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The Influence of Chatbots on Consumer Behavior

A Comparative Study of Rule-Based and Generative AI Chatbot
Interactions

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Master Thesis

presented as partial requirement for obtaining a master's degree in data-driven Marketing

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

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by

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Master Thesis presented as partial requirement for obtaining the master's degree in data-driven Marketing, with a specialization in Digital Marketing and Analytics

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June, 2024

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism, any form of undue use of information, or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Constança Maria Albino Capela Empadinhas Neves

Oeiras, 15-June-2024

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ABSTRACT

In today's rapidly evolving technological landscape, new support assistants have emerged to change the way businesses interact with consumers. This study investigates the impact of chatbots on consumer behavior through a single-factor experimental design comparing rule-based and generative artificial intelligence chatbots in e-commerce. The results indicate that generative artificial intelligence chatbots significantly improve service quality and engagement, which positively impacts consumer responses such as satisfaction, word-of-mouth, loyalty, and purchase intent. The study shows that consumer responses are more positive when interacting with generative artificial intelligence chatbots, highlighting the importance of adaptive and personalized interactions. This improved interaction quality leads to stronger emotional engagement, which reinforces positive consumer behaviors. By understanding these dynamics, the research provides valuable insights for companies seeking to optimize customer interactions through advanced artificial intelligence technologies, ultimately driving better consumer outcomes and strategic retail advantages.

KEYWORDS

Generative AI chatbots ; Rule-based chatbots ; Consumer Behavior ; Engagement; Service Quality; E-commerce

Sustainable Development Goals (SDG):



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LIST OF ABBREVIATIONS AND ACRONYMS

AI Artificial Intelligence

VS Versus

WOM Word-Of-Mouth

ML Machine Learning

IV Independent Variable

DV Dependent Variable

1. INTRODUCTION

The rapid advancement of Internet technologies has dramatically changed the shopping behavior and habits of consumers, significantly altering the retail landscape (Acquila-Natale & Iglesias-Pradas, 2021). The integration of these technologies has also revolutionized customer service approaches, leading to the widespread adoption of conversational agents, also known as chatbots.

These agents are designed to simulate human conversation and provide immediate responses to customer queries (Misischia et al., 2022). Rule-based chatbots are programmed with pre-defined answers to specific questions, allowing them to effectively handle simple, repetitive tasks (Naveen, 2020). With the advancement of technology, artificial intelligence (AI) has transformed our daily activities through the development and implementation of advanced applications and devices known as intelligent agents that can perform a variety of functions. An important development in this field is the development of chatbots and their communication capabilities (Adamopoulou & Moussiades, 2020).

In contrast to rule-based chatbots, which depend on predefined responses, generative AI chatbots are capable of generating unique and contextually appropriate responses to customer queries (Adamopoulou & Moussiades, 2020). These generative AI chatbots are powered by large language models with the potential to revolutionize consumer interaction, offering rapid responses and a more personalized and efficient shopping experience (J.-S. Chen et al., 2021). It is anticipated that these chatbots will emerge as one of the most rapidly developing AI applications. These machine conversation systems interact with human users through natural conversational language and are increasingly being employed by companies and organizations to facilitate communication with their customers (Ngai et al., 2021).

The literature on chatbots in the retail sector is growing, yet there are still some controversial opinions on user adoption, acceptance, and understanding of the real impact of generative chatbots (Zhou et al., 2023). As chatbots increasingly incorporate sophisticated AI capabilities into their design, they are able to engage in genuine human-like conversations, interacting seamlessly with customers who may be unaware of the automated nature of the interaction (Murtarelli et al., 2021).

Prior research on chatbots in the retail sector has focused on two key areas: customer satisfaction and the preference for human service over chatbots in certain contexts. For example, a study conducted by Ruan & Mezei (2022) demonstrates that chatbots are capable of performing at a level that is comparable to, or even superior to, frontline human employees in specific contexts. For example, in the context of products that prioritize functional attributes, customer satisfaction is higher when interacting with chatbots than with human frontline employees. This is primarily attributable to chatbots' capacity to furnish prompt responses and uniform information quality, which curtails the perception of waiting time and

enhances customer satisfaction. Additional conclusions regarding this topic can be found in Huang (2024).

Other existing literature addresses trust (Wang et al., 2023), fraud (Herbosch, 2024), barriers (Kamoonpuri & Sengar, 2023), usability (J.-S. Chen et al., 2021), and other pertinent issues. However, there is an opportunity to explore the potential of this new "era" of AI chatbots and the differences in consumer behavior toward them.

By this means, this study aims to investigate the impact of rule-based chatbots versus (vs) generative AI chatbots on consumer responses, including satisfaction, word-of-mouth (WOM), loyalty, and purchase intentions. Additionally, it seeks to examine the influence of emotional engagement and service quality on these responses within the retail sector. Emotional engagement refers to the psychological connection that consumers form with a brand, which extends beyond the functional assessment of its features (L. Ma et al., 2022). Service quality is defined as the overall perception of the efficiency and reliability of the service provided, which is crucial for enhancing customer satisfaction and loyalty (Prentice et al., 2020). This connection, built on trust, commitment, and a sense of belonging, has been demonstrated to lead to increased loyalty, positive WOM, and resilience in the face of service issues (Wang et al., 2023; Pelau et al., 2021).

The guiding research question is: "What's the difference in the impact of consumer responses to rule-based vs generative AI chatbots?" Furthermore, we aim to understand service quality and consumer behavior (engagement), and how these interactions affect customer emotions such as satisfaction, loyalty, WOM, and purchase intentions.

Considering the increasing integration of AI technologies, it is crucial to understand their potential to enhance decision-making processes, business models, and customer experiences. The findings of this research will contribute valuable insights into the ways in which generative chatbots shape consumer behavior.

For practitioners, marketers, and companies, these insights can serve as basis for the strategic deployment of AI technologies to enhance customer engagement and satisfaction. As indicated by recent market data from Statista, the estimated worldwide spending on AI in the retail sector in 2023 was 19.71 billion U.S. dollars (Hormundsson, 2024). A survey conducted among retail professionals in the same year revealed that the primary application of generative AI was in customer service roles (Statista, 2024). This highlights the importance that business leaders place on AI in their strategic planning and marketing efforts. Understanding the impact of AI chatbots allows companies to effectively allocate resources to develop customer interaction tools that are more efficacious, thereby driving business growth and positive consumer behavior.

2. LITERATURE REVIEW

2.1. CHATBOTS

A chatbot is defined as a software application that engages in dialogue with humans using natural language (Rese et al., 2020). The term is derived from the combination of "chat," which refers to a conversation, and "bot," which is short for robot. These conversational agents are designed to engage in human-like conversations, either through text-based online communication or via voice using text-to-speech technology.

There are two primary methods for developing a chatbot, which are dependent on the specific algorithms and techniques utilized. These methods include pattern matching and machine learning (ML) approaches (Adamopoulou & Moussiades, 2020).

2.1.1. RULE-BASED CHATBOTS

Rule-based chatbots employ pattern-matching algorithms to ascertain the conformity of user input to predefined rules and to select responses from a set of predetermined answers (Herbosch, 2024). These types of chatbots rely on conversational patterns that are developed by the programmer and the larger the database, the better the performance of the chatbot (Adamopoulou & Moussiades, 2020).

They are highly structured and predictable. A rule-based chatbot functions in a manner similar to an interactive frequently asked questions, recognizing specific terms and patterns and responding with pre-set answers (Nayyar, 2019). Despite their inability to respond to nuanced or complex queries, rule-based chatbots are widely used due to their ease of implementation and the control they offer, which ensures the accuracy and consistency of the information they provide.

These bots respond to queries based on predefined sets of rules, which can vary in complexity. They operate on a conditional if/then basis and are relatively simple and rapid to construct (Naveen, 2020). This simplicity reduces implementation costs and ensures high accountability and security, as they are unable to learn independently and only provide responses that have been approved by the company.

2.1.2. GENERATIVE AI CHATBOTS

The arrival of big data and ML has led to a transformation of AI, which has consequently become a global term. This transformation has not only positioned AI as a central focus for numerous businesses and organizations, but it has also significantly impacted their operational structures. Generative AI systems represent a specific subset of AI, characterized by their open-ended and substantial outputs (Herbosch, 2024).

Conversational agents represent a primary example of AI's influence (C.-Y. Li et al., 2023). In contrast to conventional, rule-based chatbots, which rely on predefined responses, generative AI chatbots are capable of producing unique responses that are tailored to specific queries. By employing a computer program that utilizes natural language processing, ML, and deep learning to replicate human conversation, the system generates original text based on input data (Tam et al., 2023), thereby facilitating more dynamic and personalized interactions with users. These systems are capable of handling different languages and personalizing communication, thereby enhancing customer service by detecting and responding to customer moods (Naveen, 2020).

As AI continues to evolve, these chatbots are becoming increasingly prevalent in a number of sectors, including e-commerce, tourism, mental health, educational research, and other service-oriented scenarios (X. Ma & Huo, 2023).

In the context of e-commerce, AI chatbots are often the first point of contact for consumers where they typically interact with AI chatbots before making purchases, turning to human customer service only when the chatbots can't resolve issues (Q. Chen et al., 2022). As a result, the quality of AI chatbots has a significant impact on customers' initial impressions and overall satisfaction with the organization (Chung et al., 2020a).

2.2. USER ACCEPTANCE, AND ADOPTION CHALLENGES

As said before, AI is experiencing rapid advancement and growth in intelligence with each passing day (Norzelan et al., 2024). AI is being integrated into numerous sectors for a variety of purposes, making it a prevalent and pervasive technology in the daily lives of consumers. In both the business and commercial environment as well as at home, AI has become a commonplace technology (Pelau et al., 2021). Despite the growing prevalence of these technologies, numerous studies have examined the factors influencing consumer acceptance of AI chatbots (Pizzi et al., 2021; Rese et al., 2020; Roy & Naidoo, 2021; Sheehan et al., 2020).

A study by X. Ma & Huo, (2023) revealed that user acceptance of chatbots is primarily influenced by cognitive attitudes. Additionally, the human perception of AI will enhance acceptance in various service situations (Pelau et al., 2021), thereby empowering users and fostering a sense of equality with humans. To overcome the stigma associated with their non-human nature, chatbots are being designed to be more human-like (Y. Sun et al., 2024) creating more empathy and exerting a direct and positive influence on distrust (Yang et al., 2023).

The development of a more human-like AI chatbot allows brands and companies to leverage the interactive capabilities of the technology to challenge negative stereotypes and foster a warmer, less rigid perception commonly associated with machines. This addresses the primary obstacle to the adoption of AI chatbots, namely customer resistance (Meng et al., 2023).

2.3. CUSTOMER RESPONSES

Consumer responses encompass pivotal dimensions that reflect the influence of chatbots on consumer behavior and perceptions in e-commerce, including satisfaction, WOM, loyalty, and purchase intention. This section examines each of these variables, offering insights into their significance and the anticipated impact of generative chatbots on each aspect.

2.3.1. CONSUMER SATISFACTION

The concept of consumer satisfaction can be defined as the outcome of an evaluative process in which consumers assess and respond to a specific focal element, such as the shopping experience or consumer behavior. (Brandtner et al., 2021). This level of satisfaction is achieved when customers ascertain that the products or services in question not only meet but also exceed their positive expectations (Chung et al., 2020a).

The Expectancy-Disconfirmation model, as proposed by Oliver in 1980, is a widely accepted framework for understanding consumer satisfaction (Zhang et al., 2022). Following the purchase, the consumer assesses the experience and product performance, resulting in either satisfaction or dissatisfaction based on the degree of alignment with expectations. Positive consumer satisfaction with a particular product or service fosters a positive overall attitude toward the company and may influence future purchasing intentions. In contrast, negative consumer satisfaction may lead to a less positive overall attitude and may affect future purchasing intentions.

A substantial body of research in the social sciences has explored the concept of satisfaction. In this study, we focused on customer satisfaction, specifically evaluating it through an analysis of how products and services align with customers' needs and expectations. One of the principal advantages of participating in online e-commerce transactions is the enhancement of user satisfaction (L. Li et al., 2023).

In the context of the rapidly evolving landscape of technology-driven markets, chatbots have emerged as a pivotal tool with the potential to positively influence customer satisfaction. Jiang's (2022) research highlights the importance of adopting a conversational tone in dialogic chatbot communication, illustrating a direct and positive impact on customer satisfaction with the selected organization's chatbot services. This finding aligns with Moriuchi, (2021) who provided a more comprehensive overview of technology's transformative influence on consumer behavior.

As customers navigate the complexities of the contemporary marketplace, chatbots have been demonstrated to be adaptable and multifaceted (Jiang et al., 2022), providing uninterrupted assistance and engagement throughout the entire customer journey. These findings align with recent studies that underscore the positive impact of AI on customer satisfaction in digital banking (Mi Alnaser et al., 2023). A research framework integrates the expectation confirmation model with AI factors, testing observations from digital banking

users. The results confirm a significant link between expectation confirmation and user satisfaction, which aligns with the findings of previous studies. Furthermore, the study underscores the pivotal function of perceived performance in influencing user satisfaction.

A study from Ruan & Mezei, (2022) reveals that the efficacy of AI chatbots and human frontline employees varies based on the attributes that are emphasized. Specifically, when functional attributes are prioritized, AI chatbots demonstrate a superior ability to enhance customer satisfaction. By incorporating chatbots into customer service strategies, businesses can capitalize on these conversational agents to enrich user experiences, fostering satisfaction and contributing to the overall success of the organization in this technologically driven era.

H1 - The utilization of generative chatbots in e-commerce positively influences consumer satisfaction.

2.3.2. WORD-OF-MOUTH

There is a general consensus among experts in the field that WOM represents an extremely potent marketing instrument, capable of exerting a profound impact on consumer behavior (Guo et al., 2022). WOM can be defined as a form of information exchange between consumers regarding their experience with a service or a product. One of its primary advantages is that it is not driven by commercial interests. WOM communication occurs through a variety of channels, including social network structures, online reviews, and microblogging on social media platforms. A common practice in research is to examine social media reviews in order to gain insights into customers' perceptions of services (Çavdar & Erkip, 2023).

To gain a clear understanding of the factors that drive and influence WOM, previous studies have identified several key elements. These factors include psychological elements, such as an individual's mindset, emotions, and cognitive processes, which influence their behavior and decision-making (X. Sun et al., 2021). Additionally, previous studies have identified several key drivers of WOM, including customers' trust, satisfaction, self-connection, loyalty, commitment, perceived quality, and perceived value (Brown, 2005; Carpenter, 2008a; Gill-Simmen et al., 2018).

It has been demonstrated in previous research that customers who interact with advanced technologies perceive the services as highly valuable, which in turn leads to greater loyalty, and thus drives WOM (Nawres et al., 2024). For example, technologies such as QueVision, mobile apps, and Scan and Go have been found to significantly increase positive WOM intentions, as they are perceived as enhancing convenience and the overall shopping experience (Inman & Nikolova, 2017).

H2 - The utilization of generative chatbots in e-commerce positively influences WOM.

2.3.3. LOYALTY

In the context of customer behavior, loyalty can be defined as the consistent willingness of customers to repeatedly purchase, revisit, and recommend a product or service (Carpenter, 2008b; Chou et al., 2023). Although many researchers have traditionally measured loyalty through behavioral aspects such as purchase frequency and volume, it is essential to distinguish between attitudinal loyalty and repeat purchase behavior. This distinction is based on the premise that attitudinal loyalty represents a psychological attachment to the seller, whereas repeat purchase behavior does not inherently necessitate a psychological commitment.

As demonstrated by Carpenter, (2008b), satisfaction has been found to positively influence attitudinal loyalty. This form of loyalty demonstrates notable and positive correlations with behavioral outcomes, including WOM communication and the proportion of purchases.

In the context of online platforms, loyalty intentions indicate a customer's inclination to recommend a website to others and their resolve to continue using it (Theodosiou et al., 2019). The role of trust in fostering online loyalty is of particular importance, given the lack of personal contact and concerns about security and fraud.

As previously investigated (Ameen et al., 2022), technology plays a pivotal role in influencing consumer behaviors and interactions across diverse contexts. With regard to the domain of smart shopping malls, the incorporation of technologies such as AI, virtual reality, and augmented reality has resulted in a notable transformation of the consumer experience. These technologies provide personalized interfaces and responsive features, which foster trust and loyalty among consumers. It is therefore imperative for businesses operating in the digital domain to gain an understanding of these dynamics in order to enhance consumer

H3 - The utilization of generative chatbots in e-commerce positively influences loyalty.

2.3.4. PURCHASE INTENTION

The process of making a purchase has undergone a notable transformation in the digital age. Consumers frequently interact with numerous brands, products, or services before reaching a purchasing decision (Hanaysha, 2022). The role of assistance throughout the customer journey has become an increasingly crucial factor for businesses seeking to achieve success. Providing customers with timely and relevant assistance not only enhances their shopping experience but also guides them toward making informed purchase decisions (Yeo et al., 2022).

A number of studies have demonstrated that consumers' online recommendation agents can facilitate purchase decisions (Kowatsch & Maass, 2010), by reducing search complexity, providing relevant product information (Häubl & Trifts, 2000), improving decision quality (Xiao & Benbasat, 2007) and by providing tailored recommendations (Gao et al., 2020).

Furthermore, personalization is a vital component in the analysis of the factors that influence purchasing decisions. This is linked to an increased persuasive impact, achieved by addressing the distinctive requirements and preferences of individual consumers (Smink et al., 2020), through the utilization of consumer data, technologies can create personalized experiences tailored to each consumer (Vesonen, 2007).

In this context, this research will investigate whether generative AI chatbots can be utilized as effective tools by businesses aiming to assist customers in their journey toward a purchase decision. As previously stated, these chatbots are highly proficient in providing product knowledge (Jiang et al., 2022) by rapidly accessing and retrieving a vast quantity of product information, including features, specifications, pricing, and availability. The real-time access to product knowledge provided by these chatbots empowers customers to make informed choices, thereby streamlining the path to purchase.

H4 - The utilization of generative chatbots in e-commerce positively influences purchase intention.

Furthermore, chatbots play a pivotal role in offering personalized recommendations to customers based on the conversation (M. Li & Wang, 2023). Through sophisticated ML algorithms, chatbots can analyze customer data and behavioral patterns to suggest relevant products or services tailored to individual needs and preferences (X. Ma & Huo, 2023).

2.4. ROLE OF ENGAGEMENT

The level of engagement that consumers experience with a particular product or service can exert influence on and alter consumer responses. Engagement is a multifaceted construct that represents the depth of an individual's emotional, cognitive, and behavioral investment in their interactions with a brand, product, or service (Chou et al., 2023). In the field of consumer behavior, engagement is defined as the totality of interactions that a customer engages in with a brand or service (Z. W. Y. Lee et al., 2019).

Engaged consumers tend to perceive their interactions as more meaningful and valuable, which enhances their overall satisfaction levels (F. Li et al., 2021). García-Pascual (2023), proposes that engagement is a means to achieve satisfaction, which is a significant factor influencing future customer behavior. A positive experience makes consumers more appreciative of the brand's efforts to meet their needs, thereby boosting their satisfaction. This suggests that emotional engagement with chatbots can significantly improve consumer satisfaction (H5a).

Moreover, studies have shown us that engagement plays a critical role in influencing WOM behaviors (Islam & Rahman, 2016). Engaged consumers, due to their emotional and cognitive investment in the brand, are more likely to disseminate their positive experiences and opinions to others (Brown, 2005). Therefore, the enhancement of consumer engagement using chatbots can result in the generation of more positive WOM (H5b).

Furthermore, engagement is a significant predictor of customer loyalty, as it fortifies the emotional and psychological bonds between consumers and brands (Meyer-Waarden et al., 2023). A study by Petzer & Van Tonder (2019) indicates that engaged consumers develop a more profound sense of trust and commitment, which ultimately manifests in long-term loyalty. Loyal customers are more likely to make repeat purchases, resist competitive offers, and remain committed to the brand over time (Londoño-Giraldo et al., 2024a). Therefore, the integration of chatbots to enhance engagement can play a pivotal role in fostering customer loyalty (H5c).

Lastly, highly engaged consumers are more inclined to consider and eventually decide to purchase a brand's products or services (Recalde et al., 2024). A study by Zheng (2022) found that engagement positively influences purchase intentions and customer acquisition by increasing consumers' perceived value. (H5d).

H5a - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer satisfaction.

H5b - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer WOM.

H5c - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer loyalty.

H5d - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer purchase intentions.

2.5. ROLE OF SERVICE QUALITY

In the world of business, keeping an eye on how customers engage and feel about the service they get is crucial. The perception of service quality, as held by customers, exerts a profound influence over a number of crucial business outcomes, including customer loyalty, WOM referrals, revenue generation, and the overall sustainability of a business (Shen & Tang, 2018). The perception of service quality is shaped by the discrepancy between customers' expectations and their actual experiences (F. Li et al., 2021).

A study conducted by Ju et al. (2019) examined Airbnb's service quality attributes and their influence on customer satisfaction by analyzing a vast dataset of online reviews and surveys. The results demonstrate that high service quality is associated with greater customer satisfaction, thereby underscoring the significance of aligning service delivery with customer expectations. Similarly, recent research by Moon et al. (2019) investigated the relationship between peer-to-peer interactions and various outcome variables, including encounter satisfaction, WOM intention (H6a, H6b), and continuous intention to use.

A continuous intention to use can result in a loyal customer, one who demonstrates a strong preference for a brand. This preference is evidenced by the customer's intention to choose

the brand over competitors, to recommend it, and to increase their purchases in the future (Londoño-Giraldo et al., 2024b). A study by Rita et al., (2019) also emphasized the substantial influence of customer satisfaction and trust on fostering continuous intention to use (H6c, H6d). The researchers discovered that when customers feel satisfied with a product or service and trust the brand, they are more likely to exhibit loyalty behaviors such as repeat purchases and positive WOM recommendations.

H6a - Positive perceptions of service quality mediate the relationship between chatbots and customer satisfaction.

H6b - Positive perceptions of service quality mediate the relationship between chatbots and WOM.

H6c - Positive perceptions of service quality mediate the relationship between chatbots and loyalty.

H6d - Positive perceptions of service quality mediate the relationship between chatbots and purchase intention.

3. METHODOLOGY

To gain insight into the impact of chatbots on consumer behavior and purchasing decisions in the retail industry, and to respond to the research question "What's the difference in the impact of consumer responses to rule-based vs generative AI chatbots?" this study employed an experimental research approach. To gain a comprehensive understanding of the impact of these technologies on consumer behavior, this study compared interactions with rule-based and generative AI chatbots.

This research employed a between-subjects experimental design, a methodology in which, according to Charness (2012) different participants are assigned to separate groups, with each group experiencing a unique condition. A between-subjects design was employed to control for potential carryover effects and individual differences, ensuring that each participant was exposed to a single condition (Appendix A).

In Scenario A, participants engaged with a rule-based chatbot that operated on predefined scripts and responses. In contrast, Scenario B involved a generative AI chatbot capable of producing natural language responses using advanced language models. The specifics of these scenarios are outlined in Appendix A. The objective of each scenario was to simulate a typical customer service interaction in a retail environment, thereby ensuring the relevance and realism of the experimental setup. To control for potential biases and ensure the validity of the findings, participants were randomly assigned to either Scenario A or Scenario B. Each participant interacted with their designated chatbot and subsequently responded to a standardized set of questions designed to assess consumer behavior and purchase behavior.

Once the data had been collected, a statistical analysis was conducted using SPSS, which enabled the responses from the two scenarios to be compared. The study examined notable distinctions between users of rule-based chatbots and users of generative AI chatbots in terms of consumer behavior (loyalty, satisfaction, WOM, and purchase decisions).

The methodological approach was designed to ensure the reliability, validity, and generalizability of the study's findings, thereby making a valuable contribution to both academic research and practical applications in retail marketing and customer service.

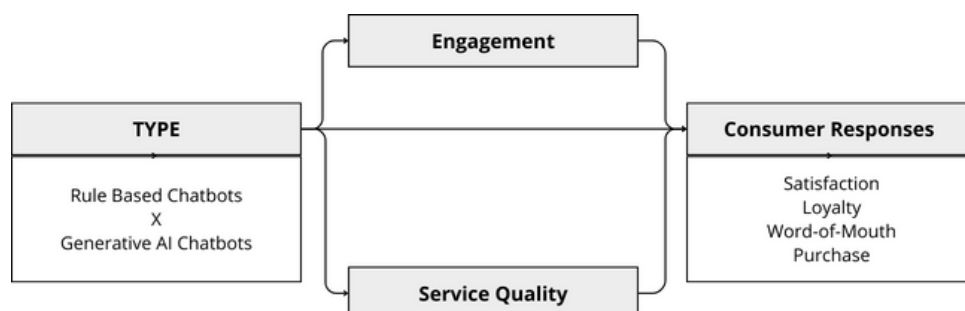


Figure 1 - Conceptual Model. Source: Author

3.1. QUANTITATIVE RESEARCH

This study will rely on primary data collected through quantitative research methods. The relationships between feelings and interactions concerning the hypotheses will be subjected to analysis. To validate the conceptual model, a questionnaire-based survey will be employed. A preliminary test will be conducted with 50 randomly selected respondents to ensure the clarity of the questionnaire and minimize inaccuracies in the responses.

3.2. SURVEY AND SCALES

The questionnaire, presented in English (Appendix A), is composed entirely of closed-ended questions. The questionnaire is meticulously structured into distinct sections to guarantee comprehensive data collection and analysis.

The survey begins with an outline of its purpose, emphasizing the confidentiality of the data collected, the requirement of informed consent, and the objectives of the research project. To filter the participants, the initial question serves as an eliminatory measure, directing those who have never engaged in an online transaction to the conclusion of the survey. Subsequently, participants are randomly assigned to one of two scenarios: a rule-based chatbot (Scenario A) or a generative AI chatbot (Scenario B). To assess the efficacy of the interaction, a manipulation check was conducted. In contrast with the methodology typically employed in experiments of this nature, which typically utilize a single question for this purpose, this study employed six questions. This approach was selected because directly inquiring of participants whether they interacted with a rule-based or generative AI chatbot would likely prove ineffective due to the technical expertise required. Instead, the characteristics commonly associated with these types of chatbots were measured.

The participants were then asked to provide their perceptions of: Interaction, “The chatbot interacted with me in a dynamic way” (Jiang et al., 2022); Adaptability, “The chatbot adapted the responses according to what I said” (Adamopoulou & Moussiades, 2020); Responsiveness, “The chatbot offered me a set of pre-defined answers” (Jiang et al., 2022); Understanding, “I felt like the chatbot understood my questions and provided relevant answers” (Adamopoulou & Moussiades, 2020), and Easiness of conversation, “I found it easy to engage in a natural conversation with the chatbot” (Jiang et al., 2022).

Subsequent questions were also measured on a 7-point Likert scale, with the aim of exploring various constructs. These include satisfaction, loyalty, WOM about the chatbot, the likelihood of recommending it, the intent to continue using both the chatbot and the retailer, engagement, time-saving, the likelihood of purchasing recommended products, and perceptions of service quality and innovation.

The following section addresses general questions regarding the respondents, including their frequency of online shopping, comfort with technology, previous experience with chatbots, the importance of customer support, and overall satisfaction with chatbots.

Lastly, the questionnaire gathers demographic data, including age, gender, and educational attainment, to facilitate a comprehensive understanding of the participant profile.

Variable	Scale	Source (Original Item)	Question (Adapted Item)	Author
Interaction	Likert-scale	The service agent is consistently courteous with customers.	The chatbot interacted with me in a dynamic way.	(Chung et al., 2020b)
Adaptability	Likert-scale	The service agent provides information about products according to my preferences.	The chatbot adapted the responses according to what I said.	
Responsiveness	Likert-scale	Provides prompt service.	The chatbot offered me a set of pre-defined answers.	(Huang et al., 2024)
Understanding	Likert-scale	This AI bot can accurately comprehend what I mean.	I felt like the chatbot understood my questions and provided relevant answers.	(Hsu & Lin, 2023)
Easiness of Conversation	Likert-scale	The AI bot's responses feel natural.	I found it easy to engage in a natural conversation with the chatbot.	
Satisfaction	Likert-scale	I was satisfied with the experience of talking with the service agent.	I would be satisfied with the assistance provided by this chatbot.	(Chung et al., 2020a)
		The service agent did a good job.	The chatbot satisfied my needs.	
WOM	Likert-scale	I recommend Apple to anyone who seeks my advice.	I would recommend using this chatbot to anyone who seeks my advice.	(Z. W. Y. Lee et al., 2019)
		I say positive things about Apple to other people.	I say positive things about this chatbot to other people.	
		I encourage friends to purchase from Apple.	I encourage friends to use this chatbot for purchases.	
Loyalty	Likert-scale	Would do more business with this tourism site in the next few years.	I would use this type of chatbot in the next years for online shopping.	(M.-W. Li et al., 2020)
Engagement	Likert-scale	Using the platform reduces the amount of time I spent doing something else in the class	Using this chatbot reduces the amount of time I spend searching.	(Gao et al., 2020)
		I have intention to buy product from Lazada	I intend to buy the product from this store.	
Purchase Intention	Likert-scale	It is likely that I will visit Lazada when doing online shopping.	I will likely use this chatbot when doing some shopping.	(Agmeka et al., 2019)
		I intend to keep purchasing product by online through Lazada.	I intend to keep purchasing products by online through this chatbot.	
		I intend to continue to purchase from Apple.	I intend to keep buying from this store.	
Repurchase intention	Likert-scale	I intend to acquire products and services from Apple.	I intend to acquire products and services from this chatbot.	(Z. W. Y. Lee et al., 2019)

Variable	Scale	Source (Original Item)	Question (Adapted Item)	Author
		intend to choose Apple as the preferred brand for my future purchases.	I intend to choose this store as the preferred brand for my future purchases.	
		Overall, my purchase experience with this online shop is excellent.	Overall, my purchase experience with this chatbot is excellent.	
Service Quality	Likert-scale	The overall quality of the service provided by this online shop is excellent.	The overall quality of the chatbot is excellent.	(Rita et al., 2019)
		My overall feelings toward this online shop are very satisfied.	My overall feelings toward this chatbot are very satisfied.	
		The service provided by Haidilao is innovative.	I perceive the services recommended by chatbots as innovative.	
Service Innovation	Likert-scale	Haidilao provides the latest user equipment	This chatbot provides the latest experience.	(W.-L. Lee et al., 2022)
		Haidilao is based on the latest technology applications	This chatbot is based on the latest technology.	
		I believe that the tourism site is concerned about my interest.	I believe this chatbot is concerned about my interest.	
Trust	Likert-scale	I have confidence in the products and services of the tourism site.	I have confidence in the products and services of this chatbot.	(M.-W. Li et al., 2020)
		I feel that the tourism site has the ability to provide good products and services.	I feel that this chatbot can provide good products and services.	
		Shopping at AIPARS would be helpful in saving my time.	Shopping with this chatbot would help save my time.	
Usefulness	Likert-scale	Using AIPARS would help in faster shopping.	Using this chatbot would help in faster shopping.	(Pillai et al., 2020)
		It is easier to do my shopping transactions at AIPARS.	It is easier to do my shopping transactions with this chatbot.	
		Was tailored to my situation	This chatbot gave me tailored responses to my situation.	
Personalization	Likert-scale	Felt like a personal experience	Using this chatbot felt like a personal experience.	(Smink et al., 2020)
		Matched my needs.	This chatbot matched my needs.	
		Matched my needs.	This chatbot provides tailored responses to my specific needs.	

Table 1 - Description and Measurement of Variables | Source: Author

In this study, certain variables were included as extra variables (trust, usefulness, personalization, service innovation, and repurchase intention) to ensure a comprehensive

examination of the effects of interactions with rule-based and generative AI chatbots on satisfaction, WOM, loyalty, and purchase behavior in the retail sector.

The perception of reliability and credibility in automated interactions is shaped by trust, which in turn affects satisfaction and the likelihood of recommending the service (WOM). The evaluation of usefulness determines the extent to which chatbots align with consumer expectations, which in turn influences satisfaction, loyalty, and purchase intentions. Personalization entails the adaptation of interactions to individual preferences, which has the potential to enhance satisfaction, loyalty, and repeat service utilization. The assessment of service innovation evaluates the impact of chatbot technology on the enhancement of customer service experiences, which in turn influences overall satisfaction, WOM, loyalty, and purchase intentions. The intention to repurchase is an indicator of the likelihood of consumers making future purchases based on their experience with the chatbot, which reflects their level of commitment to the brand or platform in question.

By analyzing these variables, this study aims to provide a nuanced understanding of how these two types of chatbots influence consumer responses, offering insights into their role in shaping the future of customer engagement strategies in retail.

3.3. SAMPLE

The pretest sample distribution was conducted in May 2024 through a multifaceted outreach strategy that included the use of multiple communication platforms, such as WhatsApp, Instagram, and email. A total of 50 responses were received, 42 of which were deemed valid for analysis. To be included in the sample, respondents were required to have made a purchase online in the retail sector and to be over the age of 18. The questionnaire utilized in the preliminary testing phase was maintained in its original form for the subsequent study.

The final study utilized the same distribution channels employed for the pretest, namely WhatsApp, Instagram, and email, which were conducted in June 2024. A total of 207 responses were received, of which 199 were deemed valid for analysis. The respondents were required to meet the same criteria, namely that they had made an online retail purchase and were over the age of 18.

4. DATA ANALYSIS

The primary data were collected using the online survey tool Qualtrics. Prior to analysis, the data underwent a recoding and cleaning process in Excel. Incomplete responses were removed to ensure the integrity and reliability of the dataset. Subsequently, the cleaned data was subjected to analysis using the statistical software package SPSS.

The coding dictionary utilized for this analysis is presented in Appendix B.

4.1. PRETEST

A preliminary evaluation was conducted in the form of a pretest to ascertain the efficacy and appropriate execution of the experimental manipulation. The primary objective is to identify and rectify any potential issues or inconsistencies in the manipulation process prior to commencing the final assessment.

The data collection for this pretest yielded 42 valid responses from respondents aged between 21 and 45 years old (mean age = 25.57, SD = 5.32). The gender distribution of respondents was 38% male and 62% female.

Sample	Options	%	N
Gender	Male	38	16
	Female	62	26
Age	21	4.8	2
	22	31	13
	23	9.5	4
	24	14.3	6
	25	4.8	2
	26	11.9	5
	27	2.4	1
	28	2.4	1
	29	4.8	2
	30	4.8	2
	34	2.4	1
	35	2.4	1
	43	2.4	1
	45	2.4	1
Diploma	Bachelor's degree	69	29
	Master's degree	28.6	12
	Doctoral Degree	2.4	1
	N/A	0	0

Table 2 - Sample Population Characteristics | Source: Author

A manipulation check was conducted in SPSS to assess the clarity and effectiveness of the scenario presented to participants. The objective of this check was to ensure that respondents understood the provided scenario and that the intended manipulation was successfully implemented.

The following table presents descriptive statistics from the manipulation check, detailing the responses gathered to verify the validity of the experimental setup.

Variable	Scenario	N	Mean	SD	Std. Error	F	Sig.
Interaction	Rule-Based Chatbot	23	3.83	1.70	0.35	27.06	<0.001
	Generative AI Chatbot	19	6.05	0.85	0.20		
Adaptability	Rule-Based Chatbot	23	4.57	1.93	0.40	12.08	<0.001
	Generative AI Chatbot	19	6.26	1.00	0.23		
Personalization	Rule-Based Chatbot	23	5.43	1.70	0.36	0.598	0.444
	Generative AI Chatbot	19	5.00	1.94	0.45		
Understanding	Rule-Based Chatbot	23	4.74	1.51	0.32	9.96	0.003
	Generative AI Chatbot	19	6.00	0.94	0.22		
Easiness of conversation	Rule-Based Chatbot	23	3.78	1.83	0.38	17.93	<0.001
	Generative AI Chatbot	19	5.84	1.17	0.27		

Table 3 – Manipulation Check - Pretest. | Source: Author

The respondents reported higher levels of interaction, adaptability, understanding, and ease of conversation associated with an interaction with a generative AI chatbot. The only variable that exhibited no significant change between the two scenarios was personalization. As the manipulation was overall successful, no changes were made to the survey or the manipulation for the final test.

4.2. STUDY 1

A total of 207 responses were received for Study 1, conducted on the Qualtrics platform. Of these, only 199 were deemed to be valid for analysis.

The participants were randomly assigned to one of the two conditions. The experiment was conducted between subjects, with each respondent viewing only one of the conditions. One hundred individuals were presented with rule-based chatbots, while 99 were presented with generative AI chatbots.

Regarding the descriptive question, "How would you rate your overall satisfaction with chatbots based on your previous experience," it was observed that several responses did not record any value. The missing values were replaced with zero, as they had no impact on the scenario analysis.

4.2.1. DESCRIPTIVE ANALYSIS

The final sample consisted of 199 participants, the majority of whom were female (53.8%), with ages ranging from 21 to 70 years. Most respondents (58.3%) possessed a bachelor's degree. The socio-demographic characteristics of the study sample are summarized in Figures 2, 3, and 4.

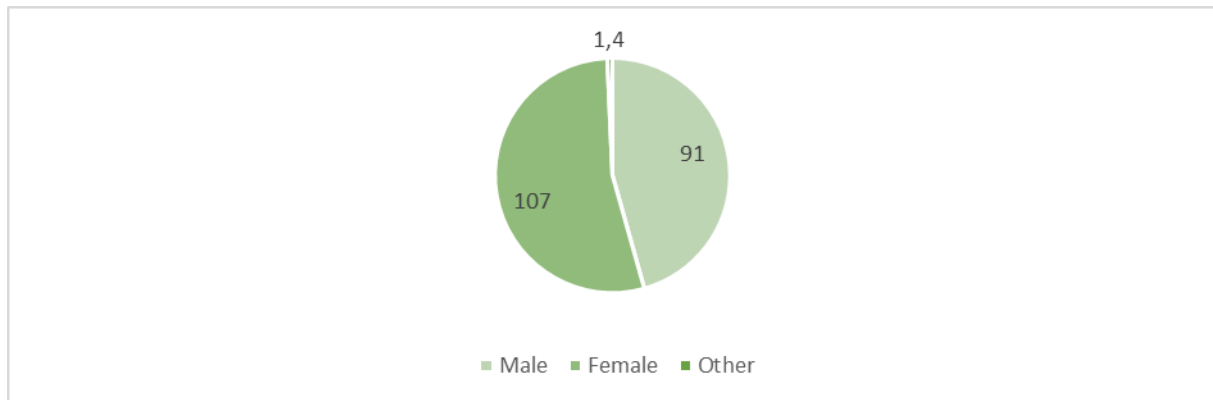


Figure 3 - Gender. Study1 | Source:Author

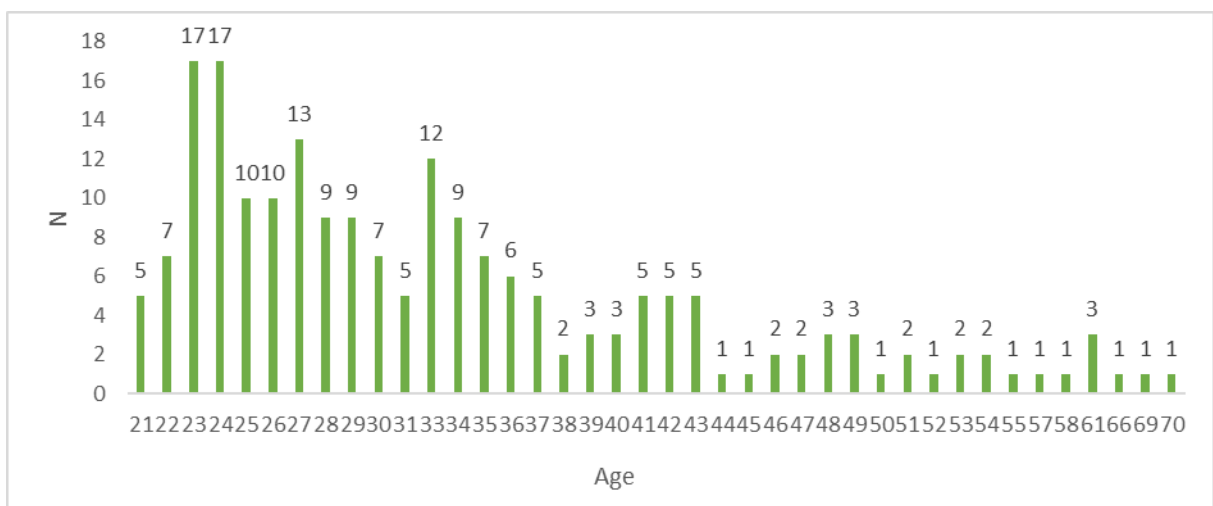


Figure 2 – Age. Study 1 | Source: Author

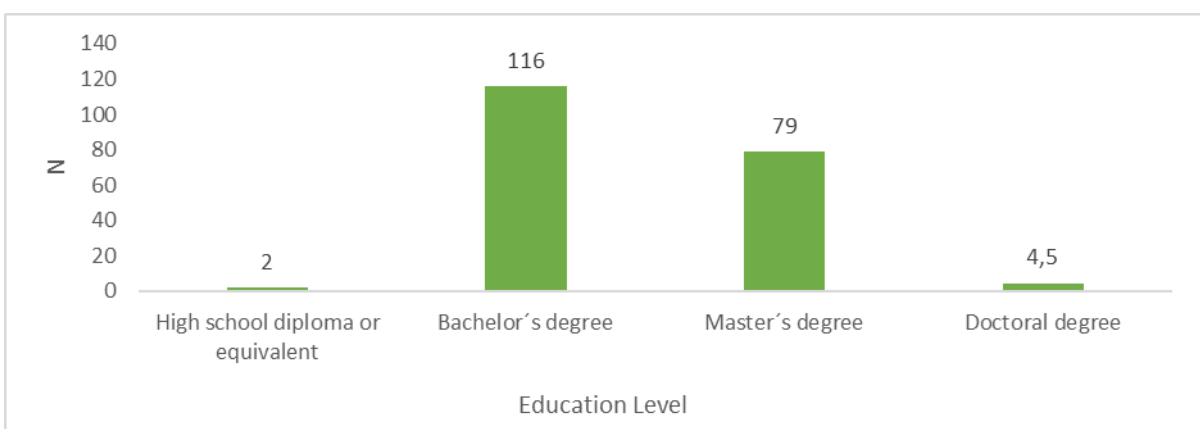


Figure 4 - Education level. Study 1 | Source: Author

To gain a deeper insight into the sample, eight questions were posed, including inquiries regarding the frequency of technology use, comfort in utilizing technology for shopping, the importance placed on customer support and availability, the abandonment of shopping carts, familiarity with chatbots, past interactions with chatbots, and satisfaction with those past interactions. The complete list of survey questions can be found in Appendix A and is summarized in Table 4.

Variable	Mean	SD
Frequency of technology use	3.06	0.95
Comfort using technology for shopping	4.31	0.95
Importance of customer support	2.54	0.80
Availability of customer support	3.42	1.1
Abandonment of shopping carts	3.93	0.91
Familiarity with chatbots	3.39	0.83
Past interactions with chatbots	1.12	0.33
Satisfaction with past chatbot interactions	2.68	1.34

Table 4 - Demographic Questions – Study 1 | Source: Author

The respondents exhibited a moderate frequency of technology use ($M = 3.06$, $SD = 0.95$), indicating that they engaged in online shopping approximately once a month. The standard deviation of 0.95 suggests a moderate variability in the frequency of online shopping among respondents, with the majority of individuals engaging in this activity between occasionally and once a week.

The results indicate that respondents generally express a high level of comfort with using technology for shopping purposes ($M=4.31$, $SD=0.95$). This suggests that the majority of respondents feel quite comfortable using websites or apps for shopping. The standard deviation of 0.95 indicates that while the majority of respondents exhibit a high level of comfort, there is a degree of variability, with a few respondents reporting a lower level of comfort.

The level of importance placed on customer support during online shopping experiences is moderate ($M=2.54$, $SD=0.80$), with respondents indicating a tendency towards occasionally seeking assistance. The standard deviation of 0.80 indicates a relatively consistent set of responses, with the majority of respondents indicating an occasional need for assistance.

Regarding the availability of customer support ($M=3.42$, $SD=1.1$), respondents also show a moderate likelihood to abandon their shopping carts ($M=3.93$, $SD=0.91$), reflecting a tendency towards likely abandoning the cart if they encounter difficulties or have unanswered questions during the checkout process. The standard deviation of 0.91 indicates some variability in responses, with a significant portion being neutral to very likely to abandon their carts.

The respondents demonstrated a moderate level of familiarity with chatbots, with an average score of 3.39 and a standard deviation of 0.83. This indicates that they have a general understanding of chatbots. The standard deviation of 0.83 indicates a high degree of consistency in responses, with the majority of respondents exhibiting a comparable level of familiarity.

The population reported a low frequency of past interactions with chatbots ($M = 1.13$, $SD = 0.33$), indicating a limited prior experience with chatbots. The standard deviation of 0.33 indicates a high degree of consistency in responses, with the majority of respondents exhibiting a comparable level of interaction. Overall, the respondents indicated a neutral to slightly dissatisfied level of satisfaction with their previous experiences with chatbots, with an average score of 2.68 and a standard deviation of 1.34. The standard deviation of 1.34 indicates a high degree of variability in satisfaction, suggesting that those who have used chatbots have had a range of experiences.

The extra variables, namely trust, usefulness, service innovation, repurchase intention, and personalization, were subjected to analysis through ANOVA (F and p values). The results demonstrated that the observed differences in perceptions of these variables were statistically significant among the participants in this study. In particular, participants rated the generative AI chatbot as more useful, innovative in service, likely to influence repurchase intention, and better at personalization than the rule-based chatbot, as evidenced in Table 5.

Variable	Scenario	N	Mean	SD	Std. Error	F	Sig.
Trust	Rule-Based Chatbot	100	3.73	1.42	0.14	32.94	<0.001
	Generative AI Chatbot	99	4.63	1.37	0.14		
Service innovation	Rule-Based Chatbot	100	3.08	1.60	0.16	71.20	<0.001
	Generative AI Chatbot	99	4.85	1.33	0.13		
Repurchase intention	Rule-Based Chatbot	100	3.82	1.57	0.16	20.91	<0.001
	Generative AI Chatbot	99	5.02	1.36	0.14		
Personalization	Rule-Based Chatbot	100	3.64	1.60	0.16	31.82	<0.001
	Generative AI Chatbot	99	5.16	1.32	0.13		
Usefulness	Rule-Based Chatbot	100	4.29	1.82	0.18	53.63	<0.001
	Generative AI Chatbot	99	5.54	1.24	0.12		

Table 5 - Extra variables analysis - Study 1 | Source: Author

4.2.2. ALPHA DE CRONBACH

To assess the reliability of the questionnaire, Cronbach's alpha was calculated. This coefficient ranges from 0 to 1, with values of 0.6 or lower indicating unsatisfactory reliability.

The current survey demonstrates strong reliability and internal consistency for each variable with more than three scales, with all values exceeding 0.89.

Cronbach's Alpha	Variables
0,97	WOM
0.90	Purchase Intention
0.93	Repurchase Intention
0.97	Service Quality
0.94	Service Innovation
0.90	Trust
0.98	Usefulness
0.95	Personalization

Table 6 - Summary of Reliability - Study 1. Cronbach's Alpha | Source: Author

4.2.3. PEARSON CORRELATION

To analyze the reliability of variables with two items, a Pearson correlation analysis was conducted. The results revealed a coefficient of 0.87 for satisfaction, indicating a strong positive linear relationship, and a coefficient of 0.68 for engagement, suggesting a moderately strong positive association.

Pearson Correlation	Variables
0.87	Satisfaction
0.68	Engagement

Table 7 - Pearson Correlation Study 1: Satisfaction & Engagement | Source: Author

4.2.4. MANIPULATION CHECK

As was the case in the pretest for Study 1, a manipulation check (ANOVA) was conducted in SPSS to assess the clarity and effectiveness of the scenario presented to participants.

The manipulation check for the experiment was successful across most variables, indicating clear distinctions between the rule-based chatbot and the generative AI chatbot.

Table 8 presents the results of the manipulation check, which were used to verify the validity of the experimental setup.

Variable	Scenario	N	Mean	SD	Std. Error	F	Sig.
Interaction	Rule-Based Chatbot	100	3.80	1.72	0.17	95.60	<0.001
	Generative AI Chatbot	99	5.70	0.87	0.98		
Adaptability	Rule-Based Chatbot	100	4.77	1.59	0.16	57.65	<0.001
	Generative AI Chatbot	99	6.14	0.86	0.09		
Personalization	Rule-Based Chatbot	100	6.14	1.19	0.12	47.14	<0.001
	Generative AI Chatbot	99	4.70	1.73	0.17		
Understanding	Rule-Based Chatbot	100	4.23	1.63	0.16	67.46	<0.001
	Generative AI Chatbot	99	5.82	1.03	0.10		
Easiness of conversation	Rule-Based Chatbot	100	3.63	1.79	0.18	73.93	<0.001
	Generative AI Chatbot	99	5.51	1.24	0.13		

Table 8 - Manipulation Check - ANOVA. | Source: Author

Regarding the Interaction variable, the generative AI chatbot exhibited a markedly higher mean score (5.70) in comparison to the rule-based chatbot (3.80). Additionally, the standard deviation was lower for the generative AI chatbot (0.87) in comparison to the rule-based chatbot (1.72), which suggests greater consistency and reliability in the quality of the interaction. Similarly, the generative AI chatbot demonstrated substantially higher adaptability, with a mean score of 6.14, in comparison to the rule-based chatbot's mean of 4.77. Additionally, the standard deviation for the generative AI chatbot was considerably lower (0.86 vs 1.59), indicating strong and consistent adaptability.

In terms of Understanding, the generative AI chatbot also demonstrated superior performance relative to the rule-based chatbot, with a mean score of 5.82 as opposed to 4.23. Additionally, it exhibited less variability (SD of 1.03 vs 1.63). With regard to Easiness of conversation, the generative AI chatbot achieved a mean score of 5.51, which was significantly higher than that of the rule-based chatbot (3.63). Additionally, the standard deviation was lower for the generative AI chatbot (1.24) compared to the rule-based chatbot (1.79), which further highlights the superior easiness of conversation capabilities of the former.

However, the anticipated pattern was not observed with regard to the variable of Personalization. The rule-based chatbot exhibited a higher mean score (6.14) than the generative AI chatbot (4.70), with a lower standard deviation (1.19 vs 1.73). This suggests that participants perceived the rule-based chatbot as more personalized than the generative AI chatbot. Nevertheless, this anomaly, the manipulation check proved generally successful for the majority of variables.

4.2.5. HYPOTHESIS TESTING

In this study, we employed hypothesis testing to assess the influence of chatbots on a range of consumer-related outcomes, as detailed in Table 9. To examine the main effects (DV), we employed independent samples t-tests to compare the performance of rule-based chatbots and generative AI chatbots on satisfaction, WOM, loyalty, and purchase intention. Furthermore, to investigate the mediating effects of engagement and service quality, we utilized the Hayes Process Model 4, conducting mediation analyses to ascertain the indirect effects of chatbots on these key outcomes.

Variables		Hypotheses	Type of Analysis
Dependent Variable	Satisfaction	H1	Independent Samples t-test
	WOM	H2	Independent Samples t-test
	Loyalty	H3	Independent Samples t-test
	Purchase	H4	Independent Samples t-test
Mediator	Engagement	H5a, H5b, H5c, H5d	Mediation Analysis
	Service Quality	H6a, H6b, H6c, H6d	Mediation Analysis

Table 9 - Type of analysis | Source: Author

4.2.5.1. MAIN EFFECT TEST

To test the main effect of chatbots on the dependent variables (DV), an independent samples t-test analysis was conducted.

The analysis compared the performance of rule-based chatbots and generative AI chatbots across four variables: satisfaction, WOM, loyalty, and purchase intention. The results indicated significant differences between the two types of chatbots in all tested hypotheses, as presented in Table 10 with generative AI chatbots outperforming rule-based chatbots in every instance.

Variables	Scenario	Hypothesis	Mean	SD	t	p	Verification
Satisfaction	Rule-based chatbot	H1	4.15	1.66	-6.51	<0.001	Supported
	Generative AI chatbot		5.49	1.19			
WOM	Rule-based chatbot	H2	3.62	1.79	-6.94	<0.001	Supported
	Generative AI chatbot		5.21	1.42			
Loyalty	Rule-based chatbot	H3	3.71	1.87	-6.04	<0.001	Supported
	Generative AI chatbot		5.20	1.60			
Purchase	Rule-based chatbot	H4	4.1	1.43	-5.57	<0.001	Supported
	Generative AI chatbot		5.17	1.18			

Table 10 - Main effect test | Source: Author

The independent samples t-test analysis demonstrated that generative AI chatbots significantly outperformed rule-based chatbots across all variables: satisfaction, WOM, loyalty, and purchase intention. The results for each hypothesis (H1 to H4) were strongly supported, with generative AI chatbots showing higher mean scores in all variables and achieving statistically significant differences ($p < 0.001$) compared to rule-based chatbots.

4.2.5.2. MEDIATION EFFECT

In this study, we employed mediation analysis using the simple mediation conceptual model (Model 4) as proposed by Andrew Hayes. The objective is to examine the mediating effects of engagement and service quality on the relationship between chatbots - independent variable (IV) - and various dependent variables (DV), including satisfaction, WOM, loyalty, and purchase behavior.

By conducting eight different tests, we aimed to uncover whether the presence of engagement and service quality could explain the impact of chatbots on these key outcomes.

Independent Variable	Mediator	Dependent Variable	Path A IV on Mediator	Path B Mediator on DV	Total Effect	Direct Path	Indirect Path		Mediation
							BootLLCI	BootULCI	
Chatbots	Engagement	Satisfaction	5.37 (1.11)**	15.85 (0.74)**	6.51 (1.33) **	3.50 (0.51)**	0.329	0.705	Significant
Chatbots	Engagement	WOM	5.37 (1.11)**	19.02 (0.89)**	6.94 (1.59) **	4.11 (0.60)**	0.362	0.741	Significant
Chatbots	Engagement	Loyalty	5.37 (1.11)**	19.65 (0.97)**	6.05 (1.49) **	2.70 (0.41)	0.368	0.763	Significant
Chatbots	Engagement	Purchase	5.37 (1.11)**	18.22 (0.71)**	5.67 (1.05) **	2.16 (0.26)*	0.104	0.765	Significant
Chatbots	Service Quality	Satisfaction	7.64 (1.60)**	23.65 (0.84)**	6.51 (1.33) **	-0.113 (-0.01)	0.641	1.056	Significant
Chatbots	Service Quality	WOM	7.64 (1.60)**	24.13 (0.94)**	6.94 (1.59) **	0.57 (0.07)	0.638	1.040	Significant
Chatbots	Service Quality	Loyalty	7.64 (1.60)**	20.67 (0.97)**	6.05 (1.49) **	-0.44 (0.07)	0.627	1.026	Significant
Chatbots	Service Quality	Purchase	7.64 (1.60)**	17.81 (0.70)**	5.67 (1.05) * *	-0.49 (-0.06)	0.694	0.997	Significant

Table 11 - Process Model by Andrew Hayes. Source: Author

*<0.05

**<0.01

The mediation analysis results for your study examining the effects of chatbots on various consumer outcomes through two mediators - emotional engagement and service quality - are summarized in Table 11. The significance of the mediation effects is determined by whether the confidence intervals (BootLLCI and BootULCI) include zero.

All hypothesized mediation effects were found to be significant, as the confidence intervals for all indirect paths do not include zero. This suggests that both consumer emotional engagement and positive perceptions of service quality are significant mediators in the relationships between chatbot use and various consumer outcomes such as satisfaction, WOM, loyalty, and purchase intentions. These findings highlight the importance of enhancing emotional engagement and service quality perceptions to leverage the full potential of chatbots in driving positive consumer behaviors.

5. DISCUSSION

The research findings are presented in this section along with a comparison analysis of the findings with previous research on chatbots in retail. The purpose of this study is to respond to the guiding research question: "What's the difference in the impact of consumer responses to rule-based vs generative AI chatbots?" and to understand how service quality and consumer behavior, affect customer emotions such as satisfaction, loyalty, WOM, and purchase behavior in retail.

In table 12 is possible to have an overview of the hypothesis results.

Hypotheses	Verification
H1 - The utilization of generative chatbots in e-commerce positively influences consumer satisfaction.	Supported
H2 - The utilization of generative chatbots in e-commerce positively influences WOM.	Supported
H3 - The utilization of generative chatbots in e-commerce positively influences loyalty.	Supported
H4 - The utilization of generative chatbots in e-commerce positively influences purchase intention.	Supported
H5a - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer satisfaction.	Supported
H5b - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer WOM.	Supported
H5c - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer loyalty.	Supported
H5d - Consumer emotional engagement mediates the relationship between the use of chatbots and consumer purchase intentions.	Supported
H6a - Positive perceptions of service quality mediate the relationship between chatbots and customer satisfaction.	Supported
H6b - Positive perceptions of service quality mediate the relationship between chatbots and WOM.	Supported
H6c - Positive perceptions of service quality mediate the relationship between chatbots and loyalty.	Supported
H6d - Positive perceptions of service quality mediate the relationship between chatbots and purchase intention.	Supported

Table 12 - Hypothesis Verification | Source: Author

The results of the data analysis corroborated the hypotheses, indicating that generative AI chatbots outperform rule-based chatbots in various aspects of consumer interaction in e-commerce settings. In particular, the findings demonstrate that generative AI chatbots markedly improve consumer satisfaction, WOM, loyalty, and purchase intentions.

A key factor contributing to these positive outcomes is the superior service quality and engagement provided by generative AI chatbots, which offer more adaptive and personalized responses compared to their rule-based counterparts. This enhanced interaction quality leads to stronger consumer emotional engagement, further amplifying the positive effects on consumer behavior.

6. CONCLUSIONS AND FUTURE RESEARCH

6.1. THEORETICAL CONTRIBUTIONS

This study makes several notable contributions to the existing literature on the application of AI in the retail sector. The study presents empirical evidence indicating that generative chatbots outperform rule-based ones in enhancing consumer satisfaction, fostering WOM, strengthening customer loyalty, and influencing purchase intentions. The research extends the work of Ngai (2021) on the importance of chatbots in customer service by demonstrating the specific advantages of generative AI. Furthermore, it extends the work of Zhou (2023) by offering insights into user adoption and the impact of advanced AI mechanisms. Moreover, the study aligns with Huang (2024) who examined customer satisfaction with chatbot performance, and also with the studies regarding user acceptance and the impact of AI chatbots on fostering loyalty (Hsu & Lin, 2023; Pelau et al., 2021). These contributions significantly enhance the existing body of knowledge, providing a more nuanced understanding of the factors that drive positive consumer responses to AI chatbots. Some of the studies that compared AI and generative models did not include the variables that I utilized, while others included my variables but did not conduct a comparison between the two types of chatbots. The results of this study present a more comprehensive analysis by incorporating both the unique variables and a comparison of both chatbot types.

By confirming that generative chatbots significantly enhance consumer satisfaction, WOM, loyalty, and purchase intentions, this study adds to the theoretical framework that positions AI as a pivotal tool in modern customer service and engagement strategies. The findings emphasize the role of consumer emotional engagement and positive perceptions of service quality as critical mediators in the relationship between chatbot type and consumer responses, which aligns with and extends existing theories on technology acceptance and user experience.

6.2. MANAGEMENT IMPLICATIONS

The results of this study have significant implications for the retail industry. The integration of generative AI chatbots into customer service strategies can significantly enhance customer engagement and loyalty. The practical applications of these chatbots include the ability to provide tailored product recommendations, facilitate efficient service delivery, and more. By capitalizing on the sophisticated capabilities of generative AI, retailers can enhance customer satisfaction, foster brand loyalty, stimulate WOM, and influence purchase behavior, ultimately leading to improved overall business performance.

In practice, this means that companies can deploy generative AI chatbots to handle a variety of customer service tasks, ranging from answering frequently asked questions to assisting with complex queries that require a more nuanced understanding. Moreover, the use of generative chatbots can contribute to better data collection and analysis, as these systems can capture

and analyze customer interactions in real time. This data can be used to gain insights into customer preferences and behaviors, allowing companies to refine their strategies. The insights gained from chatbot interactions can also inform product development and improvement, ensuring that companies can meet the evolving needs and expectations of their customers.

To effectively implement these findings, managers should consider adopting generative AI chatbots into customer service channels to handle common inquiries, offer personalized recommendations, and provide 24/7 support. Continuously train and optimize these chatbots using customer interaction data to improve their understanding and responsiveness, regularly updating them to address new types of customer queries and feedback. Utilize generative AI to streamline service delivery, reducing wait times and improving the accuracy of responses, thus enhancing overall customer experience and satisfaction and leverage the data collected from chatbot interactions to gain insights into customer behavior and preferences, implementing these insights to refine marketing strategies, develop new products, and improve existing offerings.

6.3. RESEARCH LIMITATIONS AND FUTURE STUDIES

Despite its contributions, this study has some limitations. Firstly, the study was limited to the retail sector, raising concerns about the generalizability of findings to other industries and it did not explore the long-term impacts of chatbot interactions, which could provide further insights into their sustained effects over time.

It would be beneficial for future research to investigate the impact of generative AI chatbots in other sectors, such as healthcare and finance, in order to gain a more comprehensive understanding of their broader applicability. It would also be beneficial to investigate the long-term effects of customer behavior resulting from interactions with AI chatbots.

Another important area for future research is the investigation of consumer reactions to poor chatbot performance, comparing responses to failures in generative AI chatbots vs rule-based chatbots. Understanding how different chatbot types handle errors and the subsequent impact on consumer satisfaction, trust, loyalty, and purchase behavior. This would provide valuable insights into the resilience of these systems and help develop strategies to mitigate negative effects in instances of poor performance.

Finally, future studies could examine the impact of integrating AI chatbots with other advanced technologies, such as augmented reality and virtual reality, to create even more immersive and engaging customer experiences. By exploring these innovative combinations, researchers can provide valuable insights into the future direction of customer service and engagement technologies.

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APPENDIX A

22/06/24, 22:07

Qualtrics Survey Software

Consentimento informado para participar da pesquisa

Dear participant,

My name is Constança Neves, and I am currently working on my thesis dissertation as part of the Master's program in Data Driven Marketing with a specialization in Digital Marketing and Analytics at Nova Information Management School.

This study aims to **understand consumer behavior regarding Chatbots.**

There is no wrong or right answer, and there is no risk involved in answering any of the following questions. Remember that your participation in this survey is voluntary, which means that you are free to participate or not and give up at any time. However, your responses are important, completely anonymous, and will be used only for academic purposes.

This study will take approximately 5 minutes to complete.

If you have any questions, please don't hesitate to contact me at 20220164@novaims.unl.pt.

Thank you very much for your attention and co-operation.

Informed Consent Form

- I declare that I am 18 or over and agree to participate in this research.
- I declare that I was informed that my participation in this study is voluntary and that I can leave this survey at any time without penalty, and all data is confidential.
- I understand that I will evaluate responses and that this study does not offer serious risks.

- ☐ Yes, I agree to participate
- ☐ No, I disagree to participate

Eliminatória

Have you ever made a purchase from an online retail store?

- ☐ Yes
- ☐ No

Scenario A - Rule Based Chatbots

Chatbots are innovative digital assistants designed to provide support and assistance to users, particularly in scenarios such as online retail, where their primary goal is to enhance the shopping experience and facilitate customer interactions.

Before we proceed, please consider a scenario where you are considering purchasing personal care products from an online retailer. You go to the company website but you have doubts about the products, so you interact with the chatbot to try to clarify your questions

shop

Q

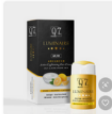
+

♥

🛒

Sign in

Results:



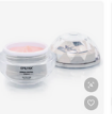
G'Pari Skincare
G'Pari Lumina 848PM Advanced Active
Lightening Face Cream with Vitamin C...
★★★★★ (5)
£29.99



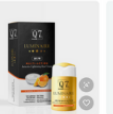
Wholesale Natural Body Care
Vitamin C Ret Aging Moisturizer - Retinol
Lotion - Whitening - Face Cream
★★★★★ (5)
\$5.99



Glimmer Goddess® Organic Skin Care
Organic Vitamin C Face Cream SPF 30 -
Brightens and Tightens Skin
★★★★★ (5)
\$29.95



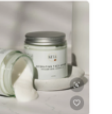
Epilure
Retinol Smoothing Hydrating Face Cream
Retinol and Aloe Vera Skin - Evening an...
★★★★★ (5)
\$29.99



G'Pari Skincare
G'Pari Lumina 848PM Advanced Active
Lightening Face Cream with...
★★★★★ (5)
£29.99



Dilucant
Retinol Vitamin C Daily Skin Face
Cream
★★★★★ (5)
\$9.95



Kosmelecce
antiwrinkle PORE CREAM infused with
vitamin E
★★★★★ (5)
£24.99

Hello! How can I assist you today? (Choose one option)

Product

Returns

Shipping

Order Status

Promotions

Store Locations

Other Help

chatbot

Product

Ok. Below are some categories you might be interested in: (Choose one option)

Skincare

Makeup

Haircare

Fragrances

Men's Grooming

Other Help

chatbot

Skincare

Great. Choose a category within skincare:(Choose one option)

Cleansers

Moisturizers

Serums

Masks

Sunscreen

Acne

Other Help

chatbot

Acne

These are our top acne treatment products. Is there anything else I can assist you with? (Choose one option)

Product

Returns

Shipping

Order Status

Promotions

Store Locations

Other Help

chatbot

No, thank you

Product

your response

Skincare

your response

Acne

your response

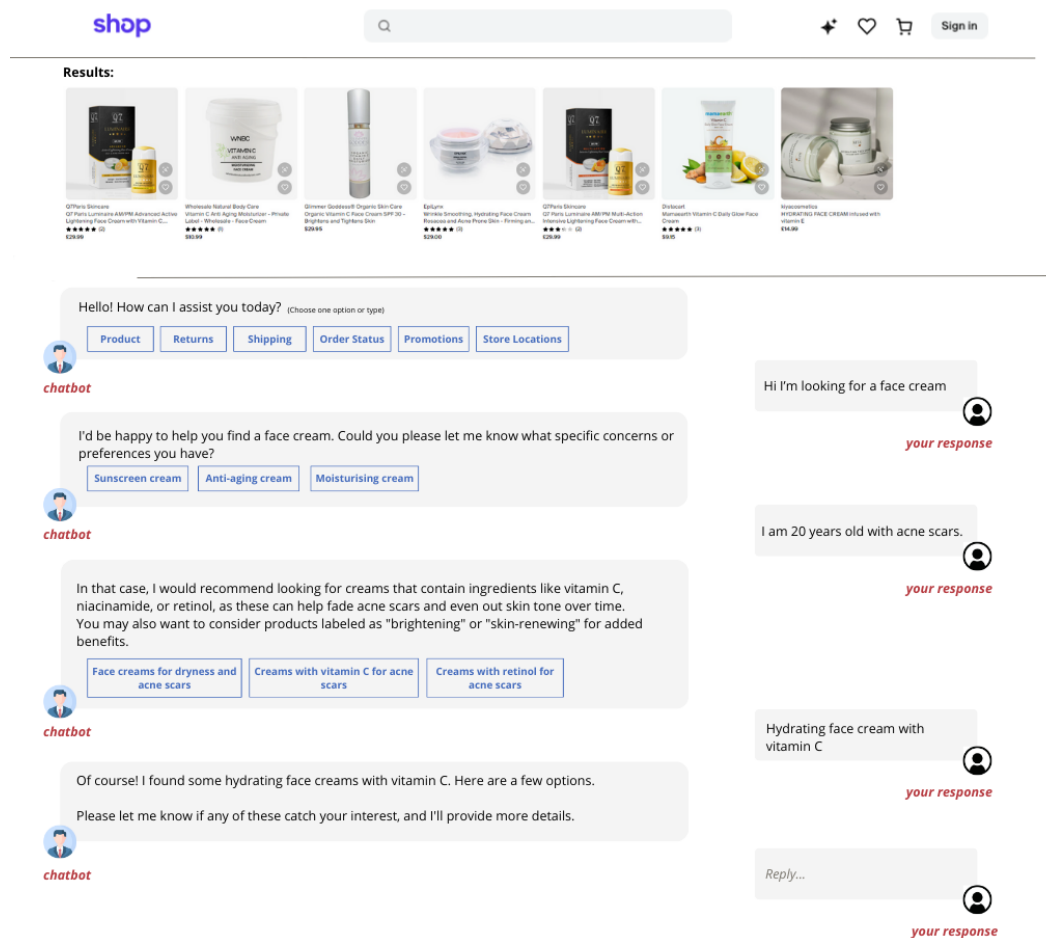
No, thank you

your response

Scenario B - Generativa AI Chatbots

Chatbots are innovative digital assistants designed to provide support and assistance to users, particularly in scenarios such as online retail, where their primary goal is to enhance the shopping experience and facilitate customer interactions.

Before we proceed, please consider a scenario where you are considering purchasing personal care products from an online retailer. You go to the company website but you have doubts about the products, so you interact with the chatbot to try to clarify your questions



Manipulation check

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

1 (Totally disagree) - 7 (Totally agree)

	1	2	3	4	5	6	7
The chatbot interacted with me in a dynamic way	☐	☒	☐	☐	☐	☐	☐
The chatbot adapted the responses	☐	☒	☐	☐	☐	☐	☐

1 (Totally disagree) - 7 (Totally agree)

	1	2	3	4	5	6	7
according to what I said							
The chatbot offered me a set of pre-defined answers	☐	☐	☐	☐	☐	☐	☐
I felt like the chatbot understood my questions and provided relevant answers	☐	☐	☐	☐	☐	☐	☐
I found it easy to engage in a natural conversation with the chatbot	☐	☐	☐	☐	☐	☐	☐

Construct table

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

1 (strongly disagree) - 7 (strongly agree)

	1	2	3	4	5	6	7
I would be satisfied with the assistance provided by this chatbot	☐	☐	☐	☐	☐	☐	☐
I would feel my needs were completed by this chatbot.	☐	☐	☐	☐	☐	☐	☐
I would recommend this chatbot to others for online shopping.	☐	☐	☐	☐	☐	☐	☐
I would say positive things about this chatbot to others.	☐	☐	☐	☐	☐	☐	☐
I would encourage others to use this chatbot for online shopping.	☐	☐	☐	☐	☐	☐	☐
I would use this type of chatbots in the next	☐	☐	☐	☐	☐	☐	☐

1 (strongly disagree) - 7 (strongly agree)

	1	2	3	4	5	6	7
years for online shopping							

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

	1 (strongly disagree) - 7 (strongly agree)						
	1	2	3	4	5	6	7
Interacting with this chatbot would enhance my engagement with the product.	☐	☐	☐	☐	☐	☐	☐
Using this chatbot would reduce the amount of time I spent searching.	☐	☐	☐	☐	☐	☐	☐

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

	1 (strongly disagree) - 7 (strongly agree)						
	1	2	3	4	5	6	7
I would intend to buy a product from this retailer.	☐	☐	☐	☐	☐	☐	☐
It is likely that I would use this online retailer for future shopping.	☐	☐	☐	☐	☐	☐	☐
I would plan to purchase a product with the help of this chatbot.	☐	☐	☐	☐	☐	☐	☐
I would intend to keep buying from this store.	☐	☐	☐	☐	☐	☐	☐
I would plan to acquire products from this online retailer using	☐	☐	☐	☐	☐	☐	☐

1 (strongly disagree) - 7 (strongly agree)

	1	2	3	4	5	6	7
the chatbot in the future.							
I would choose this chatbot as my preference for future purchases.	☐	☐	☐	☐	☐	☐	☐

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

1 (strongly disagree) - 7 (strongly agree)

	1	2	3	4	5	6	7
Overall, the experience with this chatbot's service is excellent.	☐	☐	☐	☐	☐	☐	☐
The quality of service provided by this chatbot is excellent.	☐	☐	☐	☐	☐	☐	☐
I would be very satisfied with my overall experience with this chatbot.	☐	☐	☐	☐	☐	☐	☐
I perceive the services provided by this chatbot as innovative.	☐	☐	☐	☐	☐	☐	☐
This chatbot offers a cutting-edge experience.	☐	☐	☐	☐	☐	☐	☐
This chatbot utilizes the latest technology.	☐	☐	☐	☐	☐	☐	☐

Please assess the following statements considering the situation you just saw:

(According to the scale where 1 represents Totally Disagree and 7 represents Totally Agree)

1 (strongly disagree) - 7 (strongly agree)

	1	2	3	4	5	6	7
I trust that this chatbot has my best interests in mind.	☐	☐	☐	☐	☐	☐	☐
I have confidence in the products provided by this chatbot.	☐	☐	☐	☐	☐	☐	☐
I believe this chatbot is capable of providing high-quality products and services.	☐	☐	☐	☐	☐	☐	☐
Interacting with this chatbot is helpful in saving my time.	☐	☐	☐	☐	☐	☐	☐
Using this chatbot makes shopping faster and more efficient.	☐	☐	☐	☐	☐	☐	☐
It is easier to complete my shopping tasks with the assistance of this chatbot.	☐	☐	☐	☐	☐	☐	☐
This chatbot provides tailored responses to my specific needs.	☐	☐	☐	☐	☐	☐	☐
Interacting with this chatbot feels personalized to my situation.	☐	☐	☐	☐	☐	☐	☐
This chatbot effectively meets my individual needs.	☐	☐	☐	☐	☐	☐	☐

Uso e conhecimento de Chatbot

How often do you shop online?

- ☐ Rarely or never
- ☐ Occasionally
- ☐ Once a month
- ☐ Once a week
- ☐ Several times a week

How comfortable are you with using technology, such as websites or apps, for shopping purposes?

- ☐ Very uncomfortable
- ☐ Uncomfortable
- ☐ Neutral
- ☐ Comfortable
- ☐ Very comfortable

How often do you seek assistance or information from customer service representatives when shopping online?

- ☐ Never
- ☐ Rarely
- ☐ Occasionally
- ☐ Often
- ☐ Always

How important is the availability of customer support during your online shopping experience?

- ☐ Not important at all
- ☐ Slightly important
- ☐ Moderately important
- ☐ Very important
- ☐ Extremely important

How likely are you to abandon your online shopping cart if you encounter difficulties or have unanswered questions during the checkout process?

- ☐ Very unlikely
- ☐ Unlikely
- ☐ Neutral
- ☐ Likely
- ☐ Very likely

How familiar are you with chatbots?

- ☐ Not familiar at all
- ☐ Somewhat familiar
- ☐ Moderately familiar
- ☐ Very familiar
- ☐ Extremely familiar

Have you ever interacted with a chatbot while shopping online before?

- ☐ Yes
- ☐ No

How would you rate your overall satisfaction with chatbots based on your previous experiences?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neutral
- ☐ Satisfied
- ☐ Very satisfied

Demographic

How old are you? (in number)

Your gender?

- ☐ Male
- ☐ Female
- ☐ Other

☐ I'd rather not answer

What is the highest level of education you have completed?

- ☐ Below high school
- ☐ High school diploma or equivalent
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctoral degree
- ☐ N/A

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APPENDIX B

This **coding dictionary** is used to standardize the database in Excel by converting variable names into numerical codes, facilitating analysis in SPSS.

Consent	1 – Yes 2 - No
Eliminatory	1 – Yes 2 - No
Q7 – Frequency of technology use: “How often do you shop online?”	1 - Rarely or never 2 - Occasionally 3 - Once a month 4 - Once a week 5 - Several times a week
Q8 - comfort using technology for shopping “How comfortable are you with using technology, such as websites or apps, for shopping purposes? “	1 - Very uncomfortable 2 - Uncomfortable 3 – Neutral 4 - Comfortable 5 - Very comfortable
Q9 - need for assistance when shopping online “How often do you seek assistance or information from customer service representatives when shopping online? “	1 - Never 2- Rarely 3 - Occasionally 4 - Often 5 - Always
Q10 - importance of customer support “How important is the availability of customer support during your online shopping experience?”	1 - Not important at all 2- Slightly important 3 - Moderately important 4 - Very important 5 - Extremely important
Q11 - likelihood of abandoning the shopping cart “How likely are you to abandon your online shopping cart if you encounter difficulties or have unanswered questions during the checkout process?”	1 - Very unlikely 2 - Unlikely 3 – Neutral 4 - Likely 5 - Very likely
Q12 - familiarity with chatbots “How familiar are you with chatbots?”	1 - Not familiar at all 2 - Somewhat familiar 3 - Moderately familiar 4 - Very familiar 5 - Extremely familiar
Q13 - previous interactions with chatbots “Have you ever interacted with a chatbot while shopping online before?”	1 - Yes 2 – No
Q14 - overall satisfaction with those experiences - “How would you rate your overall satisfaction with chatbots based on your previous”	1 - Very dissatisfied 2 - Dissatisfied 3 - Neutral 4 - Satisfied 5 - Very satisfied
Q16 - Age	1 - Male 2- Female 3 - Other 4 - I’d rather not answer
Q17 - Degree	1 - Below high school 2 - High school diploma or equivalent 3 - Bachelor’s degree 4 - Master’s degree 5 - Doctoral degree
Scenario	1 – Scenario A – Rule-based Chatbot 2 – Scenario B – Generative AI Chatbots

