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Review

Human-Computer Interaction in Customer Service: The Experience with AI Chatbots—A Systematic Literature Review

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Abstract: Artificial intelligence (AI) conversational agents (CA) or chatbots represent one of the technologies that can provide automated customer service for companies, a trend encountered in recent years. Chatbot use is beneficial for companies when associated with positive customer experience. The purpose of this paper is to analyze the overall customer experience with customer service chatbots in order to identify the main influencing factors for customer experience with customer service chatbots and to identify the resulting dimensions of customer experience (such as perceptions/attitudes and feelings and also responses and behaviors). The analysis uses the systematic literature review (SLR) method and includes a sample of 40 publications that present empirical studies. The results illustrate that the main influencing factors of customer experience with chatbots are grouped in three categories: chatbot-related, customer-related, and context-related factors, where the chatbot-related factors are further categorized in: functional features of chatbots, system features of chatbots and anthropomorphic features of chatbots. The multitude of factors of customer experience result in either positive or negative perceptions/attitudes and feelings of customers. At the same time, customers respond by manifesting their intentions and/or their behaviors towards either the technology itself (chatbot usage continuation and acceptance of chatbot recommendations) or towards the company (buying and recommending products). According to empirical studies, the most influential factors when using chatbots for customer service are response relevance and problem resolution, which usually result in positive customer satisfaction, increased probability for chatbots usage continuation, product purchases, and product recommendations.

Keywords: AI conversational agents; AI chatbots; customer service; customer experience

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1. Introduction

Artificial intelligence (AI) conversational agents (CA), also known as AI chatbots are seen as software applications that are capable to communicate through natural language [1], and they represent interactive systems in which human-computer interaction takes place. In the recent years, CA started to be used on a large scale, due to newer developments of artificial intelligence and machine learning and also the fact that, after 2016, Microsoft and Facebook launched frameworks for the integration of CA on their platforms [2,3].

Conversational agents are used in diverse fields and contexts (entertainment, marketing, education, health care, support systems, culture diffusion) [3] as, at present, AI technologies and machine learning allow AI enabled chatbots to mimic human behavior and enter conversational situations [4]. However, one important area in which CA/chatbots are used is the customer service activity, as AI enabled chatbots are seen as a promising technology for service providers [1] by providing automated customer service [4]. In the

last two years of the COVID-19 pandemic, the development of this specific IT-enabled service was prevalent in many companies, the year 2021 being a decisive year for the inclusion of the AI CA/chatbot technology for customer service activities, as we will present later in the paper.

In this context, expectations are high in the customer service field when using the AI enabled CA/chatbot technology [2]. The achievement of the benefits that are potentially associated with the use of CA/chatbots for customer service requires positive user experiences [5]. Therefore, detailed knowledge of the customers' experiences with customer service chatbots is one field of interest for both practitioners and researchers [4].

Practical motivation. Customer service is an emerging area for the application of chatbots, as AI CA are a means to automate customer service and make this activity more cost efficient for service providers. Practitioners [6] consider that there will be an increase in the adoption of chatbots for customer service as AI-enabled virtual agents can work with most customer relationship management (CRM) activities and allow for CRM automation. They consider that smart automation is the biggest transformation of contact centers during 2021, as smart automation took over the frontline of customer service across industries. In addition, the global chatbot market is expected to grow up to 10.08 million $ by 2026 [7]. However, the success of using AI CA for customer service depends on the experiences that customers have with the automated customer services provided by CA/chatbots. Service providers can enhance their AI-enabled customer service activity and improve their CA interaction design only when they are fully aware of how customers feel like, how they act, and what are the factors that influence their feelings and behaviors when using CA for customer service.

Theoretical motivation. The analysis of the customer experience can be conducted based on user experience theories, as customers represent one category of users for AI CA. User experience refers to how a person perceives and responds to the use or anticipated use of a product, system or service [4]. Different studies look solely at one or another particular aspect of users' experiences with AI CA/chatbots regarding both perceptions (trust, enjoyment, satisfaction) and/or responses (continuance, purchase) [8,9]. The creation of an overall image of customers' experiences with AI chatbots can bring clarification on how this concept applies in relationship to AI conversational agents. Therefore, one first aim of this paper is to see what the components of the overall customer experience with CA are and what the characteristics of the interaction process are. Secondly, it is of interest to see how the overall users' experiences with CA apply to the particular field of customer service, an activity offered by companies to strengthen customer satisfaction [10]. User-centered evaluations of CA/chatbots are necessary, as there is the need for more knowledge about CA/chatbot experiences from the perspectives of the end users [11,12], in the present case, customers. To fulfil these aims, a systematic literature review (SLR) is conducted.

Other literature reviews look at human–chatbot interaction from different perspectives: technical [13], historical [14] or only one particular perspective of the interaction: customer loyalty [15]. To our knowledge, there is no literature review to look at the overall customers' experience (perceptions/attitudes/feelings and responses/behaviors) with AI CA and chatbots for customer service from the end user perspective. Therefore, the present study tries to fill in this research gap by specifically proposing a systematic literature review to analyze the overall customer experience with AI CA for customer service.

The research questions that this research tries to answer are the following:

RQ1.: What are the factors that influence the customer experiences with AI CA/chatbots for customer service?

RQ2.: What are the resulting dimensions of the overall customer experience with AI CA/chatbots for customer service?

The dimensions of the overall customer experience refer to two main components that are considered in the present study: (a) the perceptions, attitudes, and feelings of customers when using AI CA/chatbots and (b) the responses and behaviors that customers have after using AI CA/chatbots.

The rest of the paper is structured as follows. In Section 2, the theoretical background necessary to answer the research questions is presented. Following, Section 3 presents the materials and methods employed for the present SLR. Section 4 includes the results of SLR and discussions related to the findings. At last, Section 5 concludes the paper.

2. Theoretical Background

2.1. Conversational Agents—Definition, History and Classifications

Conversational agents or chatbots have been defined in different ways. Table 1 presents a few definitions.

Table 1. Conversational agents/chatbots definitions.

Definition	Reference
Conversational agents/chatbots in general	
A software which can chat with people by using artificial intelligence	Alam et al. [16] (p. 33)
A computer program that simulates human–human conversation.	Ho et al. [17] (p. 712)
Conversational agents/chatbots for customer service	
An artificial intelligent program that can interact with consumers via different messaging apps.	Riikkinen et al. [18] (p. 1148)

The idea of chatbot as a conversational agent has been developed in 1950's by Alan Turing, who was curious to find out if a computer program could talk to people without them realizing that the speaker is artificial [3]. Adamopoulou and Moussiades presented a short history of chatbots/CA development over time starting with chatbot ELIZA (1966), continuing with PARRY (1972), Jabberwacky (1988), TINYMUD (1991), ALICE (1995), SmartChild (2001), Siri (2010), Watson (2011), Google Now (2012), Google Assistant (2016), Cortana (2014), Alexa (2014), each of them representing a more evolved bot as compared to the previous ones. Recently, more advanced technologies started to be used with chatbots (shifting from pattern-matching to machine learning and AI) [3]. Starting in 2016, new AI advancements allowed companies to develop CA for their brands or services.

CA/chatbots can be classified according to different criteria and, here, there are some relevant classifications. According to the response mechanisms used, there are two major response mechanisms used by CA/chatbots: (a) the rule-based model also called the retrieve-based model or template-based model and (b) the generative model. The rule based/retrieve-based model uses predefined sets of responses that are retrieved from a large collection and are offered in the conversation. These are the simplest forms of CA/chatbots. The generative model implies that the CA/chatbot generates a new response from scratch, and produces completely new sentences based on AI and machine learning [19,20]. These are the AI CA. There are also hybrid CA/chatbot systems that have partly defined and partly free responses [21]. Another important classification considers the knowledge domain of CA/chatbots. There are: (a) open-ended domain CA/chatbots (that have knowledge and can answer questions from any domain) and (b) closed-ended domain CA/chatbots (that have knowledge and can answer only questions that belong to a particular domain) [3].

According to the type of interaction, there are: (a) chatbots for customer service (providing information, help, advice by a company, government or a non-profit organization); (b) personal assistant chatbots that serve the user continuously (Alexa); (c) content curation chatbots that offer access to useful information (news, weather) and entertainment, and (d) chatbots for coaching that have the purpose to guide the user with specific tasks (education or therapy) [3].

Considering these three criteria, the CA/chatbots of interest for the present study are machine learning-AI chatbots/CA, specialized in a closed domain pertaining to customer service interaction for businesses.

Even though CA/chatbots exist for a long time, only recently (after 2016), companies started to use chatbots for communicating with clients and for customer service.

A virtual customer service agent (a chatbot, a conversational agent) consists of "computer-generated characters that are able to interact with customers and simulate behavior of human company representatives through artificial intelligence" [22] (p. 530). The next section looks at customer service and the use of conversational agents/chatbots for customer services.

2.2. Customer Service and Conversational Agents

Customers are one very important category of stakeholders for any organization, therefore ensuring their satisfaction is (or should be) one of the main preoccupations for companies. One way of creating customer satisfaction is through good customer service. Customer service has been defined as "the interaction that takes place between somebody from a company and the customer and links all tasks and functions in a company" [23] (p. 4).

In very recent years, IT-enabled digital systems started to be used by companies for providing customer service activities with the purpose to increase customer satisfaction. Among those, one technology that took prevalence is the chatbot technology that includes AI conversational agents that interact with customers.

Generally speaking, the virtual conversational agents are used by companies for fulfilling different tasks related to customer service such as: solving complaints, identifying items for purchase, making recommendations [7,24].

The purpose of using chatbots for customer service is to encourage the positive development of interaction with customers [25] by making use of the chatbots' benefits. Researchers agree that the use of the chatbot technology determines both benefits and challenges from the perspective of both companies and consumers. Among the main benefits for companies are cost reduction, time saving for customer service tasks [7,24], also the possibility to serve multiple customers simultaneously [3]. At the same time, for consumers, benefits refer to 24/7 access to customer service allowing them to post their questions at any time, therefore increasing customer satisfaction [3].

Digital transformation is considered to bring new ways for value creation for customers, such as automation, individualization, interaction, and transparency and control, that further can determine perceived customer benefits, such as convenience, relevance, experience, empowerment, and savings [26], benefits that can apply when consumers interact with CA/chatbots, as well.

However, there are also a number of challenges and limitations related to the CA/chatbot use for both companies and consumers and these include: risks related to personal data security; limitations regarding the level of understanding of messages (they do not recognize the intention of their interlocutor) and the production of natural language, that can create disappointment for the user and drive the customer away [3] (p. 13).

Therefore, the opinions of customers using CA/chatbot become important.

2.3. Customer Experience and Conversational Agents

As we have seen, customer experience is essential for the success of CA used in customer service activities. As customers are one important category of IS users, the theories on user experience with IS are used as a starting point for the development of the theoretical framework developed to analyze and answer the research questions.

User experience, in general, can be defined as "a person's perceptions and responses resulting from the use and/or the anticipated use of a product, system or service. Users' perceptions and responses include the users' emotions, beliefs, preferences, perceptions, comfort, behaviors, and accomplishments that occur before, during and after use" [27], (3.2.3.). At the same time, chatbot user experience is seen as "concerning how users perceive and respond to chatbots and how chatbot layout, interaction mechanisms and conversational content influences perceptions and responses" [12] (p. 2924).

Based on the definition, it can be considered that the dimensions of customer experience with CA include: (a) the perceptions, attitudes and feelings of customers when using

AI CA/chatbots, on the one hand, and (b) the responses and behaviors that customers have after using AI CA/chatbots, on the other hand.

In order to characterize the customers' experience with CA/chatbots, there is the need to identify the factors that influence the customer experience in the interaction with CA, on the one hand, and the resulting dimensions of customer experience, on the other hand. Two types of theories are considered, for this purpose: (a) the IT acceptance models that help identify influencing factors and (b) the IT user satisfaction models that help identify results of customer experience with CA/chatbots.

Various IT acceptance models exist in the literature, such as Technology Acceptance Model (TAM) and the Unified Theory of Adoption and Use of Technology (UTAUT) and its extension [28], and they propose a variety of influencing factors for IS use (such as usefulness, ease of use, performance expectancy, effort expectancy, social influence, etc.). The models can also be applied in the context of CA/chatbots for customer service. Given the large variety of factors that can influence the customer experience with CA, there is the need to group these factors. Different typologies classified factors influencing the use of IS [2,29–31]. The typology selected to group factors influencing customer experience with CA in this study is the one proposed by [8] (p. 9) for factors assumed to affect trust in chatbots for customer service, which include chatbot-related factors, environment- related factors, and user-related factors.

The other category of theoretical models refers to the user satisfaction models and explain the behavior of consumers. One such model is the expectation–confirmation theory, which states that satisfaction with Information Systems (IS) is predicted by user's confirmation of expectation from IS and further on determines the IS continuance intention [32] (p. 366). Another model is DeLone and McLean's IS success model, which states that user satisfaction and the intention to use IS depend on information quality, system quality, and service quality. These models are used to identify the dimensions of customer experiences in the present study [33] (p. 24).

The above-presented theoretical concepts and models, namely the IT acceptance models and factors' typology, on the one hand, and the IS user satisfaction models and the definition of user experience, on the other hand, are used to develop the theoretical framework adopted to analyze customer experiences with AI CA/chatbots. The theoretical framework applied in this paper is presented in Figure 1.

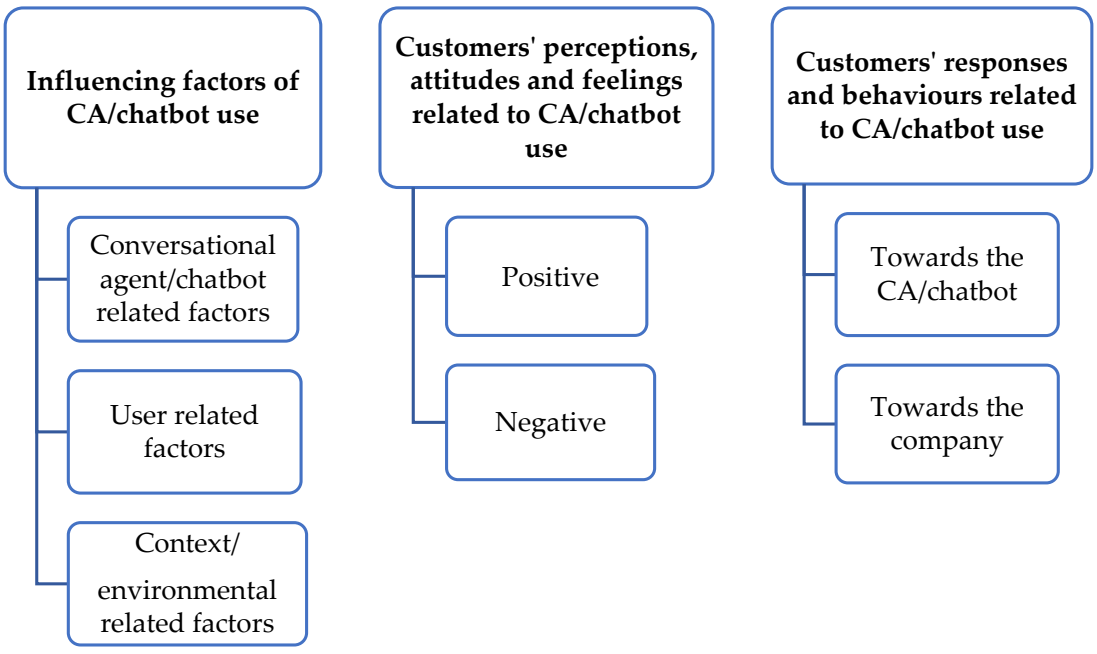

Figure 1. Theoretical framework for analysis of customer experience with AI CA/chatbot.

3. Materials and Methods

The research method utilized in this study is the systematic literature review that was characterized as a way to identify, evaluate, and interpret all available research relevant to a research topic [34]. Among the types of SLR, the describing literature review is selected as it allows to summarize the existing literature and better understand the current state of knowledge [35,36] in the field of customers' experiences with AI CA for customer services.

In order to ensure replicability of the study, Okoli's [37] guidelines for conducting the literature review are used, a protocol that is tailored for IS research and it is highly relevant for the present study. Okoli [37] proposed four phases with eight steps in total for the literature review process (see Figure 2), steps that have been applied for the present research.

The *planning phase* has two steps: (1) establish the goal and the purpose of the study and (2) establish a research protocol and train researchers [37] (p. 885). The general purpose of the present paper is to analyze the progress of research on the overall customer experience when using AI CA for customer service. The research protocol established for the present literature review is presented in detail in this section.

The *selection phase* explains how the literature to be reviewed is selected and, according to Okoli [37] (p. 885), it has two steps: (3) apply initial screening and (4) apply search of the relevant literature. In the present research work, the initial screening is based on the online search of five databases: EBSCO, Web of Science, Science Direct, ACM Digital Library, and Google Scholar, which were searched using keywords.

The search string strategy is developed in strong connection with the terms of the research questions and also includes synonyms for these terms [34]. The Bolean practice was used and OR and AND operators were included, as well as sign as (*) or (""), as required by the use conditions of each database. The operator OR was included between keywords considered to be synonyms and the operator AND was used to ensure the inclusion in the search of all terms simultaneously. The final search string was "AI conversational agent OR AI chatbot AND user experience OR customer experience OR customer satisfaction AND customer service OR customer relationship management OR marketing". The key words were searched in title, abstract, and text (if available).

In order to ensure the quality of the publication sample, specific criteria were applied starting with the initial screening stage, criteria that also considered the qualitative procedures used by the journals of the publications. Therefore, the initial screening applied the databases' filters and the inclusion criteria employed at this stage were: (a) papers that include the keywords according to the search string; (b) papers published in peer-reviewed journals and in highly ranked conference proceedings (also needed according to [38]) (for ensuring quality); (c) papers that have access to full text (to ensure access); (d) papers that are published in English (to ensure understanding), and (e) papers published during 2010–March 2022 (to ensure recency and relevance for AI CA/chatbots, but also to enclose early publications on the topic). Duplicates of papers (papers found in more than one database) were removed.

As a result of the initial screening, 186 papers were selected. Table 2 presents the results of the keyword search (and associated criteria) for each database.

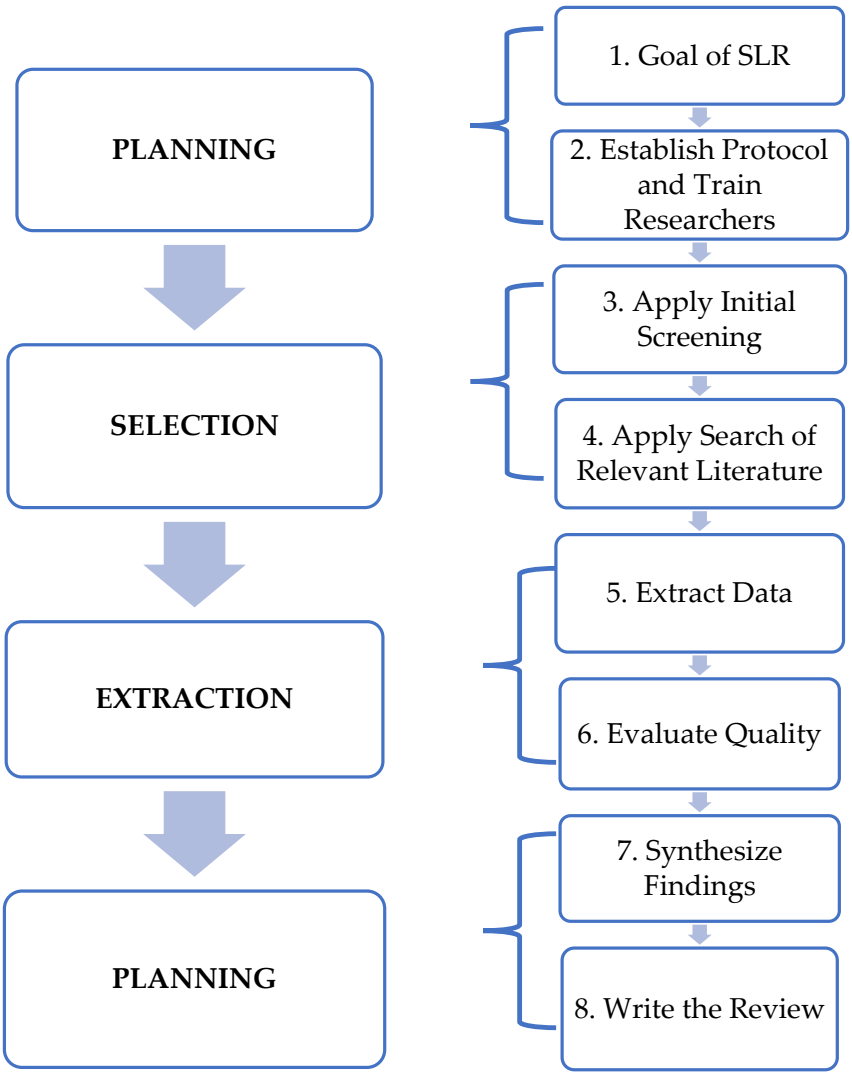

Figure 2. The phases and steps of the literature review process—Adapted from [37] (p. 43) and [39] (p. 3).

Table 2. Results of the keywords search by database and other sources.

Database/Source	Initial Hits (Keywords)	Hits after Initial Screening	Hits after Abstract Reading	Hits after Full Text Reading
EBSCO	68	11	9	8
Web of Science	84	19	14	11
Science Direct	392	80	13	5
ACM Digital Library	295	32	12	4
Google Scholar	156	44	15	5
Citation screening [1]	-	-	12	5
Additional papers	-	-	-	2
TOTAL	995	186	75	40

[1] Backward and forward screening.

These papers were selected further during the next step, the search of literature based on content-related inclusion/exclusion criteria that are presented in Table 3. In order to ensure a high quality of the publications to be included in the sample, only academic publications were considered (published in peer-reviewed journals and top conferences

proceedings), while non-academic publications were excluded. In the sample, only publications with content were selected that directly answered to the research questions of the present paper, while remotely connected subject-wise publications were excluded. A more detailed thematic selection was done by including only publications that focused on AI CA and chatbots used for customer service in the business field, while publications referring to other types of use of AI CA and chatbots (such as social companion or for learning purposes) or publications dealing with the use of chatbots in other sectors of the economy (public administration, the health sector or education) were excluded. In order to be able to analyze the customer experience, only publications that researched AI CA and chatbots from the customers' perspectives were included, while the publications that discussed the topic from the companies' perspective were excluded. Finally, methodologically, only publications presenting empirical studies with clear research methodologies were included, while reviews of literature were excluded. The inclusion/exclusion criteria were first applied to the abstracts of publications and then to the full texts of the publications. It resulted in 33 publications selected based on keywords. The search process continued with the backward (looking at publication references) and forward (looking at publication citations) search of the most relevant publications [40] and five more publications were included. In addition, two additional papers were included that were relevant in content, even though they do not fit into the initial screening criteria [41]. Figure 3 presents the process of the online literature search using the PRISMA 2020 flow diagram [42].

Table 3. Inclusion and exclusion criteria for relevant literature search (publication screening).

Inclusion Criteria	Exclusion Criteria
(a) Answer directly to research questions	(a) Do not answer directly research questions
(b) Only academic publications	(b) Publications that are not academic
(c) Focus on AI CA and chatbots for customer service	(c)Focus on other CA/chatbots related aspects (design)
(d) Include and focus on customers' perspective	(d) Focus solely on company's perspective of using AI CA/chatbots
(e) Only primary studies that include empirical results obtained based on a specified research methodology	(e) Studies that include reviews of literature
(f) Studies that refer to the use of CA in only business (retailing, transportation, banking, hospitality)	(f) Studies that refer to the use of CA in non-business sectors (health, education, public administration)
	(g) Studies that refer to the use of CA for other purposes than business customer service (social companion, robotics, learning)

At the end of the entire literature selection process, the number of publications included in the final literature sample is 40.

The *extraction phase* refers to taking information from each paper for synthesizing it and has two steps: (5) extract data and (6) evaluate and appraise quality [37] (p. 885). The data were extracted from the 40 publications based on an extraction form that was developed using two models [34,43]. In order to accommodate the interdisciplinary character of the present study, the extraction form specifically designed for this study used two models originating from two different fields as starting point: software engineering [34] and social sciences [43].

The extraction form was developed to serve two purposes: take out and organize the relevant information from each paper, but also to evaluate and appraise the quality of the paper. For these two purposes, the extraction form included the paper identification information (title, journal, authors, origin of authors, year of publication, journal domain, geographical setting of the study, industry under investigation, time of data collection) and also included detailed information about both methodological considerations and also results of the study. Appendix A presents the extraction form used in the present study for both purposes: information synthesis and quality evaluation of papers.

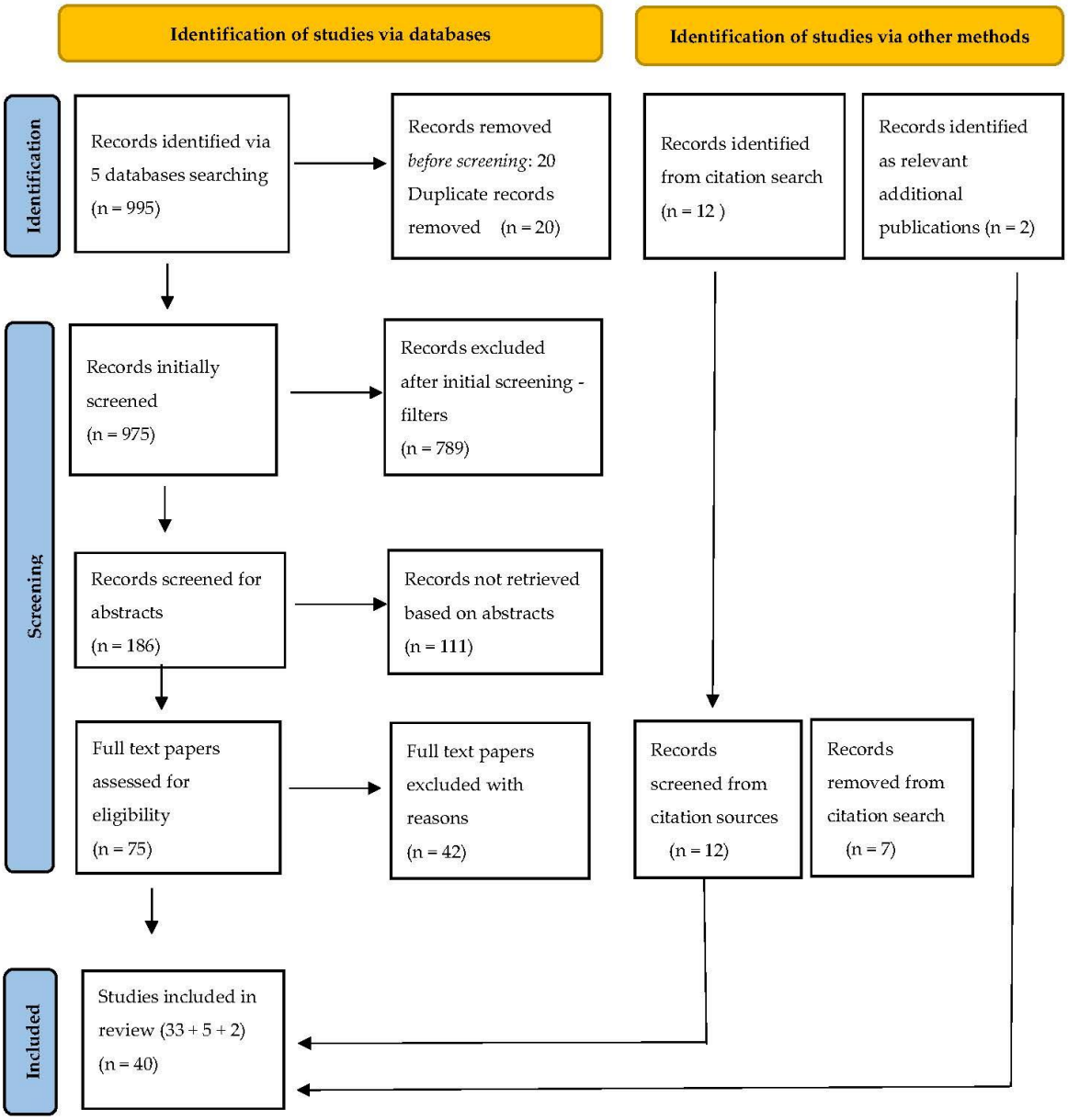

Figure 3. Results in the stages of the literature selection process (PRISMA diagram flow) [42].

It can be stated that the quality of the selected sample publications was ensured from the early stages of the research, given the rigorous multi-stage selection process they went through in order to be included in the final sample of literature (initial screening and content screening, both including extensive and quality-oriented inclusion/exclusion criteria). At this stage, the quality of the publications is appraised based on the information obtained via the extraction form that allowed the researchers to evaluate the quality of the papers using two criteria: the methodological thoroughness employed by the studies and also the level of detail in terms of results of the empirical studies and consequent implications of the findings. In the final sample, publications were included that presented in detail all the required methodological aspects (objectives and research questions, research design, research methods, sources of data, sample characteristics—participants and sample size, location, industry, data collection period, research instruments, and methods for data analysis). The existence of a very detailed presentation of the methodological organization of the empirical research and of the methods of data analysis were used as a dichotomous criterion to evaluate the quality of the studies and to accept them in the final sample. From

the perspective of the results of the study, the publications sample included the papers that described their empirical findings in detail and studies with empirical results related to our research questions (influencing factors for customer experience with AI chatbots for customer service and the dimensions of the overall user experience, as defined in the present study as feelings, attitudes, and perceptions of customers, as well as reactions and behaviors of customers).

All publications with a thorough description of the methodology employed for the empirical research passed the qualitative threshold and were included in the sample and all publications with a detailed description of results, containing topic-relevant results and also discussing implications of their empirical results, also qualified from qualitative point of view and were included in the final sample of publications.

The *execution phase* has two steps: (7) synthesize findings and analyze studies and (8) write the review [37] (p. 885). The analysis of findings was handled by aggregating, discussing, organizing, and comparing the selected publications [37]. The data were synthesized using the narrative synthesis that according to Okoli comprises tabulating the included studies and describing the study sample of publications [37]. This is presented in the next section.

4. Results and Discussion

The present narrative synthesis includes two types of analyses: (a) a description of the publications selected for review and (b) the thematic analysis of the publications according to the research questions and based on the proposed theoretical framework.

4.1. Descriptive Analysis—The Organization of the Studies

The descriptive analysis presents the results from the analysis of 40 studies that empirically researched customers' experiences with customer service conversational agents, according to: (a) year of publication, (b) countries of origin of authors (first author) and countries in which the empirical research was conducted, (c) the subject area of the publication venues, (d) the research methods and tools adopted, and (e) industries involved in the studies.

It can be observed that the increased development of AI CA for customer service after 2016 and the recency of the uprise of this technology use for customer service was reflected also in an increased interest of researchers in this topic. The majority of the publications on this topic (77%) were published in the last years 2020–2022, see Figure 4a. It is expected that the topic will be further researched in the future, as the use of this technology is foreseen to increase in the business context. Most of the publications (75%) were authored by researchers originating from European countries, among which authors from Germany, Norway, and UK were the most numerous. Likewise, almost half of the empirical research was also conducted in European countries, followed by research conducted in the US and in Asian countries, see Figure 4b,c.

At present, Europe represents a pole of research on the topic of AI CA/chatbots in customer service and in customer experience-related subjects.

The main venue of publication was represented by journals from the information systems and computing-related domains (over 55%), see Table 4. Another important publication venue was represented by journals from the marketing domain, explained by the specificity of the topic: customer service (that is a marketing activity) and customer experience (that is a marketing concern). Other publication venues were journals publishing papers specific to certain industries that have been studied (tourism, retailing, services).

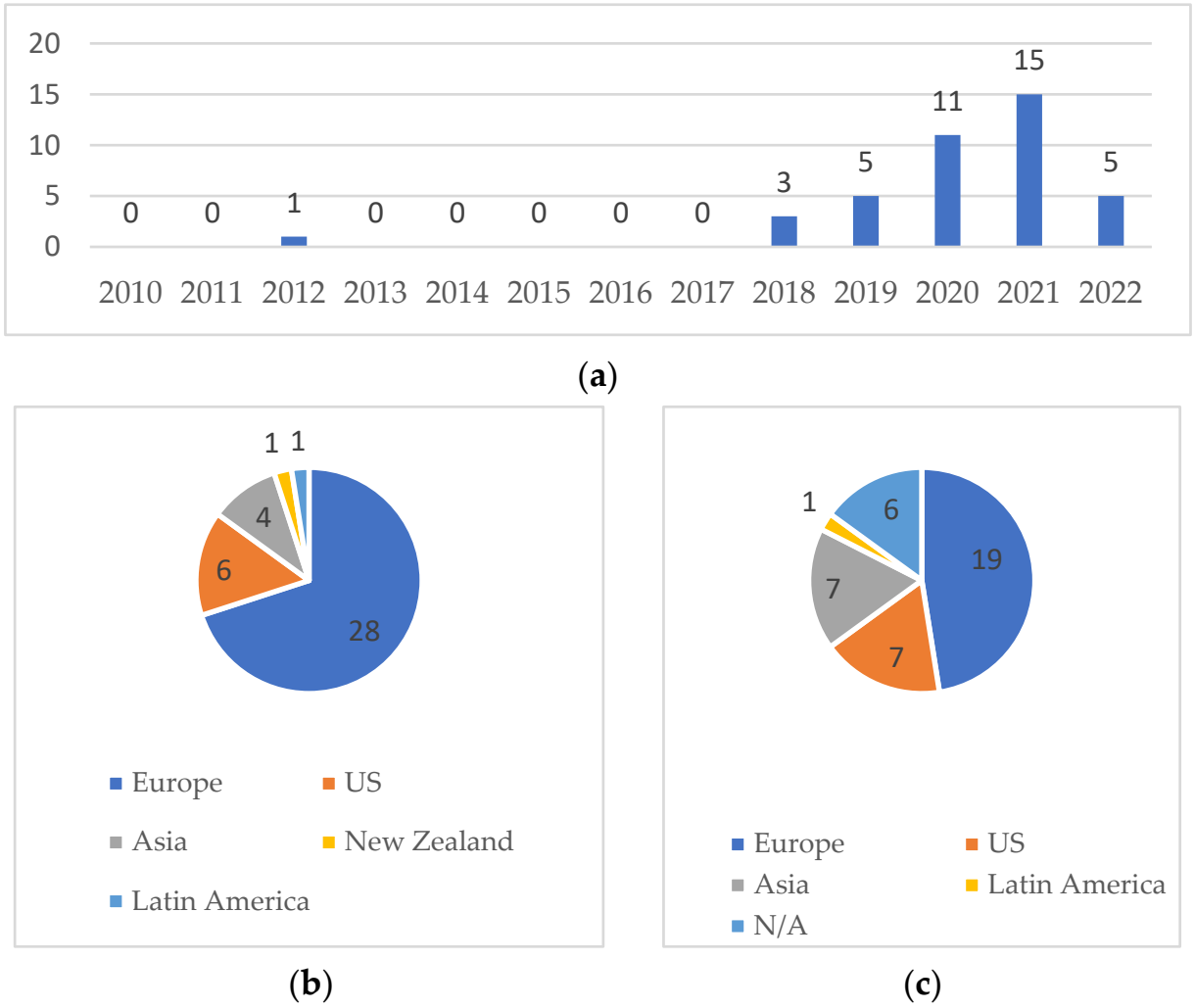

Figure 4. Characteristics of the publications in the sample. (**a**) Publication year; (**b**) First author origin; (**c**) Location of empirical research.

Table 4. Publication venues for the literature sample.

Domain of Publication	Number of Publications	Percentage
Information Systems	12	30%
Computing	9	22.5%
Marketing	9	22.5%
Communication and Electronic Media	4	10%
Others	6	15%
TOTAL	40	100%

The most suitable research methods to analyze this research topic were experiments (more than half of the studies) of customer–CA interaction followed by questions related to the interaction experience, both in real life or simulated settings, see Table 5.

CA are used for customer service in different industries. Figure 5 shows that the financial domain (banking and financial investment) is the most researched field (11 papers) for the topic of customer experience with customer service AI conversational agents/chatbots.

Table 5. Research approaches.

Research Method	Number of Publications	Research Method	Number of Publications
Experiments with questions	22	Real life	22
Survey	7	Simulations	18
Data analysis (dialogues)	5		
Qualitative (interviews)	3		
Combined	3		
TOTAL	40		40

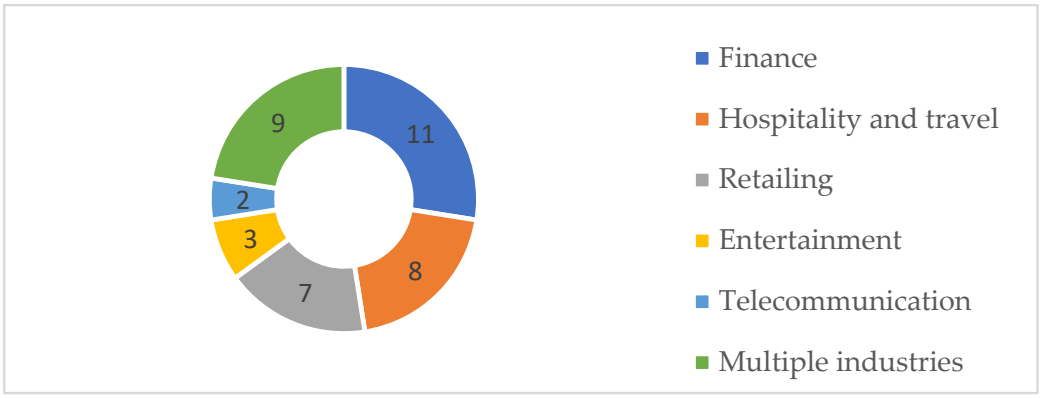

Figure 5. Industry researched.

4.2. Thematic Analysis—Narrative Description

Table 6 presents details on the seven constructs of the theoretical framework proposed (Figure 1) based on the analysis of the literature sample. Table 6 includes the related publications for each construct, the main findings in relationship with each construct and implications. The construct influencing factors of CA use has three sub-categories: CA-related, user-related, and context-related factors that are seen (according to the studied literature) as drivers for customer experience with this technology for customer service.

Table 6. Overall customer experience with AI conversational agents/chatbots—summary.

Construct	Publications	Main Results	Implications
Influencing factors			
A. AI CA/chatbot related influencing factors			
-> CA functional features (7 studies)	Zarouli et al. [44]; Van den Broeck et al. [45]; Khadpe et al. [46]; Schuetzler et al. (2020) [9]; Følstad and Taylor [5]; Grundner and Neuhofer [47]; Ringfort-Felner et al. [48]	Functional features of AI CA/chatbots, such as response relevance, tailored responses, response understandability, dialogue outcome (the user received the needed support), dialogue efficiency (low time and effort), competence (error free interaction), helpfulness, usefulness, ease of use represent the key drivers for positive customer experience.	Companies should emphasize with priority on functional features when designing and using CA/chatbots for customer service. Make customers aware of the ease of use of CA.

Table 6. *Cont.*

Construct	Publications	Main Results	Implications
-> CA system features (8 studies)	Følstad et al. (2018) [49]; Trivedi [50]; Luo et al. [51]; Meyer-Waarden et al. [52]; Borsci et al. [53]; Nguyen et al. [54]; Bührke et al. [55]; Grundner and Neuhofer [47]	System-related features, such as accessibility of CA/chatbot functions, reliability (constant accuracy), service quality has a positive influence on customer experience and its trust. At the same time, chatbot identity disclosure has rather a negative impact on consumers' intentions.	System features are to be considered for improving quality of the service (chatbot training). At the same time, the dilemma about transparency related to CA/chatbot identity needs to be considered.
-> CA anthropomorphic features (16 studies)	Andrews [56]; Borsci et al. [53], De Cicco et al. [57]; Ischen et al. [58]; Meyer-Waarden et al. [52]; Adam et al. [59]; Crolic et al. [60]; Bührke et al. [55]; Danckwerts et al. [61]; Ng et al. [62]; Ordemann et al. [63] Chaves et al. [64]; Mehra [65]; Toader et al. [66]; Schroeder and Schroeder [67]; Svikhnushina et al. [68]	Studies present contradictory results in relationship with the effects of the anthropomorphic features on customer experience. Certain anthropomorphic features were found to have no effects on customers' perceptions and behaviors (empathy, visual aspect, an extrovert personality of CA). Other findings illustrated that social presence, human-like design, identity, small talk have a positive influence on trust, enjoyment, and customer satisfaction. Among unfavorable effects identified are that anthropomorphic features of the AI CA/chatbot can harm companies, when consumers are in an angry state at the time of interaction. The conclusion is that the effects of such features need to be interpreted in correlation with the context of customer experience.	The decision on the inclusion or not of the anthropomorphic features for CA and on what type of anthropomorphic features to be included, needs to be correlated with the type of product assisted by the CA, with the customers' characteristics and with the context in which the AC is used.
B. User-related influencing factors (8 studies)	Andrews [69]; Følstad et al. (2018) [49]; De Cicco et al. [57]; Cheng and Jiang [70]; Melián-González et al. [71]; Svikhnushina and Pu [72]; Tsekouras et al. [73]; Sonntag et al. [74]	Factors related to the customers that can influence their experiences with AI CA/chatbots are of two types: (a) customer characteristics, such as age, personality, expectations, and (b) customer relationship with technology, such as personal interest in technology, previous experience with the technology, openness to innovation, media, and technology appeal to customers.	Companies can build profiles of customers both who are prone of using the CA technology for customer service and who are reluctant in doing so, by using both customer characteristics and customer relationship with technology.

Table 6. *Cont.*

Construct	Publications	Main Results	Implications
C. Context-related influencing factors (6 studies)	Følstad et al. (2018) [49]; Trivedi [50]; Xu et al. [75]; Cheng and Jiang [70]; Brüggemeier and Lalone [76] Taehyee et al. [77]	Contextual and environmental factors can also affect the customer experience with AI CA. General privacy and security conditions, especially in sensitive fields such as banking can have a negative influence on the experience. At the same time, the company's image and brands contribute to trust building and positive experiences.	Context-related factors are business and company-related and have to be identified individually by each company using the CA technology for customer service.
Customers' perceptions/attitudes/ feelings—positive (14 studies)	Zarouli et al. [44]; Følstad et al. (2018) [49]; De Cicco et al. [57]; Schuetzler et al. (2020) [9]; Kvale et al. [56]; Ischen et al. [58]; Hildebrand and Bergner [78]; Borsci et al. [53]; Nguyen et al. [54]; Brüggemeier and Lalone [76]; Toader et al. [66]; Svikhnushina and Pu [72]; Schroeder and Schroeder [67]; Tsekouras et al. [73]	Customer experiences with AI CA/chatbots can results in positive perceptions/attitudes and feelings. - Trust in CA can be built by information quality, system quality, service quality, but also by the conversational capacity of CA. - Enjoyment and fun are determined by experiential perceptions and two-way communication with CA and by social presence. - Pleasure and arousal when using CA are determined by humanness and social presence. - Perceived usefulness is influenced by accurate and timely service. - Benevolence towards the company appears due to positive customer experience with AI CA.	In order to obtain and increase customer satisfaction and other positive attitudes and feelings, companies need to optimize customer experience with CA.
Customers' perceptions/attitudes/ feelings—negative (9 studies)	Følstad et al. (2018) [49]; Van den Broeck et al. [45]; Kvale et al. [56]; Cheng and Jiang [70]; Melián-González et al. [71]; Chaves et al. [64]; Schuetzler et al. (2019) [79]; Tsekouras et al. [73]; Sonntag et al. [74]	Studies show that interaction with AI CA can also generate negative perceptions/attitudes and feelings. - Perceived high risks that can diminish intention to use AI CA/chatbots. - Privacy risks reduce the level of customer satisfaction. - Perceived intrusiveness can have a negative effect on consumers' attitudes. - A low customer satisfaction is encountered when CA/chatbots offer generic responses to a request. - Inconvenience of using chatbots (new way of communication).	Negative perceptions, attitudes and feelings when using CA/chatbots, have to be studied and known by companies in the first place, in order to be able to deal with them. The privacy issues represent the most important aspect to be dealt with for diminishing negative feelings.

Table 6. *Cont.*

Construct	Publications	Main Results	Implications
Customers' responses and behaviors related to the CA (11 studies)	Luo et al. [51]; Xu et al. [75]; Ischen et al. [58]; Hildebrand and Bergner [78]; Nguyen et al. [54]; Brüggemeier and Lalone [76]; Stanley et al. [80]; Ng et al. [62]; Ordemann et al. [63]; Svikhnushina and Pu [72]; Presti et al. [81]	The customers' responses and behaviors as part of customer experience with AI CA/chatbots manifests both, as intentions and as actions and behaviors. Intentions and actions can be related to the technology itself, the AI CA. Certain factors determine the intention to continue to use AI CA (tangibles, competence, reliability of chatbots, trust, perceived usefulness). In terms of actions, there are: the re-use of chatbot technology, a higher acceptance of the AI CA recommendations and advices, and the recommendation of the chatbot use to other customers.	Companies need to identify the specific factors that have a positive influence on the customers' intention to re-use the CA and their higher compliance to the CA recommendations and focus on those.
Customers' responses and behaviors—related to the company (7 studies)	Trivedi [50]; Van den Broeck et al. [45]; Luo et al. [51]; Khadpe et al. [46]; Cheng and Jiang [70]; Hildebrand and Bergner [78]; Danckwerts et al. [61]	Intentions and actions of customers based on customers' experience with AI CA can manifest towards the company, as well. Reactions can be both positive and negative. - Benevolence towards the company is determined by high conversational skills of CA. -Patronage intentions (buy and recommend the company's product) are influenced by the trust in CA/chatbots, by social presence and competence of CA/chatbots, by perceived usefulness, helpfulness and relevance of the CA/chatbots' answers. -In addition, loyalty to brands is influenced by customer satisfaction and love for brands is influenced by the CA/chatbot success (information, system and service quality). -Negative reactions to AI CA/chatbots were encountered when consumers know that the conversational partner is not human, they purchase less.	Companies need to be aware of both: (a) the effect of the use of AI CA technology for customer service on the company's image and brands and, (b) vice versa, the effect of the company's image and brand on the perception of the CA used for customer services.

Based on the literature sample, three new sub-categories were identified for CA related factors, namely the functional features of CA, the system features, and the anthropomorphic features of CA. The constructs customers' perceptions/attitudes and feelings (with the two sub-categories positive and negative) and the customers' responses and behaviors (with the two sub-categories: related to the CA and related to the company) represent results and components of the overall customer experience.

The narrative description intents to answer the research questions of the study using the findings presented in the analyzed publications. The analysis is based on the theoretical framework proposed for the analysis (Figure 1).

4.2.1. Influencing Factors of AI CA/Chatbot Use

RQ1.: What are the factors that influence the customer experiences with AI CA/chatbots for customer service?

Some studies considered and analyzed just one influencing factor (CA/chatbot social presence [57], CA/chatbot personality [69], problem resolution capacity [56], while others looked at a combination of influencing factors [5,45]. Influencing factors for the overall customer experience with AI CA/chatbots were grouped in the literature in three major categories [8] (chatbot-related, user-related, and context-related) and our analysis used this typology to discuss the factors that influence customer experience.

The factors that are related to the technology itself, in our case the AI CA/chatbot, are numerous and they can also be further grouped. The typology we propose for grouping the CA/chatbot related factors include (a) factors related to functional features; (b) factors related to the system's features, and (c) anthropomorphic factors.

Among the functional features, Borsci et al., for example, found as main factors that influence customer experience with AI CA/chatbots: perceived quality of the chatbot functions, perceived quality of the conversation and information provided, perceived privacy and security and time response. In addition, in their study, the perceived accessibility to chatbot functions was another influencing factor that is part of the system's feature category [53].

Similarly, based on a survey conducted in France related to the use of a French CA/chatbot from the airline industry (FlyBot), Meyer-Waarden et al. showed that when chatbots for customer service provide consumers with relevant, reliable, and functional content, it positively impacts future intentions to re-use the technology. At the same time, non-instrumental factors such as empathy were found not to be relevant for automated customer service involving routine interaction [52].

Anthropomorphic features have been extensively studied in order to identify their influences on customers' reactions. In an experiment conducted in Germany with bank customers, Adam et al. illustrated that anthropomorphic cues, such as identity, small-talk and empathy, positively influence the customer's behaviour by encouraging customer compliance with the AI CA/chatbot request [59]. In lab experiments with US students, Schuetzler et al. found that conversational skills of CA (manifested through tailored responses and through variety of responses) increase the social presence perceived by customers and, therefore, the perceived anthropomorphism of CA [9]. In other words, customers perceive a CA/chatbot that has higher conversational skills as being more human-like and with a higher level of engagement than one that has lower conversational skills (offers more generic and non-varied responses. In a research study conducted in Italy with millennials, De Cicco et al. identified as an influencing factor of customer experience, the social presence of chatbots, which was defined by visual cues (avatar/non-avatar) and interaction style (social-oriented or task-oriented) that had a positive influence on customers' feelings [57].

However, the anthropomorphic traits, in certain circumstances have been found to have rather negative influences on the customer experience. Based on an extensive set of real life data of customer interaction (34,639 entries) and four experiments (more than 1000 participants in total), Crolic et al. found that when customers enter interaction with

an anthropomorphic chatbot in an angry state (in a customer complain situation, for example) (a context-related factor), there is a higher probability that the customer will be less satisfied with the interaction, will evaluate at a lower level the company, and its purchase intentions will diminish. These negative responses relate to the violation of the high pre-interaction expectations in terms of chatbot efficacy that consumers have from chatbots with anthropomorphic features [60].

There were studies that considered a larger number of influencing factors, combining the different categories of factors. Melián-González et al. conducted a survey with 476 young Spanish tourists who have interacted with CA/chatbots for their travel purposes and revealed four factors that positively influenced their intention to use chatbots for tourism: (a) the performance expectancy when using chatbots (CA/chatbot related—functional); (b) consumers' habit of using chatbot technology (user-related); (c) consumers' hedonism motivations (user-related), and d) the social presence depicted in chatbot interaction (CA/chatbot-related—anthropomorphism). At the same time, the inconveniences associated with chatbot use (such as the need of adapting to a new communication style) have a negative influence on their intention to use chatbots in the future [71].

4.2.2. Resulting Dimensions of Customer Experience

RQ2.: What are the resulting dimensions of the overall customer experience with AI CA/chatbots for customer service?

This research question aimed to identify the resulting dimension of the overall customer experiences in relationship with the use of AI customer service CA/chatbots. According to the theoretical framework, there are two types of resulting dimensions: (a) feelings, attitudes, and perceptions (that can be positive or negative) and (b) responses and behaviors (that can include intentions and actions and can be directed towards the CA/chatbots or towards the company).

A. Perceptions, attitudes, and feelings

The perceptions, attitudes, and feelings of customers when using AI CA/chatbots for customer service can be both positive and negative, depending on the various previously presented factors and on the different circumstances in which the experience takes place.

Love for a brand was a feeling that was studied by researchers in the context of CA/chatbot use [50]. Generation Y Indian consumers of banking companies who interacted with customer service chatbots offered by banks, reported rather positive customer experiences with CA/chatbots (influenced by the service quality, information quality, and system quality of chatbots) that further increased their brand love for the bank brands that use CA/chatbots as opposed to the ones that do not use the technology.

In addition, De Cicco et al. found that for millennials in Italy, a social-oriented conversational style induces the feeling of social presence for AI CA/chatbots, higher levels of trust and perceived enjoyment when using them and, in addition, drives a positive customer attitude towards AI CA/chatbots [57].

However, experiences with AI CA/chatbots determined also negative feelings for some customers. Kvale et al. found that when CA/chatbots offer too generic information as opposed to information that directly follows the customers' request, the result is low customer satisfaction [56]. In another study, Chen and Jiang illustrated that a high perceived privacy risk diminishes the customer satisfaction with CA [70]. Some customers reported inconveniences and difficulties when interacting with CA because they consider that the relationship cannot be based on natural language [71]. Another feeling affecting negatively the patronage intentions of customers is the perceived intrusiveness of ads displayed by CA [45].

B. Responses and behaviors

In addition, responses and behaviors of consumers as part of customer experience with CA/chatbots was a topic extensively approached in research studies. Such responses and behaviors can be categorized according to two criteria: (a) the type of reaction (intention

and actual behavior) and (b) the recipient of the responding behavior (the technology itself—CA/chatbot and the company offering the service). Accordingly, there are intentions towards the CA/chatbot (the intention to re-use the CA for customer service or not) [52,70,71,75] and intentions towards the company (the intention to buy or re-buy from the company) [81]. At the same time, there are behaviors towards the CA/chatbot (the use and re-use of the technology, complying with the CA recommendations) [54,58,59,78] and behaviors towards the company (patronage intentions, buying the company's products, recommending the company's products) [44,51,66]. For example, when chatbots for customer service provide consumers with relevant, reliable, and functional content, they support the users' intention to re-use the customer service CA/chatbot [52].

Studies tried to make the connection between influencing factors, attitudes, and feelings of customers when using customer service CA and resulting behaviors related to CA use. In a research paper that conducted 4 experimental studies with over 300 active investors in Switzerland, Hildebrand and Bergner empirically tested the influence of conversational robo-advisors versus influence of the non-conversational robo-advisors on the perceptions and the behavior of investors. They demonstrated that the conversational capacity of a robo-advisor (with or without social cues) offers a more engaging user experience during the investors' acquisition stage, with a positive influence first on their perceptions (higher affective trust) and based on these, subsequently, on their behaviors (accepting recommendations) for investment from conversational robo-advisors, as compared to the non-conversational ones [78].

Another study [66] was based on a simulated experiment in which 240 US participants interacted with a prototype commercial site for apparel products that included CA/chatbots. The research revealed that both users' perceptions on social presence and competence of the chatbot play a critical role in developing strong trusting beliefs and that trust further determines a positive effect on purchase intentions.

Patronage intentions as a result of customers' experience with CA/chatbots was also approached in a number of studies [44,45,66] considering both the intention to buy the company's product and to recommend it to others.

One particular category of studies were the comparative studies, in which CA/chatbots for customer service were compared to human interaction for customer service or to other IT technologies for the customer service [51,58,75,77]. For example, based on a real-life field experiment conducted with Asian customers, Luo et al. illustrated that AI CA/chatbots are equally effective as proficient workers and four times more effective than workers with less experience, in generating sales for a FinTech company (for renewing loans) (product purchase behavior) [51].

Results and learnings of such studies can be applied for the improvement of the activity of CA, first of all, in customer service of businesses [15], but also for other types of activities or domains [82,83].

The cross-study synthesis applied the theoretical framework proposed, in which influencing factors and overall customer experience dimensions were put together (as presented in Table 6). As a conclusion, all elements of the theoretical framework are part of a logical sequence in the customer experience flow and are interconnected: first, influencing factors enter and contribute to the interaction customer–AI CA/chatbot; second, as a result of the experience, customers have certain perceptions, attitudes, and feelings regarding CA/chatbot interaction and, third, further on the feelings and perceptions determine certain behaviors (related to the chatbot itself and related to the company and its products).

5. Conclusions

This paper aimed to identify the main influencing factors for customer experience with customer service AI CA/chatbots, as well as to analyze the customer perceptions, attitudes and feelings related to AI CA/chatbot use, on the one hand and the customers' responses and behaviors on the other hand. The systematic literature review method was used for

this purpose and, based on Okoli's [37] SLR methodology, 40 empirical publications were included in the analysis.

The main ideas that emerge related to overall customer experience with customer service AI CA/chatbots are:

1. There is a large variety of influencing factors of AI CA/chatbot use, as well as perceptions, attitudes and feelings and also responses and behaviors that are related to customer experience as presented in Table 6. The influencing factors can be grouped in three major categories: factors related to the CA/chatbot itself, factors related to the user, and factors related to situational context. In addition, the AI CA/chatbot-related factors can be further categorized in functional features, system features, and anthropomorphic features. The factors' effects on customer experience can be both positive or negative.
2. The most relevant influencing factors for obtaining customer satisfaction with customer services as part of the customer experience are the functional and utilitarian features of AI CA/chatbots that impact their performance. When AI CA/chatbots function and perform well (in terms of capability to understand the request, relevance of the responses offered, solving the customer's request, bring time and effort economy for customer), they are perceived as being competent and reliable. In these circumstances, they always have a positive influence on customer experience with AI CA/chatbots. At the same time, solving the consumer's task and offering relevant information diminishes other potentially negative perceptions on AI CA/chatbots, such as intrusiveness or lack of privacy.
3. One important influencing factor that was highly analyzed by researchers relates to the anthropomorphism of AI CA/chatbots and its effects on customer experience. The anthropomorphic features of AI CA/chatbots can have both positive and negative effects on customer experience. According to a number of studies, anthropomorphic characteristics with positive effects on customer experience are: female gender CA/chatbots are found to be positively perceived; social presence and social interaction positively influence young consumers, as communication and interactivity creates enjoyment. However, other studies concluded that anthropomorphic features can harm companies. When consumers enter interaction with the AI CA/chatbot in an anger state (in a customer complain situation), the existence of anthropomorphic cues of the CA/chatbot induces higher efficacy expectations of the consumer from the CA. In addition, if the anthropomorphic CA cannot fulfil appropriately the tasks, the customers' satisfaction diminishes and their purchase intention also decreases. The diverse and also contradictory results illustrate that customer experience is highly dependent on circumstances, as well.
4. It can be stated that the contextual influencing factors also contribute to the customer experience. Among those, another important moderating factor of the relationship CA/chatbot–customer that appears frequently in research studies, refers to privacy issues. Results illustrate that privacy assurance can have positive effects on customers' experience, up to higher degrees of product purchase. At the same time, perceived high privacy risks have negative effects on customers' attitudes, especially for privacy sensitive domains, such as financing (banking, investment).
5. In many industries, customer service chatbots perform very well and are very well perceived by consumers (in terms of utility, helpfulness, time and effort) when fulfilling low-complexity tasks. At the same time, task-oriented chatbots (as opposed to social-oriented chatbots) have been found in more studies to have a higher level of suitability in case of customer services.
6. The use of diverse customer service AI CA/chatbots can determine both positive feelings (such as satisfaction, trust, enjoyment, pleasure) but also negative feelings (such as distrust, intrusion, inconvenience) for customers, depending on the effects of the three major types on influencing factors (CA/chatbot-related, customer-related factors and context/environment-related factors) on customers' overall experience.

7. The effects of the use of customer service AI CA/chatbots on customers' responses and behavior manifest in two directions and for two types of responses: first, towards the chatbot itself (intention and usage continuation or not) and, second, towards the company and the brand (intention and product purchase and recommendation or not).

Practical implications. The results of the present study have important practical implications for AI CA/chatbots designers and generally for companies willing to integrate AI/CA chatbot technology in their customer service activity. CA/chatbot designers have to consider those features that are well perceived by customers. In terms of anthropomorphic features, female identity and voice and social presence are important positive influencers, when targeting young customers, for example. At the same time, functional features that allow for solving the task are of paramount importance for all types of customers using AI CA for customer service. However, designers can avoid those features that are either negatively perceived and/or have no contribution at all, such as empathy when the task is simple information provision.

Companies integrating AI CA/chatbot technology can use the technology for low-complexity customer services tasks, while for high-complexity tasks, they can offer a combination of computerized followed by human-assisted services or solely human-assisted services. In addition, companies should focus on using customer service AI CA/chatbots for solving those tasks for which a very concrete and relevant response can be provided via this technology.

Theoretical implications and future research. Previous studies and reviews approached AI CA/chatbots from different perspectives, some technical, some historical, some looking at AI CA/chatbot use and user experience by considering just one or a limited number of influencing factors. The present paper contributes with a comprehensive synthesis on the numerous influencing factors for customer experience with customer service AI CA/chatbots and also the resulting customers' feelings and behaviors as presented in empirical research and proposed a theoretical framework that integrates them.

The contribution of the paper consists in using an overall approach to customer experience with customer service AI CA/chatbots that follows the logic of identifying the influencing factors for the use of the CA; then, we see what are the resulting dimensions of customer experience with CA in terms of customers' reactions. The multitude of influencing factors were first grouped by looking at the existing typologies in the literature (CA-related, user-related, and environment-related), but the study further proposes a more detailed way for categorizing the CA/chatbot-related factors (in functional features, system features, and anthropomorphic features). The two resulting dimensions of customer experience (feelings and behaviors) were also categorized in this paper, illustrating the diversity of outcomes that can result during and after customers' experience with AI CA/chatbots. The customers' perceptions/attitudes and feelings when using AI CA/chatbots can be both favorable (satisfaction, pleasure, enjoyment) and unfavorable (distrust, inconvenience). The paper also proposes the categorization of customers' reactions when using AI CA/chatbots based on two criteria: the recipient of the reaction (the CA itself and the company) and the type of reaction (intention and action). The proposed framework is a good tool to be used to analyze the customer experience with this technology (CA) in the context of customer service for different industries and its use can be extended to other types of IT technologies, as well.

Future research can extend to customer service CA/chatbots used in other domains, such as public services, for example, education or health or local authorities' services. At the same time, the analysis of customer experience with other types of AI CA/chatbots, such as social companions and personal voice assistance is another interesting direction for further research.

Limitations. The limitations of the study relate to the small research team and associated time restrictions. Another limitation relates to the fact that the paper considers only the

business domain to look at customer service AI CA/chatbots, while the technology applies to other domains as well.

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Appendix A

Table A1. Extraction form for users' experience (UX) with customer service AI CA and chatbots.

Data to Be Extracted and Evaluated	Reviewer Notes
Title of the publication	
Journal	
Journal domain	
Author(s)	
Authors' origin (country and institution)	
Year of publication	
Setting (town/country/continent)	
Industry	
Time of data collection	
M: Objective of the study	
M: Research question(s)	
M: Study design (quantitative, qualitative, combined)	
M: Research methods (survey, experiments, etc.)	
M: Sources of data	
M: Sample characteristics (participants) and sample size	
M: Research instruments	
M: Data analysis methods	
V: Influencing factors for customer experience (UX)	
V: Feelings/attitudes/perceptions of customers	
V: Responses and behaviors of customers	
V: Benefits and challenges of using AI CA and chatbots	
R: Main findings	
R: Implications	
R: Conclusions	

M—methodology; V—variables studied; R—results.

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