



# Humanization of Digital Interfaces through Conversational Agents: Contributions, Mechanisms, and Implications for User Experience

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**Abstract:** This article studies conversational agents and their role in humanizing digital interfaces. Based on a literature review, it highlights their evolution from simple chat programs to AI-powered systems.

It shows that humanization relies on anthropomorphism, personalization, and artificial intelligence. These mechanisms make interactions more natural and adaptive.

The study concludes that conversational agents improve user experience by increasing accessibility, engagement, and trust in digital environments.

**Keywords:** Conversational agents; chatbots; digital interfaces; humanization; artificial intelligence; user experience.

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## **1. Introduction**

In the dynamic context of the convergence between humans and technology, our article firmly engages with the technological dialogue by focusing on Conversational Agents as key elements in the humanization of Digital Interfaces (DI). This journey into the heart of conversational technology unfolds through a series of stages, revealing the multiple facets of virtual agents and their growing impact on our digital experience.

Our exploration begins with an in-depth analysis of the roles and definitions of conversational agents, examining their constantly evolving nature and their increasing influence on customer experience. Through this initial immersion, we highlight how these agents are redefining the way we interact with digital environments, thereby paving the way for a deeper investigation.

The narrative then progresses toward the humanized emergence of Artificial Intelligence (AI), emphasizing the human-like forms embodied by intelligent virtual agents and chatbots. Through this exploration, we analyze how conversation modeling, integrated into the holistic vision of the company, and the pivotal role of chatbots in conversational commerce contribute to enriching our understanding of these virtual entities.

At the core of our discussion, ChatGPT emerges as a central figure, defining a new era of intelligent conversation driven by AI. This section details the underlying principles of ChatGPT and examines how it significantly transforms user experience, transcending the conventional boundaries of virtual communication.

Our exploration continues with a deep dive into the complex field of deep learning, highlighting the fundamental role of this technology in the evolution of learning systems that power conversational agents. This section provides insight into how deep learning enables more sophisticated and adaptive dialogues, thereby shaping our interaction with these virtual entities.

The discussion then extends to exploring conversational agents as innovative educational assistants, revealing how they can serve as virtual guides in the field of interactive learning.

Finally, our study concludes with an in-depth analysis of anthropomorphism in the virtual world, highlighting how this characteristic influences user behavior and impacts the trust they place in these virtual agents. Thus, our journey through technological dialogue and the humanization of digital interfaces presents itself as a fluid narrative, revealing the multiple dimensions of these virtual entities within our digital universe.

Accordingly, the central research question of this article can be formulated as follows: to what extent do conversational agents contribute to the humanization of digital interfaces and the improvement of user experience?

To address this question, this article is structured around a conceptual framework defining the key notions, followed by a literature review analyzing the existing theoretical contributions.

## **2. Conceptual Framework of the Humanization of Digital Interfaces**

### **2.1. Conversational Agents: Definitions, Roles, and Evolution**

“Chatbots will fundamentally revolutionize the way people experience computing. At first, they will improve applications, but very quickly they will replace them and become the new communication interface.” (Satya Nadella – CEO of Microsoft, WPC 2016).

A chatbot, also called a “conversational agent,” is a computer program capable of simulating a conversation with one or more humans through voice or text exchange. Nowadays, this tool is widely

used on the Internet by customer service departments of brands and online retailers through instant messaging (Nocentini et al., 2015).

It is designed to respond effectively to users' immediate needs, such as obtaining information, making reservations, placing orders, conducting searches, and many other tasks. Its fields of application are almost unlimited, and its continuous improvement is closely linked to the progress of Artificial Intelligence. A chatbot is therefore an application intended to automate tasks or simulate conversations. This computer program can read messages (emails, SMS, chats, etc.) and respond within seconds thanks to a set of pre-recorded answers (Dahiya, 2017).

Bots, chatbots, and social bots are tools and conversational agents that are transforming our daily habits into entirely new experiences. In 1966, long before Hoffer and his colleagues created SmarterChild, a computer scientist named Joseph Weizenbaum developed ELIZA, a program designed to imitate human conversation. ELIZA worked by analyzing the words entered by users and then matching them with a list of the most appropriate possible responses (Skjuve et al., 2021).

In 1972, PARRY was created by Kenneth Colby. It simulated a person with paranoid schizophrenia. PARRY was more advanced and serious than ELIZA and was described as "ELIZA with attitude."

In 1988, Jabberwacky was created by British developer Rollo Carpenter as a conversational agent intended to "simulate human conversation in an interesting, entertaining, and humorous way." It was one of the earliest attempts to create AI capable of human interaction.

In 1992, the program Dr. Sbaitso was created using AI for personal computers running MS-DOS and distributed with various sound cards published by Creative Labs. The program "conversed" and interacted with the user as if it were a psychologist.

In 1995, Richard Wallace developed ALICE (Artificial Linguistic Internet Computer Entity), inspired by ELIZA but enhanced with natural language processing through an unprecedented collection of linguistic samples made possible by the emergence of the Web.

In 1997, Clippy was introduced as an assistant in Microsoft Office.

In 2001, SmarterChild was designed by developers at ConverseAgent. It was a virtual conversational partner capable of chatting with users on MSN and AIM networks. Beyond simple conversation, it also provided text-based services such as dictionaries, encyclopedias, and web search tools, along with small games for entertainment.

In 2006, Watson, the "supercomputer" of IBM, was introduced. It was capable of understanding human language and reasoning. Watson had a database approaching one million books and could simulate human reasoning. In 2011, Watson made history by becoming the first computer to win the television quiz show Jeopardy!

In 2010, Siri, developed by Apple, was introduced as an intelligent personal assistant. Its human-machine interface relies on advanced voice recognition, natural language processing, and speech synthesis.

In 2012, Google Now, developed by Google, was launched. By considering time, user location, and personal data, it provided useful contextual information. For example, if a user had an event in Google Calendar, Google Now could help ensure timely arrival by suggesting travel times and transport information.

In 2015, Alexa, developed by Amazon for the Amazon Echo device, became a voice assistant capable of voice interaction using Natural Language Processing algorithms to receive, recognize, and respond to spoken commands.

The same year, Cortana was introduced by Microsoft as a personal assistant capable of setting reminders, recognizing natural voice commands, and answering questions using the Bing search engine.

In 2016, Bots for Messenger became a platform allowing developers to create bots that could interact with users of Facebook. During the same year, Tay was developed to imitate the language and habits of American teenagers in order to improve interactions with users.

Today, more advanced chatbots exist. These systems learn without direct human assistance by feeding on dialogues with users through machine learning and natural language processing.

As explained by Grégory Renard, Head of AI at Oscaro.com, in the magazine *Stratégies*: “We have moved into the era of the intelligent web, succeeding Web 2.0. This proactive web, anticipating your needs, will rely on the semantic web, natural language search, data management and extraction, machine learning, recommendation agents, and artificial intelligence technologies.”

The year 2017 marked the emergence of two highly notable chatbots. These highly creative tools communicated directly with brand communities through simple and effective mechanisms.

The Rogue One: A Star Wars Story chatbot, known as the Star Wars Bot, invited fans to join the rebellion and fight the Empire. It offered an immersive experience within the universe of the film and the broader Star Wars saga, perfectly matching the expectations of online gamers and fans.

These experiential chatbots generated significant media coverage and strong fan engagement.

The AI-powered conversational assistant is a virtual agent designed as a computer program that uses new technologies associated with natural language to perform tasks. These high-value missions, combined with customer relationship center staff, make the service even more efficient (Cahn, 2017).

Faced with recent technological developments such as learning algorithms, machine learning, and neural learning systems, conversational robots now display reactions very close to those of humans, such as:

- Conversing with users
- Providing answers to specific requests
- Identifying positive or negative emotions
- Making dialogue more engaging through humor
- Improving performance by learning from previous interactions

Virtual assistant, conversational robot, intelligent bot, chatbot, and many other names all refer to the AI conversational agent. This software robot is designed to provide effective solutions to customer service management challenges. Its creation, integration, and administration within customer relationship centers are generally handled by specialized expert providers (Lokman et al., 2019).

Depending on its configuration, the intelligent bot can receive all incoming requests within the contact center. It can also redirect customers with complex requests to specialized customer service advisors. Every aspect of the virtual AI robot's behavior and reactions is determined and configured collaboratively between the company and the chatbot designer.

## **2.2. Intelligent Virtual Agents and Customer Experience**

Customer experience is defined as “the set of interactions between a customer and a product/service, a company, or part of its organization, which generates a reaction in the customer. It is strictly personal and involves different levels: rational, emotional, sensory, physical, and spiritual” (Gentile et al., 2007). Furthermore, it refers to the coordination of a multitude of mechanical and human clues within a specific consumption environment. These clues summarize all the elements that constitute the experience, whether related to the product, the service, the moment, the place of the experience, the people involved, and so on. They may therefore be linked to a functional, emotional, or sensory level (Dahiya, 2017).

That being said, customer experience is currently undergoing major transformations, significantly changing consumer behavior and the value they seek (B. Joseph Pine II and James H. Gilmore, 2002). More specifically, the focus is no longer merely on use value or symbolic value, but rather on memorable moments and meaningful solutions. Customer experience therefore describes a global moment or an integrated whole that provides consumers with memories, continuous learning, or a sense of fulfillment. In reality, this playful dimension helps re-enchant highly solicited consumers by satisfying their need for wonder.

Today, the Internet has become an essential part of this transformation by enabling invisible, permanent, and relevant connections with consumers. Thanks to the multiplication of contact points through the web, companies are now able to sustain this experience by optimizing the customer journey in highly specific usage contexts.

The promoted customer experience integrates all contact points before, during, and after consumption, but is not limited to them. In this sense, it aims to stimulate consumers who are immersed in a phygital universe at the heart of brands through social interactions and personalized experiences (Pine and Gilmore, 2002). This observation appears quite natural given the transformation of consumption patterns (Mercanti-Guérin, 2013), pushing companies to design more agile and effective experiences (Salerno, 2014).

The objective is to align with the deepest desires of the target audience (Body and Tallec, 2015) in an original way (Katherine N. Lemon and Peter C. Verhoef, 2016). In this context, the general concept of personalization refers to a set of approaches consisting of adapting a number of alternatives corresponding to the real needs of the customer as an individual (Salerno, 2001b; Salerno, 2005; Lendrevie and Lindon, 2003).

Some studies distinguish personalization from customization. More specifically, while customization allows consumers to provide information themselves in order to adapt the proposed offer to their own preferences (Abidi, 2004), personalization is more aligned with Artificial Intelligence logic, allowing the machine to systematically record user content based on visits and actions on the web, thus generating products and experiences that are more personalized to individual profiles (Viot, 2011).

In this perspective, authors distinguish utilitarian personalization—of the product itself (Salerno, 2001a; Roux et al., 2008; Cornet, 2016), its identity (Salerno, 2001b), and its positioning—from customer experience personalization, which addresses the emotional and symbolic aspects of the customer journey (Mimouni, 2007) in order to meet the customer's deepest expectations (Gilmore and Pine, 2002; Lemon and Verhoef, 2016).

From this angle, a set of algorithms derived from Artificial Intelligence allows processing speeds measured in fractions of a second (velocity) (Reinsel and Gantz, 2011) for a wide range of customer data (volume), whether structured or unstructured (variety) (Laney and Beyer, 2012). It therefore becomes possible to “film” the individual through the multiple digital traces left on the web in order to offer solutions that align as closely as possible with their expectations (Barzenji and Atanasov, 2018).

In this context, consumption modes and associated services are channeled through social content (Salerno, 2002) and the context of customer-company interaction (Viot, 2011; Body and Tallec, 2015). In this logic, Sheid et al. (2012) argue that personalization can take place at the heart of communication itself, giving consumers the impression of receiving an offer specifically intended for them.

Indeed, social networks, consumer reviews, official forums, community managers, and chats with advisors clearly illustrate this reality by enabling more interactivity, more friendliness, and more human contact. In this sense, the experience promoted by the company becomes interactive, focusing more on

content than form and pushing personalization to an advanced level, resulting in greater customer satisfaction (Saleem et al., 2018; Berry and Gresham, 1986).

The configuration of the virtual assistant remains flexible, and as the chatbot becomes integrated into the company's contact center, the organization can continuously improve its functioning so that it becomes better adapted to incoming customer requests.

The capabilities of the intelligent chatbot elevate customer relationship management to a higher level. Customer experience takes on a new dimension. Long telephone waiting times and unproductive calls can be significantly reduced.

The virtual assistant also strongly impacts the daily work of customer service advisors. Thanks to the chatbot, they are freed from repetitive or demotivating tasks and can dedicate more time to higher value-added activities that contribute to the development of the customer contact center. When a customer request requires expert judgment, the advisor can take over and devote the necessary time to properly assist the customer.

The chatbot designer can also better inform and guide clients regarding the strategic and practical aspects to consider when integrating an intelligent conversational assistant into the customer relationship center.

## **2.3. The Humanization of Artificial Intelligence**

### **2.3.1. Typology and Characteristics of Intelligent Virtual Agents**

There are numerous definitions of Intelligent Virtual Agents (IVAs). First of all, an IVA can be defined as “a program capable of performing independent actions within a given environment on behalf of a user.”

IVAs represent a computer-generated system (Choi et al., 2001; Diesbach and Galan, 2006; Viot, 2011) or “digital representations of computer programs that perceive their environment and are capable of acting upon it” autonomously (Viot, 2011). Their appearance and missions may vary, as they can represent either “imaginary characters or real humans” (Choi et al., 2001) or simply an “entity” (Holzwarth et al., 2006). They may be responsible for assisting Internet users during a purchase process as well as participating in customer relationship management (Viot, 2011).

In other words, IVAs can “take various forms and perform certain functions usually carried out by frontline staff” (Diesbach and Galan, 2006). Moreover, they are characterized as “intelligent” (Diesbach and Galan, 2006; Viot and Bressolles, 2012) because they are “controlled by artificial intelligence” (Choi et al., 2001). To summarize, IVAs are a “general graphic representation personified through computer technology” (Holzwarth et al., 2006), “designed to interact with humans and behave like humans.”

Intelligent agents can also be defined in very simple terms as autonomous entities equipped with sensors that allow them to gather information about their environment and effectors that provide them with means of interaction. Behind this abstract definition, a multitude of interpretations—or “embodiments”—have emerged in numerous research laboratories across all continents.

These are largely robotic agents, equipped with their own means of locomotion and physical interaction; however, for at least two decades, virtual agents have also developed in the form of animated avatars whose presence is limited to display on a computer screen. In most cases, their primary role is to assist humans in everyday tasks; therefore, these agents are often referred to as “companions” (Hadi, 2019).

IVAs are known by different names. Gauzente and Guilloux (2003) refer to them as interface agents. They distinguish between interface agents serving the user and interface agents serving the company. IVAs are also sometimes called “avatars,” although this term does not seem entirely appropriate since

an avatar is controlled by humans, whereas IVAs are controlled by computers (Viot and Bressolles, 2012).

However, in practice, the terms “intelligent virtual agent” and “avatar” are often used interchangeably (Viot, 2011). In fact, Philip Kotler et al. (2009) do not make a distinction, as they define avatars as “small animated virtual characters that respond to customers and guide navigation,” thereby contributing to website interactivity.

IVAs also have different names depending on their mission. An IVA may appear as a recommendation agent or an interactive shopping assistant (Diesbach et al., 2006; Stenger and Bourliataux-Lajoine, 2011), or as a negotiation or search agent (Diesbach et al., 2006). However, for Bressolles and Viot (2010), IVAs must be clearly distinguished from “simple recommendation agents” and “online shopping assistants” because, unlike IVAs, these do not possess a human form.

An IVA may also be defined as a prescriber (Stenger and Bourliataux-Lajoine, 2011), in the sense that a prescriber represents someone who exerts influence on the consumer or “a third party (other than a commercial intermediary) whose contribution is a condition for the functioning of the exchange.” The contribution here refers to a form of “knowledge” that the consumer does not possess when making a purchasing decision. On an e-commerce website, the prescriber may resemble a “professional expert” or a “choice guide” (Stenger and Bourliataux-Lajoine, 2011).

IVAs also have different classifications depending on their appearance. Contrary to Bressolles and Viot (2012), who define an IVA strictly as a human-shaped agent, there are other forms of IVA representation such as conversational agents. These are not necessarily human-shaped but are equipped with speech (Gauzente and Guilloux, 2003), and they are valued by consumers because they provide access to an interlocutor (Ben Mimoun and Poncin, 2011).

There are also embodied virtual agents (Diesbach and Galan, 2006), which create an “illusion of life” (Gauzente and Guilloux, 2003). These generally refer to 3D agents equipped with speech and movement. In contrast, there are disembodied virtual agents, which many people use every day without realizing it, since they do not have a human form—such as the Google search engine (Diesbach and Galan, 2006).

### **2.3.2. Chatbots and Conversational Systems**

A chatbot, or conversational agent in its most francophone version, is a computer software powered by Artificial Intelligence that has the ability to simulate a conversation with a human. The concept is to make the user believe that the chatbot is capable of understanding the requests formulated by the human in order to respond as effectively as possible according to the context (ideally) and according to its predefined objectives. The conversation can take place either through text or voice and generally relies on natural language for communication.

Historically, the first chatbot, called ELIZA, was developed by Joseph Weizenbaum, a professor at Massachusetts Institute of Technology, in 1966. Its functioning was quite basic, as it mainly reformulated statements sent by users into questions without contextualizing events.

Other notable chatbots followed, such as PARRY in 1972, Jabberwacky in 1988, ALICE in 1995, and SmarterChild in 2001.

SmarterChild was an active chatbot on instant messaging platforms AIM and MSN and interacted with several million people on these platforms. Its main objective was to attract as many users as possible and entertain them.

Cleverbot, launched in 1997, is also well known in this field.

More recently, examples have multiplied with chatbots widely recognized by the general public, such as Watson by IBM, Siri by Apple, and Google Now by Google.

Since 2015, the biggest players in technology have joined the field: Amazon with Alexa, Microsoft with Cortana and Tay, and Facebook with the integration of bots into Messenger.

The recent involvement of the world's largest technology companies such as Microsoft, Apple, Facebook, and Google clearly demonstrates the potential of chatbots.

More recently, at Georgia Institute of Technology, students interacted online with what they believed was their computer science professor, asking numerous questions and receiving rapid answers. What they did not know was that it was actually a chatbot powered by IBM's Watson responding to them. They did not notice the difference.

One certainty remains: the human interface is becoming increasingly strategic and its mission is changing. Knowledge resides in machines, but the essential element—human interpersonal skills and emotional intelligence—can only truly be learned through human interaction.

### **2.3.3. Conversational Modeling in the Company**

Conversational services are a set of algorithms that can act on behalf of an individual or an organization and are capable of imitating human conversation. They are designed to interact with users mainly through voice or text. A Conversational Service Instance is often referred to as a “bot” or “chatbot.” Related terms used in the industry include, but are not limited to: software robot, virtual agent, digital personal assistant, conversational user interface, conversational user experience, and conversations as a platform, among others (Virkar et al., 2019).

There are two main types of chatbots:

- Chatbots designed to serve one or several specific business objectives. These are commonly found in messaging applications such as Facebook Messenger, WhatsApp, Slack, WeChat, etc. For example, a user can order flowers from a local florist through their preferred messaging application (Dos et al., 2023).
- Chatbots designed to assist with a wide range of information needs and services. Examples include virtual assistants such as Siri, Google Assistant, Alexa, Cortana, and IBM Cloud-based conversational systems.

Conversational services and chatbots are transforming the way individuals interact and engage with brands. These systems are likely to replace the need for many standalone smartphone applications that do not offer conversational functionality. This trend appears irreversible: users increasingly expect to communicate in a conversational manner anytime and anywhere. This shift has significant implications for both consumer and business markets (Tsai et al., 2023).

### **2.3.4. Conversational Commerce and Its Applications**

Today, we can identify five key domains in which chatbots are becoming an essential component of customer experience (Shin et al., 2023):

- Customer service, by integrating a chatbot into an e-commerce website that automatically answers frequently asked customer questions;
- Mobile applications, which allow users to interact with virtual agents using natural language;
- Messaging channels, such as Twitter, Slack, Facebook Messenger, and other messaging platforms;

- Instant conversational systems, enabling real-time interaction with users across different channels;
- The Internet of Things (IoT), where connected devices are able to understand natural language and respond to user commands;
- Robotics, where machines are equipped with natural language understanding and conversational capabilities.

These application areas constitute a new trend known as “conversational commerce,” which is based on four pillars:

- Anthropomorphism of computing, meaning the attribution of human characteristics and value judgments to non-human entities (in this case, algorithms). Interactions with bots shift from “cold” to “warm” thanks to a sufficient level of emotional intelligence. Today, some hotel chains already use humanoid robots capable of answering different types of customer requests.
- The concierge economy, where robots act as perfect assistants capable of anticipating human behavior. In the future, individuals may even be represented by a bot functioning as a digital alter ego.
- The battle of micro-moments, referring to short mobile usage moments characterized by rapid information consumption and immediate decision-making opportunities (e.g., waiting for a train or bus). During these micro-moments, users seek to know, buy, move, or act. Chatbots help support these immediate human needs.
- The conversational office, referring to the integration of bots and chatbots into workplace environments. This includes forms such as the digital employee and the digital manager. Today, some companies even include bots as members of their boards of directors.

Conversational services are expected to become the central hub of customer engagement, based on natural language interactions, consistent omnichannel experiences, multi-platform deployment, business process support, emotion detection, and advanced machine learning capabilities.

#### **2.4. The Impact of Conversational Agents on User Experience**

Trust is a concept with multiple definitions (Lewicki, McAllister and Bies, 1998; Urban, Amyx and Lorenzon, 2009). It is sometimes considered as a presumption, an expectation, or a belief, but also as a behavioral intention or actual behavior (Guibert, 1999; Chouk and Perrien, 2005; Toufaily et al., 2010). It is also defined, according to D. Rousseau et al. (1998) and Anita L. Sitkin and Roth (1993), as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another.”

In addition, trust can be understood as the feeling experienced by one party toward another during interaction, in line with its own interests (Cécile Godé-Sanchez, 2003).

In marketing, the concept of trust is generally approached through two main dimensions: inter-organizational trust (Morgan and Hunt, 1994) and consumer trust, which can be directed toward the brand (Chaudhuri and Holbrook, 2001; Gurviez and Korchia, 2002; Sirieix and Dubois, 1999), advertising (O’Cass, 2002), or the salesperson (Swan, Bowers and Richardson, 1999; Swan, Trawick and Silva, 1985; Wood et al., 2008).

Trust is particularly critical in an online context, where human contact is generally absent and interactions tend to be impersonal (Boulaire and Ballofet, 1999; Holzwarth, Janiszewski and Neuman, 2006). However, when a certain degree of human presence is introduced into online interfaces—such

as chatbots, virtual agents, or avatars—the determinants of trust may differ from those observed in a standard text-based website.

In studies focusing on trust in online environments, Nicole Chouk (2005) and Chouk and Perrien (2003, 2004) identified five explanatory factors:

- factors related to the website itself,
- factors related to the consumer,
- factors related to third parties,
- factors related to the brand or retailer,
- and contextual factors.

**Table 1:** Determinants of Trust in an Online Context (based on Chouk, 2005; Chouk and Perrien, 2003, 2004).

<b>Site-related factors</b>	<b>Consumer-related factors</b>	<b>Third-party-related factors</b>	<b>Retailer-related factors</b>	<b>Context-related factors</b>
- Perceived website quality -Assurance mechanisms and transaction security -Clear and fast navigation -Breadth of the offered products/services -Information integrity -Social presence	-Familiarity with the website -Familiarity with the Internet -Experience with the Web -Propensity to trust -Receptiveness to new technologies	-Intervention of a certification body -Partnerships with well-known websites -Testimonials from previous customers	-Perceived reputation -Perceived size -Past experiences with the retailer -Existence of a physical store -Market authentication	-Perceived risks associated with the financial purchasing context

**Source :** Chouk, 2005 et Chouk et Perrien, 2003, 2004).

In marketing, trust analysis is a theoretical research stream that mainly focuses on trust related to consumer behavior. Various concepts are linked to the notion of trust. It may refer to a presumption, an expectation, a belief, a willingness, or even a behavior, and its conceptual and empirical framework remains a fertile field of research (Chouk, 2005).

In virtual commerce, unlike traditional commerce, trust is essential. This observation is confirmed by several research studies (Chouk and Perrien, 2005). When referring to consumer trust, perceived website quality in e-commerce is strongly associated with it (Corbitt et al., 2003; McKnight et al., 2002).

Regarding perceived reputation, it is a very important criterion, especially in the initial phase of the trust-building process (McKnight et al., 2002). It is a key determinant of trust regardless of the type of commerce (Jarvenpaa and Tractinsky, 1999; Yoon, 2002). A positive reputation acts as a reassurance signal for consumers. As a result, companies avoid opportunistic behaviors that could negatively affect their reputation.

Consumer propensity to trust is an important variable in e-commerce research (Gefen, 2000; Stewart, 2003), even though it has received relatively limited attention in marketing studies.

Social presence is a concept that can be defined as the feeling of being with others. It emerged in the 1970s and measures the subjective perception of other individuals when communication does not occur face-to-face but is mediated by a technological interface (Short, Williams and Christie, 1976).

### **3. Methodology**

This article adopts a purely theoretical methodology based on a narrative and analytical literature review. The objective is to analyze, structure, and integrate existing scientific contributions related to conversational agents and their role in the humanization of digital interfaces, in order to better understand their implications for user experience and trust in digital environments.

The research follows a qualitative and interpretative approach, without any empirical data collection. It aims exclusively at producing conceptual knowledge through a critical analysis of academic works drawn from several disciplines, including marketing, information systems, consumer psychology, and artificial intelligence.

The methodology is structured around three main axes: (1) the theoretical foundations of conversational agents and digital interfaces, (2) the mechanisms of humanization through anthropomorphism, personalization, and artificial intelligence, and (3) the effects of these technologies on user experience and trust in digital environments.

The sources used include both foundational works and recent research recognized in the scientific literature, ensuring both a historical and contemporary coverage of the phenomenon under study.

The analysis of the selected works follows a three-step complementary approach: a descriptive analysis aimed at clarifying key concepts (conversational agents, anthropomorphism, user experience, trust), a comparative analysis identifying similarities and differences between theoretical approaches, and an integrative analysis proposing a holistic understanding of the role of conversational agents in the humanization of digital interfaces.

This approach highlights the mechanisms through which conversational agents contribute to transforming human-machine interactions by articulating the technological, interactional, and behavioral dimensions of user experience.

### **4. Results and Discussion**

The literature analysis on conversational agents and the humanization of digital interfaces highlights several key findings, organized around three main axes: the contributions of conversational agents, the mechanisms of humanization, and their implications for user experience.

#### **4.1. Conversational Agents as Drivers of the Humanization of Digital Interfaces**

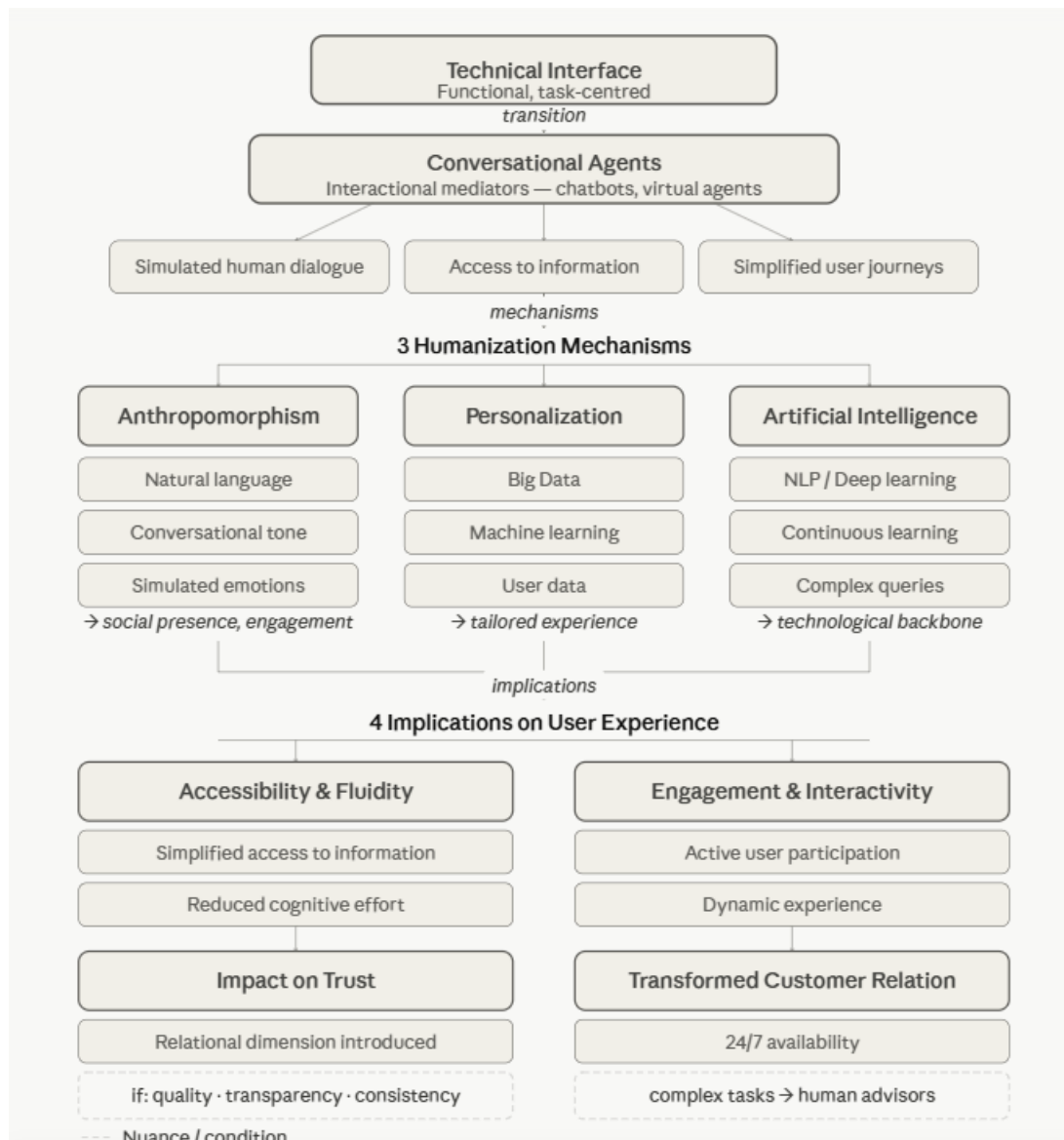
The analyzed studies converge on the idea that conversational agents represent a major evolution in digital interfaces, transforming them from simple technical tools into relational and interactive interfaces.

Historically, interfaces were primarily functional and task-oriented. The introduction of chatbots and intelligent virtual agents marks a shift toward systems capable of simulating human interaction by using natural language, contextual understanding, and machine learning.

Thus, conversational agents appear as interactional mediators capable of:

- reproducing certain dimensions of human dialogue,
- facilitating access to information,
- reducing the complexity of user journeys.

This finding confirms that the humanization of digital interfaces largely depends on the ability of systems to imitate the codes of human communication.



**Figure 1.** Conceptual Model of the Humanization of Digital Interfaces and Its Implications for User Experience

#### 4.2. Mechanisms of Humanization: Anthropomorphism, Personalization, and Artificial Intelligence

The analysis highlights three fundamental mechanisms underlying the humanization of digital interfaces:

##### 4.2.1. Anthropomorphism as a Central Lever

Conversational agents integrate human-like characteristics (natural language, conversational tone, simulated emotions), which fosters:

- a perception of social presence,
- a more natural interaction,

- a reduction of the human–machine distance.

Studies show that attributing human traits to machines increases user engagement and familiarity.

#### **4.2.2. Interaction Personalization**

Through the use of user data (Big Data, machine learning), conversational agents adapt their responses to individual preferences.

This personalization occurs at several levels:

- the content of responses,
- the timing of interactions,
- contextualized recommendations.

It contributes to creating an experience perceived as unique and tailored, thereby enhancing the user's perceived value.

#### **4.2.3. The Structuring Role of Artificial Intelligence**

Advances in natural language processing and deep learning enable conversational agents to:

- understand complex queries,
- learn from their interactions,
- continuously improve their performance.

Artificial intelligence thus constitutes the technological foundation that makes it possible to achieve smooth, adaptive, and evolving interaction.

### **4.3. Implications for User Experience**

The results highlight several significant effects of conversational agents on user experience:

#### **4.3.1. Improved accessibility and fluidity**

Conversational agents simplify access to information and reduce the cognitive effort required for navigation.

#### **4.3.2. Increased engagement and interactivity**

Conversational interaction promotes active user participation, transforming the experience into a dynamic process.

#### **4.3.3. Impact on Trust**

The presence of conversational agents can enhance trust by introducing a relational dimension into a digital environment that is often perceived as impersonal.

However, this effect strongly depends on:

- the quality of responses,
- system transparency,
- interaction consistency.

#### 4.3.4. Transformation of the Customer Relationship

Conversational agents provide continuous availability (24/7) and increased responsiveness, thereby improving overall satisfaction.

They also contribute to a redistribution of roles between humans and machines, with complex tasks remaining assigned to human advisors.

#### 5. Conclusion

The theoretical analysis highlights that conversational agents constitute a key driver in the humanization of digital interfaces. By integrating mechanisms such as anthropomorphism, personalization, and advanced artificial intelligence capabilities, these systems profoundly transform interactions between users and machines. They thus make interfaces more intuitive, interactive, and engaging.

Moreover, the findings show that these technologies contribute to improving user experience by facilitating access to information, enhancing engagement, and influencing trust in digital environments. However, these effects remain dependent on the quality of agent design, particularly in terms of response relevance, transparency, and interactional consistency.

Therefore, the humanization of digital interfaces through conversational agents represents a major evolution of digital systems, while also raising important issues related to user experience and human-machine relationships.

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