# The Impact of AI Chatbot on Customer Experience

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## Abstract

The extensive adoption of artificial intelligence (AI) chatbots has revolutionized customer service across industries by offering cost-effective, rapid, and personalized interactions. While previous studies have discovered individual chatbot dimensions which are usability, responsiveness, personality, and trustworthiness on customer experience, particularly in the banking sector. This focus is important because it demonstrates how chatbots not only streamline transactional services but also improve emotional connection, resulting in greater customer relationships and loyalty.

A survey experiment is conducted to gather the data needed for this research. A within subjects design is used, the researcher was able to gather 384 completed questionnaires. Results found showed that the four dimensions of AI Chatbot (Responsiveness,

Trustworthiness, Personality and Usability) have both a significant and a direct relation and impact on Customer experience and its attributes which are Extrinsic Values and Intrinsic Values.

**Keywords:** Chatbot – Artificial Intelligence- Customer Experience- Intrinsic Values- Extrinsic Values – Customer Satisfaction – Customer Loyalty

## تأثير روبوت الدردشة المدعوم بالذكاء الاصطناعي على تجربة العملاء

**الملخص :**

لقد أحدث الانتشار الواسع لاستخدام روبوتات الدردشة المدعومة بالذكاء الاصطناعي ثورة في خدمة العملاء عبر مختلف الصناعات من خلال تقديم تفاعلات سريعة وشخصية وفعّالة من حيث التكلفة. في حين أن الدراسات السابقة قد تناولت الأبعاد الفردية لروبوتات الدردشة، مثل سهولة الاستخدام، الاستجابة، الشخصية، والمصداقية، وتأثيرها على تجربة العملاء، لا سيما في القطاع المصرفي، فإن هذا التركيز يعد مهمًا لأنه يوضح كيف أن روبوتات الدردشة لا تسهم فقط في تبسيط الخدمات المعاملاتية، بل أيضًا في تعزيز العلاقة العاطفية مع العملاء، مما يؤدي إلى تحسين العلاقات مع العملاء وزيادة ولائهم.

تم إجراء تجربة استقصائية لجمع البيانات اللازمة لهذه الدراسة. تم استخدام تصميم داخلي، حيث تمكن الباحث من جمع ٣٨٤ استبيانًا مكتملًا. أظهرت النتائج أن الأبعاد الأربعة لروبوتات الدردشة المدعومة بالذكاء الاصطناعي (الاستجابة، المصداقية، الشخصية، وسهولة الاستخدام) لها علاقة مباشرة ومؤثرة بشكل كبير على تجربة العملاء وخصائصها، والتي تشمل القيم الخارجية والقيم الداخلية.

**الكلمات الرئيسية:** روبوت الدردشة – الذكاء الاصطناعي – اتجربة العملاء – القيم الداخلية – القيم الخارجية – رضا العملاء – ولاء العملاء

## 1. Introduction

It is now highly recognized that the internet's power, scope, and interactivity supply retailers with the potential to radically change their customers' buying experience, and in so doing, enhance their own competitive positions, the internet offers retailers a mechanism for: broadening target markets, enhancing customer communications, extending product lines, enhancing cost efficiency, enhancing customer relationships, and delivering personalized offers. By and large, customers have responded enthusiastically to these innovations, and online retail sales have grown notably over the previous 15 years and are expected to proceed rising into the future. (Chen, Le, & Florence, 2021)

The rise of digital platforms has led to a significant surge in online shopping, with many customers opting for this option due to its numerous benefits. One of the main advantages is the convenience of being able to make purchases at any time and from any location, eliminating the need to be physically present. However, customers often face challenges when navigating online shopping platforms, which can present both risks and opportunities. As a result, today's consumers expect more from retailers, particularly in the e-commerce sector. Organizations strive to provide exceptional customer service, as it is a key factor in driving revenue and profitability. Nevertheless, providing high-quality customer service can be hindered by issues such as poor accessibility and high costs, as personnel may

be overwhelmed by repetitive inquiries from numerous customers at any given time, which can be efficiently addressed through automation. (Akcora, 2020)

The concept of artificial intelligence (AI) has been around for centuries, with early attempts to create machines that mimicked human-like qualities dating back to the middle Ages. From then on, humans have been fascinated by the idea of creating machines that can think and behave like humans. Today, this goal is often referred to as "human-like" intelligence or "cognition". The extent to which machines have achieved this similarity is evident in the naturalness and advancements in Human-Computer Interaction (HCI). One notable milestone in this field was the development of ELIZA, a pioneering chatbot created in the 1970s by Joseph Weizenbaum, which can be considered the first chatbot in history. (Rieke, 2018).

Since then, chatbot development has accelerated, and in the digital age, AI-driven conversational agents are now crucial for improving customer service and engagement. In order to comprehend and react to consumer inquiries in real-time, modern chatbots use machine learning algorithms and natural language processing (NLP), frequently simulating human interaction. These chatbots are revolutionizing how companies engage with customers in addition to increasing the effectiveness of customer service. Chatbots are getting more complex as AI develops; they

can now provide tailored responses and learn from past exchanges to enhance conversations in the future. AI-powered chatbots are now a vital tool for merchants looking to offer quick, easy, and excellent customer care, particularly as the needs of online buyers keep growing (Rieke, 2018).

## 2. Artificial Intelligence

Artificial intelligence defined as "the theory and development of computer systems capable of doing activities that ordinarily require human intellect, such as visual perception, speech recognition, decision-making, and language translation (Daqar & Smoudy, 2019). Artificial intelligence: The creation of machines that can carry out difficult jobs that are typically done by humans. Artificial intelligence manages to depend on natural processes rather than designing robots to carry out specific tasks. To make decisions that often demand human intelligence, there are a huge number of patterns and algorithms.

(Kaplan & Haenlein, 2020) defined the Artificial intelligence as a moving target as a result of the Artificial intelligence effect since it never seems to be within reach. It’s based on its cognitive and emotional capabilities, Artificial intelligence can be classified as analytical, human-inspired, or fully human. Artificial Intelligence has a range from limited to general to super intelligence. Ten years ago, we witnessed a similar dilemma with respect to the word social media. Those were the terms we used

to describe social media and internet at the time: "a set of internet-based apps that expand through time". Humans created a definition for social media and internet to specify what specifically should be included in this concept and how it differs from related ones like Web 2.0 and user-generated content. So soon will be commonly used like social media and internet.

## 3. AI chatbot

Chatbots, a type of AI technology, have gained popularity in a variety of industries, including mental health, customer service, and education. Research has underlined the need of thoroughly training chatbots to reduce errors. (Abd Alrazaq, et al.,2019)

Chatbots are employed in the healthcare industry for duties like diagnosis, screening, and treatment since they are made to mimic human conversation through text or speech. (Palanica, Flaschner, Thommandram, Li, & Fossat, 2019)

(AI)-driven virtual assistants and voice-activated chatbots have completely changed several industries and the way customers and businesses engage. These conversational AI agents provide virtual reference services with a fresh perspective, especially in libraries. (Panda & Chakravarty, 2022)

AI chatbots can comprehend language in addition to a predefined set of commands and can learn new things from the inputs they get. They may also adapt to new situations by looking

for patterns, which helps them become more intelligent over time. This type of chatbot can be used for many different things, such as predicting what a customer would search for on your website or assessing emotions. (Suhel, Shukla, Vyas, & Mishra, 2020).

## 4. AI Chatbot types:

- **Menu/Button-Based Chatbots**

The menu-based chatbots, which come in the shape of buttons and top-down menus, are the most often used and the most basic variety available today. These chatbots operate on the principles of decision trees, where you must make choices in order to get the most accurate results. The user is told to choose their selections and look more into the proper response from the AI in order to make these decisions. These menu-based chatbots can sometimes be relied upon to provide the desired response, but they are generally slower in terms of performance. . (Gupta, Hathwar, & Vijayakumar, Introduction to AI Chatbots , 2020)

- **Keyword Recognition-Based Chatbots**

These chatbots identify particular terms in order to deliver the desired outcome. They pay attention to what users enter and react appropriately. The bot chooses an acceptable response for the user using algorithms with the aid of artificial intelligence technology and a list of personalized keywords. When there are keyword similarities between numerous related questions, these chatbots will start to fail. For example, if a user asked the question ‘How do I set up an auto-

login authentication on my phone?', the bot would likely use the keywords like 'auto', 'login', to determine which answer is the best to respond with. . (Gupta, Hathwar, & Vijayakumar, Introduction to AI Chatbots , 2020)

- **Contextual Chatbots**

One of the most technologically sophisticated chatbots on the market right now is contextual.

To read the user's emotions, they make use of machine learning a nd artificial intelligence technologies like voice recognition, spee ch-to-text conversion algorithms, etc.

This kind of bot's core philosophy is to determine the user's desir es and, in response, offer a smart response by interpreting the dat abase's pattern.

As the bot encounters more and more experiences, it learns and d evelops over time. An easy-to-understand representation of one of these bots can be seen in a food delivery service. The database is used to keep the prior order history, the user's payment preferences, and the delivery address. These chatbots examine the user's viewpoint and provide recommendations based on previous orders and the user's preferences. (Gupta, Hathwar, & Vijayakumar, Introduction to AI Chatbots , 2020)

## 5. AI Chatbot Dimensions:

### 5.1 Personality

Human personality is the mixture of traits, actions, and feelings that come together to create a unique character. (Kuhail, Thomas, Alramlawi, Shah, & Thornquist, 2022)

Personality is an essential component for developing socially engaged (Lee, Lee, Jin, & Yan, 2006) According to (Åberg, 2017)chatbots show their individuality through their voice, tone, and graphical look. What the chatbots say and how they are communicated are thus critical. The bot's tone and voice, as well as how interactions are created, are ultimately at the heart of the experience, and these are largely dictated by the bot's personality attributes (Asher, 2017) (De Lannoy, 2017).

Through expressions of personality and emotions, the virtual agent can Produce compelling and believable interactions (Armstrong, 2016)To be perceived as intelligent and humanlike, the conversational agent must fulfill users' expectations regarding general personal characteristics, such as being kind or mean, extrovert or introvert or humorous or serious (Silvervarg, Gulz, Haake, Sjöden & Tärning, 2010).In the discipline of psychology personality can be defined as the pattern of collective character, behavioral, temperamental, emotional and mental traits of an individual that has consistency over time and situations (Dw Lennoy, 2017).

Personality has been extensively researched in the discipline of psychology. Goldberg's (1990) Big Five model is a popular choice. This model is made up of the attributes extraversion, agreeableness, neuroticism, conscientiousness, and openness to experience. This is considered the most descriptive model of human personality (Aly & Tapus, 2016). Personality plays a crucial role in human-robot interactions, with growing interest in the. A chatbot's personality refers to the role it plays or performs during conversational exchanges (Qian, Huang, & Zhu, 2017).

This personality of robots can be conveyd in the linguistics of the bots because linguistic style can be an indicator of personality. The bot's personality can be enhanced by focusing on its language style (Grishma Jena, 2017).

## 5.2 AI Chatbot Trustworthiness

The development of connections between service or product owner and customer is highlighted by the roles that trust and engagement to a relationship play. Online retailing, group buying websites, brand relationships in online communities, fan pages on social media, online shipping attitude, and how trust helps to increase relationship commitment between customers and retailers in online settings and on social media are just a few of the contexts in which the theory has been studied over the years. (Ameen, Anand, Tarhini, & Reppel, 2021).

An attitude of solid trust that one's weaknesses in a risky scenario won't be used is a traditional definition of trust. This applies to internet commerce and involves having faith in both the brand and the technology. Recent research demonstrates the importance of trust in assuring the adoption, continued advancement, and development of AI. On the topic of trusting technology of Artificial intelligence services, two research areas have emerged: confidence in the technology AI and trust in the company of the product or service, including their communication and operations. (Rehman, Bhatti, Mohamed, & Ayoup, 2019)

A classic definition of trust is an attitude of confident expectation that one's flaws in a risky situation will not be used. This involves having faith in both the brand and the technology when it comes to online shopping.

According to current research, trust is essential to the adoption, advancement, and development of AI (Siau & Wang, 2018)

Regarding trusting technology-mediated services, two research streams have emerged: trusting the technology itself and trusting the innovative firm, including its procedures and communication.

The idea of trust is more complicated when it comes to AI-enabled customer service, since it encompasses not just the brand and technology but also the intention behind and method of utilizing AI (Hengstler, Enkel, & Duelli, 2016); (Siau & Wang, 2018).

The process dimension refers to the technology's understandability, whereas the purpose displays faith in intentions (Hengstler, Enkel, & Duelli, 2016). According to (Lee, Lee, Jin, & Yan, 2006), confidence is more likely to be strengthened when algorithms and functional logic are transparent.

Traditionally, IS trust research has focused on analyzing interactions between humans and organizations mediated by an IS, such as a customer's relationship with a service provider (Matthias Söllner, 2016).

### 5.3 AI Chatbot Usability

Since usability is a subjective characteristic, (Oostenbrink, 2015) claimed that it was challenging to measure usability objectively. Usability, however, is defined as the user's perception of an IS's usability. If the developer wants chatbots to be widely used, users must believe utilizing them is simple. Consumers' experiences utilizing chatbots may be negatively impacted if they believe that using them is difficult.

(Miraz, Jin, & Hasan, 2024) Found one type of intelligent, conversational software agent that is activated by human interaction is a chatbot. While chatbots may be more or less sophisticated in their capacity to facilitate a natural dialogue with end users or to assist clients in accomplishing their objectives conversations with humans are usually considered as being heavily influenced by artificial intelligence. Nevertheless, in literature chatbots and conversational agents

are often used as synonyms. When attached to a company service, chatbots aim to support the decision-making and information retrieval of end-users and are generally used as customer relationship management (CRM) tools. These CRM chatbots may be used to reduce operational costs associated with customer service and to enhance the brand image by providing 24/7 rapid and effective exchanges with costumers to facilitate the access to These service tools, being usually proprietary or customized systems of a company, may substantially vary in terms of appearance, behavior and capabilities and provide a different experience to end-users.

### 5.4 Chatbot Responsiveness

Responsiveness A human-to-human dialogue embeds certain conversational norms regarding the content, timing, and flow of the conversation (Ryan M. Schuetzler, 2019). One of the conversational norms is relation, which indicates the expectation that the dialogue partner will provide a tailored response by adjusting the responses to the conversation accordingly). This responsive process refers to the conversational relevance of responses.

For a chatbot to maintain relevance, it is necessary to process customers' messages and add context to sustain continuity from the preceding messages, which allows the chatbot to appear natural and even conversationally skilled. According to (Go & Sunder, 2019), a key feature of interpersonal communication is contingency in responses since a response in dialogues is

contingent upon the preceding messages. Considering the back-and-forth nature of human conversations, termed the level of contingency in exchanging messages as message interactivity. Additionally, in a chatbot context, having message-interactivity makes chatbots appear more anthropomorphic because it mimics the responsiveness, observed from human-to-human interactions.

An empirical study also uncovered that higher message interactivity in an online chat elevates social presence as people are more likely to evaluate the interaction as a dialogue since message interactivity resembles human interactions Situated in the aforementioned literature on relevance, contingency, and message interactivity, examples of responsiveness in chatbot communication thus include chatbot service agents providing prompt feedback to customers' comments, making adequate changes based on their feedback, addressing their complaints in a positive and prompt manner, and staying sensitive to customers' needs throughout the communication process (Hua Jiang, 2022).

The ability to provide customers with instant access to services, as defined by (Chung, Ko, Joung, & Kim, 2020) and (Brock & Wangenheim, 2019), results in convenience. (Roy R. , 2018) Asserts that chatbots' ability to respond quickly, be easily contacted, and be available when needed, instills a sense of comfort and value in their users and makes them enjoy interacting with the chatbot for that reason.

According to (Parasuraman, 1988), responsiveness is how users feel about a chatbot's capacity to help them quickly and efficiently. This definition is applicable to chatbot services because the goal of chatbot-enabled service agents is to give users prompt, dependable responses and services that are similar to those provided by human customer service representatives. This helps users feel confident when interacting with these automated systems.

Based on the research conducted by (Verkeyn & Meerschman, 2019), chatbot responsiveness is a critical component that may be used to ensure the overall quality of the system. According to (Verkeyn & Meerschman, 2019), responsiveness can significantly improve chatbot design, especially when it comes to creating interactive user profiles.

(Roy R. , 2018) state that customers' sense of comfort and perceived value are largely influenced by chatbots' availability, accessibility, and quick reaction times (Chung et al., 2020). Customers enjoy chatting with chatbots as well. Fun is an important aspect of the customer experience since it influences consumers' perceptions of the value and likelihood of using digital products. (Wahab, 2023)

Responsiveness in the context of artificial intelligence (AI) is a multidimensional notion that includes aspects such as transparency, accountability, fairness, trustworthiness, and ethical concerns. Organizations using AI systems are rapidly

understanding the significance of not just adhering to legal requirements, but also proactively tackling the dangers connected with AI technologies (Minkkinen, 2022).

Stakeholders from various areas, including healthcare, underline the importance of openness and explainability in AI decision-making processes (Ploug, 2021). Trustworthy human-AI partnerships necessitate AI systems evolving from their current solipsistic state to the ability to cooperate, coordinate, and compete with both other AI systems and human counterparts (Ramchurn, 2021).

AI chatbots have gained significant attention in recent years due to their potential to automate customer service, provide information, and assist users in various domains. Chatbot responsiveness, defined as the ability to provide timely and appropriate responses to user queries, is a critical factor in ensuring user satisfaction and engagement. This literature review aims to examine the current state of research on AI chatbot responsiveness, including key factors influencing responsiveness, techniques for improvement, evaluation metrics, and challenges. (Martin Adam, 2020).

(Allard C. R. van Riel, 2004). Stated that responsiveness us the quality of support customers receive when they have questions or run into problems, and the speed with which this support is provided. It compares the capability of e-retailers to give appropriate data to customers when a problem happens,

having mechanisms for handling returns and giving online guarantees. The faster a provider responds to requests, the better the service will be evaluated.

## 6. Customer Experience

Understanding customer experience (CE) has grown more difficult in the ever changing business world of today. Because of the ever-changing needs, expectations, and behaviors of consumers, it can be difficult for businesses to continuously meet and beyond their expectations. Although there isn't a one method that can fully capture what constitutes a pleasant customer experience, it is evident that CE includes a number of attributes, from the functional advantages to the emotional fulfillment gained from encounters.

Creating client experiences that not only meet fundamental needs but also foster advocacy and loyalty is a challenge for businesses, particularly in intensely competitive industries like banking. The ways that businesses engage with their customers must change along with their requirements. The use of artificial intelligence (AI), particularly chatbots driven by AI, to improve customer service and maximize the customer experience has been one of the biggest shifts in recent years. AI chatbots are made to interact with clients in real time, answering their questions, completing transactions, and offering immediate, 24/7 support with little assistance from humans. Businesses may improve the effectiveness, accessibility, and personalization of their services

all are essential elements of a great customer experience by including AI chatbots into their customer service plans.

## 7. Customer Experience with Chatbots

Chatbots can help service organizations improve client experiences and maintain market share (Kushwaha et al., 2021). Thus, offering a seamless and intelligent client experience has been a primary motivator for courier service firms to widely adopt and rely on chatbots as a new mechanism (Androutsopoulou et al., 2019; Cui et al., 2017; Ngai et al., 2021). This could be reflected in chatbots' ability to predict customer attitudes, emotional and cognitive involvement, and thus satisfaction and loyalty (Araujo, 2018; Sivaramakrishnan et al., 2008). Kunze (2016) also highlighted the importance of customized features that chatbots might offer users by adapting information and recommendations to their interests. However, there has been little focus on the consequences of chatbots in this field. (Abdullah M. Baabdullah, 2022)

The success of chatbots in creating a unique and positive customer experience depends largely on certain critical factors, such as the proposed conversation content factors (readability and transparency) or the chatbots-as-systems factors (responsiveness, personalisation, and ubiquitous connectivity). Some of these factors are related to the ability of customers to accurately read and fully understand the chatbots' text replies. In turn, to match customers'

expectations, chatbots will need to fully understanding their input and enquiries and replying to them accurately (Sheehan et al., 2020, (Abdullah M. Baabdullah, 2022)

A few research (Arya, 2019) (Chen, Ja-Shen, Le, & Florence, 2021); (Jano Jiménez-Barreto, 2021); (Amit Kumar Kushwaha, 2021); (Sanjeev Verma, 2021)) have looked at how AI Chatbots can affect the online customer experience. For instance, Chen et al. (2021) empirically examined the primary Technology-Acceptance Model (TAM model-based predictors) of online customer experience in the context of online commerce.

Their findings generally supported the idea that consumers' cognitive (or extrinsic) experiences are greatly impacted by usability and convenience of use, whereas the affective (or intrinsic) aspects of their experiences are more significantly impacted by chatbot responsiveness. Additionally, they provided statistical evidence showing that clients are more likely to be satisfied with their business when they have a favorable online experience with AI applications in general (Abdullah M. Baabdullah, 2022).

Specifically, they took into account the intrinsic and extrinsic characteristics to capture the customer's online experience with AI-chatbots. The authors also discussed how responsiveness and usability affect how customers interact with AIchatbots online. Additionally, (Sanjeev Verma, 2021) verified the beneficial

impact of AI-enabled chatbots on expediting client experience through their systematic study.

To predict customer experience with AI (Amit Kumar Kushwaha, 2021) integrated a comprehensive model based on various theories: customer experience theory, Hoffman and Novak's model of flow in interactive computer-mediated environments (CME), customer experience theory, IS success model, commitment trust theory, and diffusion of innovation. The model was able to predict approximately 57.40% of customer experience with AI chatbots. They authors also found that service quality, brand trustworthiness, transparency, telepresence, perceived risk, challenges, and skills significantly impacted customer experience with AI chatbots (Abdullah M. Baabdullah, 2022).

Specifically, motivational customer experience was tested by (Jano Jiménez-Barreto, 2021) using a novel model based on self-determination and assemblage theories, and a mixed-method approach based on both quantitative and qualitative data. They empirically approved the impact of self-determined interaction dimensions (competence, autonomy, and relatedness) on customers' experience with AI chatbots, which was also proven to positively determine customers' attitudes toward such emerging systems.

(Trivedi, 2019)Studied IS success model factors and perceived risk to investigate customer experience with AI chatbots. Their realistic results confirmed the impact of information, service, and system quality on customer experience

and that perceived risk moderates the relationship between IS success factors and customer experience. Trivedi also observed another interesting relationship, between customer experience with chatbots and brand love.

## 8. Research Objectives

1. To investigate the effect of AI Chatbot responsiveness, personality, usability, trustworthiness on customer experience.
2. To investigate the impact of AI Chatbot responsiveness, personality, usability, trustworthiness on intrinsic values.
3. To discover the impact of the usability of AI Chatbot responsiveness, personality, usability, trustworthiness on Extrinsic values

## 9. Research Hypothesis

The empirical study consists of main hypothesis stated as the following:

$\boldsymbol{H_1}$: The AI Chatbot (Responsiveness, Trustworthiness, Personality, and Usability) have a significant impact on customer experience.

## 10. Research Methodology

### 10.1 Research Purpose

The type of this study is descriptive and explanatory. It is descriptive as literature review was examined, variables are explained and described, and hypotheses are tested. Moreover, it is explanatory because it defined and formulate the research

study and the study's objective is to investigate the impact or the effect of the independent variable the AI Chatbot on the dependent variable the customer experience.

### 10.2 Research Approach

The approach used in this study is the quantitative approach, as this study aims to test the causality between the variables and the research hypotheses and questions requires testing. Moreover, the quantitative approach fits with the positivism philosophy, as well as serving the type of the research which is the descriptive and explanatory. Finally, this research collects and analyzes data numerically and in a statistical form and survey.

### 10.3 Research Strategy

The strategy applied on this research is the survey strategy, as it served our quantitative approach. By collecting data that can be statistically examined, it allowed the researcher to quantify the problem. Moreover, this research aims to investigate the AI Chatbot and its impact on customer experience by dealing with the mass population by targeting a random sample from as many consumers as we can reach. Also, the survey strategy is appropriate for the descriptive and explanatory nature of this research. Lastly, the survey strategy is used to objectively generalize the research results and findings.

### 10.4 Research Philosophy

Positivism is aligned with the hypothetico-deductive model of science that builds on verifying a priori hypotheses and experimentation by operationalizing variables and measures; results from hypothesis testing are used to inform and advance science. Studies aligned with positivism generally focus on identifying explanatory associations or causal relationships through quantitative approaches, where empirically based findings from large sample sizes are favored—in this regard, generalizable inferences, replication of findings, and controlled experimentation have been principles guiding positivist science. Criteria for evaluating the quality of positivist research are discussed. An example from health professions education is provided to guide positivist thinking in study design and implementation.

## 11. Population and Sample Size

The researcher used population unknown size of the population size to get the highest value for sample size to be presentable to the study population, and the methodology of selecting the sample size is the random sampling technique which is defined as the following:

$$n_o = \frac{Z^2 * p * q}{e^2}$$

**Where:**

- $\boldsymbol{n_o}$: Is the sample size for unlimited population.

- ***Z***: Is the area under the normal distribution curve for confidence interval ***95%*** and it has a standardized value of ***1.96.***
- ***P***: Is the estimated proportion of an attribute that is present in the population in order to obtain the maximum sample size ***(p)*** value has to be ***0.5.***
- ***q***: Is the complement of ***(p)*** which equal $(\mathbf{1} - \boldsymbol{p}) = \mathbf{0.5}$.
- ***e***: Is the margin of error for the confidence interval by which if the confidence interval is 95% then the margin of error ***(e)*** will be ***5%.***

**By substituting in the above formula, the adjusted sample size (n) will be:**

$$n_o = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 385$$

The researcher succeeded in collecting 395 responses for the study questionnaire and found that all responses are valid. Therefore, the final sample size that will be analyzed to obtain the statistical results and used for testing the study hypotheses are 395 responses..

## 12.Descriptive Analysis

The dimensions of the independent variables, and the dependent variable will be analyzed in order to determine measures of central tendency which presented by (weighted

average mean, maximum and minimum values), then measures of dispersion which presented by (standard deviation and coefficient of variation) for each variable.

**Table (12.1): The descriptive analysis of Dimensions study variables.**

| Variable | Minimum | Maximum | W. A. Mean | Standard Deviation | Coefficient of Variation |
|---|---|---|---|---|---|
| Responsiveness | 1.00 | 5.00 | 3.878 | 1.210 | 0.312 |
| Trustworthiness | 1.00 | 5.00 | 3.878 | 1.214 | 0.313 |
| Personality | 1.00 | 5.00 | 3.875 | 1.202 | 0.310 |
| Usability | 1.00 | 5.00 | 3.879 | 1.209 | 0.312 |
| Customer experience | 1.00 | 5.00 | 3.868 | 1.221 | 0.316 |

**Source: prepared by the researcher from SPSS output.**

## From table (12.2) it is concluded that:

- The independent dimension "Responsiveness" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.73, and its standard deviation is 1.2151 and this value is less than 1 which led to a low coefficient of variation of 32.59% which means that there is a low level of dispersion of values around the arithmetic mean.
- The independent dimension "Trustworthiness" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.73, and its standard deviation is 1.2163 and this value is less than 1 which led to a low coefficient of variation of 32.65% which means that there is a low level of dispersion of values around the arithmetic mean.

- The independent dimension "Personality" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.73, and its standard deviation is 1.2170 and this value is less than 1 which led to a low coefficient of variation of 32.60% which means that there is a low level of dispersion of values around the arithmetic mean.
- The independent dimension "Personality" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.73, and its standard deviation is 1.2170 and this value is less than 1 which led to a low coefficient of variation of 32.60% which means that there is a low level of dispersion of values around the arithmetic mean.
- The dependent dimension "Usability" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.72, and its standard deviation is 1.2110 and this value is less than 1 which lead to a low coefficient of variation of 32.51% which means that there is a low level of dispersion of values around the arithmetic mean.
- The dependent variable "Customer experience" has a minimum value of 1.00 and maximum value of 5.00 with an arithmetic mean of 3.71, and its standard deviation is 1.2253 and this value is less than 1 which lead to a low coefficient of variation of 33.03% which means that there is a low level of dispersion of values around the arithmetic mean.

## 13. Test of Normality

The researcher applied Shapiro-Wilk test to determine whether the main variables of study follow the normal distribution or not, Shapiro-Wilk test is a Chi-squared test of normality which its null hypothesis states that variables are not normally distributed if the test *p-value* is less than or equal 0.05, while its alternative hypothesis states that variables are normally distributed if the test *p-value* is more than 0.05.

**Table (13.1): Shapiro-Wilk test of normality.**

| Variable | Statistic | DF | *P-value* |
|---|---|---|---|
| **Responsiveness** | 0.826 | 385 | 0.000 |
| **Trustworthiness** | 0.824 | 385 | 0.000 |
| **Personality** | 0.830 | 385 | 0.000 |
| **Usability** | 0.824 | 385 | 0.000 |
| **Customer experience** | 0.825 | 385 | 0.000 |

**Source: prepared by the researcher from SPSS output.**

From table (13.1) it is concluded that all the independent variable dimensions, and dependent the variable dimensions are not normally distributed as their *p-value* of Chi-square statistic is less than 0.05, so the alternative hypothesis will be accepted that the dimensions are not follow the normal distribution.

## 14. Test of Responses Reliability

The term reliability generally refers to the consistency of a measure. The statistical approach to estimating reliability varies depending upon the purpose of the measure.

Cronbach's Alpha test to measure the degree of study variables stability and the following table presents that the stability factor for the sample responsiveness is 97.5% which means that the responses were very high and stable in that questionnaire.

**Table (14.1): Cronbach's Alpha Reliability test for variables of study.**

| Dimension | Number of statements | Cronbach's Alpha | $\sqrt{\text{Alpha}}$ |
|---|---|---|---|
| **Responsiveness** | 7 | 0.998 | 0.999 |
| **Trustworthiness** | 3 | 0.997 | 0.998 |
| **Personality** | 3 | 0.996 | 0.998 |
| **Usability** | 7 | 0.999 | 0.999 |
| **Customer experience** | 5 | 0.996 | 0.998 |

**Source: prepared by the researcher from SPSS output.**

From table (14.1) it is concluded that there is a high level of reliability for the responses for each variable as the Cronbach's Alpha test show high level of stability as it values for each variable is more than 60% and also for the trust factor which calculated by square root of Alpha factor showed a trust level of more than 80%.

## 15. Test of Responses Validity

Validity is the extent to which a concept, conclusion or measurement is well-founded and likely corresponds accurately to the real world based on probability. The validity of a measurement tool is considered to be the degree of probability to which the tool measures what it claims to measure, in this case, the validity is an equivalent to a percent of how accurately the claim corresponds to reality.

**Table (15.1): Validity t-test for study variables**

| Dimensions and variables | t-test | *df* | *P-value* |
|---|---|---|---|
| **Responsiveness** | 62.901 | 384 | 0.000 |
| **Trustworthiness** | 62.678 | 384 | 0.000 |
| **Personality** | 63.255 | 384 | 0.000 |
| **Usability** | 62.947 | 384 | 0.000 |
| **Customer experience** | 62.147 | 384 | 0.000 |

**Source: prepared by the researcher from SPSS output**

The validation t-test used to measure the extent of statements consistent with the responses in the questionnaire, and from the following table it found that t-test values are all positive and significant as its all *p-value* is equal to 0.000 and this presents a high level of consistency.

## 16. Correlation Matrix

After applying test of normality for the main dimensions of the independent, and the dependent variables of study and founding the study variables don't follow the normal distribution,

So Spearman correlation coefficient will be the most appropriate coefficient for determining the relation strength and direction between each two variables, then the correlation coefficient is tested by a t-test which its null hypothesis states that correlation does not exist if the test p-value is greater than 0.05.

**Table (16.1): Spearman correlation coefficient for the study variables.**

| Variable | Responsiveness | Trustworthiness | Personality | Usability | Customer experience |
|---|---|---|---|---|---|
| **Responsiveness** | **1.00** | | | | |
| *P-value* | - | | | | |
| **Trustworthiness** | 0.990** | **1.00** | | | |
| *P-value* | 0.000 | - | | | |
| **Personality** | 0.988** | 0.988** | **1.00** | | |
| *P-value* | .000 | 0.000 | - | | |
| **Usability** | 0.987** | 0.990** | 0.991** | **1.00** | |
| *P-value* | 0.000 | 0.000 | 0.000 | - | |
| **Customer experience** | 0.992** | 0.991** | 0.990** | 0.987** | **1.00** |
| *P-value* | 0.000 | 0.000 | 0.000 | 0.000 | - |

**Source: prepared by the researcher from SPSS output**

## From table (16.1) it is concluded that:

- There is a direct, strong, and significant relation between the independent dimension Responsiveness and the dependent variable customer experience with correlation coefficient value 0.992 and *p-value* 0.000.

- There is a direct, strong, and significant relation between the independent dimension Trustworthiness and the dependent variable customer experience with correlation coefficient value 0.991 and *p-value* 0.000.
- There is a direct, strong, and significant relation between the independent dimension Personality and the dependent variable customer experience with correlation coefficient value 0.990 and *p-value* 0.000.
- There is a direct, strong, and significant relation between the independent dimension Usability and the dependent variable customer experience with correlation coefficient value 0.987 and *p-value* 0.000.

## 17.Multiple Regression model for testing the main hypothesis

The main hypothesis of study states that " The AI Chatbot (Responsiveness, Trustworthiness, Personality, and Usability) have a significant impact on customer experience", so the researcher will develop multiple linear ordinary least squares (OLS) regression model to test the impact of the for dimensions of the AI Chatbot (independent variables) on customer experience (dependent variable).

For the following table (17.1) presents multiple linear regression models the researcher had accepted the coefficients of independent variables significance at 5% level of significance.

**Table (17.1): Multiple regression model for the main hypothesis $H_1$**

| Model | *OLS Multiple* | Dependent variable | **Customer Experience** |
|---|---|---|---|
| Variables | *Coefficient* | *p-value* | Significance |
| **Constant** | −0.0397058 | 0.0231 | **Significant** |
| **Responsiveness** | 0.462112 | <0.0001 | **Significant** |
| **Trustworthiness** | 0.287244 | <0.0001 | **Significant** |
| **Personality** | 0.156065 | 0.0007 | **Significant** |
| **Usability** | 0.102426 | <0.0001 | **Significant** |
| Adjusted R-squared | | 94.3153 % | |
| F-test *P-value* | | <0.0001 | |

**Source: prepared by the researcher from SPSS output**

## From table (17.1) it is concluded that:

- The overall multiple (OLS) regression model is significant as the overall F-test of significance has a *p-value* of <0.0001, with and adjusted R-squared value 94.3153 % which means that the dependent variable Customer Experience changes by 94.3153 % due to the changes in the independent dimensions: (Responsiveness, Trustworthiness, Personality, and Usability).
- Constant has a significant impact on Customer Experience.
- Responsiveness, Trustworthiness, Personality, and Usability have a positive significant impact on Customer Experience.

The (OLS) regression model forecasting equation will be:

$$\widehat{Customer\ Experience} = -0.0397058 + 0.462112\ \text{Responsiveness} + 0.287244\ \text{Trustworthiness} + 0.156065\ \text{Personality} + 0.102426\ \text{Usability}$$

## 18. Heteroscedasticity Test variables Homogeneity

The regression models and the OLS method are based on several assumptions, including the constancy of homoscedasticity by which the mean should be equal to zero, and if the Heteroscedasticity variation is used, some methods are used to overcome this problem, such as the White test. The null hypothesis is that the model has a problem of random error instability (exogeneity) if *p-value* is less than 0.05.

**Table (18.1): Heteroscedasticity test for Homogeneity.**

| Overall test of Heteroscedasticity | Chi-square | *P - value* |
|---|---|---|
| | 0.270146 | 0.050230 |

**Source: prepared by the researcher from AMOS output.**

The above table shows that the chi-squared test of value 0.270146 has a *p-value* of 0.050230 which means accepting the alternative hypothesis which means that the study model does not suffer from the problem of random error instability and the study variables are endogenous to each other's.

## 19. Variance Inflation Factor (VIF) test

The test has a minimum possible value equals to 1.0 and the values greater than 10.0 indicate a collinearity problem.

**Table (19.1): VIF of the independent variable dimensions**

| Variable | VIF |
|---|---|
| **Responsiveness** | 7.146 |
| **Trustworthiness** | 6.886 |
| **Personality** | 4.538 |
| **Usability** | 6.752 |

**Source: prepared by the researcher from AMOS output.**

From the previous table (19.1) it is concluded that there is no dimension that suffers from multi-collinearity as the VIF values don't exceed 10.

## 20.Conclusion

The results showed that all of the dimensions had positive means, indicating that the reliability and validity of the scale were acceptable, which implies that the overall variables of the study were also acceptable. In summary, this study's results reveal that all four dimensions responsiveness, personality, usability, and trustworthiness—had positive mean scores, indicating that the measuring scale's validity and reliability were acceptable. This finding suggests that the study's primary variables were precisely specified and successfully assessed, enhancing the validity of the findings. Furthermore, the study shows that these AI chatbot features have a noticeable and substantial effect on the banking industry's customer experience.

These characteristics have a big impact on how consumers feel about using AI chatbots in banking. A well-thought-out chatbot that performs exceptionally well in these domains can boost satisfaction among customers, encourage more use of the bank's offerings, and foster loyalty.

Future research can examine the dynamic interaction between these variables and the long-term impacts on customer loyalty and service quality in the banking industry as AI technology develops.

## 21.Research Limitations

Every study contains limitations and restrictions because there are no absolutes. Here are a few of the study's shortcomings listed below:

- This study examined the associated problems with AI-powered chatbots from the viewpoint of the consumer, but it did not go far enough in covering the service providers.
- To the best of the researcher's knowledge, there were few publications and literature reviews on the independent variable "AI Chatbot" that addressed all its discussed dimensions that impacting it.
- To the best of the researcher's knowledge, there were no models or hypotheses that incorporated all the variables under investigation.

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