EXPLORING THE IMPACT OF AI CHATBOTS ON CUSTOMER SATISFACTION

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Abstract

Artificial intelligence (AI) has revolutionized the e-commerce experience and opened up new ways for businesses to communicate with customers through chatbots. This study aims to investigate how factors of chatbots influence customer satisfaction in e-commerce. A quantitative approach was adopted to explore the impact of usability, responsiveness, perceived trust, accessibility, and empathy on customer satisfaction. Empirical data was collected from 317 participants through an online survey and was analyzed using regression analysis by SPSS. The results indicate that usability, perceived trust, and empathy have significant positive effects on customer satisfaction, which paves way for future studies to enrich the research field. The study also presents practical insights to managers, chatbot designers, and customer service units in improving chatbots and enhancing customer satisfaction.

Keyword: Chatbots, Artificial intelligence, Customer satisfaction, E-commerce.

1.INTRODUCTION

As the world is getting increasingly digital day by day, the expanding number of e-consumers and the fast-changing nature of industries force e-commerce to stand out by offering improved customer experience. Consequently, this has driven changes in the design and roles of various types of artificial intelligence (AI) technologies that play roles in the e-commerce ecosystem, and chatbot is not an exception [42][5][12]. Chatbots integrated into e-commerce have become one of the fastest-growing implementations of AI [41][50]. Even though previous research has attempted to investigate the use and importance of chatbots in service interactions [10][51], a few studies look at what factors help chatbots interact with customers more effectively and efficiently [43]. This study presents a conceptual model that investigates the links among five factors of chatbots (usability, responsiveness, perceived trust, empathy, and accessibility) and customer satisfaction. The findings contribute to the existing knowledge in the field of e-commerce research on chatbot adoption for online consumer satisfaction. The following research question is addressed:

Research question: What are the determinants of customer satisfaction in chatbot use?

AI - including chatbots - is expected to significantly alter marketing strategies as well as consumer behavior [12][49]. In the desire to improve corporate operational efficiency and customer experience, it has spread to the larger community [20]. A chatbot is defined as a computer software that imitates human interaction by utilizing natural language capabilities. It is frequently used as a virtual assistant online [17]. Chatbots with AI play a key role in increasing engagement because of their communicative, data-driven, and predicting nature [39].

Customer satisfaction is explained in various ways in many studies. Tu et al. [46] stated that customer satisfaction contributes to the intentions and attitudes of the repurchasing effect, which leads to future profits and revenues for the organization. Anderson [3] also pointed out that customer satisfaction could be utilized to rate both internal levels of company performance to equilibrate human resources, keep the performance on track, assign funds for external importance to satisfying customers and also deliver pieces of information to all stakeholders. Our study adopts the definition provided by Fornell [17] which refer to customer satisfaction as an overall evaluation based on the total purchase and

consumption experience with the good or service over time.

Usability is referred to as the degree to which a computer program can be used to achieve specific goals related to effectiveness, efficiency, and satisfaction in a specific context of use [38] [33] [15]. According to a Userlike survey issued in 2019, customers see organizations that use chatbots as being innovative instead of being inexpensive. This is due to e-commerce sites' capacity to demonstrate product or service functioning as well as the ability to form a conversation [24]. Customers see conversation as customized to their specific needs when a chatbot provides credible, useful advice.

H1: The usability of a chatbot positively affects customer satisfaction in e-commerce.

Responsiveness is the ability to provide customers with quick and accessible services and give them a convenient experience [10] [47]. Responsiveness is also associated with time response [45] or timeliness in doing service [14][25].

H2: The responsiveness of a chatbot positively affects customer satisfaction in e-commerce.

The term "perceived trust" is conceptualized in various ways in different studies. [10] states that a feeling of trust refers to something or someone that gives one a sense of security that enables them to rely on that person or thing. Both academic and practitioner communities recognize trust as the key facilitator of e-commerce, as it increases customers' likelihood to make online transactions [7] [18][16].

H3: The perceived trust of a chatbot positively affects customer satisfaction in e-commerce.

The ability to empathize means recognizing a person's feelings and expressing emotions in response (affective or emotional empathy) and understanding the feelings of another person through taking their perspective (cognitive empathy) [19]. The ways customers evaluate the service quality are affected by the performance of empathy [31], which then leads to the level of satisfaction [2][23]. Fam et al. [15] believed that trust, in similarity with customer satisfaction, is a dynamic process that develops over time, leading to satisfaction beyond the impact of economic outcomes.

H4: The perceived empathy of a chatbot positively affects customer satisfaction in e-commerce.

This study will adopt Wirtz's [53] definitions of accessibility, which state that anyone using any type of web browser should be able to access any webpage and gain a full understanding of the information, as well as have the complete ability to interact with the site if necessary. Accessibility makes consumers feel satisfied and have higher tendency to repurchase, recommend to others to buy, and become not sensitive to price increases [21].

H5: The customer's perception of accessibility positively affects customer satisfaction in the use of a chatbot in e-commerce.

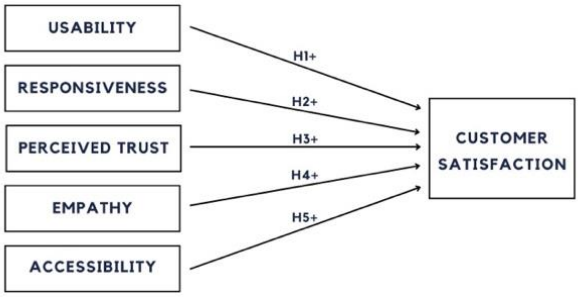

Figure 1: Conceptual framework

2. METHOD

2.1. Survey instrument and measurement

A brief description of chatbots was provided in the form prior to the survey. All constructs were measured using existing scales adopted and modified from extant literature to ensure the validity and reliability of the model. Usability used the 5-item scale from Rose et al. [36] and Finstad [15]. Responsiveness adopted a 4-item scale from Roy et al. [38] and Chung et al. [10]. Perceived trust was measured with 4 items from Roy et al. [37], Ponte et al. [34], and Zhang et al. [54]. The scale to assess empathy included 7 items from Orden-Mejía and Huertas [29]. Accessibility used the 4-item scale from Orden-Mejía and Huertas [29]. Finally, to measure customer satisfaction, a scale consisting of 4 items from Rose et al. [36] and Pappas et al. [30] was adopted. 5-point Likert type scale was used to measure all constructs, ranging 1 – Strongly disagree to 5 – Strongly agree.

	Questionnaire item
	Usability (U) (α = 0.844) (Rose et al., 2012; Finstad, 2010) Responsiveness (Roy et al., 2018; Chung et al., 2020)
U1	Learning to navigate through e-commerce websites is simple with assistance from the chatbot
U2	The chatbot makes e-commerce websites easy to use and effortless
U3	The chatbot provides a complete solution to my problems
U4	The chatbot is aware of the context during a conversation
U5	The chatbot is able to solve my problems
	Responsiveness (R) (α = 0.807) (Roy et al., 2018; Chung et al., 2020)
R1	The chatbot replies quickly
R2	Getting in contact with the chatbot is easy
R3	The chatbot is always available when I need it
R4	The chatbot provides credible advice
	Customer Satisfaction (CS) (α = 0.887) (Rose et al., 2012, Pappas et al., 2014)
CS1	I am pleased with using the chatbot
CS2	I am satisfied with the pre-purchase experience of using the chatbot (e.g. product search, quality of information on products or services, product comparison)
CS3	I am satisfied with my overall experience using the chatbot
CS4	I would recommend that others use the chatbot
	Perceived Trust (PT) (α = 0.862) (Roy et al., 2001; Ponte et al., 2015; Zhang et al., 2019)
PT1	I feel that information provided by the chatbots is honest and authentic
PT2	I feel that chatbots have clarity of services provided and reliable opinions
PT3	I feel chatbots in e-commerce services are trustworthy
PT4	I feel that the chatbots have the necessary expertise ability to provide the service that I need
	Accessibility (A) (α = 0.847) (Orden-Mejía & Huertas, 2021)
A1	I can use the chatbot anywhere
A2	The chatbot has an easy-to-use interface
A3	I accessed the chatbot without a complicated registration process
A4	I can use the chatbot at any time
	Empathy (E) (α = 0.910) (Orden-Mejía & Huertas, 2021)
E1	It was fun when it replied
E2	I was impressed by the responses of the chatbot
E3	I smiled at the chatbot's responses
E4	I liked chatting with the chatbot
E5	The chatbot uses affective expressions to communicate
E6	The chatbot understands the user's needs
E7	In general, the chatbot has empathy for chitchat

Table 1: Questionnaire items

2.2. Sampling and data collection

To investigate the hypotheses in this research, a questionnaire was designed using Google Form. The survey instrument was pilot tested by a few professors and a group of students. We used convenience sampling and snowball sampling methods to find participants. The data was collected from April 7 to April 18, 2022. Finally, we received three hundred and twenty responses, but three cases were disqualified due to the incompletion of the questionnaire. Hence, the sample comprises the responses of 317 participants.

Gender	Frequency	%	Age	Frequency	%
Male	162	15.1	Younger than 20	24	7.6
Female	152	47.9	20 - 29	217	68.5
Other	3	.9	30 - 39	49	15.5
			40 - 49	21	6.6
			50 or older	6	1.9
Total	317	100.0	Total	317	100.0

Country of origin	Frequency	%	Vocation	Frequency	%
North America	24	7.6	Student	197	62.1
Europe	217	68.5	Professional	48	15.1
Asia	49	15.5	Business person	11	3.5
Other	21	6.6	Office worker	31	9.8
			Homemaker	3	.9
			Other	27	8.5
Total	317	100.0	Total	317	100.0

Table 2: Demographic characteristics

3. DATA ANALYSIS

We used SPSS Statistics to investigate the constructs' reliability and test the hypotheses. Cronbach's Alpha (α) was obtained to test the reliability of each scale. The value of Cronbach's Alpha for each construct (range 0.807-0.910) passed the threshold value of 0.7, complying with the conditions stated by Nunnally and Bernstein [28] (See Table 3). This indicates that the degree of internal consistency is relatively high.

Scale	N of Items	Cronbach's Alpha (α)
Usability	5	.844
Responsiveness	4	.807
Perceived Trust	4	.862
Accessibility	4	.847
Empathy	7	.910
Customer Satisfaction	4	.887

Table 3: Cronbach's Alpha (α) of the scales

The hypotheses were tested using linear regression analysis. The outcome shows a positive, significant relationship between usability and customer satisfaction ($\beta = 0.291$, $\alpha < 0.001$). Therefore, hypothesis H1 is supported. On the other hand, responsiveness shows an insignificant effect on customer satisfaction ($\beta = 0.063$, $\alpha > 0.05$). Thus, H2 is not supported. The positive, significant relationship between perceived trust and customer satisfaction ($\beta = 0.339$, $\alpha < 0.001$) has validated H3. Accessibility has an insignificant effect on customer satisfaction ($\beta = 0.017$, $\alpha > 0.05$, making H4

unsupported. Finally, empathy shows a positive and significant relationship with customer satisfaction, thus supporting H5 (β = 0.285, α < 0.001). In summary, among the proposed hypotheses, H1, H3, and H5 are supported (See Table 5).

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.132	.148		-.889	.375
	Usability	.320	.050	.291	6.442	<.001
	Resonsiveness	.071	.051	.063	1.399	.163
	PerceivedTrust	.351	.049	.339	7.206	<.001
	Accessibility	.017	.047	.017	.372	.710
	Empathy	.276	.042	.285	6.550	<.001

a. Dependent Variable: CS

Table 4: Linear regression result of hypothesis H1, H2, H3, H4, H5

Notes: (1) CS = Customer Satisfaction; (2)***p < 0.001;

Path (hypotheses)	Standardized Coefficient Beta	Sig.	Results
Usability → Customer Satisfaction (H_1)	0.291	<0.001	Supported
Responsiveness → Customer Satisfaction (H_2)	0.063	0.163	Not supported
Perceived Trust → Customer Satisfaction (H_3)	0.339	<0.001	Supported
Accessibility → Customer Satisfaction (H_4)	0.017	0.710	Not supported
Empathy → Customer Satisfaction (H_5)	0.285	<0.001	Supported

Table 5: Hypothesis testing result

4. RESULTS AND DISCUSSION

To begin with, the usability of chatbots exerted a significant positive effect on customer satisfaction. Consumers who experience chatbots high in usability find their overall shopping experience satisfactory and are more likely to recommend it to others. This is in line with those of previous studies in that usability has a positive effect on the satisfaction of online customers [44] [9].

In contrast, there is an insignificant relationship between responsiveness of chatbots and customer satisfaction. A possible explanation is, the responsiveness in service has become a necessity, an essential quality of technology. Customers are likely to expect responsiveness to be a given when encountering a service technology during their shopping experience. While this is not aligned with some of the past studies [44][9], this result is consistent with Wang & Shieh [48], Munusamy et al. [27], Zaim et al. [52] which also found an insignificant link between responsiveness and customer satisfaction.

Third, the result shows that perceived trust positively affects customer satisfaction. To have a satisfactory experience with online services, customers must first trust the service or the company [24]. This is supported by several existing literature, including an empirical study by Akter et al. [1] which found perceived trust to have significant impact on continuance intention of customer. Trust is also a fundamental element in the process of developing and maintaining loyalty and user satisfaction [26][40].

Our findings indicated that accessibility of chatbots makes no impact on customer satisfaction. This result is contradictory with some previous literature that shows perceived accessibility increases the overall experience of customers [32] and arouses satisfaction. This may be interpreted under the fact that the majority of the participants are from a young population (76% are younger than 29) who were born in the technology era and have grown up with smart devices. As a result, using the chatbots is already simple and accessible for them; accessibility thus becomes an evident, apparent factor of a technology experience. This is consistent with the studies of Biswas et al. [6] and Assaker et al. [4], which found age to be a moderating factor in the accessibility-customer satisfaction relationship. It indicated that young people do not value accessibility, and thus diminish the connection. This finding is also in line with a recent study on smart tourism technology that showed accessibility is not a predictor of satisfaction [29].

Our results also reveal that empathy is an important factor that predicts customer satisfaction. The affectional expressions of chatbots impress customers, making the experience more enjoyable, thus generating satisfaction. This is consistent with an empirical research by [8], which found that the presence of empathy in a technology agent creates a significant and positive effect on the users' perception and opinions. This finding is also supported by previous literature on empathy in technology [35] [13][29].

5. CONCLUSIONS

The findings of the study suggest that customers will achieve a higher level of satisfaction when they perceive their experience with chatbots as helpful, and trustworthy and when the chatbots show empathetic emotions. This provides valuable insights into how factors of chatbots including usability, responsiveness,

perceived trust, accessibility, and empathy influence customer satisfaction in e-commerce. The study also takes a step forward in enriching the field of research by offering key findings for the researchers who want to examine customer experience regarding the implementation of chatbots. Furthermore, managers can identify and implement important factors of chatbots in a way that is fitting with the organization's business model. Enjoyable wording and expressions can be implemented when constructing the chatbot to create a pleasant, amusing, and friendly experience. This study also assists business executives in designing a suitable strategy for information technology that help enhance chatbot technologies in a way that improve customer experience, leading to higher customer satisfaction.

The empirical data of this paper was obtained under a limited period with a convenience and snowball sampling approach. Its findings, therefore, do not intend to reach generalizable conclusions about factors of chatbots on customer satisfaction. Further studies that provide a higher level of demographic diversity would enrich such a research field. Regardless, the findings could provide a backdrop to designing and improving effective chatbots in e-commerce and serve as a guide for managers, e-marketers, and chatbot architecture designers in terms of understanding the connection between chatbot elements and customer satisfaction.

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