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Chatbots in customer service: Their relevance and impact on service quality

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Abstract

Chatbots are increasingly finding their way into e-commerce and e-services, as their implementation opens up promising opportunities to improve customer service. The present paper examines chatbots in this context, elaborating on their functional aspects that are rapidly leading to significant improvements in service quality. First, based on a literature review of recent publications in this field, an overview of their key features and functionalities underlining the relevance of chatbots for customer service is provided. Second, a further contribution is made by introducing two categories of chatbots' objectives based on their functional dedication, i.e. "improvement of service performance" and "fulfillment of customer's expectations". The considered chatbots' customer-related functions are interaction, entertainment, problem-solving, trendiness, and customization. The chatbot categories are discussed in detail. Their positive influence on service quality, constituting the chatbots' functional goal, as well as the potential of chatbots in customer service are pointed out.

Keywords: chatbot; e-service agents; customer service; service quality; e-services; e-commerce; artificial intelligence

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1. Introduction

The Internet has become an essential component in every aspect of our daily lives. As a consequence, this has resulted in a significant impact on the way people make their business purchases today, increasingly expanding what is today known as electronic commerce, or more commonly e-commerce. Indeed, with an annual growth rate of 20 to 25% in online sales, the e-commerce economy is literally sparking off. The reason is simple: In the eyes of consumers, trading products or services via the Internet is synonymous with speed, efficiency and a wide range of offers, which inevitably translates into convenience in people's daily lives [1]. This increasingly close confrontation with the digital world has led to a shift in people's expectations and needs, which cannot and must not go unheeded. For this reason, i.e. in order to meet these new market requirements, companies are becoming more and more forced to adapt their strategies to the conditions of the Internet, offering a broader service tailored to their customers by extending standard services through digital ones [1,2,3].

This is exactly where implementations of artificial intelligence come in. Natural language processing, machine learning, robotics along with e-service agents, also commonly referred to as chatbots, are regarded as the best known applications of artificial intelligence to date (cf. e.g. [2,4,5]). Especially the incorporation of chatbots in e-services is gaining momentum nowadays, representing a promising new way to improve customer service [2,6]. In fact, they are supposed to act as company representatives to assist consumers online in solving problems, providing information and giving advice, regardless of long call centre queues, reason for which customers are often dissatisfied [7,8]. In summary, the goal in their usage is to best meet customers' needs, since when these are fulfilled, the result is likely to be a positive attitude, favorable purchase intention and loyalty, in a word: customer satisfaction [8,9].

In order to contribute to existing research in this area, the aim of this paper is to examine chatbots in the customer service context, pointing out to what extent they have an influence on service quality. In the second section the chatbots' relevance for the e-business context is defined based on their key characteristics. Then, five chatbots' marketing efforts identified by Chung et al. [2], which can be interpreted as chatbot's customer-related functions, are presented in the third section. These are divided by the authors of the present work into two newly presented categories based on their qualities: "improvement of service performance" and "fulfillment of customer's expectations", representing the chatbot's objective categories. These are then examined from a customer care perspective, by highlighting their impact on service quality. Finally, the central findings of this paper are summarized in a concluding discussion in section 4, where implications for research and practice are pointed out.

2. Theoretical framework

As already mentioned in the introduction, the purpose of this work is the examination of chatbots, emphasizing the crucial aspects which have made them meanwhile so relevant for improving customer service quality. The decision to adopt the term "chatbot" as the one to be addressed in this study, was the result of a careful review and comparison of the found literature. In fact, a meticulous search by the authors revealed an unclear denomination of several terms and an ambiguous delineation between various concepts. For instance, it was observed that the notion "e-service agents" doesn't seem to be classified with any clear boundary. In fact, Chung et al. [2] equate the latter with the term "virtual agents", referring to these as synonyms. Relevant works on virtual agents were consulted, yet no overarching classification could be identified, as in several papers the term "virtual agent" is used in association with the term "chatbot", either to define its meaning or as a synonym [5,10,11]. In addition, Chattaraman et al. [12] divide virtual service agents into three categories, namely presentation agents, recommendation agents and customer service representatives. However, further research revealed that numerous papers associated these three notions not with virtual agents but once again with chatbots, as the latter are able to completely fulfil the tasks of information presentation, recommendation and customer service [8,10,13,14,15].

In summary, scientific literature suggests the presence of various contradictions and inconsistencies which make it difficult to determine clear distinction and the relation between the expressions in this field. On the other hand, it was noted that in the vast majority of the works, the term "chatbot" was repeatedly inferred or even used almost exclusively. For these reasons, a targeted literature search on chatbots was conducted based on various relevant economic data sources. This resulted in approximately 60 papers, from which about 30 positively ranked ones by VHB-Jourqual were chosen for the elaboration on chatbots in the paper at hand.

The term "chatbot" is a portmanteau word which amalgamates the verb "chatting" and the noun "robot" [13]. A chatbot can be described as a conversational software system capable of simulating human communication skills so as to interact with a user via chat [14]. They are programmed on the basis of natural language processing to carry out real-time communication, with the aim of advising, supporting or simply conversing with the interlocutor. As already introduced, the implementation of artificial intelligence in e-services is no longer a rarity, so that also chatbots are becoming increasingly well-known and popular in customer service, being most commonly assigned to the sales (41%) and support functions (37%) in the e-commerce area [10]. As a matter of fact, browsing a voluminous website is very often inefficient as the information or answers needed are difficult to find or even missing. Unanswered queries result then in the need to contact the customer service, which in turn is mainly associated with long waiting times and inflexible working hours. This leads above all to customer frustration and thus to dissatisfaction with the respective company [7]. On the other hand, according to Holzwarth et al. [8] the lack of support, social interaction and personal advice reflect the primary aspects that consumers argue against online purchasing. Consequently, a traditional customer service matched with the convenience of online shopping provides the best combination to improve the conversion rate and attract potential buyers. Chatbots are able to provide exactly this: a more convenient, interactive and unique alternative to traditional customer service [2]. In fact, whenever it is needed to get in touch with the company or receive assistance, a chatbot is always ready to offer 24/7 support [7]. Its mood remains unaltered, far from the stressful and tired human feeling, thus demonstrating care and kindness to customers on a constant basis [16]. In summary, regardless of whether a FAQ-answer, an information about a specific product, a price or a contact, e.g. in case of a complaint or refund, is required, chatbots may guarantee an immediate response to every concern in real-time [7]. The chatbot's ability to perform such decision- making tasks with a minimized error rate, offering targeted solutions that reflect the user's wishes, is related to the chatbot's operating rules [17]. In fact, the latter is able to analyse the incoming text through a pattern-matching approach, thus identifying the keywords, phrases and sentence constructions [13,18]. This not only allows to systematically respond to the customer, but also to predict his or her behaviour, sense the emotions as well as identify specific product preferences. This collected data is then immediately stored and used for conversations in the future. Chatbots have actually the ability to record a conversation history to which they can refer back by using their artificial memory, in order to be able to formulate more satisfying and tailored responses [18,19]. Moreover, by aggregating customer data on a large scale, chatbots help businesses to best understand consumer behaviour patterns to then adapt, rethink and optimize decision-making processes [20]. Hence, two types of consequences of chatbots for companies can be identified: On the one hand, chatbots change the way companies communicate and act with their customers, whereas on the other hand, they may also strongly influence and change the communication among them [7]. Nevertheless, the goal of a chatbot should remain only one: accompanying its user towards greater overall satisfaction, which from a customer care perspective is seen as one of the keys to a company's success [7,14].

3. Chatbots' customer-related functions and their influence on service quality

Chung et al. [2] recognize in chatbots an emerging digital marketing strategy, which companies are increasingly implementing in order to adapt to the growing digitally oriented service world. Focusing on the marketing sector, five chatbots' central functions were identified, i.e. interaction, entertainment, trendiness, customization and problem-solving, which can also be interpreted as chatbots' customer-related functions. Based on the these, a study was conducted, revealing a positive correlation between them and the chatbot's communication accuracy and credibility, as between the latter and customer satisfaction. Similarly, other studies have likewise approached customer satisfaction as the subject of their research, however in relation to service quality. Based on the results of their investigations, a positive relationship between the two variables could be established here as well [10,21,22]. Based on these studies, this work will consider the five above-mentioned chatbots' functions from a customer care perspective, elaborate on them and enlighten how they affect service quality. As a result of an in-depth literature review, so far undetected commonalities between the five customer-related functions were uncovered by the authors of this work and for this reason subsequently divided into two categories: "improvement of service performance" and "fulfillment of customer's expectations". These are intended to represent the chatbots' objectives, which in turn serve to achieve the chatbots' final functional goal of enhancing service quality. An overview of the determination of the chatbots' objectives' categories based on scientific literature can be found in Table 1.

Table 1. Determination of the chatbots' objectives' categories based on scientific literature.

Objective category	Customer-related function	Quality	Literature
Improvement of service performance	Interaction	Shows language expertise, emotionality, openness, empathy, trustworthiness, listening capacity, reactivity, social orientation, engagement	[8], [23], [24]
	Entertainment	Improves customer's attitude through funny content	[25], [26], [27], [28], [29]
	Problem-solving	Supports by information request, search queries, complaints, returns, exchanges, refunds etc.	[4], [7], [8], [10], [17], [30]
		Stores data for future requests	
Fulfillment of customer's expectations	Trendiness	Updates the user with current news about newly products or emerging trends	[31], [32], [33]
	Customization	Captures user-related information, such as interests and preferences	[2], [7], [15], [19], [28], [34], [35]
		Saves and stores data from conversations, purchase history and other activities	
		Prepares customized content	

Furthermore, a theoretical framework on the categorization of chatbots' customer-related functions and their impact on service quality is provided in Figure 1.

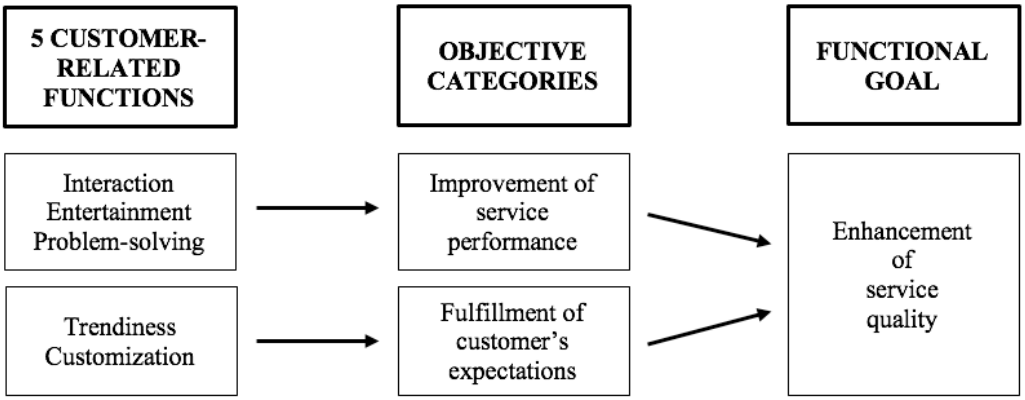

Fig. 1. Theoretical framework on the categorization of chatbots' customer-related functions and their impact on service quality.

3.1. Improvement of service performance

By analysing the five chatbots' customer-related functions identified by Chung et al. [2], three of them, namely interaction, entertainment and problem-solving, seem to appear necessary for improving service performance. For this reason, they were grouped together and are presented in the following.

As already mentioned in section 2, social interaction plays a key role in the offline customer service, an aspect which is considered almost absent in the digital world [8]. When it comes to customer advice, people usually place a high value on salesperson's politeness, helpfulness and trustworthiness [23], as their desire is to receive useful advice, feel valued and be supported in their buying process by enjoying a pleasant conversation [8]. Consequently, if the aim is to make interactions between customer and chatbot positive, the latter needs to display characteristics that are as similar as possible to those of a human agent. The prerequisites for a successful assistance from chatbots is given. Indeed, it is not their technological features that may raise concerns about their interaction capabilities, but rather their lack of humanness. For example, chatbots might not meet users' expectations regarding the chatbot's language skills, which in turn could lead to negative emotions, such as frustration of not being properly understood.

Furthermore, the absence of human forms of communication, like voice and gestures, can make interaction problems even more acute [24]. Another aspect that is closely related to human interactions are emotions. According to Rapp et al. [24], chatbots can trigger different types of emotions in a user as well. Unfulfilled expectations may cause negative emotions, which are often associated with communication break-offs. Conversely, studies show that self- disclosure and empathy aptitudes should be given, in order to enhance the pleasure of the dialogue by building a closer relationship between the two interlocutors, which in turn stands for a successful interaction and thus for a satisfactory service performance. In summary, the user's willingness to interact depends to a large extent on the "attitude" of the chatbot and on the "feelings" the latter transmits. Additionally, in order to interact in a more authentic way in the eyes of the user, chatbots should possess attributes such as a trustworthy personality, active listening, prompt responding and a socially oriented interaction style, e.g. through the use of emojis or modern idioms in their messages. All these elements are essential to promote the engagement of the interaction. In fact, engagement, trust and satisfaction seem to play a significant role for the quality of the latter and thus for improving the service performance of the chatbot. In conclusion, if chatbots can replicate all the "human" interaction features mentioned above, then they also have the potential to offer an interpersonal shopping experience to the customer, who may value service quality higher [8].

Concerning entertainment, this term describes a hedonistic way of introducing meaningful and valuable information in a funny manner, managing to increase the value perception of the latter. Moreover, on the basis of multiple scientific sources, entertainment and fun appear to underpin a person's attitude towards technology [25,26,27,28,29]. More specifically, the use of digital tools, such as social networking and social media for the consumption of user- generated content, as well as the participation in virtual communities are highly influenced by the level of entertainment that the person in question associates with these types of activities [26]. According to Nysveen et al. [29], even with regard to technology-based services, or mobile services, perceived entertainment appears to be an important motivation for usage. This implies that the mere entertainment premise of a mobile service should positively influence the intention to use it. In accordance with a study carried out by Kasilingam [25], the respondent's attitude that was most significantly and positively influenced by the entertainment factor was the one towards the use of online shopping chatbots. Indeed, perceived entertainment positively affects consumers' attitude towards the overall chatbot's service performance and consequently also their intention to buy through mobile technology [27]. This is due to the fact that perceived entertainment is defined as an intrinsic motivation, meaning that if the user has an entertaining service experience through chatbots and benefits from them, the likelihood of that technology being used in the future will increase. In other words, the more the user enjoys shopping using an amusing interface with animated features and funny content, the more the chatbot will be considered for further purchases [25,27]. In this connection, it is also interesting to note that the research conducted by Wang and Li [28] identified a positive effect of perceived entertainment, resulting from the use of mobile services, on perceived service quality, brand awareness, brand associations and customer loyalty. For the above given reasons, i.e. to increase the acceptance and use of chatbots, it is essential, especially from a customer care point of view, to take into account the implementation of the entertainment factor in the respective online service [25].

So far, the idea of chatbot's customer service has been indirectly discussed in the context of problem-solving. Indeed, generally speaking, the latter deals with the main task of helping clients with their issues, i.e., solving their problems. Nowadays, such concerns are handled by chatbots in several departments, however, the support one is among the most important, where chatbots can be found in 37% of cases [10]. Whether issues arise while searching for information, with search queries, complaints or other customer service requests, like returns or exchanges, the chatbot's support is available around the clock allowing consumers to post concerns and receive a tailored response within seconds [4,7,8]. In fact, chatbots are able to identify key words in a customer's request and ultimately deliver the best possible solutions to customer problems through coherent answers. In addition, after every use, the database from which the information is extracted is updated and enlarged, being able to solve future customers' problems even faster and in greater detail [17]. Therefore, all these characteristics make a chatbot a powerful problem-solving tool to be used in a customer service context [17]. Indeed, since users or customers are often forced to search and browse a website for a long time, chatbots represent a fast, uncomplicated and efficient alternative to retrieve such information in the fastest possible way [7]. Moreover, according to Xu et al. [30], problem-solving appears to be a key element in evaluating service performance and thus to play a mediating role in customer preference for either chatbots or human customer service.

In fact, it was found that users highly valued the problem-solving capabilities of chatbots for low-complexity tasks, even more than those of human customer service. This indicates that users were more willing to seek low-risk advice from a chatbot and prefer it to human help, as they perceived the service quality to be higher. All in all, it can be concluded that problem-solving also proves to be essential for improving service performance and for this reason attention should be paid to the implementation of advanced technologies on which the chatbot relies.

3.2. Fulfillment of customer's expectations

The remaining two chatbots' customer-related functions, trendiness and customization, were clustered together due to their ability to meet customer expectations.

The term trendiness is understood as a part of people's lifestyle as well as the extent to which they see themselves being involved in the latest trends, in order to pursue the goal of strengthening their social identity [31]. Especially today's era of social media allows consumers to have a wider access to a wealth of information and a greater control over content consumption than ever before. Thus, meanwhile, the extensive range of social media competes with the traditional advertising, being considered by consumers as a more trustworthy source for making purchasing decisions. Indeed, in relation to aspects such as customer's opinions, attitudes, purchasing behaviour and information gathering, they seem to be a major influencing factor [32]. According to Muntinga et al. [33], information provides an important motivation for people to consume brand-related content, as it covers four sub- motivations: Surveillance, knowledge, pre-purchase information, and inspiration. Firstly, surveillance involves observing one's own social environment and examining what is currently popular, trendy or in vogue. Secondly, knowledge implies benefiting from others' expertise by retrieving and consuming brand or product-related information. Third, pre-purchase information helps consumers in making a well thought purchase decision by analysing product reviews. Fourth and finally, inspiration refers to the brand-related information that people consume as a source of inspiration. This means that consumers choose to get inspired and influenced by products that other people wear or use, in order to get a feeling of what is currently in and thus obtain social recognition. For these reasons, chatbots rely on technologies which allow them to provide the user, during or beyond the conversation, with high quality information about newly designed products or emerging trends. In this way, the new customer requirements may be met and the service quality enhanced. From a customer care perspective, care should be taken not to ignore this social phenomena and to design chatbots in a way that allows them to best meet the newly developed trendiness expectations.

Customization is to be interpreted as the care taken to offer customers personalized products or services without their explicit request, which are based on their main interests and preferences [34]. As with trendiness, once again social media plays a significant role, facilitating service customization by providing helpful information about consumers. In fact, social networks offer businesses nowadays a new and different way to get to know their customers. There are various ways to obtain such data. First and foremost, users very often tag their messenger profile to their social media one, giving companies the opportunity to infer their interests and preferences. Furthermore, the chatbot is able to collect and store information from their conversations, purchase history or other activities of the user. Based on the collection of this data, customized content can be prepared for the individual user, making the latter feel directly and personally addressed by the company [7]. For example, in the case of luxury brands, customer needs are particularly specific, as clients expect to be served in a personalized and unique way. For this reason, instead of addressing the general audience, products and services targeting the needs and desires of the individual client are offered instead [2]. Even bank customers seem to have explicit expectations about the service they receive. As a result, Bank of America has launched its own chatbot named Erica, which provides savings tips based on the customer's spending habits [15,35]. Thus, thanks to chatbots, individual customer needs and expectations can be met in an effective and personalized way, which in turn also improves the overall experience [19]. From a customer care view this may be a relevant issue, as the study of Wang and Li [28] found that the more personalized the chatbot's service is, the more likely the consumer perceives it as being of high quality, increasing in turn its brand loyalty.

4. Conclusion

This work examined chatbots in the context of customer service context and substantiates their relevance for customer service quality. In order to achieve this goal, five essential chatbots' customer-related functions derived from literature were assigned to two distinct categories. Interaction, entertainment and problem- solving were assigned to the category "improvement of service performance", which contains customer-related functions that aim to increase service performance. It was shown that a chatbot's trustworthy personality, an empathetic and open manner, as well as a socially oriented interaction style increase the quality of the interaction and thus the service performance of the chatbot [24]. On the other hand, the perceived entertainment shall positively affect consumers' attitude towards chatbots, thus also promoting the chatbot's service performance [27]. Further, problem-solving, seems to be relevant for the evaluation of service performance by determining customer preference for either chatbots or human assistants [30]. The second derived category "fulfilment of customer's expectations" contains the customer-related functions trendiness and customization that focus on meeting customer expectations. Since consumers increasingly value a fancy lifestyle, trendiness is a determinant factor for chatbots, enabling these new customer expectations to be met [31]. Moreover, customization is also linked to the latter, as a personalized and unique way of being served corresponds to the new requirements [2,15].

The main contribution of this work might be particularly relevant for all industries with a high B2C communication frequency and where customer service is of great importance. The categorization of the customer- related functions may give software engineers an approach for identifying the key features a chatbot needs, in order to improve service performance and fulfil customer expectations, meeting the ultimate goal of enhancing service quality.

Concerning the present state-of-the-art research domain, the implementation and use of such communication systems in the field of e-commerce suggest multiple opportunities for further study in this area. Further studies may explore the applications and/or sectors in which chatbots generate greater value, and which functionalities need to be implemented in order to make chatbots more effective for specific applications. Selected implementation examples and show cases may be subject of empirical studies to determine and evaluate the performance of the chatbots in terms of service quality, and to identify those factors that have a particularly strong impact on the latter.

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