

Chatbots versus human assistants in the online customer decision process

Author: Antonius Brühöfner
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT

Each customer goes through a decision process when shopping online. It is up to the companies to offer touchpoints that connect them to the (potential) customer. Besides traditional phone hotlines, chats are becoming an increasingly popular method to make contact to customers. In these chats, some organizations are using bots (with artificial intelligence and natural language processing), some are using human assistants to chat with a (potential) customer. This research tries to investigate in which occasion (either pre-transaction, transaction, or post-transaction) which method (either a chatbot or an employee as a human assistant) is more satisfactory for the customer.

It is important to note that besides the satisfaction of a customer, which this research focusses on, other factors such as operating costs should also be considered when deciding which service to offer.

Graduation Committee members:

First supervisor – dr. C. Herrando

Second supervisor – dr. E. Constantinides

Keywords

Chatbots, customer decision process, e-commerce, online chat support, contact with customer, interaction with customer

1. INTRODUCTION

According to Shawar and Atwell, chatbots are a chat application, which interface can be used to get answers from an artificial intelligence for questions that can be rather simple or more complex (Shawar & Atwell, 2003). While the conversation can be either held per voice or with chat messages, this study focusses solely on the latter. The chat based chatbots get increasingly important for companies trying to offer a contact possibility for customers, as more than 80% of all businesses are considering working with chatbots until 2024 (Hildebrand & Bergner, 2019). According to Moore (2019), from 2020 on 25% of the customer interactions are managed through virtual assistants or chatbots.

Empirical studies proved anthropomorphism positively influences the willingness to interact with a chatbot (Moriuchi, 2021). In addition, a study of Hildebrand and Bergner (2019) showed that customers were almost twice as willing to buy more costly options and add-on services when they were offered by a human-like chatbot. If the interface is similar to the consumers characteristics, this increased even more.

However, this does not mean that making a chatbot more human-like is solving the general issue that customers generally tend to avoid chatbots rather than using them. As shown in previous studies, the disclosure at the end or at the beginning of a conversation that a customer is interacting with artificial intelligence (AI) reduces the purchase rate by up to 79.7% (Luo, Tong, Fang & Qu, 2019). Assuming that such disclosure is inevitable, this leaves companies up to decide on for which occasion they should use their resources to implement an AI chatbot on their website or focus on another way of customer contact, such as the chat with an actual employee.

It seems like there is a research gap in previous studies. When testing the customer's denial or acceptance of anthropomorphic chatbots, they measured the impact of a chatbot on the customer experience along the customer decision-making process (Hoyer et al., 2020). The customer decision process steps pre-transaction, transaction, and post-transaction categorize these situations. The impact of a chatbot on the customer experience along the customer decision process was measured. In all decision process steps, the impact was equal to or higher than other technologies such as AR (Augmented reality), VR (Virtual reality), MR (mixed reality) or IoT (Internet of things). The research paper shows that the impact of chatbots on the customer experience along the customer journey is high in both the pre-transaction and transaction steps. At the same time, it is medium in the post-transaction step. This underlines the effectiveness of a chatbot and leads to the assumption that a customer might be more willing to interact with a chatbot in the first two steps than in the post-transaction step. Nevertheless, it is left open, how the impact itself is measured and how a chatbot compares to chat assistance with a human assistant.

Additionally, the competences a chatbot needs to have differ depending on the customer journey. For example, before a transaction takes place, companies can target advertisement with the help of chatbots via Facebook messenger (Facebook, 2018). There, chatbots can send sponsored messages via the Facebook Messenger app to people that were previously in contact with a certain company. In contrast, when a purchase is already made, a chatbots skills need to be tailored more to the customers after-

sales service requests. This leads to the following research question:

To what extent does the stage of the customer decision making process affect the customers interaction with a chatbot?

With this research, companies could distinguish between different occasions (the customer-decision process stages) when they should either implement a chatbot on their website or better use a real assistant. Theories of user experiences with interactive systems highlight pragmatic and hedonic aspects as important factors to rate the user experience (Hassenzahl, Vermeeren & Kort, 2009). Therefore, to measure the impact of a chatbot versus a real assistant in each customer-decision process stage, impact is measured in pragmatic- and hedonic attributes of a chatbot/real assistant, perceived by the contestants. The concentration on pragmatic attributes as criteria is also supported by results of a study from Brandtzaeg and Følstad, which pointed out the importance of productivity as a key motivator for users to use a chatbot (Brandtzaeg, Følstad, 2018). Consequently, a conclusion about the impact of a chatbot in each customer-decision process stage can be made. The contribution is important because it gives companies advice on using a chatbot rather than providing chat assistance by a real human. It serves as guidance to efficiently allocate resources.

2. THEORETICAL BACKGROUND

A (potential) customer can interact with a chatbot by using either voice or text. For instance, some chatbots are triggered by specific actions, meaning that if certain commands or patterns are typed in, a previously defined response is triggered (Bieliauskas & Schreiber, 2017). With artificial intelligence, chatbots have become more complex. They become capable of engaging in a meaningful conversation with a user. For this, techniques of natural language processing (NLP) and artificial intelligence (AI) are needed (Io & Lee, 2017). In customer service areas e.g., a chatbot uses NLP to understand the intentions and more complex demands of users (Liddy, 2001). Fully developed, in an ideal scenario, a chatbot can imitate the conversation partners' language to stimulate the conversation (Shawar & Atwell, 2005).

This study builds upon the customer decision process's three steps (Hoyer et al., 2020). The process helps to identify which needs of the customer a chatbot should satisfy, depending on which stage he/she is currently in. The overall goal is to determine in which stage a chatbot is accepted the most and therefore has the most impact.

The first phase is the pre-transaction. In this step, the companies need to trigger the next decision-making process steps if there is a customer need. Selecting, advising, and customizing is the crucial task of a chatbot. For such advisory and customization, recommendation agents can be used (Häubl & Murray, 2003; Benbasat & Wang, 2005). With an information overload, a chatbot can successfully filter the information and successfully give advice while taking the users' individual needs and preferences into account. Customer service chatbots are even able to answer fact questions using in-page product information (Cui, Huang, Wei, Tan, Duan & Zhou, 2017).

The second step in the customer decision-making process is the transaction. Here, a chatbot's key role is to partner and negotiate

as part of the transaction. It can help execute a transaction; security issues play an important role (Bhuiyan, Islam, Razzak, Ferdous, Chowdhury, & Tarkoma, 2020).

In the customer decision's post-transaction stage, effective marketing aims to satisfy both high and low-involvement purchase decisions. In contrast, the most cognitive dissonance comes up with high-involvement purchases. The goal is to reduce the buyer's remorse (if present) or even recommend another product based on recommendation techniques from the pre-transaction.

3. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In a customer's journey, chatbots are becoming increasingly important. According to Jain, Kota, Kumar & Patel (2018), social media services like Facebook Messenger, Skype etc. are hosting a total of more than one million chatbots. According to a report on emerging technologies and marketing by Oracle (2018), in 80% of all customer interactions chatbots will play a significant role for customer interaction by 2020.

To increase the likelihood that a transaction takes place, chatbots can enhance the online shopping experience. For example, a chatbot makes the customer feel that he is served at the right time, increasing the perception of employee presence (Wang et al., 2007).

When shopping, customers move through different phases from information gathering to purchase and, finally, the evaluation of the purchase (Howard & Seth, 1969; Neslin et al., 2006; Neslin & Shankar, 2009; Pucini et al., 2009). Studies have shown that it is possible to subdivide the customer decision process into different stages. Under Lemon and Verhoef (2016) and Shankar et al. (2016), Hoyer et al. (2020) conceptualized the decision-making process into the three steps "pre-transaction, transaction, and post-transaction." They contribute managerial implications for marketers for chatbot usage in each step. These marketer implications can be applied to how a chatbot can act in each decision-making process step. The hypothesis is that the extent of a customer's interaction with a chatbot, also called impact, varies depending on the phase of decision-making he/she is currently in. Therefore, there might be a variance between the chatbots versus real human assistants' impact and the customer decision process stage.

Another study supports this assumption, which investigated people's motivation for using chatbots (Brandtzaeg, Følstad, 2017). Its results show that productivity is the most common reason people use chatbots. The priority to use a chatbot to obtain information quickly and efficiently reasons the assumption that in the phase of information search (pre-transaction), a chatbot is more likely to be used and perceived as effective by a potential customer than in the post-purchase evaluation of the decision.

In contrast to this, another conference paper shows that chatbots are the 84.6% preferred consumer channel to get answers to "simple questions" (Di Gaetano & Diliberto, 2018). This means it is preferred over email or online form, phone, or chat with operators. Again, the framing "simple questions" indicates that the user's extent of use may vary with the occasion, suggesting to structure customers' use occasions into the decision-making process. Di Gaetano and Diliberto's conclusions also promote the assumption that chatbots are more effective in certain stages. A study of Lugar and Sellen (2016) connects to this finding. In their study, virtual assistants failed to meet users requests for more complex tasks and therefore were only used for rather simple tasks. Even though this supports the previous assumption, it needs to be interpreted with caution. The study is from 2016, AI became more advanced since then. Moreover, they used VA's

from Apple, Google, and Microsoft, which are not as limited in their area of application as chatbots.

A study of Piccolo, Mensio & Alani (2019) concluded that chatbots can potentially be used for emotional needs, addressing sensitive topics with privacy and in humanitarian contexts. This is supported by Di Gaetano & Diliberto, who found out that chatbots allow us to face sensitive topics without affecting users' sensitivity, which might be relevant for the decision-making process stage "post-purchase evaluation of the decision" (Di Gaetano & Diliberto, 2018, p.62-70). In this third stage, also customer service takes place (Lemon & Verhoef, 2016; Kelly & Davis, 1994). A study of Xu, Liu, Guo, Sinha, and Akkiraju (2017) researched on the quality of chatbots for customer service, using social media chats as a platform. Their conclusion, that chatbots are performing equally as good as human agents in helping users to cope with emotional situations, indicates that chatbots are also satisfying at more complex tasks. In addition, Nuruzzaman & Hussain (2018) show that chatbots have the advantage of shorter response times and more relevant answers in customer service in comparison to live chats. The fact that chatbots are available 24 hours per day is a main driver positively affecting the user satisfaction (Johannsen, Leist, Konradl & Basche, 2018). The conclusion on the application of chatbots for the customer service area of Adamopoulou & Moussiades (2020), is that with ongoing development, chatbots will soon dominate the customer service industry.

Therefore, not only for simple tasks, but also at different stages of the customer decision process chatbots have a high potential to be effective and satisfying the customer needs. As development continues to enhance the artificial intelligence of bots and their algorithms, research shows that they become capable of coping with tasks (of the health care sector, for example). Nevertheless, humans still feel another human would do better (Horgan, Romao, Morré & Kalra, 2019), even though algorithms can well analyze the conversation partner's reactions (Kodra, Senechal, McDuff, & ElKaliouby, 2013).

To assess and evaluate the customers satisfaction with a virtual assistant, a research of Følstad and Brandtzaeg (2020) on users' experience with chat assistants is used to further define pragmatic and hedonic aspects and provide a framework for scale items. It categorized pragmatic attributes of the assistants into help and assistance (perceived usefulness, practical value and helpfulness), information and updates (benefit for general information searches, routine updates, and support for finding general information), and negative pragmatic attributes of the assistant (Interpretation issues, inability to help, repetitiveness). Hedonic attributes were defined by the entertainment factor (entertainment value, extent of stimulation), inspiration and novelty factors (engaging topics), social factors (social value creation, enjoying the situation), and negative hedonic factors (strange or rude responses, unwanted events, and boredom). The fact that emotional, hedonic attributes play an important role is also supported by a study of Costa (2018), where users see chatbots as friendly companions and not just mere assistants. Moreover, 40% of the users requests are rather emotional than informative (Xu, Liu, Guo, Sinha & Akkiraju, 2017).

Taking all findings into account, there is a gap of finding the right scenario/occasion for using a chatbot. Companies may need to distinguish between the different customer decision making process stages, when deciding whether they should use a human assistant or a bot as a chat assistant. With the following hypotheses, the customers overall satisfaction when using either a bot or a human assistant can be compared in each stage of the decision-making process based on pragmatic and hedonic attributes.

3.1 Conceptual Framework

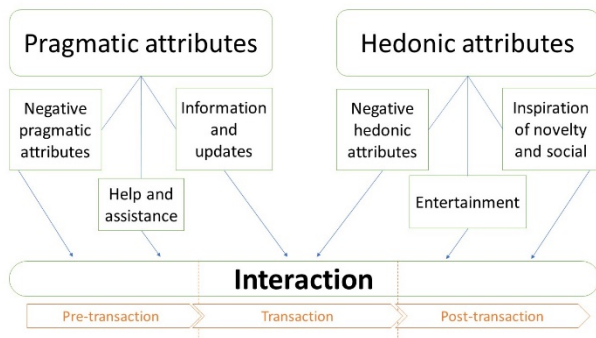


Figure 1: Conceptual Research Model. Original creation, with the “Pragmatic and hedonic attributes” as defined by Følstad and Brandtzaeg (2020) and the customer decision process “Pre-transaction, transaction and post-transaction” as defined by Hoyer et al. (2020).

3.2 Hypotheses

H1: Which decision process stage a consumer is currently in, has an effect on how he/she rates the chat in terms of 1a) pragmatic and 1b) hedonic attributes.

H2a: Whether the consumer is chatting with a bot or a human, influences how he/she rates the chat in terms of pragmatic attributes.

H2b: Whether the consumer is chatting with a bot or a human, influences how he/she rates the chat in terms of hedonic attributes.

H3: In which decision process stage a consumer is in, influences whether he/she preferably chats with a human or a bot.

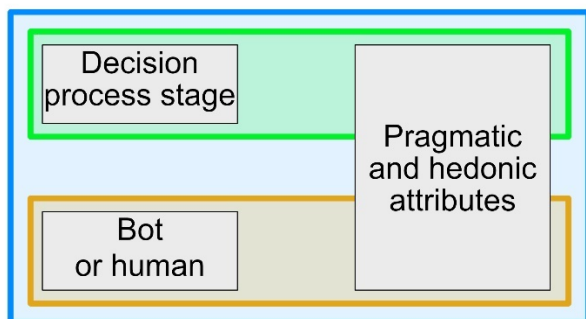


Figure 2: Hypotheses. Green=H1, Orange=H2a/b, Blue=H3.

4. METHODOLOGY

4.1 Design

The experimental research design consists of the three customer-decision process stages to contextualize the testing situation. Either a human chat assistant- or chatbot chat-history is given as a stimulus to the contestants. The hedonic and pragmatic attributes (explained in detail in the literature review) are the dependent variables. They are influenced by the independent variable “interaction” with either a) a chatbot or b) a real human assistant. The latter has the function of a control group.

Therefore, the interaction with chatbots can be compared against interaction with human assistants in each customer-decision process stage (pre-transaction, transaction, post-transaction) by creating six groups of contestants. Each group gets assigned to one decision-process stage and either a sample of a chat with a chatbot or a chat with a human chat assistant in the case of the control group. This means the study is built up as a between-

subjects study design so that each person is only exposed to a single user/chat interface.

The chat (either from a bot or a human assistant) is a screenshot at the beginning of the questionnaire. The screenshots are taken from conversations on websites. The occasion and topic of each chat depends on the customer decision-process step. Hoyer et al. (2020) described the tasks of a virtual assistant or chatbot per stage as following:

In the pre-transaction phase, the human assistant/chatbot is responsible for assisting, advising, and customizing. In the transaction phase, it should partner and negotiate with the customer as part of the transaction. Lastly, it should give feedback in the post-transaction phase and recommend additional consumption. Therefore, the chat history- and content is built up according to these schemes, and the topic is adapting to these needs. This serves as a part of the conceptual framework.

Then, each contestant of a group must rate the chat based on different groups of pragmatic and hedonic attributes with suiting items on 7-point Likert scales (McKnight, Choudhury & Kacmar, 2002). With the pragmatic and hedonic attributes, it is possible to categorize whether the chatbot or virtual human assistant satisfies the customer and makes a high impact on the users satisfaction in the respective customer decision-process step. The attributes and the resulting scale items are based on the research findings of customers driving factors in a virtual assistant conversation from Følstad and Brandtzaeg (2020).

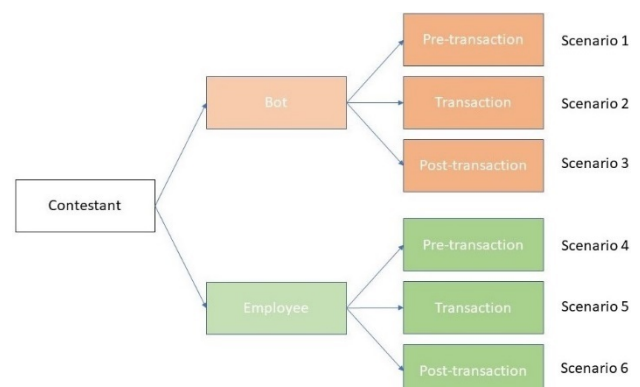


Figure 2: Experimental design

4.2 Operationalization

4.2.1 Pragmatic attributes

To test the group of the pragmatic attributes for "help and assistance," contestants need to rate each the perceived usefulness, the practical value, and the perceived help from 1-7, whereas a 7 is the best score possible (in this case, the assistance is the most helpful). This will reflect on the perceived usefulness or practical value of a certain chat conversation.

The group of pragmatic attributes, "information and updates," is tested with scales rating the three items pragmatic benefit on general information, the benefit of routine updates, and support for retrieving general information. This shows how much the selected chat conversation assists the user with more general information searches and basic routine updates, rather than the help in particular situations tested in the previous group of “help and assistance”.

The group of “negative pragmatic attributes” of the assistance is tested with three 7-point Likert scales for the items interpretation issues, inability to help, and repetitiveness. With this, pragmatic issues occurring in the chat can be evaluated. For example, with

the Likert scale the contestants perceived interpretation issues or repetitiveness that occur when he/she is reading through the chat are measured.

4.2.2 Hedonic attributes

While the attributes connected to pragmatism focus on usability and utility, the hedonic attributes focus on entertainment. In a chat conversation, not every single message necessarily needs to deliver highly useful information. For a good and involving interaction, the chat should be stimulating and engage the user into the conversation.

The group of hedonic attributes "Entertainment" is tested with the items entertainment value, stimulation, and fun-factor on a scale from 1-7, 7 being the most entertaining. These criteria test how happy and entertained a respondent feels.

How potentially evocative the character of the chat partner is, is tested with the items of the group of the hedonic attribute "Inspiration of novelty and social". The items are inspiration, engaging topics, and social value. A seven means the chat is more inspirational or social.

The group of "negative hedonic attributes" is tested on scales with the items strange or rude responses, unwanted events, and boredom. In this case, a score of seven represents the least negative hedonic attributes shown possible.

4.3 Questions and Stimuli

Table 1: Scale

Scale
<i>Pragmatic attributes</i> – adapted from Følstad and Brandtzaeg (2020)
HA1: I perceive a high usefulness of this chat.
HA2: This chat has a practical value.
HA3: I perceive this chat as helpful.
IU1: There is a pragmatic benefit on general information.
IU2: There is a benefit of routine updates with this chat.
IU3: This chat gives support for retrieving general information.
NP1: There is a low amount of interpretation issues in this chat.
NP2: The inability to help in this chat is low.
NP3: There is a low amount of repetitiveness in this chat.
<i>Hedonic attributes</i> – adapted from Følstad and Brandtzaeg (2020)
E1: This chat has a high entertainment value.
E2: I perceive this chat as highly stimulating.
E3: This chat has a high fun-factor.
IN1: This chat is inspirational.
IN2: The chat partner is coming up with engaging topics.
IN3: The chat partner is creating social value.
NH1: The responses in this chat are neither strange nor rude.
NH2: There are no unwanted events occurring in this chat.
NH3: The chat is boring.

Note: HA=Help and assistance; IU=Information and updates;
NP=Negative pragmatic attributes; E=Entertainment;
IN=Inspiration of novelty and social; NH=Negative hedonic attributes

The questions can be found in appendix 1: Survey. While the questions remain unchanged, the stimuli changes with each one of the six surveys. Each stimulus is a screenshot of an actual chat conversation, the screenshots can be found in appendix 2: Stimuli – Chat conversation. The topic and content of the stimulus varies with the decision process step the customer is in.

4.4 Data Collection and Analysis

The questions were sent in a google survey form to random participants via multiple online platforms such as WhatsApp, Instagram, Facebook groups (specialised on exchanging surveys) and Survey. It was approved by the Ethics committee of the University of Twente. The survey is in English, but respondents can have any nationality. The only requirement is that they speak English. Five out of the six screenshots of chat conversations are in German but were also translated below each screenshot. To avoid that the translation influences the outcome, the contestants are asked whether they speak fluently German (Level C2 or higher) or not. Besides gender and age, no other demographic factors are tested in the experiment.

4.5 Reliability and Validity

With a total of six groups, each group consisted of at least 30 respondents, counting a total number of more than 180 respondents. To ensure the scale validity, a manipulation check was conducted at the end of the survey. It proves whether the stimuli were perceived as intended. For this, contestants were asked whether they have seen a chat conversation or a phone call in the beginning. After excluding all contestants that did not answer the control question correctly (stating that they have seen a phone call), the data set consists of 191 respondents. This sample size establishes sufficient evidence of reliability in terms of size.

The collected data was analysed in SPSS. To check the consistency and relation of the items from a variable, the measure of scale reliability Cronbach's alpha of 0.7 is applied. The Chronbach's alpha values of both attributes are far above the recommended value of 0.7. Therefore, the statistical test implies that there is a good inter-item reliability. The tables of the SPSS output can be found in appendix 11.3 "Chronbach's alpha". The overall values for each attribute can be found below in table 2.

Table 2: Chronbach's Alpha

	CHRONBACH'S ALPHA	NUMBER OF ITEMS
PRAGMATIC ATTRIBUTES	0.881	9
HEDONIC ATTRIBUTES	0.805	9

4.5.1 Gender, Age and Language

The homogeneity control was done to check if the groups were equally distributed.

The gender distribution within the total data set was relatively equal. Out of 192 total answers, 92 (47.92%) were female, 98 (51.04%) were male. One (0.52%) identified as diverse but was left out in the analysis since the size of one does not make it a significant group. The distributions variance within the different scenarios was slightly higher, but with a Chi-Square of 0.622 and a Levene's test Sig. (equal variances assumed) of 0.069 being greater than $\alpha=0.05$, the H0 hypothesis can be accepted. This means that the homogeneity is supported. The cross table containing a detailed overview with the gender distribution in each scenario, the Chi-Square table as well as the Levene's test table can be found in appendix 11.4 "Gender".

With a valid 80.63% of the contestants being in the age of 18-30, the majority of the sample group is considered as young. A more detailed overview of the age distribution is portrayed as a table in appendix 11.5 “Age”. The effects this might have are discussed in the part “Research limitations”.

Since five out of the six chat conversations took place in German, a translation to English was provided to the contestants. Because it might influence the outcome that 20.94% (40 out of 191) of the contestants did not speak German, the effects are discussed in the part “Research limitations”.

5. RESULTS

The answers to all surveys have been imported to and were analysed with SPSS 25. The most relevant tables are included in the text, further detailed tables are in the appendix.

To check the research question and hypotheses, the collected data was examined using a multivariate analysis of variance (MANOVA). This part focusses on the main findings of the analysis as well as the means and standard deviations.

5.1 Customer decision process stages

In the tests of between-subjects effects, the pragmatic attributes show no overall significant difference in each stage ($F(2.185) = 1.86, p=.159$). The same is valid for the hedonic attributes ($F(2.185) = 1.559, p=.213$). The pragmatic attributes score a statistical significance value (Sig.) of 0.159, the hedonic attributes score 0.213, as shown in table 3. Both values are above the statistical significance value (Sig.) of $\alpha=0.05$, so the outcome is considered as not significant. The α value of 0.05 is also used as a critical value for the following test results. The results are supported by the multivariate tests, of which all three tests (Pillai's Trace .081, Wilks' Lambda .081 and Hotelling's Trace .082) show an α above 0.05. The mean of the respondents votes for pragmatic- as well as hedonic attributes shows no large gap when comparing the decision process stages to each other. More detailed information can be found below in table 5 – means and standard deviations: Stages. Therefore, the hypothesis that the decision process stage influences how users rate the chat in terms of 1a) pragmatic and 1b) hedonic attributes can be rejected. The process stage itself is neither affecting 1a) pragmatic attributes nor 1b) hedonic attributes.

Additionally, comparing the means (M) of each attribute in table 5 to each other confirms the previous observation from the MANOVA test. The three values from each attribute lie close to each other and show no significant difference.

Table 3 – MANOVA effects: Stages

Dependent measures	Sum of sq.	Df	Mean sq.	F	Sig.
Pragmatic attributes	3,418	2	1,709	1,858	,159
Hedonic attributes	2,867	2	1,433	1,559	,213

Table 4 - Multivariate Tests: Stages

Multivariate test	Sig.
Pillai's Trace	.081
Wilks' Lambda	.081
Hotelling's Trace	.082

Table 5 – Means and standard deviations: Stages

Dependent variable	Decision process stage	Mean	SD
Pragmatic attributes	Pre-transaction	5,143	,114
	Transaction	5,148	,125
	Post-transaction	5,433	,123
Hedonic attributes	Pre-transaction	4,113	,114
	Transaction	3,847	,125
	Post-transaction	3,871	,123

5.2 Employee (human assistant) versus bot

The employee (human assistant) versus bot test of between-subjects shows significant differences in hedonic attributes ratings ($F(1.185)=23.853, p=.000$), while it has no significant differences in pragmatic attributes rating ($F(1.185)=2.275, p=.133$). This indicates that contestants saw a significant difference in the behaviour and expression of the chat partner. However, pragmatic attributes, which contribute to how the task itself was done, how questions were answered, and customers were provided with answers, do not seem to differ significantly on whether a bot or an actual employee is chatting. Based on these findings, the hypothesis 2a) that whether the consumer is chatting with a bot or a human, influences how he/she rates the chat in terms of pragmatic attributes, can be rejected. In contrast, the hypothesis 2b) whether the consumer is chatting with a bot or a human, influences how he/she rates the chat in terms of hedonic attributes, can be accepted.

An additional observation is that those contestants who were assigned to an actual employee, rated the chat on average better for both the pragmatic attributes (Employee $M=5.35, SD=.10$; Bot $M=5.14, SD=.10$) and the hedonic attributes (Employee $M=4.28, SD=.10$; Bot $M=3.60, SD=.10$). This finding is also addressed again in the discussion part.

Table 6 – MANOVA effects: Employee or bot

Dependent measures	Sum of sq.	Df	Mean sq.	F	Sig.
Pragmatic attributes	2,092	1	2,092	2,275	,133
Hedonic attributes	21,853	1	21,853	23,761	,000

Table 7 – Means and standard deviations: Employee or bot

Dependent variable	Decision process stage	Mean	SD
Pragmatic attributes	Employee	5,346	,101
	Bot	5,136	,096
Hedonic attributes	Employee	4,284	,101
	Bot	3,604	,096

5.3 Customer decision process stage combined with employee versus bot

There is a significant difference between the stage and whether the chat partner was an employee (human assistant) or a bot. For hedonic attributes, the difference is significant with a Sig. of .030

($F(2.185)=3.584$, $p=.030$), for pragmatic attributes it is even higher with .000 ($7.1564E-7$) ($F(2.185)=15.291$, $p=.000$). This means it makes a significant difference which stage you are in and whether you use a bot or a human assistant in each stage.

Table 8 – MANOVA effects: Stage*employee or bot

Dependent measures	Sum of sq.	Df	Mean sq.	F	Sig.
Pragmatic attributes	6,592	2	3,296	3,584	,030
Hedonic attributes	28,127	2	14,063	15,291	,000

For pragmatic attributes, the bot has a higher mean in the pre-transaction stage (5.293 M bot vs 4.993 M employee), while the employee scores better in the other two stages. A higher mean indicates that the chat partner (bot/human) was rated better by the contestants on the scale from one to seven. As explained before, due to the warm start method a higher score implies a more positive impact.

Taking a closer look at the attributes, the same observation continues to be validated for the hedonic attributes. The bot scores a higher mean in the pre-transaction stage (4.30 M bot vs. 3.92 M employee), while in the transaction and post-transaction stage (with an even higher difference between the means) the human clearly sets itself positively apart from the bot (3.196 M bot vs. 4.498 M employee in the transaction stage, 3.313 M bot vs. 4.429 M employee in post-transaction stage). This can be reasoned by the fact that a (potential) customer is looking for simple information delivery in the pre-transaction phase as explained before, more complex tasks following in the second and third stage seem to need more social interaction and sensitivity. This was also explained before in the literature and methodology section and was defined by Hoyer et al. (2020).

Based on these findings, the hypothesis 4 “In which decision process stage a consumer is in, influences whether he/she preferably chats with a human or a bot”, can be accepted.

Moreover, the hedonic attributes scored a significantly lower mean in every scenario than the pragmatic attributes. This means both human and bot lack of entertainment, fun-factor etc., but are better in delivering useful information, being helpful and giving support.

Table 9 – Means and standard deviations: Stage*Employee or bot

Dependent variable	Decision process stage	Employee or bot	Mean	SD
Mean of pragmatic attributes	Pre-transaction	Employee	4,993	,170
		Bot	5,293	,154
	Transaction	Employee	5,410	,178
		Bot	4,885	,175
	Post-transaction	Employee	5,636	,178
		Bot	5,229	,170
Mean of hedonic attributes	Pre-transaction	Employee	3,924	,170
		Bot	4,302	,154
	Transaction	Employee	4,498	,178
		Bot	3,196	,175
	Post-transaction	Employee	4,429	,178
		Bot	3,313	,170

Note: Green highlights the higher mean score when comparing bot versus employee in each stage. This visualizes that the bot scored better in the first stage for both attributes, while the employee did so in the second and third stage of the decision process.

6. DISCUSSION AND CONCLUSION

This research aimed to investigate the extent to which the customer decision process is affecting the interaction with a chatbot.

As mentioned in the results, according to the statistical test results, it makes a significant difference whether someone uses a bot or a human chat assistant, depending on which stage of the customer decision process he/she is in.

This can be decisive because it builds on the previous findings of the literature review. The type of task and especially its demands from the user to the chat partner, which differ with the process stage, seem to match the preference of having contact with either a bot or a human. In the pre-transaction stage, simple information requests used to base a purchase decision on are demanded by the customer. Due to the significantly higher mean for both hedonic and pragmatic attributes for a bot, users seem to prefer it over a human assistant in this stage. This is not only confirmed by the observation of the mean values themselves in table 9, but also by the statistical significance (Sig.) values of table 8, which are below the critical value of 0.05. This can be explained with the research of Brandtzaeg and Følstad (2017), according to which users prefer chatbots to obtain information quickly and efficiently. As assumed in the literature review, this supports the assumption that in the information search phase, a chatbot is a preferred medium. At the same time, for more complex tasks such as transaction requests, negotiation, or post-transaction requests handling customer care and service, a human can shine with the necessary social sensitivity for taking care of unique and more individual customers' requests. For example, in the transaction phase, the human assistant came up with more personalized offers suiting the customers' situation (such as student discounts, e.g.). Simultaneously, the bot answered with a somewhat standardized answer stating several options on how to get a discount. The bot shortly listed several solutions for the existing problem in the post-transaction stage and even recommends getting in contact with an actual employee from the customer service if the answers are not helping any further. Therefore, the answers stay broad, and the individual problem could not be fully approached in detail. On the other hand, the human assistant was able to solve the individual problem and even offered a coupon code as an excuse for the issues.

These approaches to dealing with customer requests is also reflected in the statistical test results. According to the MANOVA analysis for stage versus employee or bot, there is a significant difference for the pragmatic attributes in each decision process stage. An even higher significant difference for the hedonic attributes is observed for whether a customer uses a bot or an employee in each stage. As mentioned in the results, this is also noticeable by comparing the means. A bot having a significantly higher mean in the pre-transaction stage and a human employee having a higher mean in the other two stages for both attributes emphasizes a correlation between the usage of either a bot or an employee and the respective decision process stage. The first MANOVA test for solely the stages, as shown in table 3, proves that there is no significant difference in neither of the attributes rating when comparing the stages to each other without considering the chat partner being an employee or bot. But when adding the variable of the chat partner (bot or employee), there is a significant difference in the contestants

mean rating between each decision process stage (as shown in table 8 and 9).

Therefore, the users extend of interaction depends heavily on the type of chat partner, bot or human, and the customer decision process stage.

When solely comparing the bot against the human, without taking the decision process stages into account, the human scores a higher mean for hedonic attributes than the bot, and the MANOVAs Sig. value in table 6 confirms that this difference between the means is significant. But it also shows that there is no significant difference between bot and human when they are compared in terms of pragmatic attributes. This reasons the assumption from the literature review, that bots can be used for productivity, because they are equally as good as a human chat assistant in terms of the mean for pragmatic attributes. However, the significant difference in the means for hedonic attributes, where the human scored higher, reasons that a bot cannot cope with emotional situations. This contradicts with the conclusion from a study of Xu, Liu, Guo, Sinha, and Akkiraju (2017), mentioned earlier in the literature review. They assumed that the opposite is the case, that chatbots are capable of coping emotional situations.

For the means of pragmatic attributes, generally both the bot and the human score a higher mean than for the hedonic attributes. This demonstrates two things. Firstly, a chat conversation with (potential) customers is better for providing help and assistance and information and updates, rather than having a social and emotional interaction with the customer. Secondly, this shows that no matter for which type of attributes, a bot receives significantly higher overall ratings in the pre-transaction stage, while a human assistant does so in the transaction- and post-transaction stage.

This underlines the previous assumption from the literature review about using chatbots for efficiency reasons and connects it to the customer decision process stages. While a customer focuses on obtaining information quickly and efficiently in the pre-transaction stage, he/she concentrates on social sensitivity (hedonic attributes) in the transaction and post-transaction stage for more individual interactions.

Furthermore, as shown in table 7, when not considering the different decision-making process stages, the employee is rated better on average than the bot. This is due to the fact, that it is getting the better rating in two out of three stages.

Finally, taking all statistical test results as well as the discussed comments into account, the following conclusion can be made:

With the research question, this study aimed to investigate to what extent the stage of the customer decision-making process is affecting the customers' interaction with a chatbot. Based on the statistical tests from the sample groups, it can be said that there is a significant extent to which the decision process stage is affecting the interaction with a chatbot. With the help of the previous hypotheses, results show that customers preferably use a chatbot for tasks of the pre-transaction stage over a chat with a human employee. In contrast, the human chat assistant is preferred in both the transaction and post-transaction stage.

Additional findings of the significant differences between a bot and a human for hedonic attributes are discussed in the future research section.

7. IMPLICATIONS FOR THEORY AND PRACTICE

This study opens possibilities for companies and organizations to use the growing technology of chatbots when in contact with customers. Whereas a bot was used before by companies to

handle multiple types of customer requests, it is now possible to formulate more narrow fields of activity for bots and human chat assistants. Using the theory of the decision-making process stages defined by Hoyer et al. (2020), taking the variables of pragmatic and hedonic attributes from Følstad and Brandtzaeg (2020) and combining this with a real bot and employee chat interactions, a decisive theoretical contribution is made. Furthermore, it serves as a guideline to distinguish between the different tasks a chatbot can perform, in which scenario it is more effective than a human and where it is not.

The overall conclusion that a chatbots impact is higher than a human one in the pre-transaction stage, and vice versa for the transaction and post-transaction stage, comes with the following practical implications for companies offering contact possibilities via chat:

For customer advisory and customization in the pre-transaction step, this research shows that the usage of a bot is more effective than a human employee as a chat partner. Companies could use product pages and other web pages for advertising their products to implement the possibility for the customer to chat with a bot. For example, when a customer needs assistance with comparing different versions of products from a particular company, a chatbot is more effective to compare these and assist with additional data and information than a chat with a human assistant. Additionally, the Skyscanner example from the survey shows that not only customer goods advisory and customization, but also the service sector can make use of the chatbot technology. It can take over the work for a potential customer of clicking through websites and their filters, settings etc., which tend to increase in complexity. In contrast, the customers online demands get more complicated and diverse over time.

For customer requests in the transaction stage, on the other hand, a trained human employee should chat with the customer. Negotiation as part of the transaction is a crucial task in this stage. Companies can offer chat support when a customer already has articles in their shopping cart on their website or is about to check out. Even when items are removed from the shopping cart or with the help of cookie tracking, it is noticed that the customer is switching websites or spends time with comparison, offering a chat to negotiate and offer discounts could increase the likelihood of a sale. This research shows that a human assistant is better than a bot for this, because it seems to be better not only at the pragmatic task itself but is also more effective concerning social skills. This research shows that the latter (besides all other hedonic attributes) are significantly important and should be considered when training the employees.

Furthermore, the recommendation to use a human assistant holds true for the post-transaction stage. The research shows that a human is more effective at giving after-sales service and support than a bot. In the real example of the survey, the employee even came up with a coupon code for the next purchase, stimulating additional consumption. As Hoyer et al. (2020) wrote, giving feedback and recommending additional consumption is precisely the task that should be performed in the post-transaction stage. Therefore, companies should offer the possibility to chat with an actual human assistant when the customer already made the purchase. This offer should be implemented for example, on the company's customer service center website, where he/she can manage his/her purchases. Nevertheless, also on product/service FAQ websites, the chat could serve as an offer to answer more complex questions.

8. RESEARCH LIMITATIONS AND FUTURE RESEARCH

This study has significant limitations, which simultaneously open a set of possibilities for future research.

Firstly, the test results rely on the different types of stimuli given to each sample group. Each stimulus was a screenshot from an actual chat conversation with a real human or a real bot. Therefore, the research is limited to the meaningfulness of each chat conversation sample. Therefore, the answers are still solely dependent on each screenshot showing the conversation. Due to limited resources, it was not possible to program a chatbot or hire a trained employee as a trained chat assistant, which contestants could interact with in each customer decision process stage.

Future research could take this experimental setup as a fundament and add more chat samples for stronger representativeness. Alternatively, even better, a chatbot could be programmed, or an already programmed chatbot could be used and given to the contestants to chat with. For the comparison, a real employee could be hired to chat with the control group. In general, the gap for future research lies within the requested task area for each scenario in this research and further tasks which could be requested from a customer when chatting.

Secondly, as another limitation, the demographics show that 80.63% of the contestants' age was between 18-30. A different age group could have different requirements and requests for the chat partner. This should be tested in combination with the before suggested individual test setting. Additionally, 20.8% of all contestants did not speak German but English and used the translation of the chat (which can also be found in appendix 2: Chat conversations). Therefore, the results of this research are partly limited to the extent to which the translation is correct.

Furthermore, as mentioned in the results section, both human and bot are scoring low compared to other variables when it comes to entertainment and fun factors and other hedonic attributes. Future research should compare these attributes ratings with other customer service and contact tools and compare in which scenarios these might be even more effective (also in terms of sales and additional profit generation).

While there is already research about how bots can show emotion, this research indicates a lack of hedonic attributes for the bots, especially in the transaction and post-transaction stage creates new narrow fields and areas of application for a necessary anthropomorphisation of bots.

Most importantly, this study focussed solely on the impact and effectiveness of a chatbot compared to a human employee. It is crucial for companies to consider cost factors coming with each method. It is important to counterweight the added value of an employee and chatbot against the added costs. The latter can be for example wage of an employee, or programming costs of a chatbot. While this study suggests using a bot in the pre-transaction stage and an employee in the other two in terms of effectiveness, this recommendation might differ from the final decision in reality. For example, even though an employee was perceived as more effective by the contestants in this study for the post-transaction phase, his/her wage might be higher than the profit it is adding by selling additional products.

Counterweighting the costs against the added value is therefore a crucial task for future research.

Last but not least, as mentioned in the literature review, the technology of artificial intelligence and bots is under constant development. The experimental conditions were tied to the available technology. With further development, which especially for artificial intelligence gets better with data

collection, the herewith measured impact might change in favour of the chatbots.

9. ACKNOWLEDGEMENTS

First and foremost, I would like to express my gratitude to my first supervisor, Carolina Herrando, for her unwavering support during the preparation of my thesis. This research would not have been successful without her extensive and precise feedback.

Furthermore, I would like to thank my fellow thesis circle students for assisting me whenever it was necessary. I am also grateful to everyone who took the time to fill out my survey. Without the 191 answers for my surveys, building the data set, there would be no statistical proof for my theoretical foundation.

Finally, I am thankful for the support from my family and friends, guiding me through all situations coming up throughout the journey of this research.

10. REFERENCES

- Adamopoulou, E., & Moussiades, L. (2020). Chatbots: History, technology, and applications. *Machine Learning with Applications*, 2, 100006.
- Benbasat, I., & Wang, W. (2005). Trust in and adoption of online recommendation agents. *Journal of the association for information systems*, 6(3),4.
- Bhuiyan, M., Islam, S., Razzak, A., Ferdous, M. S., Chowdhury, M. J. M., Hoque, M. A., & Tarkoma, S. (2020). A Blockchain Empowered Chatbot for Financial Transactions. *BONIK*
- Bielauskas, S., & Schreiber, A. (2017, September). A conversational user interface for software visualization. In *2017 IEEE working conference on software visualization (vissoft)* (pp. 139-143). IEEE.
- Brandtzaeg, P. B., & Følstad, A. (2017). Why People Use Chatbots. In I. Kompatsiaris, J. Cave, A. Satsiou, G. Carle, A. Passani, E. Kontopoulos, S. Diplaris, & D. McMillan, *Internet Science Cham*.
- Brandtzaeg PB, Følstad A (2018) Chatbots: Changing user needs and motivations. *Interactions* 25(5):38–43.
- Costa, P. C. F. (2018). Conversing with personal digital assistants: on gender and artificial intelligence. *Journal of Science and Technology of the Arts*, 10(3), 2-59.
- Cui, L., Huang, S., Wei, F., Tan, C., Duan, C., & Zhou, M. (2017, July). Superagent: A customer service chatbot for e-commerce websites. *ACL 2017, System Demonstrations* (pp.97-102).
- Di Gaetano, S., & Diliberto, P. (2018). Chatbots and conversational interfaces: Three domains of use. In *Fifth International Workshop on Cultures of Participation in the Digital Age*, Castiglione della Pescaia, Italy (Vol. 2101, pp. 62-70).
- Facebook (2018). Messenger for business: Communiceren met klanten. Retrieved May 19th, 2021, from <https://nl-nl.facebook.com/business/products/messenger-for-business>
- Følstad, A., & Brandtzaeg, P. B. (2020). Users' experiences with chatbots: findings from a questionnaire study. *Quality and User Experience*, 5(1), 3.
- Häubl, G., & Murray, K. B. (2003). Preference construction and persistence in digital marketplaces: The role of

- electronic recommendation agents. *Journal of Consumer Psychology*, 13(1-2), 75-91.
- Hoyer, Wayne D., et al. "Transforming the customer experience through new technologies." *Journal of Interactive Marketing* 51 (2020): 57-71.
- Howard, J. A., & Sheth, J. N. (1969). The theory of buyer behavior (No. 658.834 H6).
- Horgan, D., Romao, M., Morré, S. A., & Kalra, D. (2019). Artificial intelligence: power for civilisation and for better healthcare. *Public Health Genomics*, 22(5-6), 145-161.
- Io, H. N., & Lee, C. B. (2017, December). Chatbots and conversational agents: A bibliometric analysis. In 2017 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM) (pp. 215- 219). IEEE.
- Jain, M., Kota, R., Kumar, P., & Patel, S. N. (2018, April). Convey: Exploring the use of a context view for chatbots. In *Proceedings of the 2018 chi conference on human factors in computing systems* (pp. 1-6).
- Johannsen, F., Leist, S., Konadl, D., & Basche, M. (2018). Comparison of commercial chatbot solutions for supporting customer interaction.
- Kelley, S. W., & Davis, M. A. (1994). Antecedents to customer expectations for service recovery. *Journal of the academy of Marketing Science*, 22(1), 52-61.
- Kodra, E., Senechal, T., McDuff, D., & El Kaliouby, R. (2013, April). From dials to facial coding: Automated detection of spontaneous facial expressions for media research. In 2013 10th IEEE International Conference and Workshops on Automatic Face and Gesture Recognition (FG) (pp. 1-6). IEEE.
- Law, E. L. C., Roto, V., Hassenzahl, M., Vermeeren, A. P., & Kort, J. (2009, April). Understanding, scoping and defining user experience: a survey approach. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 719-728).
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of marketing*, 80(6), 69-96
- Liddy, E. D. (2001). Natural language processing.
- Luger, E., & Sellen, A. (2016, May). "Like Having a Really Bad PA" The Gulf between User Expectation and Experience of Conversational Agents. In *Proceedings of the 2016 CHI conference on human factors in computing systems* (pp. 5286-5297).
- Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Frontiers: Machines vs. humans: The impact of artificial intelligence chatbot disclosure on customer purchases. *Marketing Science*, 38(6), 937-947.
- McKnight, D. H., Choudhury, V., & Kacmar, C. (2002). Developing and validating trust measures for e-commerce: An integrative typology. *Information systems research*, 13(3), 334-359.
- Moore, S. (2018). Gartner says 25 percent of customer service operations will use virtual customer assistants by 2020. <https://www.gartner.com/en/newsroom/press-releases/2018-02-19-gartner-says-25-percent-of-customer-service-operations-will-use-virtualcustomer-assistants-by-2020> (last accessed 4/12/2019).
- Moriuchi, E. (2021). An empirical study on anthropomorphism and engagement with disembodied Ais and consumers' re-use behaviour. *Psychology & Marketing*, 8(1), 21-42.
- Neslin, S. A., & Shankar, V. (2009). Key issues in multichannel customer management: current knowledge and future directions. *Journal of interactive marketing*, 23(1), 70-81.
- Neslin, S. A., Grewal, D., Leghorn, R., Shankar, V., Teerling, M. L., Thomas, J. S., & Verhoef, P. C. (2006). Challenges and opportunities in multichannel customer management. *Journal of service research*, 9(2), 95-112.
- Nuruzzaman, M., & Hussain, O. K. (2018, October). A survey on chatbot implementation in customer service industry through deep neural networks. In 2018 IEEE 15th International Conference on e-Business Engineering (ICEBE) (pp. 54-61). IEEE.
- Oracle Corporation (2018). Can virtual experiences replace reality? The future role for humans in delivering customer experience
- Piccolo, L. S. G., Mensio, M., & Alani, H. (2019). Chasing the Chatbots. *Internet Science Cham*.
- Puccinelli, N. M., Goodstein, R. C., Grewal, D., Price, R., Raghubir, P., & Stewart, D. (2009). Customer experience management in retailing: understanding the buying process. *Journal of retailing*, 85(1), 15-30.
- Shawar, B. A., & Atwell, E. S. (2005). Using corpora in machine-learning chatbot systems. *International journal of corpus linguistics*, 10(4), 489-516.
- Shawar, B.A., & Atwell, E. (2003, March). Using dialogue corpora to train a chatbot. In *Proceedings of the Corpus Linguistics 2003 conference* (pp. 681-690).
- Wang, L. C., Baker, J., Wagner, J. A., & Wakefield, K. (2007). Can a retail web site be social?. *Journal of marketing*, 71(3), 143-157.
- Xu, A., Liu, Z., Guo, Y., Sinha, V., & Akkiraju, R. (2017, May). A new chatbot for customer service on social media. In *Proceedings of the 2017 CHI conference on human factors in computing systems* (pp. 3506-3510).

11. APPENDIX

11.1 Appendix 1: Survey

This is a questionnaire for a study, which aims to investigate to what extent the stage of the customer decision making process is affecting the customers interaction with a chatbot. For this, you are being randomly assigned to one out of six groups. Each group gets a different chat conversation. Please read it carefully and answer all questions honestly.

The study is conducted by Antonius Brühöfner, a 3rd year IBA student from the University of Twente. Your participation is voluntary and you can withdraw at any time. Please answer the questions honestly according to your own personal opinion.

There are no risks involved in participating in this study. Your data will be collected and stored anonymously. It is not possible to trace your answers back to you.

If you have any questions, please contact: a.bruehofner@student.utwente.

I consent voluntarily to participate in this study. I have read the information above and agree with the terms. I understand that it is possible to withdraw from this study at any time.

() I agree with the above-mentioned terms and conditions.

1. What is your gender?
 - a. Male
 - b. Female
 - c. Diverse
2. What is your age?
 - a. <18
 - b. 18-30
 - c. 31-40
 - d. 41-50
 - e. >50

Do you speak fluently German (Level C2 or native speaker)?

- a. Yes
- b. No

(Here, a screenshot of either a chatbot or virtual chat with a human assistant is shown, taking place in either the pre-transaction, transaction, or post-transaction phase)

Please rate the next questions on a scale from 1 (strongly disagree) to 7 (strongly agree):

Group “help and assistance” (Følstad and Brandtzaeg, 2020)

Q1 I perceive a high usefulness of this chat.

Q2 This chat has a practical value.

Q3 I perceive this chat as helpful.

Group “information and updates” (Følstad and Brandtzaeg, 2020)

Q4 There is a pragmatic benefit on general information.

Q5 There is a benefit of routine updates with this chat.

Q6 This chat gives support for retrieving general information.

Group “negative pragmatic attributes” (Følstad and Brandtzaeg, 2020)

Q7 There is a low amount of interpretation issues in this chat.

Q8 The inability to help in this chat is low.

Q9 There is a low amount of repetitiveness in this chat.

Group “entertainment” (Følstad and Brandtzaeg, 2020)

Q10 This chat has a high entertainment value.

Q11 I perceive this chat as highly stimulating.

Q12 This chat has a high fun-factor.

Group “Inspiration of novelty and social” (Følstad and Brandtzaeg, 2020)

Q13 This chat is inspirational.

Q14 The chat partner is coming up with engaging topics.

Q15 The chat partner is creating social value.

Group of “negative hedonic attributes” (Følstad and Brandtzaeg, 2020)

Q16 The responses in this chat are neither strange nor rude.

Q17 There are no unwanted events occurring in this chat.

Q18 The chat is boring.

For the following question, please select either a) or b):

Q19 What did you see in the beginning?

a. A chat conversation

b. A phone call

11.2 Appendix 2: Stimuli - Chat conversations

11.2.1 Pre-transaction, Employee



Translation:

A: Welcome at Apple. What can I do for you today?

B: Hello, am I talking to a bot or an employee?

A: You are now being redirected to an Apple chat-specialist. Please wait a moment.

A: Hello and welcome at Apple. My name is Steffi. I am happy to assist you with questions.

B: Hi, the MacBook Air and MacBook Pro are both having almost similar specs, why should I choose the Pro model?

A: I am made out of flesh and blood- hello and good afternoon!

B: Thats great!

A: Yes, great that you are interested in the Macbooks. The Macbook Pro is a bit more professional in the audio system and is suitable for multitasking thanks to the built-in cooling system. It also has a touch bar. The battery autonomy is 2 hours higher for the Pro - it is stated to be up to 20 hours.

B: If youre talking about multitasking, do you mean browsing the internet with multiple tabs opened where the Macbook Pro is better? Or are the advantages more significant if you open multiple programs?

A: Exactly, it refers to the simultaneous execution of 7 programs or more. In that case, the MacBook Air would heat up.

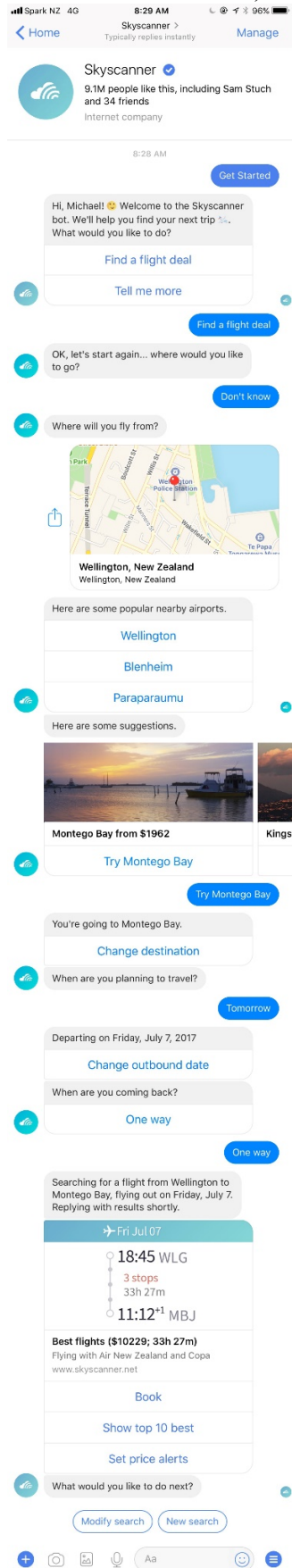
B: Ah, I think in that case the MacBook Pro is the better choice for me. Thanks a lot!

A: Great. I wish you a lot of fun with your new MacBook Pro!


B: Thanks, have a great day!

A: Thanks for the nice conversation, have a good day and goodbye! Stay healthy!

11.2.2 Pre-transaction, Chatbot



11.2.3 Transaction, Employee



Der Chat wurde beendet

Ah okay, aber die generalüberholten Modelle sind dann gebraucht und haben somit keine Garantie, richtig? Und was ist der Bildungsstore?

Auch die generalüberholten Modelle haben unsere Garantie. Sie sind im Prinzip wie neu :)

Du erhältst ein Gerät, das „wie neu“ ist, mit original Apple Ersatzteilen (wo nötig), und das gründlich gereinigt und untersucht wurde. Refurbished iOS Geräte kommen mit einer neuen Batterie und einem neuen Gehäuse.

Der Bildungsstore ist für Studenten und Alle die an einer staatlichen Hochschule arbeiten.

Auf dem Bildungsstore kann man über UniDays zugreifen oder man lässt sich hier im Chat einen Waren Korb mit dem Rabatt packen :)

Achso, ich bin sogar Student. Dann werde ich mal in dem Bildungsstore vorbeigucken. Danke! :)

Ach super, dass freut mich! Soll ich Ihnen gerade Preise heraus suchen oder möchten Sie sich bei UniDays anmelden?

Oh, tut mir leid - ich kann leider die Preise momentan nicht einsehen


Auch ich muss bis um 13.00 Uhr warten, tut mir leid :)

Oh, alles klar. Kein Problem, ich werde einfach ab 13 Uhr selber nachschauen und mich anmelden. Trotzdem Danke! :)

Super, ich danke Ihnen :) Liebe Grüße und schönen Tag wünsche ich noch!

Gleichfalls!

Lieben Dank



Sie sind dem Chat beigetreten

23.04.2021 13:23

Sie sind jetzt verbunden mit Apple

13:23

Willkommen bei Apple.
Was können wir heute für Sie tun?

Hallo, ich würde gerne ein MacBook Air kaufen. Gibt es eine Möglichkeit Rabatt auf den Laptop zu bekommen?

Sie werden jetzt an einen Apple Chat-Spezialisten weitergeleitet. Einen Moment bitte.

23.04.2021 13:24

Sie sind jetzt verbunden mit Sarah

13:24

Willkommen bei Apple. Mein Name ist Sarah und ich freue mich Ihnen heute behilflich sein zu können!

Hi, das ist eine gute Frage, - leider haben wir als einziges Angebot unseren Store mit generalüberholten Modellen.

Dieser ist momentan aber in Bearbeitung. Um 13.00 Uhr ist dieser wieder offen zum Kauf

Ansonsten gibt es auch einen Bildungsstore.

Ah okay, aber die generalüberholten Modelle sind dann gebraucht und haben somit keine Garantie, richtig? Und was ist der Bildungsstore?

Auch die generalüberholten Modelle haben unsere Garantie. Sie sind im Prinzip

Translation:

A: Welcome at Apple. What can we do for you today?

B: Hi, I would like to buy a MacBook Air. Is it possible to get a discount?

A: You are now being redirected to an Apple Specialist. Please wait a moment.

A: Welcome at Apple. My name is Sarah and I'm happy to assist you today! That's a great question. Unfortunately our only offer is our store with refurbished models. But at the moment, this store is in progress. At 13:00 it is available again for shopping. In addition, there is an education store.

B: Alright, but the refurbished models are used and therefore don't come with warranty, right? And what is that education store you mentioned?

A: The refurbished models also come with our warranty. They are as good as new :) You receive a device, which is "as good as new", with original components, which was cleaned and inspected thoroughly. Refurbished iOS devices

come with a new battery and new case. The education store is accessible via UniDays or you create a shopping cart in this chat :)

B: Ah, I'm actually a student. I'll take a look at the education store. Thanks! :)

A: Ah great, I'm happy to hear that! Should I look up the prices for you or do you want to sign up for yourself at UniDays?

Oh wait, I'm sorry - At the moment, I can't look up the prices. I also have to wait until 13:00 :)

B: No Problem, I'll just have a look by myself after 13:00 and sign up. Thanks anyways!

A: Great, thanks :) best regards and have a good day!

B: The Same to you!

A: Thanks.

11.2.4 Transaction, Chatbot

The screenshot shows a chat interface with a blue header bar containing a close button (X) and a status bar that reads "Du sprichst mit baby-walz". The chat history consists of alternating light blue (bot) and light green (user) bubbles, with timestamps indicating the flow of the conversation.

User (Green): Hallo, Du sprichst mit baby-walz. Wie kann ich Dir helfen?

Bot (Blue): Ich möchte eine Babytrage kaufen. Ist es möglich Rabatt zu bekommen?

Bot (Blue): Bitte stelle deine Frage etwas genauer.

User (Green): Gibt es aktuelle Rabatt-Aktionen?

Bot (Blue): Wir haben Mehrlinge. Bekommen wir bei baby-walz als FAMILY & FRIENDS Mitglieder einen besonderen Rabatt?

User (Green): Gibt es für alles Punkte?

User (Green): ... meine Frage ist nicht dabei.

User (Green): Gibt es aktuelle Rabatt-Aktionen?

Bot (Blue): [[Gehe hierzu einfach auf unsere Aktions-Seite, hier erfährst Du immer alles über aktuelle Gutschein- und Rabatt-Aktionen] -> <https://www.baby-walz.de/aktionen/>]

User (Green): Wir haben Mehrlinge. Bekommen wir bei baby-walz als FAMILY & FRIENDS Mitglieder einen besonderen Rabatt?

Bot (Blue): Mitglieder bei baby-walz FAMILY & FRIENDS dürfen sich freuen:

Bot (Blue): Als Eltern von Mehrlingen und auch schon während der Schwangerschaft erhältst Du bei uns einen Einkaufsrabatt von 10%. Bis zum zweiten Geburtstag Deiner Kinder wird Dir der Rabatt automatisch bei allen Bestellungen angerechnet. Bücher und Geschenk-Gutscheine sind von Rabatten ausgenommen.

Bot (Blue): Der Rabatt ist nicht übertragbar und kann nicht in Verbindung mit anderen Aktionen oder bei Kooperationspartnern eingelöst werden. Bitte hab Verständnis dafür, dass wir den Rabatt nicht auf bereits getätigte Bestellungen gewähren können.

Bot (Blue): Mitarbeiter der baby-walz GmbH und verbundener Unternehmen oder deren Angehörige sind von der Aktion ausgeschlossen.

Bot (Blue): Gib uns vor Deiner Bestellung einfach an, dass Du Mehrlinge erwartest und schicke uns eine Kopie Deines Mutterpasses bzw. nach der Geburt Kopien der Geburtsurkunden per eMail an kundenservice@baby-walz.de oder postalisch an baby-walz FAMILY & FRIENDS, baby-walz GmbH, 88336 Bad Waldsee.

Bot (Blue): Bei weiteren Fragen erreichst Du uns jederzeit unter der Service-Hotline 07524 / 703 - 307.

Bot (Blue): Diese Aktion gilt nur für Mitglieder von baby-walz FAMILY & FRIENDS. Du bist noch kein Mitglied?

Bot (Blue): Dann registriere dich jetzt einfach und kostenlos [hier] -> <https://www.baby-walz.de/webappwecs/stores/servlet/LoginForm?catalogId=100000&langId=3&storeId=100011&cryptopriPaUQcBYVtuhBC764jnxoOV0e>

Input field: Gib Deine Nachricht ein.

Translation:

A: Hi you are talking with Baby-Walz. How can I assist you?

B: I'd like to buy a baby carrier. Is it possible to get a discount?

A: Please make your question more specific. Suggestions: "Are there current discount offers?", "We just gave multiple births. Are we getting a special discount as baby Walz FAMILY & FRIENDS members?", "Do you get points for everything?"... "my question is not listed".

B: Are there current discount offers?

A: For this, simply visit our discount page, where you get information about current coupon and discount offers: www.baby-Walz.de/aktionen

B: We just gave multiple births. Are we getting a special discount as baby Walz FAMILY & FRIENDS members?

A: Members at baby baby-Walz FAMILY & FRIENDS can be happy: As parents of multiple kids and even already while being pregnant you receive a discount of 10%. Until the second birthday of your kids the discount is taken off all your orders automatically. Books and gift cards are not included. The discount is not transferable and can not be combined with other offers nor can be used at our corporation partners. Please bear in mind that the discount cannot be applied to existing orders. Employees are not included in this offer. Before your order tell us that you are expecting to give birth of multiple children and send us your mother pass after the birth and copies of the birth certificates via mail. If you have any further questions you can reach our service hotline 07524 / 703 307.

This offer is only valid for members of the baby Walz FAMILY & FRIENDS. Not a member yet? Sign up here for free: (...)

11.2.5 Post-transaction, Employee

Chat gestartet: Mittwoch, März 10, 2021, 12:27:29 (+0100)

Chat-Quelle: Fashion DE Plus

Agent Julia

(1s) Julia: Hallo Christine Brühöfner, gern helfe ich dir weiter.

(18s) Christine Brühöfner: Hallo

(1m 2s) Christine Brühöfner: Ich habe Birkenstock Sandalen in Größe 48 bestellt, im Paket ist allerdings ein anderes Modell in Größe 39.

(1m 38s) Julia: Oh das wird wohl nicht passen, kannst du mir deine Bestellnummer sagen?

(1m 59s) Christine Brühöfner: 101 [REDACTED]

(2m 37s) Christine Brühöfner: Kann ich die Bestellung einfach retournieren? Nicht, dass das nicht möglich ist weil ja ein ganz anderes Paar im Paket ist.

(2m 58s) Christine Brühöfner: Auf dem Lieferschein ist nämlich noch der ursprüngliche Artikel angegeben

(3m 25s) Julia: Du kannst das Paket gern zurück senden, wir informieren unser Partner darüber das eine falsche Größe und Modell geliefert wurde. Vermerk bitte auf dem Rücksendeschein die falsche Lieferung. Ich mach dir auch gleich eine Mail fertig und einen Gutschein :)

(3m 44s) Christine Brühöfner: Alles klar, das ist nett. Danke, mache ich dann so :)

(4m 15s) Julia: Sehr sehr gerne, hast du noch weitere Fragen? :)

(4m 38s) Christine Brühöfner: Nein, das war's. Meine Mail Adresse ist bruehoefner@icloud.com!

(4m 48s) Christine Brühöfner: Schönen Tag noch :)

A: Hello Christine Brühöfner, I am happy to assist you.

B: Hello. I ordered Birkenstock sandals in size 48, but the ones in the package I received are size 39.

A: Oh, that won't fit, can you tell me your order number?

B: 101(...). Is it possible to simply send my order back? Because there is a completely other pair of sandals in this package. The original article is still specified on the delivery note.

A: You are welcome to return the package, we will inform our partner that the wrong size and model has been delivered. Please note the wrong deliveries on the return slip. I'll also get you ready for an email and a voucher :)

B: All right that's nice. Thanks, I'll do that :)

A: You're very welcome, do you have any further questions? :)

B: No, that's it. My mail address is (...)! Have a nice day :)

11.2.6 Post-transaction, Chatbot

The screenshot shows a chat window titled "Service Chat" with a red header bar containing a minus and close icon. The chatbot's avatar is a small robot icon. The conversation is as follows:

- Chatbot: Was darf ich für dich tun?
- Customer: Hi, mein Name ist K. (a) I.
- Chatbot: Hallo, meine Bestellung wird nicht im Kundenkonto angezeigt.
- Chatbot: Deine Bestellung findest du kurz nach deren Abschluss in der Übersicht deiner Bestellungen im Kundenkonto.
- Chatbot: Es kann einen Moment dauern, bis das alle Informationen ersichtlich sind.
- Chatbot: Solltest du auch nach einer Weile deine Bestellung nicht finden können, melde dich bitte bei unserem Kundenservice und halte die Auftragsnummer bereit.
- Chatbot: Die Auftragsnummer wurde dir am Ende der Bestellung mitgeteilt. Außerdem hast du sie von uns per E-Mail erhalten.
- Customer: Alles klar, dankeschön.
- Chatbot: Bitte sehr.

Each message is followed by a timestamp "vor ein paar Sekunden". The chat window has a vertical scrollbar on the right side.

Translation:

A: How can i help you?

B: Hi, my order is not displayed in the customer account.

A: You will find your order shortly after it has been completed in the overview of your orders in the customer account.

It may take a moment until all information is visible. If you still cannot find your order after a while, please contact our customer service and have the order number ready.

The order number was communicated at the end of the order.
 You also received it from us by email.
 B: Alright, thanks.
 A: You're welcome.

11.3 Chronbach's Alpha

11.3.1 Variable pragmatic attributes

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,881	,885	9

11.3.2 Variable hedonic attributes

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,805	,791	9

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
entertainment_value entertainment value	32,20	67,837	,781	,783	,746
stimulating_stimulating stimulating	32,01	68,247	,794	,703	,745
funfactor_fun-factor fun-factor	32,32	68,357	,742	,792	,751
inspirational inspirational	32,40	68,695	,778	,706	,747
engaging_topics engaging topics	31,84	67,954	,770	,688	,747
social_value_social social value	31,83	68,165	,714	,572	,754
neither_strange_nor_rude neither strange nor rude	29,95	81,997	,354	,389	,802

no_unwanted_events	30,26	83,634	,268	,386	,812
no unwanted events					
Boring Boring	31,46	109,629	-,534	,307	,892

11.4 Gender

Scenario	N	%	% Male	% Female
1	32	16.8	40.6	59.4
2	29	15.3	55.2	44.8
3	29	15.3	62.1	37.9
4	38	20.0	57.9	42.1
5	30	15.8	46.7	53.3
6	32	16.8	46.9	53.1

Chi-Square Tests

	Value	df	Asymptotic Significance (2- sided)
Pearson Chi-Square	8,069 ^a	10	,622
Likelihood Ratio	7,367	10	,690
N of Valid Cases	191		

a. 6 cells (33,3%) have expected count less than 5. The minimum expected count is ,15.

11.5 Age

Age * Stimuli Crosstabulation

Count

		Stimuli						Total
		1 Employee, Pre- transactio n	2 Employee , Transactio n	3 Employee , Post- Transactio n	4 Chatbot, Pre- transactio n	5 Chatbot, Transactio n	6 Chatbot, Post- transactio n	
age	<18	0	2	0	0	1	0	3
Age	>50 >50	3	6	4	0	1	5	19
	18-30	28	18	25	38	22	23	154
	18-30							

	31-40	0	0	0	1	5	2	8
	31-40							
	41-50	1	3	0	0	1	2	7
	41-50							
Total		32	29	29	39	30	32	191

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<18	3	1,6	1,6	1,6
	>50 >50	19	9,9	9,9	11,5
	18-30 18-30	154	80,6	80,6	92,1
	31-40 31-40	8	4,2	4,2	96,3
	41-50 41-50	7	3,7	3,7	100,0
	Total	191	100,0	100,0	