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# INTEGRATING ARTIFICIAL INTELLIGENCE AND HUMAN INTERACTION: A CONCEPTUAL FRAMEWORK FOR TRANSFORMING ONLINE CUSTOMER EXPERIENCE THROUGH CHATBOTS

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**Abstract**

*In the face of fast-growing transformation, the chatbots and/or virtual assistants have the potential to transform various business settings by improving customer experience. In digital marketing, the adoption of chatbots is rapidly growing. This artificial intelligence (AI) based technology is now an essential component of online customer experience. It is designed to mimic human interaction, enabling it to respond to customer requests and provide information about the organization's offerings. However, using chatbots to manage online interactions with customers presents some technical and ethical issues. Hence, endowing human characteristics into chatbots, or "humanizing" chatbots, can simply counter chatbot technology maturity and challenges, and hence influence chatbot users' perceptions. This paper highlights the role played by chatbots in enhancing customer experience. Managerial implications and a future research agenda are also addressed.*

## INTRODUCTION

Digital marketing, or the fourth marketing revolution (Balmer & Yen, 2017) is the integration of digital technologies with traditional communications to accomplish marketing goals and manage various forms of online firm presence, such as company websites and social media pages (Chaffey & Ellis-Chadwick, 2016). In other terms, digital marketing can be achieved through non-Internet channels such as TV, radio, SMS, or through internet channels such as social media, e-mail ads, and banner ads (Jain & Yadav, 2017).

Digital marketing has undergone major changes with the help of big data and AI technologies (Lahbabi et al., 2021). The concept 'big data' is '*an evolving term that describes any voluminous amount of structured, semi-structured and unstructured data that has the potential to be mined for information*' (Chebbi et al., 2015, p. 638). McKinsey Global Institute defines big data as "*data sets whose size is beyond the ability of typical database software tools to capture, store, manage and analyse*" (Manyika et al. 2011, p. 1). Big data is characterized by five V's, namely: volume, velocity, variety, veracity, and value (Fan, Wei, & Bifet, 2013). *Volume* is related to a huge amount of data, which is duplicated in size every 1.2 years (Shankar, 2018). *Velocity* refers to a high speed of storing, analyzing, and retrieving data (Fan, Wei, & Bifet, 2013) and to the rate at which data changes or is created (Elgendy & Elragal, 2014). *Variety* describes different data types and sources that

have their own framework for analysis (Arora & Goyal, 2018). *Veracity* emphasizes data quality (Elgendy & Elragal, 2014), such as authenticity, trustworthiness, and accountability of the data (Fan, Wei, & Bifet, 2013). *Volume* is the most important V of big data and refers to generating valuable data (Fan, Wei, & Bifet, 2013).

Big data and AI are both endemic within the computer science field and inextricably linked, with big data leveraging AI for better data analysis and AI. In turn, AI has been using massive data for improved decision-making (Sestino & De Mauro, 2021). AI Artificial intelligence is a computing field that focuses on the transmission of anthropomorphic intelligence and thinking into machines that can help humans in a variety of ways (Benko & Lányi, 2009), whereby machines can think for themselves without being programmed (Pujari & Multani, 2020). In short, any technology that simulates human intelligence is referred to as AI technology (Nair & Gupta, 2021). AI is increasingly permeating our daily lives through the development and analysis of intelligent software and hardware known as intelligent agents which can perform a wide range of tasks, from manual labor to complex operations (Adamopoulou & Moussiades, 2020).

Nair and Gupta (2021) enumerated 15 applications of AI in digital marketing area, namely: AI smart content curation and content creation, voice search, programmatic media buying, propensity modeling, predictive analytics, lead scoring, ad targeting, engagement model, dynamic pricing, web and app personalization, retargeting, predictive customer service, marketing automation, dynamic email, and chatbots, This paper focuses on AI based chatbots application in modern marketing and its impact on customer experience.

## 2. Chatbot and Customer Experience: A Conceptual Framework

### 2.1 Chatbot Technology

A chatbot is a distinctive and widely used example of intelligent Human-Computer Interaction (HCI) (Bansal & Khan, 2018). Chatbot is "*an artificial construct that is designed to converse with human beings using natural language as input and output*" (Brennan, 2006, p. 61). It is computer software that mimics human interaction, but with 24-hour service and support (Kushwaha, Kumar, & Kar, 2021). Since its inception, this type of communication technology has been referred to by various names (Chocarro et al., 2021). They are known as interactive intelligent agents, voice assistants, psychological assistant bots, human chatbots, emotional AI (El Bakkouri, Raki, & Belgnaoui, 2022), artificial conversation entities, interactive agents, smart bots, and digital assistants (Adamopoulou & Moussiades, 2020).

The term "chatbot" is a mash-up of "chatting" and "robot" (Hwang & Kin, 2021) and was initially coined by Michael Mauldin in 1994 to designate conversational programs (Pichponreay et al., 2016). It is frequently designed and programmed as a process that flows between various communications modules, such as natural language understanding (NLU) and dialogue manager (DM) (Galitsky, 2020). NLU, also known as computer linguistics (Satheesh et al, 2020), generates a semantic illustration of user statements (Jurafsky & Martin, 2000). Meanwhile, DM organizes the flow of dialogue and communicates with other systems to facilitate communication between the chatbot and the user (Galitsky, 2020).

Chatbots can be classified based on their architecture (i.e., rule-based or data-driven) (Satheesh et al., 2020), purpose (i.e., assistant or conversation), and means of communication (i.e., text or voice) (Lee et al., 2020). Rule-based chatbots converse according to the rules assigned to them, whereas data-driven chatbots rely on text datasets produced by human-to-human or human-to-bot conversations. However, assistant chatbots are programmed and built-in multiple devices (e.g. Apple's Siri, Amazon's Alexa, Microsoft Cortana, and Google Assistant) to help users with everyday tasks such as Internet research, phone calls, appointment scheduling, and so on; meanwhile, conversation chatbots are designed to have human-like conversations (e.g. chatroom, Facebook messenger) (Lee et al., 2020). They usually discover the solution by searching a database for previous users' answers (Ho Lee et al., 2020). Assistant and conservation agents use both means of communication: text-based and voice-based agents.

#### *2.11. Evolution of Chatbots over the Years*

The first chatbot was invented in 1966 by Joseph Wiesenbaum at the Massachusetts Institute of Technology (MIT) and was named Eliza (Jain & Khurana, 2022). Eliza, the first rule-based (Satheesh et

al., 2020), was made to identify keywords and match them against pre-defined rules to generate appropriate responses (Singh, Joseph, & Jabbar, 2019). It mimicked the operation of a psychotherapist by translating the user's sentences in the questioning form (Adamopoulou & Moussiades, 2020) and employed pattern matching and a template-based response selection scheme (Brandtzaeg & Flstad, 2017). Although its communication abilities were limited, Eliza served as inspiration for the development of subsequent chatbots (Klopfenstein et al., 2017). Nevertheless, the initial project was introduced by Alan Turing in 1950 in his famous paper "Can machines think?" where he proposed an "imitation game" or "Turing test" by which computers could express themselves as human intellect (Geetha, 2022). Since then, chatbot technology has evolved.

In 1972, Kenneth Mark Colby -a psychiatrist and computer scientist at Stanford's Psychiatry Department - introduced PARRY, which has the same response pattern structure as ELIZA but with more control structure (Adamopoulou & Moussiades, 2020). Parry simulates a paranoid patient with the ability to express fears, anxiety and beliefs (Colby, 1974). Later, in 1995, ALICE (Artificial Linguistic Internet Computer Entity) was created by Richard Wallace. It is an open-source natural language handling Chatbot program that uses pattern matching rules to interact with humans (Thorat & Jadhav, 2020). However, ALICE lacked intelligence and was unable to generate human-like answers uttering feelings or behaviors (Adamopoulou & Moussiades, 2020).

Eliza, Parry, and Alice were text-based conversational agents (Ait-Mlouk & Jiang, 2020). However, 2001 marked a real evolution in chatbot technology with the appearance of SmarterChild, which converses over AOL Instant Messenger to assist people with their daily tasks, such as looking for sports scores, stock prices, and news, and checking the weather (Molnár & Zoltán, 2018). After some time and with a better understanding of natural human language, IBM created in 2006 IBM Watson, which won "Jeopardy," a well-known TV show in 2011), demonstrating the capabilities of AI-enabled chatbots in mimicking humans (Adamopoulou & Moussiades, 2020). The period 2010-2016 has seen a significant advancement in chatbot technology with intelligent personal voice assistants built into smartphones or home speakers capable of understanding voice communication and performing requested tasks, such as Siri from Apple and Alexa from Amazon.

### *2.1.2 Chatbot Applications in Business Settings*

In recent years, the use of chatbots has evolved rapidly and has attracted the attention of both practitioners and academics. The global chatbot market is expected to reach $9.4 billion in 2025, with a projected retail expenditure of $142 billion (Gartner, 2022). Chatbots have also influenced various sectors, including education (i.e., Bagchi, 2020; Pérez et al., 2020), financial services (i.e., Quah & Chua, 2019; Richard et al., 2019), and others. In addition, chatbots have progressively become involved in customer-firm interactions throughout consumption phases (Pillai & Sivathanu, 2020) and in various business departments such as marketing (i.e., Nair & Gupta, 2021).

In Education, Pérez et al. (2020) grouped the benefits of chatbots into two categories, namely, teaching-oriented and service-oriented. Teaching-oriented chatbots discharge teachers' workload by serving as teaching assistants or trainers (Pérez et al., 2020). They can be a mathematical tutor like Sofia, which was developed at the Harvard Mathematics Department by Knill et al. (2004) and could look for algebra problems for teachers and solve those problems for students, along with chatting with other mathematical virtual agents such as Pari and Mathematica (Almahri, Bell, & Arzoky, 2019; Shawar & Atwell, 2007).

Furthermore, chatbots can enhance students' learning of foreign languages, such as Bookbuddy and Clive (Pérez et al., 2020), or through the use of social media bots, such as Facebook Messenger (Nghi, Phuc, & Thang, 2019). Furthermore, chatbots can act as virtual patients or physicians to assist students in their learning process. For the former, the Virtual Patient bot (VPbot) was developed by Dr. Griffin Webber (2005) at Harvard Medical School and works as a patient simulator that students can interview (Almahri, Bell, & Arzoky, 2019). VPbot helped users to perform better in exams (Kerfoot, 2006).

The latter works as a virtual diabetes physician and is responsible for diabetes education (Jeong, Seong-Soo; Seo, Yeong-Seok, 2019). Meanwhile, service-oriented chatbots are used to introduce students to university

life, such as Lisa (Dibitonto et al., 2018), and inform them in a conversational manner about university communities and academic requirements, like the FAQs Chatbot (Ranoliya, Raghuwanshi, & Singh, 2017). Also, chatbots can be used in libraries such as Kornelia, which is known as the world's first public library chatbot (Bagchi, 2020). Chatbots can be supportive, especially for undergraduate students, when using library resources, by lowering the effects of library anxiety related to research, library databases, and librarian services (Bagchi, 2020; Shelmerdine, 2018).

In financial services, research reported that chatbots improve customer service (Deshpande et al., 2017; Okuda and Shoda, 2018). Erica, the first chatbot, debuted in May 2017 at Bank of America and has assisted 32 million customers with their financial needs, such as transaction details, limit amounts, and account balances (Bank of America, 2022). Since then, most commercial banks and other financial institutions worldwide have begun using chatbots. In the meantime, recent studies show that chatbots are a powerful tool for providing bank customers with 24/7 customer service and handling a high volume of customer calls from anywhere, thereby improving their banking experience and thus satisfaction while changing the customer's opinion of the bank (i.e., Quah & Chua, 2019; Richard et al., 2019). Chatbots can significantly reduce bank operational costs (Quah & Chua, 2019) by assisting customers in quickly locating various banking products and services, such as promotion information, exchange rates, and the nearest ATM location, and having the ability to register for credit cards and mortgages, as well as check balances, checking accounts, credit card information, and other administrative services (Richard et al., 2019). However, chatbot implementation has not yet matured to the point where it can handle complex banking services (Quah & Chua, 2019).

### 2.2 Chatbots and Customer Experience

The concept of customer experience (CX) was first conceived in the mid-1980s and gained currency with the publication of Pine and Gilmore's book on the experience economy in 1999 (Gentile, Spiller, & Noci, 2007). Lemon and Verhoef (2016, p. 71) view customer experience as "*a multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings during the customer's entire purchase journey*". In short, customer experience is a series of interactions between the firms and their consumers during the customer journey at different levels, including intellectual, conative, and emotional. However, modern consumers value the experience more than the actual monetary value of a product (Bilgihan et al., 2014). Thus, the importance of experience becomes even clearer as it increases community engagement and word-of-mouth intention (Zhang et al., 2017). With the advent of technology, marketing has been able to create positive customer experience. For instance, chatbots that interact with people via text messages, speech, visual signals, or gestures. They are designed to generate solutions to users' problems via conversation rather than manually providing information.

#### *2.2.1 Impact of Chabots on Customer Experience*

Muldowney (2017, p. 14) stated that '*chatbots are the new king of customer service*'. Indeed, chatbots are changing the way businesses interact with their various stakeholders, including customers. They are used in customer service to increase productivity, which means providing faster responses with less cost and effort (Brandtzaeg & Flstad, 2017). For instance, restaurant chatbots can enhance customer involvement by eliminating the need to book a table using phone calls, waiting for staff to attend to them, or standing in line for tables to become available (Parmar et al., 2019). In the banking sector, Erica, an AI-based financial assistant that was introduced by Bank of America in 2017, has assisted 32 million customers with their financial needs (Bank of America, 2022).

Chatbots help improve Customer Relationship Management (CRM), which is a vital element of modern marketing that can be digitalized and referred to as Electronic-CRM or E-CRM. Chatbots generate improved customer conversations (Satheesh et al., 2020). They can speak consistently friendly because they don't have terrible times and don't get irritated or drained like humans (Gao, Chen, & Wang, 2018). According to Galitsky (2020, p. 5) "*ask-oriented CRM chatbots tend to be highly specialized: they perform well as long as users do not deviate too far from their expected domain*," unlike employees who are usually bombarded with repetitive questions and are unable to respond

outside of office hours (Cui et al., 2017). Furthermore, Nair and Gupta (2021) stated that chatbots can be useful in gathering initial leads' information, such as contact information, which is required to begin any meaningful conversation; responding to frequently asked questions (FAQs) to save time and resources; scheduling customer service calls (e.g., sales calls); and greeting customers to websites with customized messages.

Nevertheless, despite the growth of chatbot applications, consumer acceptance of AI chatbots is not as high as expected (Zhu et al., 2022) since they are still in their early stages (Rese, Ganster, & Baier, 2020). Consumers tend to describe their interactions with human-like chatbots as creepy (Rajaobelina et al., 2021) and prefer human interaction (Araujo, 2018; Go & Sundar, 2019). This situation leads to "chatbot aversion" (Castelo et al., 2019; Schmitt, 2020), translated as hesitance in interacting with chatbots (Araujo, 2018; Go & Sundar, 2019). Thus, understanding the individual motivations for chatbot adoption is critical for developing better e-commerce technologies (Chopra, 2019).

Zhu et al., (2022) state that existing research explained the customer acceptance of AI chatbots from three perspectives: (1) chatbot design, (2) consumption contexts, and (3) consumer characteristics. Customers' acceptance of robots depends on perceived functionality (i.e., ease of use, usefulness, and social norms), perceived social-emotional elements (i.e., humanness, interactivity, and social presence), and relational elements (i.e., trust and rapport) (Wirtz et al., 2018). Similarly, chatbot design has a significant impact on its acceptance by consumers, whereby acceptance is fostered by several drivers. Brandtzaeg and Følstad (2017) highlight that productivity is the most important factor for chatbot adoption, as they assist users in obtaining timely and accurate assistance or information, followed by entertainment, social and relational factors, and curiosity. Hence, ease of use of chatbots reduces perceived creepiness (Rajaobelina et al., 2021), whereby anthropomorphic design features have a significant impact on perceived usefulness, four times stronger than the effects of functional chatbot features (Rietz, Benke, & Maedche, 2019).

Consumption context is influenced by chatbot task attributes and product type (Zhu et al., 2022). From the task attribute side, chatbots are basically task-oriented to achieve specific users' goals, even though some are designed for social interaction, such as Mitsuku (Følstad & Brandtzaeg, 2020). However, robotic work is not well accepted in the context of symbolic consumption (Granulo et al., 2020). From the product type side, products are frequently classified as either hedonistic or utilitarian (Hirschman & Holbrook, 1982). Impulsive consumers prefer hedonistic and experiential products, while rational shoppers tend to choose functional products (Sengupta and Zhou, 2007). However, anthropomorphized chatbots are used for practical reasons rather than pleasure or hedonic perception (Rietz, Benke, & Maedche, 2019).

Consumer characteristics such as gender and age have a direct impact on consumers' willingness to accept AI chatbots (Belanche et al., 2020). Gender stereotypes are consensually shared beliefs about gender roles where men and women have different characteristics to wear in different gender roles (Eagly & Wood, 2012). In chatbot design, gender covers names, avatars, voice, and textual descriptions used to introduce them to their users (Feine et al., 2020). Guo et al. (2020) argue that in a debt collection setting, chatbots with male voices negatively impact male and female customers, whereas chatbots with female attributes have a significant (positive) impact only on male customers. This explains why most chatbots have female names and avatars (Feine et al., 2020). Furthermore, Cardona et al. (2019) argue that in an insurance setting, chatbots' acceptance depends heavily on users' age, whereby the baby boomer cohort is reluctant to interact with and be served by chatbots compared to all other generations. This explains why most chatbots are age-neutral.

In light of the above, chatbots offer multiple benefits. However, the current chatbots' capability doesn't meet customers' expectations, and business applications of chatbots are still in the experimental stage (Dwivedi et al., 2019), since customers may feel uneasy if they don't communicate with a human agent (MacKinnon, Fairchild, & Fritz, 2007). Research has demonstrated that consumers desire to interact with real people rather than chatbots (Klein & Martinez, 2022), which poses real challenges for chatbot developers to improve user engagement (Pamungkas,

2019). However, Rhim et al. (2022) argue that endowing human characteristics into chatbots or humanizing chatbots can simply change users' perceptions.

### *2.2.2 Humanizing Chatbots*

Chatbots are an AI-based technology underpinning AI architecture. Hence, according to Fenwick and Molnar (2022, p.2), Humanizing AI is "*the process of creating and using AI that (i) understands not only human emotions but human unconscious dynamics, (ii) has the capability to interact with humans in a natural, human-like manner, and (iii) during this interaction it processes information in a similar way that people do*". They argued that a multilevel approach in humanizing AI is required, covering micro (programming), meso (application and organizational), and macro (societal) levels.

From a micro perspective, understanding AI architecture is critical for guiding more human-centric artificial intelligence design (Fenwick & Molnar, 2022). Viewing non-human objects as humans by imbuing them with human-like characteristics is referred to as 'Anthropomorphism' (Wan & Chen, 2021). In this case, Parry was the first emotionally aware chatbot capable of expressing human emotions such as fears, anxiety, and beliefs (Colby, 1974). Since Parry and with significant advancements in AI technologies, such as machine learning, anthropomorphism in chatbots has reached new heights. Agent humanity is implied through visual, identity, and conversational attributes that mimic human speech (Go & Sundar 2019). In the early stages of chatbot development, Emotionally Aware Chatbots (EACs) used a simple rule-based approach; however, today most EACs incorporate emotion classifiers into their architectures (Pamungkas, 2019). AI algorithms can evolve by learning new strategies that have previously worked well, or they can write new algorithms entirely on their own (Katsikeas et al., 2016), posing real ethical foundations of anthropomorphic design needed in developing ethical AI, such as respecting human rights (Fenwick & Molnar, 2022).

From a meso perspective, technological maturity influences managers' decisions regarding the adoption of chatbots (Jang, Jung, & Kim, 2021). Dwivedi et al. (2019) argue that business applications of chatbots are still experimental since customers' expectations are not being met. In contrast, Shin (2021) stated that the humanization of chatbots has met concrete industrial needs. Indeed, chatbots can offer clear benefits such as cost-effective user service, faster response times, and easier business transactions (Chocarro et al., 2021; Sarbabidya & Saha, 2020; Ukpabi, Aslam, & Karjaluoto, 2019; Parmar et al., 2019) with high cognitive intelligence and empathetic behavior (Fenwick & Molnar, 2022). Wan and Chen (2021) added that humanized chatbots have the potential to influence people's psychological and emotional connections and responses. Chatbots can also remember guest preferences and maintain context throughout conversations (Vashishth et al., 2024). This mimics human memory and attentiveness, making interactions feel more personalized and human-like.

However, chatbots can also lead to costly lawsuits, fines for breaking laws or regulations, and brand damage (Parmar et al., 2019). Fenwick and Molnar (2022) claimed to humanize AI and make it acceptable in organizations, we need: (i) to build a trust relationship between customer and society and AI tools, (ii) to eliminate unwanted bias in decision-making, demonstrate distinctive empathy, and provide a wide range of human decisions, (iii) explain to users that automated decision-making is error-prone, and (iv) firms have to manage the risk associated with AI machines. Nevertheless, Cardona et al. (2019) argued that chatbots are not yet capable of handling important or complex insurance decisions without human assistance, even though the chatbot's humanity and trust have positive impact on intent to use chatbots (Ng et al., 2020) and have been redefined with advent of deep learning (Przegalinska et al., 2019) and have become capable of responding to user requests with depth, compassion, and even humor (Wilson, Daugherty, & Morini-Bianzino, 2018).

From a macro perspective, AI usage is motivated by purpose, profit, and power, whereby purpose serves the human-centric aspect of AI technologies, profit maximization is linked to how AI algorithms are invested, and power is related to institutional behavior concerning AI-powered systems (Fenwick & Molnar, 2022). However, Fenwick and Molnar (2022) argued that allowing the profit motive to trump the purpose motive is a critical challenge to achieving a

two-way human-machine relationship; meanwhile, manipulated power benefits neither human well-being nor equality. For instance, politico bots are used for online campaigns on social media networks to manipulate public opinion and fuel conflicts between communities (Halperin, 2021), which may lead to political and social division (Fenwick & Molnar, 2022). In addition, Cardona et al. (2019) identified relative advantages and information systems (IS) infrastructure as the sociotechnical factors driving the adoption and diffusion of chatbot technology in the German insurance industry. Relative advantages refer to the extent to which an innovation is perceived as superior to the ideas it replaces (Rogers, 2003). Meanwhile, the IS infrastructure refers to IT resources for implementation within the organization (Hameed et al., 2012).

## 4. Conclusion, Managerial Implications, and Research Agenda

To enhance their customer experience through chatbot deployment, organizations would likely shift toward a holistic approach where an integrated human and AI collaborative workforce triumphs. In doing so, managers play a critical role in successfully implementing and operating chatbots between developers and customers; thus, it is critical to comprehend what managers are thinking and experiencing in the chatbot space (Jang, Jung, & Kim, 2021). Chatbots' utility should be emphasized, and managers should be trained.

Dwivedi et al. (2019) state that CEO are facing major challenges in maximizing the benefits of AI-powered automation. In the light of Dwivedi et al. (2019) work, we advance that in terms of chatbots, top managers should master how to (i) select tasks for chatbots (i.e. voice assistant, scheduling meeting), (ii) select the level of automation and anthropomorphism for each task (mechanical, thinking, and feeling), (iii) manage chatbots AI-enabled impacts on human performance and customer experience; and (iv) handle the chatbots algorithms error. In addition, most of the research on chatbots is conducted in developed countries, which can be a relevant benchmark for other countries to succeed in their digital transformation (Jang, Jung, & Kim, 2021).

In alignment with AI future research classification adopted from Dwivedi et al. (2019), this paper provides several avenues for future research on chatbots and customer experience:

*(i) Impact on society and industry*: Similarly to AI research, most chatbots-related research is technical in nature. However, industries and societies change as history tells (Dwivedi, et al., 2019) and experiences are constructed through emotional interactions at the individual, relational, and ecosystem levels of society (Kuuru et al., 2020). For instance, the Covid-19 pandemic has caused major changes in all business activities, including the way we work (Rahardja et al., 2021), leading to the adoption of new technologies handling customer inquiries such as chatbots. Thus, more research on the impact of chatbots on people's lives and hence customer experience is needed from cultural, social, and industrial lens.

*(ii) Regulatory implications*: No universally accepted approach guides best practices for AI design and deployment (Fenwick & Molnar, 2022). Chatbots are not independent agents with moral reasoning skills. Instead, they make decisions, not judgments, based on algorithms that benefit the owner or client (Murtarelli, Gregory, & Romenti, 2021). For instance, the political sphere has witnessed negative manipulation of public opinion with the use of politico-bots (Halperin, 2021). Hence, Mogaji and Nguyen (2021 argued that having a regulatory framework that guides the design process and ensures that customers are treated fairly is essential, even though managers viewed regulations or policies for employing chatbots as mandatory (Jang, Jung, & Kim, 2021). Thus, a deeper understanding of the psychological implications of chatbots regulations and their impact on customer service is required.

*(iii) Chatbot Algorithm Bias:* Chatbot algorithms are mainly human-made. However, algorithms are subject to bias that can occur in three stages: input, training, and programming (Lui & Lamb, 2018) and consequently impact the decision-making process (Dwivedi, et al., 2019). Hence, further research is needed to improve anthropomorphic algorithms capable of overcoming human-machine interaction challenges. In addition, research should consider an inclusive approach to developing chatbots and their impact on improved customer experience. Further research may also consider the mutual interactions at different levels of AI intelligence (mechanical, thinking, and feeling) proposed by Huang and Rust

(2021). Furthermore, researchers and practitioners alike suggest prioritizing design features that are anthropomorphic on the same scale as normal functional design capabilities in chatbot design and research (Rietz, Benke, & Maedche, 2019).

In conclusion, chatbots are commonplace in many organizations today, especially in developed countries, making AI technology an integral part of their digital strategy. Its growing number of AI-powered chatbots has transformed the customer experience. However, even though the path is unclear in terms of regulations and ethical concerns, human-centric and anthropomorphic bots are capable of positively impacting customer experience.

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