The impact of chatbots on purchase intention

Abstract. This paper aims to understand the use of chatbots as digital assistants in e-commerce sites. We investigate the impact of several chatbot attributes, specifically perceived usefulness, perceived ease of use and trust on consumer attitude and satisfaction with the chatbot, and the effect of these two outcomes on purchase intention. Data from a survey carried out with 298 valid respondents is being analyzed to test the proposed model. The results indicate significant positive effects of both perceived usefulness and trust on both attitude towards chatbots and satisfaction. The finding did not reveal any significant impact of perceived ease of use on attitude and satisfaction, furthermore, these two outcomes did not significantly influence purchase intention calling for further research to help explaining behavioral outcomes towards these relatively new conversational agents.

Keywords: Chatbots, Perceived Usefulness, Perceived Ease of Use, Trust, Attitude, Satisfaction, Purchase Intention.

1 Introduction

Artificial intelligence (AI) can be a valuable tool for managing and personalizing customer service [1]. One of the most visible facets of AI applications is the inclusion of bots and chatbots to answer queries and assist consumers when navigating online. With these features, businesses can automate the process of answering repetitive questions, speeding the time of resolution for clients, and reducing the pressure on human agents. Additionally, these tools allow for personalized recommendations, for example of the "next product to buy", which can lead to a substantial increase in sales [2,3]. Davenport et al. [4] show that using customer data to personalize promotions, for example including personalizing individual offers every day, can lead to an increase of one to two percent in incremental sales to traditional retailers only.

However, bots and chatbots are still relatively new concepts in the modern marketplace [5]. Despite the fact that millennials' predominant use of instant text messaging suggests that they are more likely to use chatbots, little is still known about the factors that positively influence their attitude towards this technology [6]. Although these AI-powered helpers can answer questions 24/7 and do not make users wait on hold [3] not everyone sees the benefits of interacting with chatbots in lieu of other channels [7]. According to a 2018 survey, 46% of the respondents said they would prefer interacting with a human even if a chatbot saved them ten minutes [8,9]; 41% of respondents mentioned chatbots do not provide enough detailed answers, while 37% said chatbots are not helpful generally. Moreover, six in 10 respondents said they would give up on a chatbot if the issue is too complex, and 41% would do the same if the chatbot directs them to FAQs [10].

Nevertheless, there are high expectations in this technology, including as a means to improve the navigation experience. Compared to offline shopping, the online purchasing experience lacks human warmth and sociability. Understanding how to create a higher level of engagement in online environments with new technologies such as chatbots is crucial [11].

Thus, this study aims at analyzing the attitudes towards the use of a chatbot. Specifically, we aim to answer the following research question: What is the impact of chatbots on purchase intention? We look at the impact of perceived usefulness, perceived ease of use, and trust in purchase intention mediated by satisfaction with the chatbot, and attitudes towards chatbots.

2 Literature Review

2.1 Chatbots

Chatbots consist of software that can establish a sequential conversation looking for a certain result as a facilitating tool for humans with whom it interacts [12]. Hence, a chatbot is a computer program designed to simulate human conversation. As an example, in online customer service, chatbots can generate automatic responses to questions sent through social media channels or emails [1].

With respect to how users respond to the chatbot's enquiries, Hill et al. [13] found that users communicate with chatbots using shorter messages and a less rich vocabulary compared to conversations with another human, while Corti & Gillespie [14] found that people are less willing to repair misunderstandings with chatbots compared to humans. According to the authors, this is probably due to the lower expectations people have of chatbots, as they are believed to be unable to engage in complex intersubjective processes.

In the future, companies will be able to use mostly AI bots[1], which - in some cases - work just as well as human salespeople, to make initial contact with prospective consumers. However, there is a risk that, if customers discover that they are interacting with a bot, they may feel uncomfortable, causing negative consequences [4], as customers view AI negatively, it may become a barrier to adoption [15]. Furthermore, as customers consider the bot to be less pleasurable, they are refrain from interacting with bots and therefore buy less [4].

2.2 Attributes of chatbots

Several factors linked to how chatbots are perceived have an impact in the attitudes towards chatbots and intention to purchase from e-commerce site that display a chatbot.

Perceived Usefulness & Perceived Ease of Use

[1] A bot is a program that automatically completes an action based on specific triggers and algorithms while a chatbot is a computer program designed to simulate human conversation.

According to the Technology Acceptance Model (TAM), perceived usefulness (PU) and perceived ease of use (PEU) are two key variables that explain various mechanisms related to technology adoption [16,17].

PU refers to the expected increase in performance associated with using a given technology while PEU refers to the expectation that using the technology will not require significant effort (16, 17, 18). In online context studies, both PU and PEU have been positively related to the intention to purchase online. Perceived usefulness, in particular, has been found to have stronger links to the various mechanisms that influence technological adoption in diverse contexts [19,16]. In short, a customer may not accept an application that is hard to use [20].

Trust

Trust is a significant antecedent belief that creates a positive attitude toward the transaction behavior [21] which in turn leads to transaction intentions.

Trust from both parties – seller and buyer – is needed to enable transactions [22]. Building consumer trust is a strategic imperative for web-based vendors because trust strongly influences consumer intentions to transact with unfamiliar vendors via the web. This allows for consumers to share personal information with the vendor. Hence it is critical, to promote trust in order to transform a potential consumer from curious observer to one who is willing to transact over the site [23].

As chatbots are a new technology, consumers may not trust in its use. Prior studies have shown that trust in specific online vendors are correlated with transaction intentions with those same vendors [24,25].

2.3 Attitude towards chatbots

Attitudes are an important construct of the theory of planned behavior (TPB) which refer to the extent to which an individual has a favorable or unfavorable position towards the behavior of interest [26]. Attitude toward the behavior refers to what a person thinks or feels about that particular behavior [26]. An individual tends to possess a favorable attitude when the outcomes are positively evaluated and therefore he is likely to engage in that particular behavior [26].

Based on the previously reviewed literature, the following hypotheses are proposed:

H1: The perceived attributes of a chatbot have a positive impact on the attitude towards chatbots.

H1a: Perceived usefulness has a positive impact on the attitude towards chatbots.

H1b: Perceived ease of use has a positive impact on the attitude towards chatbots.

H1c: Trust has a positive impact on the attitude towards chatbots.

2.4 Satisfaction with the chatbot

Customer satisfaction is defined by Keni [17] as “consumers’ sense of delight in which the expectation that they had toward the company exceeded by the true quality of the product or service that the company offered” (p.484). Customer satisfaction depends

on whether consumer's expectations have been met [20, 22]. If products meet customers' expectations, they are pleased, and if their expectation is exceeded, they become very satisfied or happy [22].

H2: The perceived attributes of a chatbot have a positive impact on the customer satisfaction with the chatbot.

H2a: Perceived usefulness has a positive impact on the customer satisfaction with the chatbot

H2b: Perceived ease of use has a positive impact on the customer satisfaction with the chatbot

H2c: Trust has a positive impact on the customer satisfaction with the chatbot

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2.5 Purchase intention

Purchase intention is an important outcome in consumer behavior. The TPB suggests that attitudes are predictive of the intention to perform a behavior [26], i.e. an individual's positive attitude toward a particular behavior increases his intention to perform that behavior [26]. Hence, the following hypothesis is proposed:

H3: Attitude towards using chatbots has a positive impact on purchase intention.

Customer satisfaction affects consumers' intention to rebuy or revisit the same company in the future [27]. Highly satisfied customers tend to demonstrate higher likelihood of repurchase [28,29].

Furthermore, customer satisfaction has also been deemed as one of the most studied variables in the field of marketing for its significant role in affecting customer repurchase behavior across all industries [17, 22, 27]. Thus, the following is proposed:

H4: Customer satisfaction with chatbot services has a positive impact on purchase intention

2.6 Research Model

Based on the previously reviewed literature, a research model is proposed entailing how chatbot attributes impact on attitude and satisfaction, and how the latter factors impact on purchase intention.

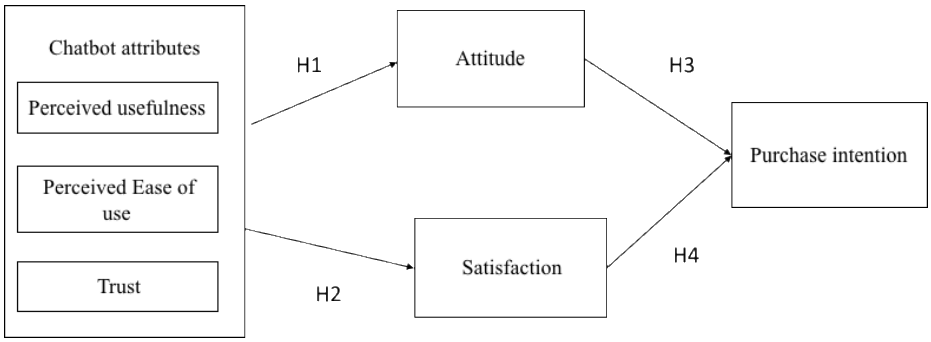

Fig. 1. Research model

3 Methodology

In order to test the proposed model, a quantitative approach was followed. Previously developed scales were used to operationalize the studied constructs: Perceived Usefulness (PU) [30,31], Perceived Ease of Use (PEOU) [32], Trust [28,33], Attitude towards using chatbots [34], Customer Satisfaction [35] and Purchase Intention [36]. Participants indicated their degree of agreement/disagreement with the items using a seven-point Likert scale.

The questionnaire, in English, was pre-tested with five respondents in order to rule out interpretation problems of the questions. A survey was applied online to a snowball sample of consumers in November 2020. A total of 415 answers, 300 of which were valid, were obtained.

4 Results

As mentioned before, an initial valid sample included 300 respondents. However, two answers were excluded from the data analysis by applying Mahalanobis d-squared test. These two answers were considered outliers based on the mentioned analysis, leading to final sample size of 298. The demographics of the final sample size shows that the age mean is 26.23, 55.4% of the sample are female, and 72.8% have an educational level of bachelor's degree or higher.

4.1 Assessment of the measurement model

To test the proposed model, we, first, tested the model fit using Confirmatory Factor Analysis (CFA). Next, we performed Structural Equation Modeling (SEM) in order to test the hypotheses. CFA of the original items indicated an acceptable model fit corresponding to the thresholds recommended by Schreiber et al. [37]: $\chi 2 = 542{,}356$, $df = 260$, $\chi 2/df = 2{,}086$, CFI = 0.960, TLI = 0.954, IFI = 0.960, RMR = 0.086, SRMR = 0.0380; RMSEA = 0.060 [90% CI = 0.053; 0.068]. Moreover, a reliability analysis was also performed on the 25 indicators. Cronbach's alpha values ranged from 0.88 to 0.96,

exceeding the recommended cut-off point 0.7 [38], and composite reliability ranged between 0.92 and 0.97 providing evidence for reliability as well. Finally, to confirm convergent validity, Average Variance Extracted (AVE) was calculated and values varied from 0.75 to 0.87 which are higher than the cut-off of 0.5 [39]. Table 1 summarizes the above-mentioned analyses.

Table 1. Item loading, Cronbach's α values, AVE, composite reliability.

Factor	Item loading	Cronbach's α	AVE	Composite Reliability
Perceived Usefulness		0,922	0.76	0.941
U1	0.87			
U2	0.86			
U3	0.86			
U4	0.88			
U5	0.89			
Perceived Ease of Use		0,898	0.83	0.936
E1	0.92			
E2	0.91			
E3	0.91			
Trust		0,886	0.75	0.922
T1	0.87			
T2	0.90			
T3	0.89			
T4	0.79			
Attitude		0,911	0.79	0.938
A1	0.87			
A2	0.90			
A3	0.87			
A4	0.91			
Satisfaction		0,960	0.84	0.968
S1	0.91			
S2	0.92			
S3	0.91			
S4	0.85			
S5	0.95			
S6	0.94			
Purchase Intention		0,926	0.87	0.953
P1	0.94			
P2	0.94			
P3	0.93			

4.2 Assessment of the structural model

To test the hypotheses, SEM was estimated. In the beginning, model fit, according to Schreiber et al. (2006) cut-off values, was confirmed: $\chi 2 = 560{,}402$, $df = 261$, $\chi 2/df = 2{,}147$, CFI = 0.958, TLI = 0.951, IFI = 0.958, RMR = 0.097, SRMR = 0. 0417; RMSEA = 0.062 [90% CI = 0.055; 0.069]. Regarding the proposed hypotheses, Table 2 shows that both usefulness and trust have a positive effect on attitude, while ease of use did not show any significant influence on this factor. Hence, H1a and H1c are supported, while H1 b is not. The same exactly applies when investigating the effect of these three factors on satisfaction. Both usefulness and trust show a significant effect on satisfaction while ease of use does not, meaning that H2a and H2c are supported and H2b is not. However, attitude towards the use of the chatbot (H3) and satisfaction (H4) does not show any significant effect on purchase intention. Even when considering the direct effect of the main three antecedents, only trust shows a significant direct effect on purchase intention.

Table 2. Regression weights.

Path	Estimate	S.E.	C.R.	*P* value
Usefulness → Attitude	0.495	0.050	9.998	**
Ease of use → Attitude	-0.018	0.041	-0.444	0.657
Trust → Attitude	0.509	0.069	7.359	**
Usefulness → Satisfaction	0.559	0.081	6.912	**
Ease of use → Satisfaction	0.082	0.073	1.130	0.258
Trust → Satisfaction	0.444	0.110	4.021	**
Attitude → Purchase intention	0.181	0.126	1.440	0.150
Satisfaction → Purchase intention	0.004	0.044	0.088	0.930
Usefulness → Purchase intention	0.158	0.088	1.793	0.073
Ease of use → Purchase intention	0.042	0.049	0.862	0.389
Trust → Purchase intention	0.641	0.109	5.911	**

Notes: Standardized path estimates are reported. ** P-Value < 0.01.

5 Conclusion

This study investigates the impact of TAM factors (perceived usefulness and perceived ease of use) and trust in purchase intention in sites displaying a chatbot feature mediated by consumers' attitude and satisfaction with the chatbot.

Our results show that perceived usefulness and trust have a positive impact on attitude and satisfaction with chatbots, while perceived ease of use does not have a significant effect. Hence, the level to which the user thinks that interacting with the chatbot is useful, helpful in performing the task and trustful are the most important attributes to consider as antecedents of positive attitude and satisfaction. These results are in line with (Baishya and Samalia, 2020; Guggemos, Seufert and Sonderegger, 2020) who reported a positive effect of usefulness on adoption of new technologies, and in line with

(Park, Tung and Lee, 2021) who suggested the importance of trust in adoption AI service robots, and (Hildebrand and Bergner, 2021) who also documented the significant effect of trust on accepting conversational robo advisors. The lack of support for ease of use may be explained by the fact, that although this TAM construct has been shown to be relevant to explain the adoption of several innovations (e.g., Baishya and Samalia, 2020; Guggemos, Seufert and Sonderegger, 2020), the respondents may simply not perceive the expected effort of using chatbots as a relevant factor in the overall experience because chatbots have a very low level of complexity. This does not mean, however, that usability factors can be neglected. It is worth mentioning that this result about the effect of ease of use is in line with several studies reported that ease of use is not a significant predictor or intention to use technologies (e.g., Koenig-Lewis et al., 2015; Shin & Lee, 2014). Moreover, the results regarding usefulness and ease of use are strongly supported by (Tamilmani, Rana and Dwivedi, 2021) meta-analytic study which conclude that the effect of usefulness on behavioral intentions is highly supported in the literature while the path from ease of use to these intentions to be less significant and questioned.

The hypothesized positive impact of attitude and satisfaction on purchase intention is not supported by the data. This may be due that, although chatbots are an important factor in the navigation experience in general, the presence of this feature does not by itself explain purchase intention. Outcome variables such as E-WOM and intention to recommend are maybe positive behavioral outcomes of positive attitudes and satisfaction with chatbots. In addition, research has to delve into other potential effect of other factors explaining the intention to purchase from e-commerce websites. In retailing context in general, several factors like shopper emotions (Mehta, Sharma and Swami, 2013), product perceptions (Ladhari, Souiden and Dufour, 2017), online and offline store environmental cues (Burlison and Oe, 2018; Moye and Kincade, 2003) are found to influence purchase intention, hence it is required to test the effect of these factors in explaining purchase intention at level of chatbot used in e-commerce context.

Customer service is the fastest growing industry using chatbots, accumulating an annual growth rate of 31,6% from 2019 to 2026 [29, 3]. From the perspective of customers, the use of the chatbot is characterized by fast customer support, no waiting time, 24 hours a day, 7 days a week, in a convenient way (Ling et al., 2021). Despite the rapid advances of AI, many consumers still have doubts regarding the benefits of interacting with chatbots in alternative to human agents [7]. The transparency and adequacy of the chatbots' dialogue and the similarities to a conversation between humans are the basis for the users' trust (Bavaresco et al., 2020). In addition, the ease and accessibility of construction, given the numerous platforms available, the notorious developments of artificial intelligence and the growth in the use of applications associated with the exchange of messages are the main factors for the boost in chatbots' use (De Cicco et al., 2020). However, there are still limitations in chatbot technologies. How these limitations impact user experience need to be object of further studies. Further research needs to delve into other dimensions of consumers' experience with chatbots, including the quality of interaction with chatbots, problem solving capabilities, entertainment and personalization levels.

Understanding the impact of chatbot features in consumers' attitudes and satisfaction, and ultimately in behavioral outcomes, not limited to purchase intention, with chatbots remains a fertile area for further research.

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