VANDA HARMAT

CHATBOTS FROM THE USERS' PERSPECTIVE – A SYSTEMATIC LITERATURE REVIEW
CHATBOTOK A FELHASZNÁLÓK SZEMSZÖGÉBŐL – SZISZTEMATIKUS IRODALMI ÁTTEKINTÉS

The application of chatbots in business organizations is becoming ever more widespread. When developing an interface, besides the aspects of efficiency, human values, and users' social and emotional needs also should be respected. From this perspective, understanding the impact of human-chatbot interaction (HCI) on individuals' behavior is paramount. This article aims to contribute to the exploration of users' perspectives on chatbots through a systematic literature review of 31 papers examined with content analysis. The results show that besides functionality, entertainment is also important for users during HCI. The growing magnitude of humanlike attributes that could support this need does however not provide users with the feeling of satisfaction but can evoke feelings of anxiety instead.

Keywords: **chatbot, human-chatbot interaction, HCI**

A chatbotok alkalmazása az üzleti szervezetekben egyre elterjedtebbé válik. A felhasználói interfész kialakításánál a hatékonyság mellett az emberi értékeket, a felhasználók szociális és érzelmi igényeit is figyelembe kell venni. Éppen ezért kiemelten fontos megérteni az ember-chatbot interakció (HCI) hatását az egyének viselkedésére. Jelen cikk célja, hogy hozzájáruljon a felhasználók chatbotokkal kapcsolatos perspektívájának a feltárásához egy szisztematikus irodalmi áttekintésen keresztül. Az eredmények alapján láthatóvá vált, hogy a funkcionalitás mellett a szórakoztatás is fontos a felhasználók számára a chatbotokkal folytatott interakció során. Az ezt az igényt kielégítő emberi tulajdonságok megléte a chatbotok esetében azonban nem feltétlen nyújtja a felhasználóknak az elégedettség érzését, sokkal inkább a szorongás érzését válthatja ki.

Kulcsszavak: **chatbot, humán-chatbot interakció, HCI**

Author/Szerző:
Dr. Vanda Harmat[a] (vanda.harmat@uni-corvinus.hu) assistant lecturer

[a]Corvinus University of Budapest (Budapesti Corvinus Egyetem) Hungary (Magyarország)

Several studies examined the effectiveness of tools used to automate organizational processes (Willcocks, Lacity & Craig, 2015; Marciniak, Móricz & Baksa, 2020) and communication (Rossmann, Zimmermann & Hertweck, 2020). However, the consideration of social aspects is also becoming more common in technology-related research (Rapp, Curti & Boldi 2021), starting from the theory of social interface, according to which people react to technology-mediated communication as if it were their partner (Mehra, 2021). Such artificial interactions can also be carried out by chatbots, which are able to imitate the feeling of a social situation (Szűcs & Jinil, 2018), through their communication with the users without human intervention based on pre-written scenarios and rules (Harmat, 2023). Chatbots can perform several tasks, therefore more and more companies decide to implement them to make business processes more effective (Luo, Lau, Li & Si, 2021). However, users' willingness to regularly communicate with them may generate some challenges. Dautenhahn (2013) stated that besides technological features, developers should create chatbots that also respect humans' social and emotional needs.

Recent systematic literature search on chatbots focused on their application in an educational context

(Wollny et al., 2021; Pérez, Daradoumis & Puig, 2020), in tourism (Calvaresi et al., 2021), in the financial sector (Wube, Esubalew, Weldesellasie & Debelee, 2022) and healthcare (Gentner, Neitzel, Schulze & Buettner, 2020). In contrast, Rapp, Curti & Boldi (2021), Suhaili, Salim & Jambli (2021) systemized the literature on chatbots from a broader view as they did not define any special application area. Bilquise, Ibrahim & Shaalan (2022) dealt with emotionally intelligent chatbots and Rapp, Curti & Boldi (2021) examined the effects of human-chatbot interaction (HCI) on users thereby highlighting the importance of HCI's social aspects. Applying the approach of Rapp, Curti & Boldi (2021) and Bilquise, Ibrahim & Shaalan (2022) the article aims to contribute to the exploration of users' perspective on chatbots through a systematic literature review. Following Dautenhahn's (2013) statement, the study strives to understand, how HCI affects individuals' behavior to discover what social and emotional needs should be considered when developing a chatbot. To explore that, we conducted a systematic literature search. Our corpus consisted of 31 journal articles. As a result of the content analysis, we identified seven key issues, among them users' expectations, attitudes, experiences, satisfaction, perceptions, trust, and acceptance. We organized the presentation of the results under these topics.

The study is structured as follows. At first we present the methodology of literature research. The next section deals with the results of the descriptive analysis. The results of the content analysis are presented in the following section. This part is followed by the conclusions, and then we deal with the theoretical limitations and future research.

Methodology

A systematic literature search was applied to map out the publications focusing on the users' perspective on chatbots. This data collection method is "explicit, comprehensive, and repeatable" and aims to identify, evaluate, and synthesize the publications of researchers and practitioners (Fink, 2005, pp. 3-4). The research was conducted according to Okoli & Schabram's (2010) methodological recommendation. After identifying the relevant articles, the data was examined using content analysis to find the emerging topics.

Research goal

The goal of the systematic literature search is to identify the relevant articles related to users' perspectives on chatbots. The research questions are based on the distinction of the human-chatbot interaction's context: (1) *What do we know about the users' perspective on chatbots in a real real-life context (interaction between existing corporate chatbots for external communication / existing corporate chatbots for internal communication and customers/ organization members)?* (2) *What do we know about the users' perspective on chatbots in an experimental setting (interaction between experimental chatbot and research subject)?*

Search strategy

Our search strategy follows the exhaustive review with a selective citation scenario proposed by Cooper (1988). This coverage method means that the researcher reviews a manageable number of papers instead of trying to find every available research published or unpublished. This procedure allows the inclusion of only journal articles (Randolph, 2009). Thus, the search base consisted of peer-reviewed, English-language journal articles. As the literature search was conducted in August 2021 and its goal was to identify all relevant journal articles, the search base consisted of papers that were published no later than 2021. The subject areas were narrowed down to "Computer Science", "Social Sciences", "Psychology" and "Business, Management, and Accounting". The articles were searched in SCOPUS and Science Direct using the following keywords: "chatbot" AND "expectation" OR "motivation" OR "attitude" OR "experience" OR "satisfaction" OR "perception" OR "trust" OR "acceptance" and "human-chatbot interaction". *Table 1* shows the number of search results by database and keyword.

Table 1

The number of search results by database and keyword

Database	Keywords	Number of results
SCOPUS	*„chatbot" AND „expectation" OR „motivation" OR „attitude" OR „experience" OR „satisfaction" OR „perception" OR „trust" OR „acceptance"*	197
	human-chatbot interaction	10
Science Direct	*„chatbot" AND „expectation" OR „motivation" OR „attitude" OR „experience" OR „satisfaction" OR „perception" OR „trust" OR „acceptance"*	778
	human-chatbot interaction	16
In total		1001

Source: own compilation

Selection process

Figure 1

Flowchart of the systematic literature search
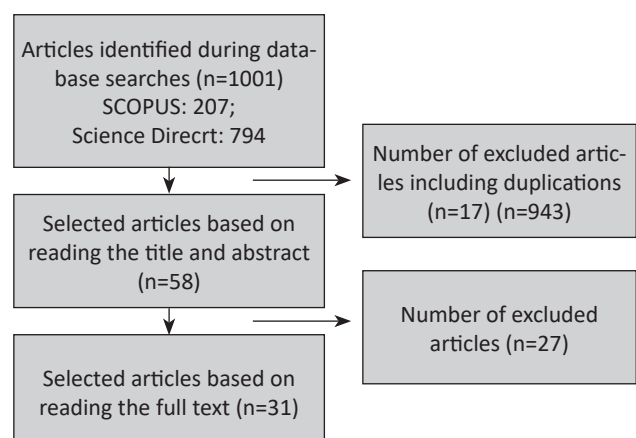
Source: own compilation

The total number of search results in the databases was 1001 articles. Based on a review of titles and abstracts, 926 publications and 17 additional articles (duplicates) were disregarded. As a result, 58 studies remained in the analysis pool, and 27 publications were excluded after reading the full text. Thus, as a result of the systematic literature search, we found 31 relevant journal articles (*Figure 1*).

Regarding the inclusion criterion, we made a distinction between the conditions for classifying publications as closely related and partially related articles. Articles defined as closely related deal with the perspective of users on chatbots in a real-life context. The partially related articles also explore user perspectives on chatbots but in an experimental setting. It has been defined as an exclusion criterion if the article does not discuss users' perspective on chatbots or it examines the phenomenon in a non-business context (the latter includes publications examining the user experiences of interactions with chatbots used for health, education, or therapeutic purposes) (*Table 2*).

Table 3

Distribution of selected articles by date of publication

Year	2015	2018	2019	2020	2021
Number of articles	1	1	6	10	13

Source: own compilation

Chatbots' application areas

Twelve articles of the corpus used an experimental method to examine user attitudes related to human-chatbot interaction in a laboratory setting, and most cases, chatbots were developed for the research. Two publications (Croes & Antheunis, 2021; Skjuve et al., 2021) explored user experiences of interaction with existing social chatbots. The application areas of the chatbots were e-commerce (n=7), customer service (n=3), tourism (n=1), telecommunications (n=1), B2B communication (n=1), and banking

Table 2

Inclusion and exclusion criteria

I/E	Criterion	Criterion description	Database	Number of publications
INCLUSION	Closely related	It discusses the perspective of the consumer/organization member towards the chatbot in a business / organizational context.	Science Direct	4
			SCOPUS	13
	Partly related	It discusses the users' perspective towards the chatbot in general.	Science Direct	5
			SCOPUS	9
EXCLUSION	Not related	It is not about users' perspective on chatbots. It is not in a business / organizational context and does not discuss users' perspectives on chatbots in general.	Science Direct	772
			SCOPUS	181

Source: own compilation

Data extraction and the presentation of results

The present review has a research outcome-oriented and theoretical focus (Cooper, 1988), as it aims to explore the results of research examining users' perspectives on chatbots and to discover the applied theories. Regarding the purpose of the literature review, it attempts to identify the central issues in the field. As a result of the content analysis, seven main issues have emerged, among them users' expectations, attitudes, experiences, satisfaction, perceptions, trust, and acceptance. We present the selected articles' results and applied theories organized under these seven topics.

Descriptive analysis

Publication date of the selected articles

Most of the studies that make up the corpus have been published in the last two years. 42% (n=13) of the articles were published in 2021 and 32% (n=10) in 2020. (*Table 3*). 16% (n=5) of the articles were published in the journal Computers in Human Behavior, while 9.6% (n=3) were in the International Journal of Human-Computer Interaction.

services assistance (n=3). Only two articles (Brachten, Kissmer & Stieglitz, 2021; Jang, Jung & Kim, 2021) were identified that examined the attitudes of organization members towards chatbots used to automate internal communication.

Content analysis

Expectations

The exploration of expectations on chatbots has great importance, as they affect users' perceptions that may define the overall satisfaction when interacting with chatbots (Rapp, Curti & Boldi, 2021).

Chaves & Gerosa (2020) identified 11 attributes that are important to equip chatbots to avoid experiencing frustration and dissatisfaction during a human-chatbot interaction. These characteristics were categorized into the following three main groups: conversational intelligence, social intelligence, and personification. Conversational intelligence includes proactivity, conscientiousness, and communication. Proactivity means that the chatbot asks follow-up questions, provides additional information, and suggests new topics, thus keeping the conversa-

tion alive and contributing to a more natural interaction. Conscientiousness refers to the attention provided by the chatbot, the meaningful answers, the continuity of the conversation, the use of visual elements, and the transparency of the chatbot's identity. Communicability means that the user's expectations are well managed through offering the next steps and providing assistance. Social intelligence covers the ability to repair damage (handling unfriendly users, identifying abusive sentences, ignoring offensive sentences), thoroughness (showing humanity, authenticity, consistency in interaction), the way of behaving (politeness, expressing gratitude, continuing small talk), morality (avoiding stereotypes, building a distortion-free database, avoiding alienation), emotional intelligence (reciprocity, use of social-emotional expressions, making the identity of the interactive agent transparent, displaying emotional reactions), and personalization (learning from the user, recommending custom services, data security). Finally, personification - which refers to the anthropomorphization of the chatbot - includes the interactive agent's identity (balance of identity and technical skills) and its personality (appropriate language use, user-adapted sense of humor, balance of personality traits).

Attitude

Attitude is an internal mental process defined by several factors and circumstances in which individuals evaluate the entities around them positively or negatively (Kohlmann, 2018). Attitude also influences an individual's actions. Examining users' attitudes towards chatbots can help in predicting their behavior during HCI.

Based on the factors of the Consumer Technology Acceptance model (CAT) and the PAD dimensions (pleasure, arousal, dominance) of the Environmental Psychology model (EPM), Zarouali et al. (2018) examined users' attitude development to a chatbot assisting in ticket reservation. The authors' model of unified technology acceptance considers not only cognitive factors (perceived usefulness, perceived ease of use, perceived helpfulness) but also the role of affective factors (joy, liveliness, dominance), through the examination of users' intention to use the chatbot technology. Zarouali et al. (2018) found a positive relationship between two cognitive factors (perceived usefulness, and perceived helpfulness), all affective elements of the unified consumer technology acceptance model (pleasure, liveliness, dominance), and attitudes about chatbots, respectively. The authors found that the acceptance of chatbots depends not only on the role of cognitive factors but also on how users feel about technology.

Kasilingam (2020) examined user attitudes and intent to use a chatbot providing online shopping assistance. The author has included seven factors (perceived usefulness, perceived ease of use, perceived entertainment, price awareness, perceived risk, trust, and personal innovation) in his research model that may influence consumer attitudes and intentions to use technology. The results of the research showed that perceived usefulness, perceived ease of use, perceived fun, price awareness, perceived risk, and

personal innovation influenced attitudes toward chatbots. However, in addition to attitude, the intention to use was only directly influenced by trust and personal innovation.

Experience

User experience related to technology is often examined through the perception of usability (Denecke, Hochreutener, Pöpel & May. 2018; Denecke, Vaaheesan & Arulnathan, 2020), however, in this study, we define experience as the users' feelings and thoughts when they interact with chatbots. User experiences play an important role in technology acceptance.

Skjuve et al. (2019) investigated whether not revealing the chatbot's identity evokes the phenomenon of the uncanny valley described by Mori (1970). Their results showed that the lack of transparency did not induce the "uncanny valley" effect; however, the authors identified the long waiting time during the conversation as a factor similar to the uncanny valley phenomenon that caused discomfort to users.

Ciechanowski et al. (2019) revealed that a simple, text-based chatbot caused fewer anxious feelings in the user compared to a more advanced chatbot with an avatar. The simple chatbot also evoked less intense reactions from the subjects and received more positive reviews.

Hill, Ford & Farreras (2015) compared the evolution of interactions between people and the chatbot in terms of quality (word uniqueness, use of profanity, shorthand, and emoticons) and quantity (words per message, words per conversation, messages per conversation). The results showed that messages sent to chatbots contained on average fewer words than those sent to the human interaction partner, however, the subjects sent more than twice as many messages to the chatbot than to the human interaction partner. It was also found that individuals used vulgar and negative terms in their interactions more with the chatbot than with the human partner.

In their research, Skjuve et al. (2021) used the Social Penetration theory to examine the phases along which human-chatbot interaction evolves. The authors found that the evolution of the human-chatbot relationship bears similarities to the process of interpersonal relationship development described by the theory of social penetration. Nevertheless, it also has specific conditions, including the disclosure of the chatbot's identity to build trust, which plays a central role in establishing the human-chatbot connection. The stages of development identified by the authors are as follows:

(1) Exploratory phase: users are not yet familiar with the technology; they have not developed trust in the chatbot. At this stage, the curiosity towards the chatbot and the desire to experience the novelty keep the interaction alive.

(2) Affective phase: Trust develops at this stage. The chatbot's accepting, supportive, understanding, and non-judgmental behavior, as well as revealing its identity contributes to trust significantly.

(3) Stable phase: in this phase of relationship development, the user already shares everyday events with the chatbot and enjoys the benefits of regular interaction,

including self-reflection facilitated by conversations with the chatbot.

Croes & Antheunis (2021) also examined the human-chatbot relationship, namely, whether the longer-term use of the chatbot could lead to a social connection – more specifically, friendship – between the human and the chatbot. The authors based their research on the ABCDE Relationship Development Model (A: attraction, B: building, C: continuation, D: deterioration, E: ending). In the frame of the research, participants interacted with the social chatbot seven times, after which they completed a questionnaire about their experiences. The results showed that the sense of friendship was increasingly reduced in the users during the interactions. Although the experience of novelty appeared at the time of the first interaction, later the chatbot became predictable, and as a result, the individuals found the interactions less enjoyable. Subjects became less and less socially attracted to the chatbot over time, and for some time were reluctant to open up and found the chatbot less empathic or competent, which, according to the ABCDE model, necessarily brought about the decline or termination of the relationship. The authors concluded that the research subjects did not develop emotions towards the chatbot and the chatbot did not become their friend.

Satisfaction

The main goal in the development of HCI systems is to achieve user satisfaction that has long been based solely on usability and efficiency but has recently been supplemented with the need to experience the entertainment provided by the interaction. Satisfaction requires the coincidence of the user's expectations and experiences with chatbots (Rapp, Curti & Boldi, 2021).

Shumanov & Johnson (2021) formulated their hypothesis of satisfaction with the chatbot based on the Similarity-Attraction theory. According to the theory, similarities between the interaction partners' personality has a positive effect on satisfaction. The authors used the Big Five Personality test to examine whether the perception of similarities leads to satisfaction. The interaction style of the chatbots was adapted to the subjects' personalities. The introverted chatbot engaged in efficient, goal-oriented communication, while the communication of the extroverted chatbot was characterized by the pursuit of a user experience. The authors found that the language used by chatbots does contribute to a sense of personalization, commitment, and satisfaction.

Ashfaq et al. (2020) conducted their research based on several models to examine the determinants of user satisfaction with chatbots, including the Expectation-Confirmation model, the Information System Success model, the Technology Acceptance model, and the Need for Interaction with a Service Employee. Their results showed that the chatbot's up-to-date, reliable, fast response and the provision of personalized attention have a positive effect on user satisfaction and, through this, on their intention to continue using the technology. The results also revealed that continuance intention (CI) is positively influenced by perceived enjoyment (PE), perceived usefulness (PU), and perceived ease of use (PEOU).

Chung et al. (2020) identified two groups of factors that can affect satisfaction: the effort made by the chatbot (interaction, entertainment, trendiness, customization, problem-solving), and the quality of communication (accuracy, information credibility, communication competence). The research results show that the chatbots used to sell luxury brands can also contribute to the acquisition of a favorable shopping experience that supports the establishment of a consumer-company relationship.

Li et al. (2020) investigated the factors that determine user demand for subsequent use of chatbots used to automate the provision of information related to travel services. The authors examined user satisfaction along the following quality dimensions that determine intent for further use: understanding, reliability, responsiveness, security, and interactivity. The results of the research showed that all quality dimensions except responsiveness had an impact on user satisfaction and, through this, the intention to use it later. The authors explain the lack of a link between responsiveness and satisfaction by stating that in China (the country in which the research was conducted), consumers are accustomed to quick responses from the human workforce, so this did not play a key role in creating their need for later use.

Eren (2021) studied user satisfaction with a chatbot used in banking services based on the Expectation-Confirmation theory, which examines consumer behavior and purchasing decisions based on perceived performance. The results revealed that perceived performance, trust, and organizational reputation show a significant relationship with consumer satisfaction with chatbots.

Cheng & Jiang (2020) examined how the use of chatbots affects overall consumer satisfaction based on the Uses and Gratification theory. The authors identified four possible categories of user satisfaction with chatbot use, which are (1) utilitarian: the usefulness and accuracy of the information provided by the chatbot, (2) hedonist: the fun experienced during the interaction and emotional support, (3) technology: simplicity and speed of technology availability and (4) social: experiencing a social presence. The research results confirmed that these categories have a positive effect on consumer satisfaction and through this the intention to use them later.

Tsai, Liu & Chuan (2021) examined how the anthropomorphic nature and social presence of the chatbot contribute to the consumer's brand commitment. The authors also incorporated the concept of parasocial interaction as a factor influencing positive branding. We speak of parasocial interactions when the relationship that people build with media people resembles an interpersonal relationship for them but is one-sided (Kassing and Sanderson, 2015). Tsai, Liu, and Chuan's (2021) research revealed that the anthropomorphic nature of a chatbot positively influenced the perception of social presence through parasocial interactions, which also had a positive effect on user brand engagement.

Perception

Examining the perception of chatbots helps to define the determinants of users' satisfaction. Based on the results of the present literature search, this area proved to be one of the most significant, as seven journal articles dealt with this topic.

Mehra (2021) examined the perception of chatbots with different personalities. For the research, three chatbots were developed based on the Big Five personality model. The three chatbot personalities were the transactional, the prosocial, and the friendly ones, respectively. The transactional chatbot was characterized by efficient and focused task performance, by as little interaction as possible, and by seriousness. In contrast, the prosocial chatbot was anthropomorphic in nature and placed more emphasis on social interactions, however, this personality was also characterized by a certain degree of distance. The friendly chatbot has been developed to interact with users as if they were close friends. The results showed that the majority of the subjects preferred the friendly chatbot, as the users perceived the interaction with it as the most comfortable and the most effective.

Lee, Lee & Sah (2019) also examined user perceptions of anthropomorphic traits. These were analyzed not in relation to the personality but to the mind (mental state) of the chatbot, namely, whether the perception of the mental state of the chatbot contributes to social presence and proximity and the intention to use. The authors claim that perceiving a mental state also has cognitive and emotional benefits for the users, as it contributes to a more meaningful experience with the chatbot and to the feeling that the user is chatting with an intelligent entity. It was found that the more conscious the subjects perceived the chatbot, the stronger their sense of social presence and interpersonal closeness was.

Han (2021) examined whether the perceptions of the humanness of a chatbot affect the perception of social presence and entertainment. The results of the study revealed that the anthropomorphization of a chatbot has a positive effect on the perception of social presence and entertainment, which play an important role in purchasing decisions.

Schuetzler, Grimes & Giboney (2020) investigated how a higher level of a chatbot's ability to chat affects the perception of social presence and humanity, as well as user engagement. The study found that chatbots with higher levels of conversational ability (which communicated with the research subject in a personalized manner and used a variety of terms in the interaction) had higher perceptions of social presence and anthropomorphic character, as well as engagement.

Beattie, Edwards & Edwards (2020) also conducted a study on chatbot perception, focusing on how the chatbot's use of emojis affects the perception of social attractiveness, competence, and authenticity. The results revealed that subjects also found the human interaction partner and chatbot to be more socially attractive, competent, and authentic when using their emojis in their communication.

Go & Sundar (2019) investigated the effect of the appearance of anthropomorphic visual signals on the interface, the interactivity of the message, and the perception of identity in their research. The authors revealed that the chatbot was able to create a sense of social presence without being visible to the user or having an identity because message interactivity could compensate the users for the lack of visual character or identity of the chatbot.

Park et al. (2021) investigated how the nature of communication with a chatbot is influenced by the perceived humanity, social competence, and ideological background of the user. The results of the research showed that the ethical orientation of the subjects influences the nature of their communication with the chatbot. Idealists were more likely to communicate more kindly with the chatbot, while relativists tended to use offensive terms. Furthermore, it became apparent that the more humane individuals perceived the chatbot, the more vulgar or hurtful the terms were used.

Jang, Jung & Kim (2021) examined perceptions of chatbots from the perspective of managers. The authors used the theory of social representations (SRT) as the basis for their research to explore collective interpretations of the chatbot. The authors found that the perception of managers regarding the use of chatbots is twofold: in addition to articulating the undoubted benefits of introducing the technology, they also perceive the challenges it generates.

Trust

Trust is a cognitive assessment and a subjective sense that security as a psychological need is present (Mayer et al., 1995). Trust plays an important role in human-chatbot interaction, especially if the user shares personal information with the chatbot which is risky (Zamora, 2017). In several HCI publications, trust appears as a determinant of attitudes towards chatbots (Kasilingam, 2020).

Toader et al. (2019) examined the effects of perceived social presence, perceived competence, and anthropomorphic character on the development of trust in the chatbot and positive consumer responses. To create their research model, the authors used the Social Information Processing theory, the Media Equation theory, and the Computers Are Social Actors (CASA) paradigm as a basis. The results have shown that the gender of the chatbot plays an important role in the development of trust and positive consumer responses. Consumers' reviews of the anthropomorphic chatbot with a female identity remained positive even when the chatbot made a mistake. The results also showed that subjects who interacted with the female chatbot were more likely to share personal information about themselves and elevate patronage intention (i.e., recommending the use of the chatbot to other individuals). They also found that errors of female chatbots were more often forgiven by users compared to those of male chatbots. Finally, it was demonstrated that chatbots that work without errors are more likely to incentivize a purchase, raise patronage intention, and also tend to make customers more satisfied.

Nordheim, Følstad & Bjørkli (2019) developed an initial model of trust in chatbots. Their model included elements revealed in the literature (expertise, predictability, humanity, ease of use, risk, reputation, propensity to trust technology), and two other factors identified by them. These factors are responsiveness (the ability of chatbots to respond quickly and efficiently as an additional factor) and the perception of the brand.

Cheng et al. (2021) examined the effect of human characteristics (empathy, friendliness) attributed to the chatbot, the disclosure of the identity of the chatbot, and the complexity of the task performed by the chatbot on the development of trust in connection with an e-commerce chatbot. The results show that the perceived empathy and friendliness of the chatbot have a positive effect on the development of trust, whereas empathy plays a more significant role compared to friendliness. The complexity of the task had no significant effect on the relationship between empathy and trust, while it was moderately affected by the disclosure of the chatbot's identity.

De Cicco, Silva & Alparone (2020) examined how perceived social presence – i.e., the feeling that one is present with someone else – affects the development of trust towards the chatbot, the experience of fun during the interaction, and the general attitude towards chatbots, respectively. The authors examined the perception of social presence along two variables, namely, whether the chatbot has an avatar or not, and whether its interaction style is relationship-oriented or task-oriented. The authors have shown that a relationship-oriented style of interaction contributes to the perception of social presence. It has also become apparent from the study that a sense of social presence plays a role in perceiving the entertaining nature of trust and interaction, which in turn leads to the development of positive attitudes towards the chatbot. However, the authors found no association between the appearance of the chatbot with an avatar and the perception of social presence.

Acceptance

Acceptance is the assessment and attitude following the use of technology (Schuitema et al., 2010) and a condition for the success of an implemented system, so it is paramount to understand how technology characteristics affect users' technology acceptance (Davis, 1987).

Richad et al. (2019) studied the willingness to accept a chatbot used in a banking environment based on the Technology Acceptance Model (TAM). The authors added innovation as an exogenous factor to the variables, i.e., the subject's attitude towards novelties. Their results have shown that innovation, perceived usefulness, perceived ease of use, and attitudes toward using chatbots have increased users' intentions of use.

Rese, Ganster & Baier (2020) investigated the willingness to accept an online shopping assistant chatbot. Their research was based on the Technology Acceptance Model and Uses and Gratification theory. Research revealed that the authenticity of the conversation, its perceived usefulness, and entertainment positively influenced the willing-

ness to accept the chatbot. At the same time, safety and the maturity of the technology had a negative effect on the intention to use and the frequency of use.

Behera, Bala & Ray (2021) examined the willingness to accept a chatbot used to automate B2B communication based on the Technology Acceptance Model and the Information Systems Success model. In addition to elements of the TAM and ISSM models, the authors also included perceived trust and perceived risk as possible determinants of the willingness to accept the chatbot. The results of the research show that perceived ease of use (PEOU), perceived usefulness (PU), and perceived trust (PT) play an important role in the formation of user attitudes and intentions to use. It was also found that perceived information quality (PIQ), perceived system quality (PSYQ), and perceived service quality (PSEQ) have an impact on user satisfaction.

Brachten, Kissmer & Stieglitz (2021) pointed out that before introducing chatbots into organizations, it is crucial to understand what factors influence employees' willingness to accept and adopt an interactive agent (without alienation from the technology). The authors used the theory of Planned Behavior as a basis for studying the phenomenon, which contributes to learning about the intention to use chatbots. The results of the research revealed that attitude played a greater role in the formation of intent to use than external factors, such as subjective norms and perceived behavioral control. It was also found that the influence of peers on the intention to use was more significant than the influence of leaders.

Conclusions

The literature review aimed to explore users' perspectives on chatbots with a research outcome-oriented and theoretical focus. As a result of the content analysis, seven topics have emerged in connection with human-chatbot interaction such as user expectations, attitude, experience, satisfaction, perception, trust, and acceptance. Most of the selected articles dealt with users' perceptions and satisfaction, while expectations, experience, and attitudes were examined only by a few publications.

Regarding users' expectations, Chaves & Gerosa (2020) identified 11 characteristics that are important for users during human-chatbot interaction. Having these attributes, a perfect entity emerges in a cognitive and affective sense that rarely appears in real human-to-human interactions. Based on this, the question arises as to whether humans need an artifact that does not have errors and owns the superintelligence and moral superiority as Gladden (2016) described it.

The studies have shown that in addition to cognitive factors, affective factors also play an important role in the development of attitudes toward chatbots. This implies that users' feelings should also be considered when developing such technology.

Regarding users' experience with chatbots, surprisingly, during the longer-term use of chatbots, individuals were less willing to interact with them because it became predictable

for them, resulting in a loss of novelty with the technology. These findings raise the question: what can create a need for multiple interactions with the chatbot? Studies examining user experience have also shown that simpler chatbots with no "uncanny valley" effect evoked less strong reactions from the users, as opposed to more complex interactive agents, which contradicts the results of Chaves & Gerosa (2020) regarding user expectations about chatbots.

Several articles focused on users' perceptions of chatbots, examining the phenomenon in terms of the anthropomorphic nature of the chatbot. One of the research findings was that individuals allowed themselves to use offensive, negative language in their communication with the chatbot much more than with a human interaction partner. Offensive communication had no negative consequences on users, which however is not true in a workplace context. Therefore, it may be an interesting question whether this use of the language is typical in the case of employees as well, given that they know the interactions could be stored by the chatbot.

Trust in the chatbot was another topic studied by the corpus articles, which is determined by several factors, including the reputation of the company's brand. This finding draws attention to the phenomenon that in an organizational context employees' trust in chatbot technology may be influenced by their commitment to the company.

Cheng & Jiang (2020) applied the User and gratification Theory to examine customer satisfaction. The author found the dimension of U&G Theory influences positively user satisfaction. It would be interesting to explore whether employees' satisfaction with chatbot technology can be positively influenced by the dimension of the model including social needs and hedonism.

The studies on acceptance showed that besides the perceived usefulness and perceived ease of use, entertainment is also an important factor for the users. Other research shows (Ciechanowski et al., 2019) that the less humanlike attributes evoke less intense reactions from the users and receive more positive feedback. Based on this one can conclude that interface developers must find the right proportion between the functional and anthropomorphic characteristics of the chatbot.

As described above, the corpus articles studied human-chatbot interaction typically only from one aspect. Although, the focus on one issue helps to expand the specific knowledge of one area, for creating successful human-chatbot interaction systems, all factors and their connections should also be considered. As *Figure 2* shows, before interacting with chatbots, users already have expectations and attitudes influenced by their beliefs and previous knowledge. During human-chatbot interaction, they gain experiences and perceptions of the technology. If their experiences and perceptions coincide

Table 4

Theories used by corpus articles

TOPIC	APPLIED MODEL	AUTHOR(S)
Attitude	Consumer Technology Acceptance Model (CAT)	Zarouali et al. (2018)
	Environmental Psychology model (EPM, PAD)	
	Technology Acceptance Model (TAM)	Zarouali et al. (2018) Kasilingam (2020)
Experience	Uncanny valley	Skjuve et al. (2019) Ciechanowski et al. (2019)
	ABCDE relationship development model	Croes & Antheunis (2021)
	Social Penetration Theory (SPT)	Skjuve et al. (2021)
Satisfaction	Similarity-attraction theory (SAT)	Shumanov & Johnson (2021)
	Big Five personality test	
	Information Systems Success model (ISSM)	Ashfaq et al. (2020)
	Technology Acceptance Model (TAM)	Ashfaq et al. (2020)
	Expectation Confirmation Model (ECM)	Ashfaq et al. (2020) Eren (2021)
	Uses & Gratification theory (U&G)	Cheng & Jiang (2020)
	Social Presence Theory (SP)	Tsai, Liu & Chuan (2021)
Perception	Big Five personality test	Mehra (2021)
	Social Presence Theory (SP)	Han (2021
	Theory of Social Attraction (SA)	Beattie, Edwards & Edwards (2020)
	Theory of Social Representations (SRT)	Jang, Jung and Kim (2021)
Trust	Social Presence Theory (SP)	Toader et al. (2019)
Willingness to accept	Uses & Gratification theory (U&G)	Rese, Ganster & Baier (2020)
	Planned Behavior theory (TPB)	Brachten, Kissmer & Stieglitz (2021)
	Technology Acceptance Model (TAM)	Richad et al. (2019) Rese, Ganster & Baier (2020) Behera, Bala & Ray (2021)
	Information Systems Success model (ISS)	Behera, Bala & Ray (2021)

Source: own compilation

with their expectations, they will be satisfied, accept the technology and they will have trust in chatbots. Due to their experiences, users' attitudes may change towards the technology, which influences their later actions.

Figure 2
The connection between the identified topics
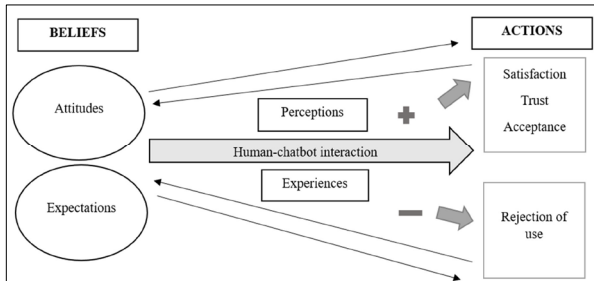
Source: own compilation

In the databases in which we conducted the literature search, no articles have been found that overviewed the theories applied for examining human-chatbot interaction. As a result of our analysis, we identified the models by topics scholars use for examining human-chatbot interaction (*Table 4*). Some theories were used for studying more topics such as the Technology Acceptance model that appeared not only in acceptance but also in attitude and satisfaction research. Most of the publications used existing theories, and only two studies created new models. One of them was developed for measuring trust in chatbots (Nordheim, Følstad & Bjørkli, 2019), and the other one was for the exploration of the human-chatbot relationship development (Skjuve et al., 2021). Some theories were applied more often such as the Theory of Social Presence, the Big Five Personality test, the Uses & Gratification Theory, the Information Systems Success Model, and the Expectation-Confirmation model. Most of the selected articles applied quantitative methods and some of them combined the variables of more models. Consequent to the literature review, it can be seen that the use of existing models from other fields and quantitative methods is dominant in human-chatbot interaction research. However, chatbot technology has its features, therefore the development of new models may help to better understand users' perspectives on chatbots. The application of qualitative methods may contribute to the deeper analysis of the nature of human-chatbot interaction.

Limitations

Our search strategy followed the exhaustive review with a selective citation scenario which means we included only the peer-reviewed journal articles in the search base. This way, conference papers, book chapters, and other publications were excluded thus hindering the identification of all relevant research in the field.

The literature search was conducted only in two databases which means we could not discover all the suitable publications.

Another limitation of our research was that we did not overview the reference list of the selected papers which would have helped to find more relevant articles.

Future research

Only two publications of the selected articles examined the attitudes of organization members toward chatbots used to automate internal communication. The study of human-chatbot interaction in a workplace context may enrich the research field. We claim that employee-chatbot interaction may generate different results in terms of satisfaction, expectation, or acceptance because workers are not allowed to reject the use of chatbots.

As the results show, besides functionality, entertainment is also important for users when interacting with a chatbot, but the presence of too many humanlike attitudes does not necessarily lead to user satisfaction. Therefore, it would be important to research the right proportion of social and technological functions of a chatbot.

References

Ashfaq, M., Yun, J., Yu, S., & Loureiro, S.M.C. (2020). I, Chatbot: Modeling the determinants of users' satisfaction and continuance intention of AI-powered service agents. *Telematics and Informatics*, *54*, 101473. https://doi.org/10.1016/j.tele.2020.101473

Beattie, A., Edwards, A.P., & Edwards, C. (2020). A bot and a smile: Interpersonal impressions of chatbots and humans using emoji in computer-mediated communication. *Communication Studies*, *71*(3), 409-427. https://doi.org/10.1080/10510974.2020.1725082

Behera, R.K., Bala, P.K., & Ray, A. (2021). Cognitive Chatbot for personalized contextual customer service: Behind the scene and beyond the hype. *Information Systems Frontiers*, *26,* 899–919. https://doi.org/10.1007/s10796-021-10168-y

Bilquise, G., Ibrahim, S., & Shaalan, K. (2022). Emotionally Intelligent Chatbots: A Systematic Literature Review. *Human Behavior and Emerging Technologies, 2022*(1), 1-23. https://doi.org/10.1155/2022/9601630

Brachten, F., Kissmer, T., & Stieglitz, S. (2021). The acceptance of chatbots in an enterprise context–A survey study. *International Journal of Information Management*, *60*, 102375. https://doi.org/10.1016/j.ijinfomgt.2021.102375

Calvaresi, D., Ibrahim, A., Calbimonte, J.P., Schegg, R., Fragniere, E., & Schumacher, M. (2021). The evolution of chatbots in tourism: A systematic literature review. In *Information and Communication Technologies in Tourism 2021: Proceedings of the ENTER 2021 eTourism Conference*, January 19–22, 2021 (pp. 3-16). Springer International Publishing. https://link.springer.com/chapter/10.1007/978-3-030-65785-7_1

Chaves, A.P., & Gerosa, M.A. (2019). How should my chatbot interact? A survey on human-chatbot interac-

tion design. *International Journal of Human-Computer Interaction, 37*(2), 729-758.
https://doi.org/10.1080/10447318.2020.1841438.

Cheng, X., Bao, Y., Zarifis, A., Gong, W., & Mou, J. (2021). Exploring consumers' response to text-based chatbots in e-commerce: the moderating role of task complexity and chatbot disclosure. *Internet Research*, *32*(2), 496-517.
https://doi.org/10.1108/INTR-08-2020-0460.

Cheng, Y., & Jiang, H. (2020). How do AI-driven chatbots impact user experience? Examining gratifications, perceived privacy risk, satisfaction, loyalty, and continued use. *Journal of Broadcasting & Electronic Media*, *64*(4), 592-614.
https://doi.org/10.1080/08838151.2020.1834296.

Chung, M., Ko, E., Joung, H., & Kim, S.J. (2020). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research*, *117*, 587-595.
https://doi.org/10.1016/j.jbusres.2018.10.004.

Ciechanowski, L., Przegalinska, A., Magnuski, M., & Gloor, P. (2019). In the shades of the uncanny valley: An experimental study of human–chatbot interaction. *Future Generation Computer Systems*, *92*, 539-548.
https://doi.org/10.1016/j.future.2018.01.055.

Cooper, H.M. (1988). Organizing knowledge syntheses: A taxonomy of literature reviews. *Knowledge in Society*, *1*(1), 104-126.
https://doi.org/10.1007/BF03177550

Croes, E.A., & Antheunis, M.L. (2021). Can we be friends with Mitsuku? A longitudinal study on the process of relationship formation between humans and a social chatbot. *Journal of Social and Personal Relationships*, *38*(1), 279-300.
https://doi.org/10.1177/0265407520959463.

Dautenhahn, K. (2013). Human-robot interaction. In *The Encyclopedia of Human-Computer Interaction* (2nd Ed.), Chapter 38. 2013. https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/human-robot-interaction

Davis, F.D. (1987). *User acceptance of information systems: the technology acceptance model (TAM) Working Paper 529*. University of Michigan. https://deepblue.lib.umich.edu/bitstream/handle/2027.42/35547/b1409190.0001.001.pdf?seque

Denecke, K., Hochreutener, S.L, Pöpel, A., & May, R. (2018). Self-anamnesis with a conversational user interface: concept and usability study. *Methods of Information in Medicine, 57*(05/06), 243-252.
https://doi.org/10.1055/s-0038-1675822

Denecke, K., Vaaheesan, S., & Arulnathan, A. (2020). A mental health chatbot for regulating emotions (SERMO) concept and usability test. IEEE Transactions on Emerging Topics Computing.
https://doi.org/10.1109/TETC.2020.2974478

De Cicco, R., Silva, S.C., & Alparone, F.R. (2020). Millennials' attitude toward chatbots: an experimental study in a social relationship perspective. *International Journal of Retail & Distribution Management*, *48*(11), 1213-1233.
https://doi.org/10.1108/IJRDM-12-2019-0406.

Eren, B.A. (2021). Determinants of customer satisfaction in chatbot use: evidence from a banking application in Turkey. *International Journal of Bank Marketing*, 39(2), 294-311.
https://doi.org/10.1108/IJBM-02-2020-0056.

Fink, A. (2019). *Conducting research literature reviews: From the internet to paper*. Sage Publications.

Gentner, T., Neitzel, T., Schulze, J., & Buettner, R. (2020). A systematic literature review of medical chatbot research from a behavior change perspective. In *2020 IEEE 44th Annual Computers, Software, and Applications Conference (COMPSAC)* (pp. 735-740). IEEE.
https://doi.org/10.1109/COMPSAC48688.2020.0-172

Gladden, M.E. (2016). *Posthuman management: Creating effective organizations in an age of social robotics, ubiquitous AI, human augmentation, and virtual worlds*. Defragmenter Media.

Go, E., & Sundar, S.S. (2019). Humanizing chatbots: The effects of visual, identity and conversational cues on humanness perceptions. *Computers in Human Behavior*, *97*, 304-316.
https://doi.org/10.1016/j.chb.2019.01.020

Han, M.C. (2021). The impact of anthropomorphism on consumers' purchase decision in chatbot commerce. *Journal of Internet Commerce*, *20*(1), 46-65.
https://doi.org/10.1080/15332861.2020.1863022

Harmat, V. (2023). The application of the sensemaking perspective for the examination of employees' behavioural responses to the HR chatbot. *Organizacija*, *56*(3), 233-246.
https://doi.org/10.2478/orga-2023-0016

Hill, J., Ford, W.R., & Farreras, I.G. (2015). Real conversations with artificial intelligence: A comparison between human–human online conversations and human–chatbot conversations. *Computers in Human Behavior*, *49*, 245-250.
https://doi.org/10.1016/j.chb.2015.02.026.

Jang, M., Jung, Y., & Kim, S. (2021). Investigating managers' understanding of chatbots in the Korean financial industry. *Computers in Human Behavior*, *120*, 106747.
https://doi.org/10.1016/j.chb.2021.106747.

Kasilingam, D.L. (2020). Understanding the attitude and intention to use smartphone chatbots for shopping. *Technology in Society*, *62*, 101280.
https://doi.org/10.1016/j.techsoc.2020.101280

Kassing, J.W., & Sanderson, J. (2015). Playing in the new media game or riding the virtual bench: Confirming and disconfirming membership in the community of sport. *Journal of Sport and Social Issues, 39*(1), 3-18.
https://doi.org/10.1177/0193723512458931

Kohlmann, D. (2018). Forradalmak az attitűdkutatásban: A kognitív-kísérleti és társas konstruktivista kutatási programok összevetése. *Magyar Pszichológiai Szemle*, *73*(2), 315-344.
https://doi.org/10.1556/0016.2018.73.2.9

Lee, S., Lee, N., & Sah, Y.J. (2020). Perceiving a mind in a chatbot: Effect of mind perception and social cues on co-presence, closeness, and intention to use. *Inter-

national Journal of Human–Computer Interaction, *36*(10), 930-940.
https://doi.org/10.1080/10447318.2019.1699748.

Li, L., Lee, K.Y., Emokpae, E., & Yang, S.B. (2021). What makes you continuously use chatbot services? Evidence from chinese online travel agencies. *Electronic Markets*, *31*, 575–599.
https://doi.org/10.1007/s12525-020-00454-z

Luo, B., Lau, R.Y., Li, C., & Si, Y. W. (2022). A critical review of state-of-the-art chatbot designs and applications. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, *12*(1), e1434.
https://doi.org/10.1002/widm.1434

Marciniak, R., Móricz, P., & Baksa, M. (2020). Lépések a kognitív automatizáció felé: Digitális átalakulás egy magyarországi üzleti szolgáltatóközpontban. *Vezetéstudomány/Budapest Management Review*, *51*(6), 42-55.
https://doi.org/10.14267/VEZTUD.2020.06.05

Mayer, R.C., Davis, J.H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*(3), 709-734.
https://doi.org/10.2307/258792

Mehra, B. (2021). Chatbot personality preferences in Global South urban English speakers. Social Sciences & Humanities Open, 3(1), 100131.
https://doi.org/10.1016/j.ssaho.2021.100131.

Mori, M. (1970). Bukimi no tani [the uncanny valley]. *Energy, 7*(4), 33-35.

Nordheim, C.B., Følstad, A., & Bjørkli, C.A. (2019). An initial model of trust in chatbots for customer service – findings from a questionnaire study. *Interacting with Computers*, *31*(3), 317-335.
https://doi.org/10.1093/iwc/iwz022.

Okoli, C., & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research. *Working Papers on Information Systems, 10*(26). http://sprouts.aisnet.org/10-26

Park, N., Jang, K., Cho, S., & Choi, J. (2021). Use of offensive language in human-artificial intelligence chatbot interaction: The effects of ethical ideology, social competence, and perceived humanlikeness. *Computers in Human Behavior*, *121,* 106795.
https://doi.org/10.1016/j.chb.2021.106795.

Pérez, J.Q., Daradoumis, T., & Puig, J.M.M. (2020). Rediscovering the use of chatbots in education: A systematic literature review. *Computer Applications in Engineering Education, 28*(6), 1549-1565.
https://doi.org/10.1002/cae.22326

Randolph, J. (2009). A guide to writing the thesis literature review. *Practical Assessment, Research, and Evaluation*, *14*(1), 13.

Rapp, A., Curti, L., & Boldi, A. (2021). The human side of human-chatbot interaction: A systematic literature review of ten years of research on text-based chatbots. *International Journal of Human-Computer Studies, 151*, 102630.
https://doi.org/10.1016/j.ijhcs.2021.102630.

Rese, A., Ganster, L., & Baier, D. (2020). Chatbots in retailers' customer communication: How to measure

their acceptance? *Journal of Retailing and Consumer Services*, *56,* 102176.
https://doi.org/10.1016/j.jretconser.2020.102176

Richad, R., Vivensius, V., Sfenrianto, S., & Kaburuan, E.R. (2019). Analysis of factors influencing millennial's technology acceptance of chatbot in the banking industry in Indonesia. *International Journal of Civil Engineering and Technology*, *10*(4), 1270-1281.
https://doi.org/10.34218/IJM.10.3.2019.011

Rossmann, A., Zimmermann, A., & Hertweck, D. (2020). The impact of chatbots on customer service performance. In *Advances in the human side of service engineering: Proceedings of the AHFE 2020 Virtual Conference on The Human Side of Service Engineering, July 16-20, 2020, USA* (pp. 237-243). Springer International Publishing.

Schuetzler, R.M., Grimes, G.M., & Scott Giboney, J. (2020). The impact of chatbot conversational skill on engagement and perceived humanness. *Journal of Management Information Systems*, *37*(3), 875-900.
https://doi.org/10.1080/07421222.2020.1790204.

Shumanov, M., & Johnson, L. (2021). Making conversations with chatbots more personalized. *Computers in Human Behavior*, *117,* 106627.
https://doi.org/10.1016/j.chb.2020.106627.

Schuitema, G., Steg, L., & Forward, S. (2010). Explaining differences in acceptability before and acceptance after the implementation of a congestion charge in Stockholm. *Transportation Research Part A: Policy and Practice*, *44*(2), 99-109.
https://doi.org/10.1016/j.tra.2009.11.005

Skjuve, M., Følstad, A., Fostervold, K.I., & Brandtzaeg, P.B. (2021). My chatbot companion-a study of human-chatbot relationships. *International Journal of Human-Computer Studies*, *149,* 102601.
https://doi.org/10.1016/j.ijhcs.2021.102601.

Skjuve, M., Haugstveit, I.M., Følstad, A., & Brandtzaeg, P. (2019). Help! Is my chatbot falling into the uncanny valley? An empirical study of user experience in human–chatbot interaction. *Human Technology*, *15*(1), 30-54.
https://doi.org/10.17011/ht/urn.201902201607

Suhaili, S.M., Salim, N., & Jambli, M.N. (2021). Service chatbots: A systematic review. *Expert Systems with Applications, 184,* 115461.
https://doi.org/10.1016/j.eswa.2021.115461

Szűcs, Z., & Jinil, Y. (2018). A chatbotok jelensége, taxonómiája, felhasználási területei, erősségei és kihívásai. *Információs Társadalom: Társadalomtudományi Folyóirat*, *18*(2), 41-55. https://inftars.infonia.hu/pub/inftars.XVIII.2018.2.3.pdf

Toader, D.C., Boca, G., Toader, R., Măcelaru, M., Toader, C., Ighian, D., & Rădulescu, A.T. (2019). The effect of social presence and chatbot errors on trust. *Sustainability*, *12*(1), 256.
https://doi.org/10.3390/su12010256.

Tsai, W.H.S., Liu, Y., & Chuan, C.H. (2021). How chatbots' social presence communication enhances consumer engagement: The mediating role of parasocial

interaction and dialogue. *Journal of Research in Interactive Marketing*, *15*(3), 460-482. https://doi.org/10.1108/JRIM-12-2019-0200.

Willcocks, L.P., Lacity, M., & Craig, A. (2015). *The IT function and robotic process automation*. LSE. http://www.lse.ac.uk/management/research/outsourcingunit/

Wollny, S., Schneider, J., Di Mitri, D., Weidlich, J., Rittberger, M., & Drachsler, H. (2021). Are we there yet? - a systematic literature review on chatbots in education. *Frontiers in Artificial Intelligence, 4,* 654924. https://doi.org/10.3389/frai.2021.654924

Wube, H.D., Esubalew, S.Z., Weldesellasie, F.F., & Debelee, T.G. (2022). Text-based chatbot in financial sector: a systematic literature review. *Data Science in Finance and Economics, 2*(3), 232-259. https://doi.org/10.3934/DSFE.2022011

Zamora, J. (2017). I'm sorry, dave, I'm afraid I can't do that: Chatbot perception and expectations. In *Proceedings of the 5th International Conference on Human Agent Interaction* (pp. 253-260). ACM. https://doi.org/10.1145/3125739.3125766

Zarouali, B., Van den Broeck, E., Walrave, M., & Poels, K. (2018). Predicting consumer responses to a chatbot on Facebook. *Cyberpsychology, Behavior, and Social Networking*, *21*(8), 491-497. https://doi.org/10.1089/cyber.2017.0518.