

Satisfaction with the Use of Chatbots: A cross-generational Comparison

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Satisfaction with the Use of Chatbots: A cross-generational Comparison

Chatbots are popular tools for customer service and marketing. However, for them to be successful in both areas, it is important to know how the interaction with chatbots must be designed to generate user satisfaction. This study therefore investigates which characteristics of chatbots (utilitarian attitudes, hedonic attitudes, humanlikeness, and perceived trust) influence satisfaction and to what extent. Since different target groups may have different expectations regarding the interaction with chatbots, a comparison of the two generations digital natives (n = 88) and digital immigrants (n = 225) was conducted. The results of a multiple regression show that utility seems to be the most important trait. Furthermore, the analysis reveals that while digital immigrants perceive trust as an important trait, digital natives expect a humanlike interaction. The results show the importance of knowing the needs and preferences of different target groups when designing chatbots.

Chatbot, User Satisfaction, Generational Differences

Digital Marketing & Social Media

1. Introduction

The application of chatbots can be beneficial for customer service and as effective marketing communication channel (van den Broeck, Zarouali, and Poels, 2019). While it is the norm for products and communications to be customized to the target audience and their needs, there is no evidence yet on whether this is also required when implementing a chatbot. It is unclear, if adjustments should be made, e.g. according to the age of the target group, in order to ensure positive effects of chatbots when communicating with customers. Several studies prove generational differences in the use of and attitudes towards online services (Hoffmann, Lutz, and Meckel, 2014; Metallo & Agrifoglio, 2015). Regarding chatbots, it was found that distinct age groups differ in their motivation to use chatbots (van der Goot & Pilgrim, 2020).

Therefore, the goal of this study is to find out how different chatbot traits influence user satisfaction and whether the characteristics have a different impact depending on the age group. To address this objective literature was consulted and relevant constructs identified.

2. Theoretical Background

Several studies present findings on chatbot features and design. It is shown that the service function of chatbots is of great importance among users, because chatbots are mainly used to receive quick and useful information (Brandtzaeg & Følstad, 2017; Jenkins, Churchill, Cox, and Smith, 2007), rather than for entertainment or social motivations (Brandtzaeg & Følstad, 2017). Accordingly, perceived utilitarian or hedonic attitudes might influence customer satisfaction. The humanlikeness of chatbot interaction might also be an important trait as non-surprisingly it can be assumed that users like the human behavior of chatbots (Holtgraves, Ross, Weywadt, and Han, 2007; Söderlund & Oikarinen, 2021).

There are also studies that look at individual technical functions of chatbots. For example, Balasudarsun, Sathish, and Gowtham, (2018) found out that, when interacting with chatbots, users perceive mainly daily updates, smart talks and answers to frequently asked questions as most important functions. Oftentimes chatbots provide this information by using emojis, pictures and videos (Balasudarsun et al., 2018).

Chatbots can be an effective communication channel as they provide personalized messages and allow interactions with (potential) customers around the clock (Balasudarsun et al., 2018; Zumstein & Hundertmark, 2017). Since marketers have recognized this potential,

Zarouali, van den Broeck, Walrave, and Poels (2018) see high relevance in investigating chatbots in the context of brand communication.

In terms of both marketing and customer service, it is important to enable users to build trust in chatbots (Følstad, Nordheim, and Bjørkli, 2018; Mostafa & Kasamani, 2022).

In conclusion, existing literature identified several important chatbot traits. To follow these findings, the traits humanlikeness, hedonic attitudes, utilitarian attitudes and trust will be investigated in this study.

Various authors indicate that further research on chatbots regarding their use as communication channel is needed (Brandtzaeg & Følstad, 2017; Zarouali et al., 2018). Like Brandtzaeg & Følstad (2017) mention, most studies were conducted in the early phase of the invention of chatbots. As a result, the findings relate primarily to early adopters who were already using chatbots at that time. They also state that future research should consider that user patterns of chatbot interactions might be related to the users' age (Brandtzaeg & Følstad, 2017). Since the number of chatbot users increases continuously (Drift, 2021), individual user age groups should be investigated to provide more detailed information about individual user's expectations to practitioners. Therefore, future studies are needed to address both: the current technological developments of chatbot features and the expectations of different user age groups. This study follows this research gap and therefore aims to answer the following research question:

RQ: Which characteristics of chatbots influence the user satisfaction depending on a user's age?

3. Method

To investigate the research question, an online survey was conducted in the summer of 2022 in Germany using the survey tool UNIPARK. The questionnaire was based on well-established constructs which are described in section 3.1.

3.1 Measurements

Based on the previous theoretical considerations, the following four characteristics of chatbots were studied as relevant independent variables in terms of their influence on user satisfaction: *hedonic attitudes*, *utilitarian attitudes*, *humanlikeness* and *trust*. The constructs *hedonic attitudes* and *utilitarian attitudes* were both measured with five items on a 7-point semantic differential (Voss, Spangenberg, and Grohmann, 2003), the construct *humanlikeness*

with three items by using a 10-point scale (Söderlund & Oikarinen, 2021), and the construct *trust* with 4 items measured on a 7-point Likert scale (Chaudhuri & Holbrook, 2001). The dependent variable *satisfaction* was measured through three items each on a 10-point scale (Fornell, 1992).

3.2 Study details

The constructs of the measurements are originally developed in English. As the study was conducted in Germany the items were translated to German to avoid misunderstandings among participants and to achieve reliable results. Therefore, the TRAPD (which means Translation, Review, Adjudication, Pre-testing and Documentation) method was used to ensure the quality of the translations of the construct questions (Harkness et al., 2010).

In order to take the influence of age into account, it was decided to conduct the study for two different generations. We therefore investigated the digital natives and digital immigrants separately. Digital natives are born in 1980 or later and represent the generations that grew up with new information and communication technologies (Prenksey, 2001). Whereas digital immigrants are the ones who were not born in the digital era, but have used this technology later in their lives (Prenksey, 2001).

The groups were chosen as there might be generational differences regarding perception and usage of technologies (Metallo & Agrifoglio, 2015; van der Goot & Pilgrim, 2020).

Survey participants were shown a real chatbot with which they were asked to interact. The chatbot presenting a fictive brand was built to avoid responses bias due to experiences with a specific brand. By integrating a control question, asking the participants whether they recognize the brand, the fictionality of the brand was ensured.

A pre-test of the study was conducted before a market research institute was commissioned to acquire participants. A monetary incentive for completing the survey was issued.

4. Results

The total sample consisted of $N = 313$ questionnaires after excluding the questionnaires in which control questions were not correctly answered. The sample was divided in the two generations of digital natives ($n = 88$) and digital immigrants ($n = 225$).

To analyze the data the software SPSS was used. To test the reliability of the constructs and their items a factor analysis was conducted. Two items (UA_4, HA_3) were excluded after the analysis due to cross-loadings. Cronbach's Alpha confirmed internal consistency, so the related items could be combined into scales by using a mean score (see Table 1).

To identify the influence of the four chatbot characteristics on user satisfaction, a multiple regression analysis was executed. In a first step the regression was applied to the full sample followed by separate a consideration of the two generations.

Table 1
Cronbach's Alpha

Construct	Cronbach's Alpha
Hedonic Attitudes	.931
Utilitarian Attitudes	.952
Humanlikeness	.967
Trust	.932
Satisfaction	.916

4.1 Results for the full sample

The multiple regression model explains the effects of *hedonic* and *utilitarian attitudes* of a chatbot as well as the effects of the perceived *humanlikeness* and *trust* in the chatbot (independent variables) on *user satisfaction* (dependent variable). The results are shown in Table 2. The adjusted R² value scores .789 which means that the independent variables explain 78.9 percent of the variable user satisfaction. The remaining 21.1 percent are explained by other factors not included in the model. The significance of the regression equation is confirmed, $F(4, 305) = 290.267$; $p < .001$.

Furthermore, all construct relations show significant results. *Utilitarian attitudes* seem to have the highest impact on user satisfaction ($\beta = .480$; $t = 11.816$; $p < .001$), followed by *hedonic attitudes* ($\beta = .184$; $t = 4.372$; $p < .001$) and *trust* ($\beta = .184$; $t = 4.586$; $p < .001$). The analysis shows that *humanlikeness* has the least influence ($\beta = .155$; $t = 3.651$; $p < .001$).

Table 2
Multiple regression results for the full sample (N =313)

Variables	Unstandardized (B)	Standardized (β)	Standard error	t
Constant	-.693		.246	-2.812
Utilitarian Attitudes	.779*	.480*	.066	11.816
Hedonic Attitudes	.265*	.184*	.061	4.372
Trust	.314*	.184*	.068	4.586
Humanlikeness	.209*	.155*	.057	3.651
R ²	.792			
Adjusted R ²	.789			
F (df = 4; 305)	290.267*			

*p < .001

4.2 Results for the digital natives generation

To answer the research question, the multiple regression model was repeated for the digital native sample group. Table 3 shows the results for this group. The adjusted R² value scores .691 which means that the independent variables explain 69.1 percent of the variable user satisfaction. The other 30.9 percent are explained by other factors not included in the model. With $F(4, 82) = 49.086$; $p < .001$ the significance of the regression equation is confirmed. Having a look at the four investigated traits of chatbots, three of them show significant results.

Table 3
Multiple regression results for the digital natives generation (n=88)

Variables	Unstandardized (B)	Standardized (β)	Standard error	t
Constant	-.042		.527	-.080
Utilitarian Attitudes	.656*	.421*	.129	5.089
Humanlikeness	.266**	.213**	.113	2.359
Hedonic Attitudes	.260**	.187**	.124	2.089
Trust	.267	.163	0.147	1.816
R ²	.705			
Adjusted R ²	.691			
F (df = 4; 82)	49.086*			

*p < .001; **p < .05

Utilitarian attitudes seem to have the highest impact on user satisfaction in the younger generation ($\beta = .421$; $t = 5.089$; $p < .001$), followed by *humanlikeness* ($\beta = .213$; $t = 2.359$; $p < .05$). *Hedonic attitudes* seem to have the least influence ($\beta = .187$; $t = 2.089$; $p < .05$). The trait *trust* is not significant in this case ($\beta = .163$; $t = 1.816$; $p = .073$).

4.3 Results for the digital immigrants generation

The multiple regression model was also applied to the sample of digital immigrant users. The results are shown in Table 4. With an adjusted R^2 value of .819, 81.9 percent of the variable user satisfaction is explained by the independent variables. The other 18.1 percent are explained by other factors not included in the model. The significance of the regression equation is confirmed, $F(4, 217) = 250.789$; $p < .001$. All of the investigated constructs show significant results. It seems like *utilitarian attitudes* are most important for user satisfaction in this age group ($\beta = .533$; $t = 11.120$; $p < .001$), followed by *trust* ($\beta = .180$; $t = 4.021$; $p < .001$) and *hedonic attitudes* ($\beta = .157$; $t = 3.240$; $p < .05$). *Humanlikeness* ($\beta = .135$; $t = 2.815$; $p < .05$) seems to be the least important.

Table 4

Multiple regression results for the digital immigrants generation (n=225)

Variables	Unstandardized (B)	Standardized (β)	Standard error	t
Constant	-.927		.276	- 3.352
Utilitarian Attitudes	.875*	.533*	.079	11.120
Trust	.309*	.180*	.077	4.021
Hedonic Attitudes	.228**	.157**	.070	3.240
Humanlikeness	.185**	.135**	.079	2.815
R^2	.822			
Adjusted R^2	.819			
F (df = 4; 217)	250.789*			

* $p < .001$; ** $p < .05$

5. Discussion and Implications

The aim of this research was to conduct a comparison across generations to shed light on how different chatbot traits influence user satisfaction. In this study the results for digital natives (12 – 42 years old) and digital immigrants (43 years and older) are compared. The

presented results show that the influence of specific characteristics of a chatbot on user satisfaction depends on the user's age. Further, the characteristics *utilitarian attitudes*, *hedonic attitudes*, and *humanlikeness* of a chatbot and the perceived *trust* were investigated. Utility seems to be the most important trait in both age groups which supports the findings of Brandtzaeg & Følstad (2017) that the main motivation to use chatbots is to receive quick and helpful information. The relevance of the characteristics *hedonic attitudes* and *humanlikeness* vary depending on the age of the user. The biggest difference between the two groups can be seen in the trait *trust*. While for older participants this seems to be the second most important characteristic to make them satisfied when using a chatbot, there was no significant relevance for the younger group. This may be explained by the fact that older generations face technologies with skepticism, whereas there is a certain basic trust among digital natives. It is the opposite case for the trait *humanlikeness*. While digital natives seem to prefer an illusion of interaction with a real human, digital immigrants perceive this as least necessary compared to the other traits.

The results of this study show the importance of knowing the needs and preferences of different target groups when designing chatbots.

6. Limitations and further Research

The present study shows that the design of chatbots must be adapted to the user group in order to increase satisfaction and to be able to use it as an efficient communication channel. Thus, the results contribute to chatbot research and offer valuable implications for practitioners. Nevertheless, there are some limitations that should be considered. First, the number of participants for the digital natives was quite small. A larger sample might yield more reliable results. Second, this study investigated the factors influencing satisfaction depending on the age. There might be other independent variables regarding the user that can have an influence when interacting with a chatbot, e.g., gender or attitude towards technology. To incorporate such constructs into a comparative study, a structural equation model would be useful, whereas multiple regression was used in this study. Third, the communication style, e.g. perceived friendliness of chatbots, was not considered as a stimulus in this study but might also influence user satisfaction. If future research takes these aspects into account, further insights can be gained into the successful use of chatbots as a communication channel. We are optimistic that the present study provides the groundwork for such further approaches.

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