interactions and emotions formed by a customer with a company or brand, whether these interactions are direct (such as purchasing, speaking with customer service, or using the product) or indirect (such as advertising, reputation, or word-of-mouth recommendations). This experience is dynamic and multi-dimensional, encompassing the customer's cognitive, emotional, behavioral, sensory, and social aspects. It is influenced by prior expectations and is evaluated through all touchpoints the customer encounters throughout their journey with the company.

2.3.2. The Importance of Customer Experience:

CX is important as it increases sales by creating a positive image and influencing customer evaluations and purchasing decisions. It also enhances customer loyalty, retention, and recommendation (Wereda & Grzybowska, 2016). The importance of CX lies in its ability to drive business growth through increased transactions and promotion by happy customers, while unhappy customers can harm the business. Understanding current customer feelings is crucial for future business success. CX management is essential for improving interactions from the customer's point of view (Kavitha & Haritha, 2019).

2.4. Review of Previous Studies Related to the Research Variables :

To establish the conceptual and empirical foundations of this research, a review of previous studies related to chatbot use and customer experience (CX) was conducted. Table 1 summarizes the main contributions of selected works that have addressed the integration of chatbots and CX across various contexts. These studies differ in purpose, methodology, and scope, yet collectively provide a comprehensive understanding of how chatbot technology influences interaction quality and customer engagement.

Table 1. Summary of Previous Studies Related to the Research Variables

Author(s), Year	Purpose of the Study	Type of Study / Context	Population & Sample	Methods / Tools	Key Findings	Relevance to Current Study
Colace et al., 2018	Develop and evaluate an e-learning chatbot prototype that identifies student needs and replies via domain ontologies.	Experimental (education, University of Salerno).	Students in two courses; sample ≈187 respondents for evaluation.	Prototype implementation; experimental evaluation; questionnaires.	Chatbot prototype produced satisfactory results; potential to improve interactive learning and engagement.	Demonstrates practical benefits of domain-specific chatbots and evaluation approaches—useful for design and evaluation methods in e-commerce chatbots.
Becker, 2020	Develop integrative premises to reconcile CX literature and guide future research.	Systematic review & metatheoretical analysis (CX literature).	Academic articles on CX; sample = 136 articles.	Qualitative/content/meta-theoretical analysis.	CX is subjective, context-specific; stimuli come both inside/outside firm touchpoints; proposed operational distinctions (cognitive, affective, physical, sensorial, social).	Provides theoretical foundations for operationalizing CX dimensions and measuring outcomes.
De Keyser, 2020	Introduce TCQ (Touchpoints, Context, Qualities) nomenclature to systematize CX components.	Conceptual/review (CX literature).	143 CX/CXM papers analyzed.	Inductive/meta-data analysis; qualitative content synthesis.	TCQ reduces conceptual ambiguity; makes CX actionable for audits and design; identifies research gaps.	Supports using clear framework to map chatbot touchpoints and contextual influences on CX.
Chaves, 2020	Survey social characteristics that improve human–chatbot interaction; propose a conceptual model for chatbot social design.	Systematic literature review + survey (multiple domains).	Studies on text-based chatbots; sample = 56 studies.	Grounded theory inspired qualitative coding and conceptual modeling.	Identified 11 social characteristics (conversational & social intelligence, personification); emotional intelligence and proactivity improve satisfaction.	Directly informs emotional-intelligence and personification design choices for chatbots in e-commerce.
Nagarhalli, Vaze &	Review current trends in chatbot system	Review (AI/NLP/chatbot research).	Recent conference/journal	Qualitative content analysis; comparative	Chatbots adopted across sectors; gaps in NLP/ML	Highlights technological gaps

Rana, 2020	development and research practices.		papers (15–20 papers sampled).	tables.	detailing and handling unstructured data; need for advanced algorithms.	(NLP, ML) relevant to improving response accuracy and personalization.
Sidaoui & Burton, 2020	Propose and validate a CE Feeling Model (CEFM) using chatbots + sentiment analysis to extract customer feelings.	Empirical/experimental (crowdsourced participants).	200 recruited (193 final).	CFA, MCAR test, multiple imputation, VADER sentiment analysis, confusion matrix, paired t-test.	High accuracy in extracting emotions via chatbot interviews (VADER); strong match with traditional measures; chatbots viable for CE data collection.	Demonstrates methods for measuring affective CX via chatbot interactions — useful for assessing emotional-intelligence effects.
Skjuve, 2021	Explore development and effects of human–chatbot relationships (HCRs), using Replika as a case.	Qualitative (human–chatbot relationships).	Replika users; 18 participants from 12 countries.	Semi-structured interviews; thematic analysis (NVivo).	HCRs progress through stages (superficial → deep); trust and non-judgmental nature foster disclosure; mixed social impacts.	Offers insights on trust, self-disclosure, and long-term relational effects—informative for emotional & trust dimensions.
Antonius Felix, 2023	Identify factors driving CX, engagement, and loyalty in Indonesian e-commerce and provide managerial recommendations.	Qualitative interpretive (case studies of major platforms).	Five largest Indonesian platforms; 11 premium-member respondents.	Interviews and explanatory case analysis.	CX drivers: promotions, product quality, ease of transactions, responsive support; engagement and loyalty driven by personalization and loyalty programs.	Contextual evidence on platform features and customer needs—useful for recommending chatbot functionalities (personalization, support).

Source: Prepared by the researcher based on previous studies

3. RESEARCH METHODOLOGY:

3.1. Sampling:

The study employed a random sampling technique targeting individuals with prior experience using AI-powered chatbots on e-commerce platforms in Algeria. A total of 164 valid responses were collected, which was considered sufficient for the exploratory nature of the research. The sample included individuals with varying ages, educational levels, and technical backgrounds, which allowed for the observation of a wide range of perceptions and behaviors. This diversity contributed to achieving the study's objectives and reaching more comprehensive and accurate results

3.2. Research Instrument:

Data were collected through a structured questionnaire designed to measure the impact of chatbot dimensions—ease of use, real-time responsiveness, emotional intelligence, and customer trust—on customer experience. The questionnaire consisted of closed-ended items using a five-point Likert scale, ranging from "strongly disagree" to "strongly agree.

3.3. Data Analysis:

The collected data were analyzed using both descriptive and inferential statistics. Descriptive statistics summarized respondent profiles and overall trends, while Pearson correlation and one-way ANOVA were applied to examine the proposed hypotheses.

3.4. Validity and Reliability:

To ensure validity, the questionnaire items were adapted from established literature and reviewed by academic experts in marketing and e-commerce. Reliability was assessed through Cronbach's alpha, with all constructs exceeding the recommended threshold of 0.70, indicating high internal consistency.

Table 2. Reliability Coefficients (Cronbach's Alpha) for the Study Variables

Stages	Number of Items	Cronbach's Alpha
Ease of Use of Chatbots	6	0.776
Real-time Responsiveness	5	0.701
Emotional Intelligence	6	0.779
Customer Trust in Chatbots	6	0.808
Customer Experience	6	0.793
Total	**29**	**0.913**

Source: Prepared by the researcher.

4. Results:

This section presents the main findings of the study based on the data collected and analyzed using SPSS V.25. The results are organized into subsections covering the demographic characteristics of respondents and the statistical analysis of the research variables. These findings aim to test the study hypotheses and provide insights into the relationship between chatbot dimensions and customer experience in the e-commerce context.

4.1. Demographic Variables

Table 3. Demographic Characteristics of the Respondents

Data	Category	Frequency (N)	Percentage (%)
Gender	Male	53	32
	Female	111	68
Age	Less than 25 years	103	63
	From 25 to 34 years	33	20
	From 35 to 44 years	19	12
	Older than 45 years	9	5
Education level	Intermediate	7	4
	Secondary level	14	9
	University level	117	71
	Postgraduate studies	26	16
Occupation			
	Student	104	64
	Consumer	30	18
	Self-employed	30	18
the device used	Smart phone	130	80
	Laptop	26	16
	Desktop	4	2
	Tablet	4	2
the service used	Customer service for an online	60	37
	store	48	29
	Delivery/food services	56	34
	Technical support		
The E-commerce platforms used	Jumia/Amazon	21	12
	Local sites (mention them...)	37	23
	Delivery / food sites	22	14
	E-commerce stores via Facebook/WhatsApp	84	51

Source: Prepared by the researcher based on the outputs of SPSS V 25

The demographic profile of respondents shows that the majority were female (68%) and under 25 years old (63%), reflecting a young and digitally active population. Most participants held a university degree (71%), and students represented the largest occupational group (64%). Regarding technology use, smartphones were the dominant device (80%), emphasizing mobile-based engagement with chatbots. The most frequently used chatbot services were customer service (37%) and delivery or food services (34%), while technical support also appeared as a common use case. In terms of e-commerce platforms, Facebook/WhatsApp and e-commerce websites were the most popular, followed by local sites and international platforms such as Jumia or Amazon. Overall, these findings highlight that chatbot usage in Algeria is driven primarily by young, educated, mobile users seeking convenience in online interactions.

4.2. User Frustration with Chatbots :

Table 4. Distribution of study sample based on User Frustration with Chatbots

Data	Category	Frequencies	Percentages%
Have you ever felt frustrated or annoyed while interacting with a chatbot?	No	121	74
	Yes	43	26

Source: Prepared by the researcher based on the outputs of SPSS V 25

The table 4 presents the distribution of participants according to whether they experienced frustration or annoyance while interacting with chatbots. The results show that the majority of respondents (74%) reported no frustration or annoyance, indicating a generally smooth and satisfactory interaction experience. However, 26% of participants stated that they did experience some level of frustration, which may stem from issues such as inaccurate or repetitive responses and limited personalization.

This finding suggests that while chatbot interactions are largely positive, there remains a portion of users whose experiences could be improved through enhanced accuracy, contextual understanding, and emotional responsiveness of AI-powered systems.

4.3. Basic Study Variables :

Table 5. Arithmetic averages and standard deviations of the sample's answers

Variables	Arithmetic Mean	Standard Deviation	Approval Level
The Ease of Use of chatbots	3,8780	0,54363	High
Real-time responsiveness	3,9512	0,53954	High
Emotional intelligence	3,7673	0,61774	High

Customer trust in chatbots	3,4665	0,67912	High
Customer Experience	3,8943	0,52218	High

Source: Prepared by the researcher based on the outputs of SPSS V 25

Table 5 presents the arithmetic means and standard deviations of the study variables. The results indicate that all dimensions recorded **high approval levels**, with mean values exceeding 3.4 on a five-point Likert scale. *Real-time responsiveness* achieved the highest mean (M = 3.95, SD = 0.54), suggesting that participants particularly valued the prompt reactions of chatbots. *Ease of use* and *customer experience* also scored highly (M = 3.88 and 3.89 respectively), reflecting users' satisfaction with the simplicity and efficiency of chatbot interfaces. Meanwhile, *emotional intelligence* (M = 3.76) and *customer trust* (M = 3.46) obtained slightly lower, yet still high, ratings—indicating positive perceptions but with room for improvement in empathy and data security aspects.

Overall, these findings demonstrate that AI-powered chatbots contribute significantly to a favorable customer experience in the e-commerce context.

4.4. Hypothesis Testing :

4.4.1. The First Sub-Hypothesis:

The first sub-hypothesis aims to examine whether gender differences influence the respondents' perceptions of the enhancement of customer experience through AI-powered chatbots at a significance level of $\alpha \leq 0.05$.

- **Null Hypothesis (H_0):** There are no statistically significant differences between the mean responses of the sample members according to gender at the 0.05 significance level.
- **Alternative Hypothesis (H_1):** There are statistically significant differences between the mean responses of the sample members according to gender at the 0.05 significance level.

Table 6. Testing the First Sub-Hypothesis Using One-Way ANOVA

Source of Variation	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Significance Level (Sig.)
Between Groups	44.124	1	44.124	1.182	0.279
Within Groups	19.322	162	0.119		
Total	**63.446**	**163**			

Source : Prepared by the researcher based on SPSS v25 outputs.

Since the significance value (**0.279**) is **greater than 0.05**, the result is **not statistically significant**. This indicates that there are **no significant differences** between the groups regarding their views on enhancing customer experience. Therefore, the **first sub-hypothesis is rejected**, implying that the independent variable does not significantly influence the

enhancement of customer experience.

4.4.2. The Second Sub-Hypothesis:

The second sub-hypothesis investigates whether **age differences** influence the respondents' perceptions of the enhancement of customer experience through AI-powered chatbots, tested at a significance level of $\alpha \leq 0.05$.

- **Null Hypothesis (H_0):** There are no statistically significant differences between the mean responses of the sample members according to age at the 0.05 significance level.
- **Alternative Hypothesis (H_1):** There are statistically significant differences between the mean responses of the sample members according to age at the 0.05 significance level.

Table 7. Testing the Second Sub-Hypothesis Using One-Way ANOVA

Source of Variation	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Significance Level (Sig.)
Between Groups	1.120	3	0.373	1.378	0.251
Within Groups	43.326	160	0.271		
Total	**44.446**	**163**			

Source : Prepared by the researcher based on SPSS v25 outputs.

Table 7 displays the results of the One-Way ANOVA test used to evaluate the **second sub-hypothesis**, which examines whether respondents' age affects their perception of customer experience enhancement through AI-powered chatbots. The obtained significance value (**Sig. = 0.251**) is greater than the 0.05 threshold, indicating that the result is **not statistically significant**. Therefore, there are **no significant differences** between the mean responses of the sample members according to age. As a result, the **null hypothesis (H_0)** is accepted, and the **alternative hypothesis (H_1)** is rejected.

4.4.3. The Third Sub-Hypothesis:

The third sub-hypothesis explores whether differences in **educational level** influence respondents' perceptions of the enhancement of customer experience through AI-powered chatbots, tested at a significance level of $\alpha \leq 0.05$.

- **Null Hypothesis (H_0):** There are no statistically significant differences between the mean responses of the sample members according to educational level at the 0.05 significance level.
- **Alternative Hypothesis (H_1):** There are statistically significant differences between the mean responses of the sample members according to educational level at the 0.05 significance level.

Table 8. Testing the third Sub-Hypothesis Using One-Way ANOVA

Source of Variation	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Significance Level (Sig.)
Between Groups	0.295	3	0.098	0.357	0.784
Within Groups	44.150	160	0.276		
Total	**44.446**	**163**			

Source : Prepared by the researcher based on SPSS v25 outputs.

Perceptionesents the results of the One-Way ANOVA test for the third sub-hypothesis, which investigates whether respondents' **educational level** leads to differences in their perception of customer experience enhancement through AI-powered chatbots. The obtained significance value (**Sig. = 0.784**) exceeds the 0.05 threshold, indicating that the differences among the means are **not statistically significant**. Therefore, the **null hypothesis (H_0)** is accepted, confirming that **educational level does not significantly influence** respondents' evaluations of customer experience improvement related to chatbot use.

4.4.4. The Fourth Sub-Hypothesis:

The fourth sub-hypothesis examines whether differences in **employment status** influence respondents' perceptions of the enhancement of customer experience through AI-powered chatbots, tested at a significance level of $\alpha \leq 0.05$.

- **Null Hypothesis (H_0):** There are no statistically significant differences between the mean responses of the sample members according to employment status at the 0.05 significance level.
- **Alternative Hypothesis (H_1):** There are statistically significant differences between the mean responses of the sample members according to employment status at the 0.05 significance level.

Table 9. Testing the fourth Sub-Hypothesis Using One-Way ANOVA

Source of Variation	Sum of Squares	Degrees of Freedom (df)	Mean Square	F	Significance Level (Sig.)
Between Groups	0.018	2	0.009	0.033	0.967
Within Groups	44.427	161	0.276		
Total	**44.446**	**163**			

Source : Prepared by the researcher based on SPSS v25 outputs

Table 9 illustrates the results of the One-Way ANOVA test for the **fourth sub-hypothesis**, which explores whether respondents' **employment status** influences their perception of customer experience enhancement through AI-powered chatbots. The calculated significance value (**Sig. = 0.967**) is far greater than the 0.05 threshold, indicating that **no statistically significant differences** exist between the mean responses across employment groups. Consequently, the **null hypothesis (H_0)** is accepted, and it is concluded that **employment status does not have a significant effect** on how respondents perceive the role of chatbots in

improving customer experience.

4.5. Correlation Coefficients :

Table 10. The Correlation Results Between the Independent Variables (Chatbot Dimensions) And the Dependent Variable (Customer Experience)

Independent Variable	Dependent Variable
ease of use of chatbots	0.690690* *
real-time response of chatbot	0.569* *
Emotional Intelligence of Chatbots	0.548**
Customer trust in chatbots	0.549**

** Significant at ≤0.05.

Source : Prepared by the researcher based on the outputs of SPSS V 25

The table presents the correlation results between the independent variables (chatbot dimensions) and the dependent variable (customer experience).

All **correlation coefficients are positive and statistically significant at ≤ 0.05**, indicating a meaningful relationship between all factors and customer experience.

- **Ease of use of chatbots (r = 0.690)** shows the strongest correlation, suggesting that the easier the chatbot is to use, the better the customer experience.
- **Real-time response (r = 0.569)** also demonstrates a strong positive relationship, meaning that faster chatbot interactions enhance customer satisfaction.
- **Emotional intelligence (r = 0.548)** indicates that the chatbot's ability to understand users' emotions positively influences their experience.
- **Customer trust in chatbots (r = 0.549)** further contributes positively to customer experience.

5.Findings Discussion:

The study revealed several important insights into the influence of AI-powered chatbots on customer experience within the Algerian e-commerce sector. The majority of respondents were under 25 years old, with females representing the larger share of participants. Most users accessed chatbot services via smartphones, primarily for customer service, technical support, and delivery inquiries.

Overall, users expressed positive perceptions across all evaluated dimensions—ease of use, real-time responsiveness, emotional intelligence, trust, and overall customer experience—with relatively high mean scores. About 74% of respondents reported smooth and frustration-free interactions, while 26% mentioned issues such as repetitive or inaccurate answers and limited

personalization.

The statistical results indicated strong and positive correlations between all chatbot dimensions and customer experience enhancement. **Ease of use** showed the strongest relationship ($r = 0.690$, $p < 0.05$), emphasizing the value of intuitive and user-friendly interfaces. **Real-time responsiveness** also had a significant effect ($r = 0.569$, $p < 0.05$), confirming that faster replies improve customer satisfaction. **Emotional intelligence** ($r = 0.548$, $p < 0.05$) enhanced user comfort and confidence through empathetic communication, while **customer trust** ($r = 0.549$, $p < 0.05$) underscored the importance of security and reliability in chatbot interactions.

Despite these positive outcomes, some limitations persist, particularly regarding user trust and data privacy, which remain areas requiring further improvement for broader adoption in Algerian e-commerce.

The findings of this study confirm that AI-powered chatbots play a significant role in enhancing customer experience in the Algerian e-commerce context. The strong correlations observed between all chatbot dimensions and customer experience indicate that these systems are not only technological tools but also relational interfaces that shape user perceptions and satisfaction.

The dimension of **ease of use** recorded the strongest impact, consistent with prior research (e.g., Davis, 1989; Gefen et al., 2003), which emphasized usability as a primary determinant of technology acceptance. In Algeria's digital environment, where many consumers are still adapting to e-commerce, intuitive chatbot design appears crucial to reducing cognitive effort and encouraging sustained interaction.

Real-time responsiveness also showed a significant positive effect, aligning with studies by Luo et al. (2019) and Gnewuch et al. (2018), who found that rapid and contextually relevant replies enhance satisfaction and perceived service quality. This result highlights the importance of efficiency and immediacy in shaping positive digital service encounters, particularly in sectors such as delivery and online retailing.

Furthermore, **emotional intelligence** emerged as a key predictor of a richer, more engaging user experience. This finding supports the growing literature (e.g., Huang et al., 2022) suggesting that emotionally responsive AI can foster empathy and a sense of social presence, thereby bridging the gap between human and automated interactions.

The dimension of **trust** also proved essential, especially in terms of information reliability and data privacy. This resonates with findings from McLean & Osei-Frimpong (2019), who noted that perceived security and ethical AI practices significantly influence customer retention. In Algeria, where digital trust remains fragile due to limited regulation and cybersecurity awareness, improving chatbot transparency and data handling practices is critical.

Despite these encouraging results, a notable portion of users still reported frustration linked to inaccurate or repetitive responses, underscoring the need for better natural language processing and contextual learning. This suggests that the maturity of AI-based systems in Algerian e-commerce is still evolving, with room for improvement in personalization and

semantic understanding.

In summary, the discussion indicates that while AI-powered chatbots already contribute to enhanced customer satisfaction and engagement, their full potential depends on achieving a balance between **technological efficiency** and **human-like emotional intelligence**, supported by **trustworthy digital environments**.

6.CONCLUSION AND MANAGERIAL RECOMMENDATIONS

This study demonstrated that AI-powered chatbots have a significant and positive influence on customer experience in the Algerian e-commerce sector. By analyzing key dimensions such as ease of use, real-time responsiveness, emotional intelligence, and customer trust, the research confirmed that each of these factors contributes meaningfully to customer satisfaction, engagement, and perceived service quality.

The results highlight that user-friendly interfaces and quick, accurate responses are fundamental to creating seamless digital experiences. Equally important are emotionally intelligent interactions and the establishment of trust through transparent, secure, and ethical chatbot operations. Together, these factors transform chatbot use from a mere technological feature into a strategic asset for enhancing customer relationships and loyalty.

However, the persistence of technical challenges such as repetitive or inaccurate responses suggests the need for further system refinement. Businesses should focus on improving chatbot learning algorithms, contextual understanding, and the ability to simulate human empathy. Moreover, attention must be given to user data protection and privacy assurance to strengthen public trust in AI-based services. From a **managerial perspective**, e-commerce firms are encouraged to:

- **Invest in adaptive chatbot design** — prioritizing simplicity, usability, and natural conversation flow.
- **Implement continuous AI training** using real user feedback to improve personalization and relevance.
- **Enhance emotional engagement** by integrating sentiment analysis to tailor tone and responses.
- **Promote data transparency and security**, ensuring compliance with ethical and privacy standards.
- **Segment users by demographics** to tailor chatbot behavior and responses to different age or experience groups.

In conclusion, the effective integration of AI-powered chatbots can serve as a powerful strategic tool for Algerian e-commerce businesses seeking to enhance the overall customer experience. When designed with empathy, intelligence, and transparency, chatbots can not only improve service efficiency but also build long-term trust and loyalty among digital consumers.

6.1. Implications for Future Research :

Future studies should expand this research by :

- **Cross-sector comparison:** analyzing chatbot impacts in different industries (banking, healthcare, tourism, education) to identify sector-specific factors shaping customer experience.
- **Longitudinal analysis:** tracking how satisfaction, trust, and perceptions change as chatbots evolve and become more human-like.
- **Exploring moderators and mediators:** examining how digital literacy, culture, personality, or prior experience affect the link between chatbot features and customer experience.
- **Qualitative research:** using interviews or focus groups to gain deeper emotional and experiential insights beyond quantitative results.
- **Regional and international comparison:** extending studies beyond Algeria to uncover cultural differences and global best practices in chatbot use.
- **Technological focus :** evaluating how emerging tools like NLP, emotional AI, and personalization algorithms enhance user engagement and satisfaction.

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