



# Radboud Universiteit Nijmegen

## Bachelor Thesis

How Does the Importance of the Most Prominent Chatbot Attributes Differ in Terms of  
User Experience Between BFSI and Other Chatbot Users?

*- Towards the Development of More User-oriented Chatbot Solutions -*

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## **Abstract**

Chatbot are becoming increasingly advanced, but most of the time they fail to deliver a positive user experience. This is due to challenges linked to realizing user needs and understanding which quality attributes impact user experience more profoundly than others. Previous literature had already identified the most prominent chatbot attributes and ranked them based on their importance to users in general. However, in order to broaden knowledge pertaining to user experience with regards to chatbot attributes, this study sets out to explore how the importance of such attributes vary between users of different chatbots. Specifically, the current study aims to investigate whether attribute importance varies between users of a specific and non-specific segment. The current use case under comparison is the BFSI segment and users of other chatbots. The study operationalized a survey, in which users were tasked to rate chatbot attribute importance. Results indicated that users of BFSI chatbots predominantly agree with users of other chatbots on attribute importance. However, several differences were also observed, leading to the conclusion that the importance of chatbot attributes varies between usage scenarios.

*Keywords:* Chatbots, user experience, user needs, quality attributes, importance, specific and non-specific segments, BFSI

## Introduction

In a world of connectivity and online communication, interaction with organizations via chatbot service interfaces can be considered a part of everyday life. As per ease of accessibility, such as Siri via IOS smartphones, millions take advantage of the boundless opportunities they offer. Customers interact with organizational chatbots to get answers to their queries, address complaints, solve issues or access product and pricing information (Chung et al., 2020). Chatbots are an interactive agent system, programmed to communicate with users through exchange of text-messages (Janssen et al., 2021). Essentially, chatbot software allows users to freely search answers to queries (Karri & Kumar, 2020). However, despite their tremendous reputations and advanced nature, chatbots are failing (Janssen et al., 2021, 2022). Prior to understanding why chatbots are not as successful as many presume, and why it is crucial to investigate, it is imperative to comprehend the depth of their history, functions and current market presence.

Contrary to popular belief that chatbots are a relatively new sensation to the market, they have in fact been around for more than half a century. Software that engages in dialogue with users first appeared in the sixties with the creation of ELIZA, the first chatbot prototype by MIT professor Joseph Weizenbaum (Weizenbaum, 1966). ELIZA was only capable of responding to queries if it recognized keywords of a sentence and provide basic answers (Weizenbaum, 1966). In 1972, PARRY was created by Kenneth Colby, to imitate patients with schizophrenia (O'Murchu, 2022). PARRY functioned using a natural language program to mimic the thought processes behind schizophrenic patients. In the following decades a variety of chatbots emerged such as Jabberwacky, A.L.I.C.E and Smarterchild in 2001 (O'Murchu, 2022). The latter is often regarded as the predecessor of modern day chatbots, as it was the first of its kind to not merely function as an "entertainment" tool but provide valuable information to its users (Meerschman & Verkeyn, 2019, O'Murchu, 2022). It is at this milestone, where due to the emergence of smartphones, chatbot evolution took a drastic turn in the direction of customer service and personal assistance (Meerschman & Verkeyn, 2019). Today, Apple's Siri, Microsoft's Cortana, Amazon's Alexa and many other modern solutions are considered cutting-edge chatbot assistants, with intelligent integrations into smartphone applications (Meerschman & Verkeyn, 2019). Chatbots have indeed come a long way and thanks to almost six decades of development, they are now capable of engaging in complex dialogues and execute intricate tasks.

Captivatingly, the global market value of the chatbot industry reached USD 3.7 billion in 2021, with a significant share held by the banking, financial services and insurance (BFSI) segment (Markets, 2022). According to Grand View Research (2022), the current BFSI chatbot market size is estimated at approximately USD 641.1 million. In addition, a 26.5% compound annual growth rate (CAGR) is projected only within the timeframe of 2022-2030 (Grand View Research, 2022). The sheer magnitude and rapid growth of the chatbot industry signals its importance and omnipresence.

In recent years, significant developments had been achieved with regards to natural language processing (NLP) and machine learning (ML) (Seeger et al. 2018), resulting in the increase of chatbot popularity (Benner et al. 2021). Such advancements allowed for the development of more sophisticated and receptive artificial intelligence (AI) and chatbot systems. Three distinctive categories of chatbots exist, that is rule-based chatbots, chatbots powered by AI and hybrids (Soeyuenmez, 2022). Rule-based chatbots, often referred to as click-bots, follow a pre-programmed interactional path (Soeyuenmez, 2022). Users are guided through predefined options, set by developers. Consequently, such chatbots are only capable of carrying out fixed tasks and provide answers only to queries they are programmed for (Candela, 2018). As due to a lack of AI and ML, click-bots do not learn from interactions to enhance future encounters. Their knowledge base only expands when reprogrammed manually. However, they are in fact more affordable and easier to set up, maintain (Candela, 2018). AI based chatbots, often designated as large language models (LLM), are much more complex. LLM chatbots essentially use huge text datasets to create and use human language (Candela, 2018, Soeyuenmez, 2022). Incorporating both ML and NLP, they are highly effective and capable of executing intelligent interactions with users (Soeyuenmez, 2022). ML, or deep learning, enables AI to recognize certain patterns in datasets, thereby, continuously improve. This feature is used to incorporate knowledge into future interactions, making them more effective and accurate. NLP refers to the capacity of the system to understand and translate human speech (Soeyuenmez, 2022). This allows chatbots to assign knowledge to sentences or recognize keywords. Furthermore, hybrid chatbots essentially use both AI (NLP, ML) and scripted programs (Soeyuenmez, 2022). Users are able to interact with them freely while also having the opportunity to select predefined queries. According to Candela (2018) most chatbots today in fact belong to this category.

Nevertheless, given their interactive nature and advances in AI, they are now widely used in various domains such as e-commerce, education, healthcare or BFSI, making them highly accessible to customers (Mogaji et al., 2021). During the last few years, a growing

number of businesses have introduced chatbots as part of their customer relationship management (CRM). According to Gartner Magic Quadrant (2019), over 70% of all online customer communication is going to be performed by chatbots by the end of 2022. Though this may seem farfetched, statistics indicate that chatbots are becoming an increasingly popular tool for customer service. Research by Rajnerowicz (2022) indicates that more than 40% of all age groups would prefer interacting with a chatbot when shopping online. Furthermore, over 62% of customers would prefer to contact a chatbot than wait for a human agent (Rajnerowicz, 2022). Chatbots offer a revolutionary aspect to customer service, which is 24/7 availability (Chung et al., 2020). This full-time availability allows for customer service even outside working hours, positively impacting customer satisfaction (Chung et al., 2020). Thinking chatbots replace human agents in customer service however, is a misconception to many. Chatbots allow employees to focus on more complex and intricate tasks, such that require a human presence, thereby reducing support cost and increasing customer retention rates (Franco, 2021). Hence, keeping such advantages in mind, businesses in various domains gradually opt to implementing chatbots for CRM.

As the current study will focus on chatbot solutions in the BFSI segment, it is crucial to demonstrate their presence. Financial institutions at large are no exception from the growing chatbot hype, as banks have also opted to implement such solutions. A CapGemini report in 2020 indicated that, at the time, over 49% of the top 100 BFSI organizations deployed chatbots for CRM purposes (Følstad & Brandtzaeg, 2020). The BFSI chatbot segment is projected to experience the second largest CAGR from 2022-2030, meaning this sector is rapidly adopting and developing chatbot technology (Grand View Research, 2022). In recent years, mainly due to COVID-19 pandemic restrictions, banks were struggling to accept clients physically on premises (Franco, 2021, Bansal, 2022). As a consequence of the pandemic, clients demanded “immediacy, personalized and flawless interactions” more than ever (Franco, 2021). Social distancing and other restrictions in general, have significantly altered how customers purchase goods and communicate (Franco, 2021). Due to the pandemic, banks now experience a growing number of customers willing to participate in digital activities (Bibbiani, 2021, Bansal, 2022). Hence, as customer demand increased, and the number of clients being able to, or willing to visit the premises decreased, a drastic acceleration of financial technology (FinTech) was underway (Franco, 2021, Bansal, 2022). Recent pivotal developments in FinTech have influenced the financial environment of clients, in terms such as loans, borrowings or shopping at large (Economides & Jeziroski, 2017, Mogaji et al., 2021) and chatbots have greatly contributed to this. Chatbots in the banking

segment serve a great multitude of purposes. At the most basic level, clients may use chatbots to pay bills, set up or cancel payments and execute transfers (Bibbiani, 2021, Sanamandra, 2021). However, chatbots can also aid in checking user account balance, track payment history or investigate suspicious activities relating to their account, much like a personal bank assistant (Sanamandra, 2021, Bansal, 2022). They are intended to serve as an omnichannel access to financial services (Bibbiani, 2021, Franco, 2021). Besides, banks also utilize chatbots for massive corporate savings (Bibbiani, 2021). By 2023, chatbots will have helped banks save an estimated USD 7.3 billion, globally (Franco, 2021). Albeit their common application in BFSI, 68% of online banking service users are not satisfied (Jain, 2021).

### **Theoretical Framework**

As demonstrated, chatbots are a rapidly increasing, decisive phenomena in customer services, however, despite their popularity and continuous advancement, chatbots are predisposed to failure (Janssen et al., 2022). In spite of the drastic explosion of interest in chatbots in 2016, they were not as successful as initially believed to be (Meerschman & Verkeyn, 2019). Janssen et al. (2021) argues that the main reason why chatbots are not successful, is simply due to system functionalities not aligning with customer expectations or needs. Users tend to become frustrated when chatbots do not match their needs and requirements (Skerrett, 2019), which in turn, results in a negative user experience. Furthermore, a negative user experience is closely linked to customer dissatisfaction (Borsci et al., 2015, Følstad & Brandtzaeg, 2020). Hence, chatbots do not live up to their true potential, as due to the challenges linked to realizing and satisfying user needs (Brandtzaeg & Følstad, 2018, Følstad & Brandtzaeg, 2020). Meerschman & Verkeyn (2019) argues that for chatbots to be used effectively in customer services, companies should first adapt chatbots to user needs, ultimately optimizing overall user experience. Therefore, realizing user needs of one's chatbot is vital in the design and implementation of a system that allows for a positive user experience and satisfaction. To ensure the continuous popularization and usage of chatbots in customer services, such systems should provide users with "valuable and pleasing experiences" (Følstad & Brandtzaeg, 2020). Conclusively, chatbots should be developed to benefit user experience.

It comes as no surprise that following the surge of chatbot popularity, user experience (UX) became a central topic of research. User experience is a complex structure, that

according to the international standard of human-centred design is the „user’s perceptions and responses that result from the use and/or anticipated use of a product, system or service” (ISO, 2020). Customer satisfaction is key for economic survival and growth. In general literature, it is widely accepted that user experience is a key component for interactive system success and customer satisfaction (Hornbæk & Hertzum, 2017). Therefore, to achieve customer satisfaction, determinants of chatbot UX quality have to be pinpointed and adopted by businesses. As to its complexity, chatbot UX had been investigated from a number of perspectives such as anthropomorphism, social presence, problem resolution efficiency or pragmatic and hedonic system quality (Haugeland et al., 2022). According to Følstad & Brandtzaeg (2020) UX quality of an interactive system is predominantly grounded in pragmatic and hedonic quality attributes, hence, the framework of Hassenzahl (2018) is of particular interest to the current research. The hedonic-pragmatic model of Hassenzahl (2018) has been critical in much of the existing literature surrounding interactive system UX (Haugeland et al., 2022). Hassenzahl (2018) proposes a clear distinction between pragmatic and hedonic attributes of interactive systems that affect UX (Følstad & Brandtzaeg, 2020). Pragmatic attributes are instrumental chatbot characteristics concerning functionality, practicality, usefulness and efficiency. Følstad & Brandtzaeg (2020) argues that pragmatic qualities concern whether a system provides “task-oriented functionality in an accessible, easy-to-use manner”. Besides, hedonic characteristics of chatbots stimulate user emotions (Haugeland et al., 2022). It concerns how pleasurable the interaction is, whether the chatbot possesses identity or evokes certain memories, emotions (Følstad & Brandtzaeg, 2020). Interactive systems tend to vary in terms of stronger pragmatic or stronger hedonic characteristics, resulting in chatbots that are either strongly instrumental or stimulating (Hassenzahl, 2018, Følstad & Brandtzaeg, 2020, Haugeland et al., 2022). However, Hassenzahl (2018) opined that the equal adoption of both characteristics should be seen as the ultimate objective of development (Følstad & Brandtzaeg, 2020, Haugeland et al., 2022). Ultimately, past research implies that chatbot UX quality depends heavily on the presence of chatbots’ hedonic and pragmatic attributes. Therefore, the current study will utilize Hassenzahl’s (2018) pragmatic and hedonic model to explore how such chatbot attributes affect UX.

In order to operationalize the research, pragmatic and hedonic chatbot attributes have to be identified. Through a comprehensive literature review and a series of explorative interviews, Meerschman & Verkeyn (2019) has collected the 28 most prominent chatbot quality attributes, assigned to eight distinctive dimensions. According to Meerschman &

Verkeyn (2019), such attributes are universal for all chatbot solutions, regardless of category. This is imperative for the current study, as institutions in the BFSI segment may opt to deploy either one of the three chatbot types. Hence, the current research adopts said 28 attributes, and categorizes the dimension into hedonic and pragmatic chatbot qualities. Meerschman & Verkeyn (2019) distributed the 28 attributes along the dimensions of ‘functionality’, ‘trustworthiness’, ‘safety’, ‘efficiency’, ‘graphical design’, ‘humanity’, ‘empathy’ and ‘responsiveness’. Functionality refers to executing requested tasks accurately (Meerschman & Verkeyn, 2019). It focuses on whether chatbot functions allow delivering services correctly. Said dimension constitutes interpreting commands accurately, flexibility in interpreting knowledge, ability to maintain a discussion, activation and number of services available through the chatbot. Through their explorative interviews, Meerschman & Verkeyn (2019) also identified execution of requested task, as a functionality feature. Applying Hassenzahl’s (2018) pragmatic-hedonic model, the dimension of ‘functionality’ clearly falls in the category of pragmatic attributes. The next dimension is ‘trustworthiness’, which refers to whether the chatbot offers what users require by looking at the quality of content (Meerschman & Verkeyn, 2019). It comprises of containing dependable information, possibility of rating the chatbot, breadth of knowledge, robustness to unexpected input and transparency. Trustworthiness also falls into the pragmatic dimension of Hassenzahl (2018). Subsequently, ‘safety’ measures the extent to which users feel safe when using chatbots, in terms of data privacy (Meerschman & Verkeyn, 2019). Safety includes protecting and respecting privacy and safety from intrusion. Thus, this dimension is categorized as a hedonic attribute. Next, ‘efficiency’ refers to the effort users need to achieve their aims (Meerschman & Verkeyn, 2019). Essentially, it focuses on how easy to navigate and accessible chatbots are. It constitutes ease of use, quick replies vs free text, availability at all times, accessibility and need of an account. Efficiency is hereby categorized as a pragmatic attribute, as it relates to overall system functionality. The following dimension of Meerschman & Verkeyn (2019) is ‘graphical appearance’. In essence, it entails chatbots’ visual design and use of imagery. It comprises of user interface and use of emojis or gifs/pictures. Ultimately, graphical appearance is a hedonic attribute. ‘Humanity’ means whether a chatbot is able to create an enjoyable interaction and whether it communicates identity (Meerschman & Verkeyn, 2019). In brief, whether the chatbot and the interaction is human-like. This dimension constitutes realness of the chatbot, ability to create an enjoyable conversation, conveying personality and reading and responding to moods. Therefore, humanity is categorized as a hedonic attribute. The dimension of ‘empathy’ focuses on the extent to which a chatbot is tailored to user



needs, in terms of providing personalized service (Meerschman & Verkeyn, 2019). It comprises of personalization options and personalized suggestions, making this dimension hedonic. The final dimension is ‘responsiveness’, which focuses on the promptness of service (Meerschman & Verkeyn, 2019). It contains responding immediately and productivity, which categorizes it as a pragmatic attribute. To summarize the dimensions, four of them are hedonic whilst the other four are pragmatic. The current study will utilize these dimensions and their respective chatbot attributes to observe how each impacts the UX of BFSI chatbots. See table 1 below for a complete overview of each dimension and their corresponding attributes.

*Table 1.* Quality dimensions of Meerschman & Verkeyn (2019) and their respective chatbot attributes

Dimensions	Item	Attributes
Functionality	1.	Interpret commands accurately
	2.	Execute requested task
	3.	Flexible in interpreting knowledge
	4.	Able to maintain a discussion
	5.	Activation
	6.	Number of services available in chatbot
Trustworthiness	7.	Containing dependable information
	8.	Possibility of rating the chatbot
	9.	Contains breadth of knowledge
	10.	Robustness to unexpected input
	11.	Transparency
Safety	12.	Protect and respect privacy
	13.	Safe from intrusion
Efficiency	14.	Ease of use
	15.	Quick replies vs free text
	16.	Available at all times
	17.	Accessibility
	18.	Need of an account
Graphical appearance	19.	User-interface
	20.	Use of emojis and pictures/gifs
Humanity	21.	Realness of the chatbot
	22.	Create an enjoyable interaction
	23.	Convey personality
	24.	Read and respond to moods
Empathy	25.	Personalization options
	26.	Personalized suggestions
Responsiveness	27.	Responding immediately
	28.	Productivity

Furthermore, Meerschman & Verkeyn (2019) conducted a survey research on the importance of these attributes. The attributes were then assigned to three distinct dimensions based on their importance to users. The first dimension, 'Must be implemented', contained attributes of utmost importance to users. This included 'interpret commands accurately', 'flexible in interpreting knowledge', 'containing dependable information', 'robustness to unexpected input', 'transparency', 'protect and respect privacy', 'ease of use' and 'available at all times'. Therefore, they concluded that these eight attributes are the most vital for users, and ultimately, UX, as users dislike not having them (Meerschman & Verkeyn, 2019). The second dimension, 'The more the better', comprised of four attributes that users like having and dislike not having in a chatbot (Meerschman & Verkeyn, 2019). This dimension is also referred to as 'Performance' attributes. These were 'able to maintain a discussion', 'safe from intrusion', 'user interface' and 'productivity'. Lastly, 'Attractive' attributes that are 'quite unexpected, but good addition' were 'number of services available in the chatbot', 'quick replies vs free text', 'accessibility', 'use of emojis and pictures/gifs', 'create an enjoyable conversation', 'convey personality', 'read and respond to moods', 'personalization options' and 'responding immediately'. Furthermore, they also identified seven attributes users are 'indifferent' about, meaning they are neutral about the importance of them (Meerschman & Verkeyn, 2019). These were 'need of an account', 'execute requested task', 'realness of the chatbot', 'possibility of rating the chatbot', 'personalized suggestions', 'activation' and 'contains breadth of knowledge'. Findings of Meerschman & Verkeyn (2019) are depicted in table 2 below. The study of Meerschman & Verkeyn (2019) established that not all chatbot attributes are equally important to UX, hence, some deserve more attention from developers than others. However, their study was solely focused on chatbots in general and conducted amongst chatbot users from various segments. Therefore, the current study aims to explore whether the importance of the previously eluded chatbot attributes differ between chatbot users in general and users from a specific segment.

*Table 2.* Findings of Meerschman & Verkeyn (2019) sorted into their respective dimensions

<b>Must be implemented</b>	<b>The more the better</b>	<b>Quite unexpected, good addition</b>
1., Interpret commands accurately	4., Able to maintain a discussion	6., Number of services available in the chatbot
3., Flexible in interpreting knowledge	13., Safe from intrusion	15., Quick replies vs free text
7., Containing dependable information	19., User interface	17., Accessibility
10., Robustness to unexpected input	28., Productivity	20., Use of emojis and pictures/gifs
11., Transparency		22., Create an enjoyable interaction
12., Protect and respect privacy		23., Convey personality
14., Ease of use		24., Read and respond to moods
16., Available at all times		25., Personalization options
		27., Responding immediately

*Note.* The remaining 7 indifferent attributes were not categorised

While there is a plethora of research on how chatbots are perceived and used, there is a lack of knowledge pertaining to what users deem as a positive or negative chatbot user experience with regards to chatbot attributes, specifically in the BFSI segment (Følstad & Brandtzaeg, 2020). In addition to the previously eluded research gap, literature is also lacking knowledge pertaining to whether the perception of importance of such chatbot attributes differs in terms of UX. In other terms, whether the perception of users of a specific segment varies from that of users in general with regards to the importance of chatbot attributes. Do BFSI users and non-users think alike when evaluating chatbot attributes or are there discrepancies? Are there attributes both users find important, or attributes that one group perceives as less important? To address the most prominent chatbot attributes, the current study sets out to explore how the importance of such features differ between chatbot users

from a specific and non-specific segment, and how such differences may affect user experience. As mentioned, the chatbot use case under investigation in the current research is the BFSI segment. Therefore, to conceptualize the research, the following research question was created:

**RQ:** How does the importance of the most prominent chatbot attributes differ in terms of UX between BFSI and other chatbot users?

In other words, does the perception of attribute importance differ between banking chatbot users and users of other chatbots? Subsequently, the following hypotheses were formulated

**H1:** BFSI users will predominantly agree with users of other chatbots on attribute importance.

**H2:** In case of differences in perception, they will primarily relate to hedonic attributes.

Conclusively, the current study aims to contribute to existing literature on chatbot attributes and user experience. Specifically, it intends to address the research gap pertaining to how such attributes relate to and affect user experience in the BFSI segment. Furthermore, this research aims to explore whether BFSI users and non-users view the attributes equally. Results of the study will provide a profound insight into how user experience is affected by chatbot attributes and ultimately, which of these attributes are more, or less important to a positive user experience in the BFSI segment. Consequently, this information allows for the development of more user-oriented chatbot solutions. This would prove beneficial to both BFSI organizations looking to maximize chatbot user experience, as well as chatbot end-users. Additionally, current research will also provide insight into chatbot usage specific to the BFSI segment. Findings of the current research will also provide perspicuity and broaden the limited body of research around the relation of chatbot attributes and user experience.

## Methodology

In order to answer the research question and explore how BFSI chatbot users and other chatbot users perceive the importance of the most prominent chatbot attributes, a survey was created.

### *Instruments*

In order to answer the research question a survey was created, with the intention to gather data on which chatbot attributes BFSI users deem important or negligible for their UX, while also observing whether BFSI users and non-users' perception differs. The research instrument was created via Qualtrics (see appendix A). Respondents were tasked to evaluate chatbot features on dimensions of: 'functionality', 'trustworthiness', 'safety', 'efficiency', 'graphical appearance', 'humanity', 'empathy' and 'responsiveness'. These dimensions were taken from Meerschman & Verkeyn (2019), and each contained multiple items, 28 overall. Each attribute was then formed into statements, based on Meerschman & Verkeyn (2019), that participants were tasked to rate. Aside from the 28 attribute questions, demographic information such as age, gender, education and nationality were also collected. The survey mostly contained close-ended questions, which is preferred when comparing responses (Hyman & Sierra, 2016), however, an open-ended question was also included on what services BFSI users turn to banking chatbot for. Respondent were assigned to three groups, based on the question 'Have you ever used banking chatbot before?'. Those who used banking chatbot before answered 'Yes', those who used chatbot of other domains answered 'No, but I have used chatbots of other domains' and those who have not used chatbots answered 'No'. Consequently, an example of an interaction with a banking chatbot was displayed. Attribute importance was then measured on a 5-point Likert scale, ranging from 1 = Not at all important to 5 = Extremely important. To see, or access the complete survey with all statements for each item, refer to appendix A.

'Functionality' comprised of six items: 'interpret commands accurately', 'execute requested task', 'flexible in interpreting knowledge', 'activation' and 'number of services available in chatbot'. The reliability of 'functionality' comprising six items was good:  $\alpha = .70$ .

'Trustworthiness' included five items: 'contains dependable information', 'possibility of rating the chatbot', 'contains breadth of knowledge', 'robustness to unexpected input', and 'transparency'. The reliability of 'trustworthiness' comprising five items was good:  $\alpha = .72$ .

‘Safety’ comprised of two items: ‘protect and respect privacy’ and ‘safe from intrusion’. The reliability of ‘safety’ comprising two items was good:  $\alpha = .75$ .

‘Efficiency’ was measured with five items: ‘ease of use’, ‘quick replies vs free text’, ‘available at all times’, ‘accessibility’ and ‘need of an account’. The reliability of ‘efficiency’ comprising five items was adequate:  $\alpha = .64$ .

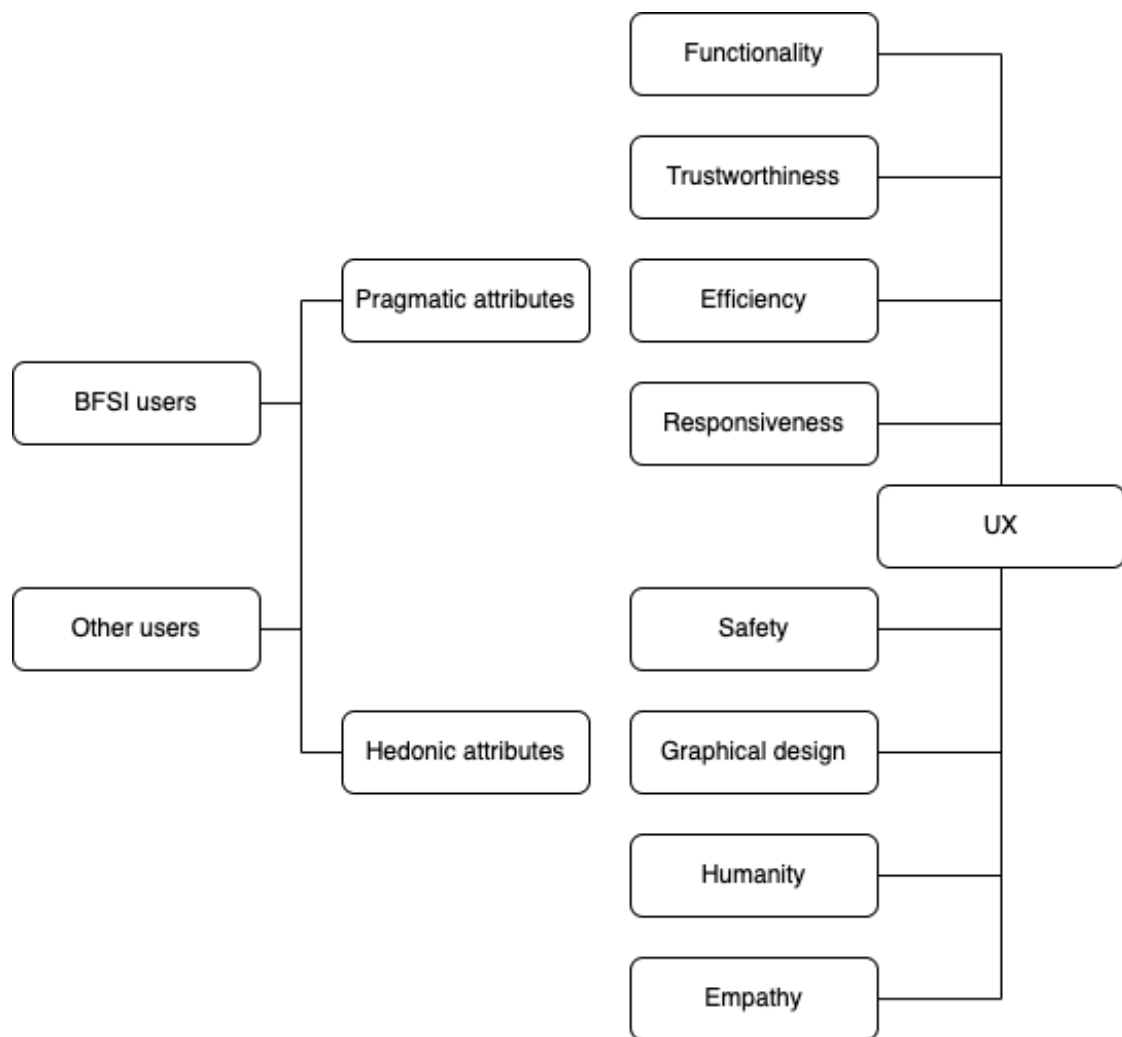
‘Graphical appearance’ comprised of two items: ‘user interface’ and ‘use of emojis and pictures/gifs’. The reliability of ‘graphical appearance’ comprising two items was good:  $\alpha = .74$ .

‘Humanity’ comprised of four items: ‘realness of the chatbot’, ‘create an enjoyable conversation’, ‘convey personality’ and ‘read and respond to moods’. The reliability of ‘humanity’ comprising four items was good:  $\alpha = .80$ .

‘Empathy’ constituted two items: ‘personalized options’ and ‘personalized suggestions’. The reliability of ‘empathy’ comprising two items was good:  $\alpha = .71$ .

Lastly, ‘responsiveness’ included two items: ‘responding immediately’ and ‘productivity’. The reliability of ‘responsiveness’ comprising two items was low:  $\alpha = .38$ . Furthermore, to conceptualize the study, the following analytical model was created:

Figure 1. Analytical Model



### Respondents

In total, 60 respondents participated in the study, with ages ranging from 17 to 62 years ( $Mage = 30.13$ ,  $SD = 11.40$ , Range = 17-62). With regards to gender, 29 female (48.3%), 28 male (46.7%) and 3 (5%) non-binary participants were involved in the study. In terms of education, 29 (48.3%) participants had a bachelor's degree, 27 (45%) participants possessed a master's degree or higher and 4 (6.7%) a high school diploma as their highest level of education. In total, respondents were from N=13 nationalities. Most participants were Hungarian (31.7%), Dutch (23.3%), British (10%), German (8.3%), Irish (6.7%) and American (6.7%), however, a great variety of respondents were of other nationalities (13.3%). From the total of 60 participant, 31 (51.7%) have indicated that they have used banking chatbots before, while 22 (36.7%) have used chatbots in other domains and 7

(11.7%) have reportedly never used chatbots before. For the aims of this study, the latter group was excluded from analysis.

### *Procedure*

Prior to survey distribution, a draft version of the survey was negotiated with chatbot experts from the Talk-a-bot chatbot developer company in Hungary. The Talk-a-bot chatbot company was desired for the aims of the research, as they provide chatbot solutions to some of Hungary's largest financial institutions such as, Erste Bank Magyarország, Magyar Nemzeti Bank and Prémium Egészség Pénztár. An explorative interview was conducted to address the 28 chatbot attributes. This was done to ensure such attributes are still relevant on the BFSI market and whether chatbot engineers could potentially add more important attributes worth researching. However, engineers did not add more attributes, but rather validate the significance of the existing 28. The finalized survey was then distributed online through researcher's personal network and by the Talk-a-bot company's network of chatbot users. It was sent through WhatsApp, Messenger and shared on Facebook, Instagram and LinkedIn. The survey was created using Qualtrics, hence, participants were provided access through a link. The survey questions were universal to all respondents and were completed on an individual basis. Participants were provided an information and consent form along the survey. The survey was disclosed to participants as a simple set of questions on their perception of general chatbot attributes. Participants who agreed to participate proceeded to the survey. Upon completion, participants were thanked for their contribution. Contact information, researcher's email address and phone number, was provided in the survey in case they wish to be further informed on the research and the results. On average, completing the survey took  $M = 4.4$  minutes.

### *Statistical treatment*

An independent samples *t*-test was carried out to measure the extent the two groups perception differs in terms of attribute importance. Furthermore, to address the open-ended question of the survey, a summary and descriptive statistical analysis was conducted to examine what services BFSI chatbot users are using banking chatbots for. All answers were screened by the researcher and similar ones were grouped, assigned to several categories.



## Results

The purpose of the current study was to investigate how the importance of the most prominent chatbot attributes differ in terms of UX, between BFSI chatbot users and users of other chatbots. Consequently, current study also sets out to determine how potential differences may impact UX. An independent samples *t*-test was carried out to examine the differences in perception of importance of the 28 chatbot attributes between BFSI chatbot users and other chatbot users. This section is dedicated to document findings.

### *Differences between BFSI chatbot and other chatbot users*

#### *Personalization options*

An independent samples *t*-test indicated a significant difference in perception of importance of ‘Personalization options’ between BFSI users and other users  $t(41.59) = 3.95, p < .001$ . Users of other chatbots perceived personalization of a chatbot more important ( $M = 3.41, SD = 1.09$ ), than their BFSI user counterparts ( $M = 2.26, SD = 0.97$ ).

#### *User interface*

Furthermore, the independent samples *t*-test showed a significant difference regarding the importance of ‘User interface’ between BFSI and other chatbot users  $t(47.08) = 3.24, p = .002$ . Users of other chatbots found a good looking chatbot interface more important ( $M = 3.77, SD = 1.11$ ), than BFSI users ( $M = 2.74, SD = 1.18$ ).

#### *The use of emojis and pictures/gifs*

The independent samples *t*-test also showed a significant difference regarding the importance of ‘Use of emojis and pictures/gifs’ between BFSI chatbot users and other chatbot users  $t(35.96) = 3.63, p < .001$ . Users of other chatbots found the use of emojis and pictures/gifs more important ( $M = 2.82, SD = 1.26$ ), than BFSI chatbot users ( $M = 1.69, SD = 0.91$ ).

#### *Conveying personality*

The independent samples *t*-test also found a significant difference with regards to the importance of ‘Convey personality’ between BFSI chatbot and other chatbot users  $t(44.70) = 2.26, p = 0.029$ . Users of other chatbots found it more important ( $M = 2.86, SD = 1.13$ ) that a chatbot has a distinct personality, than BFSI chatbot users ( $M = 2.16, SD = 1.10$ ).

*Responding immediately*

Lastly, the independent samples *t*-test indicated a significant difference with regards to the importance of ‘Responding immediately’ between BFSI and other chatbot users  $t(48.78) = 2.11, p = .040$ . Users of other chatbots found it more important ( $M = 3.05, SD = 0.95$ ) that a chatbot displays a typing animation before it gives an answer, than BFSI chatbot users ( $M = 2.45, SD = 1.09$ ).

*Insignificant differences between BFSI chatbot and other chatbot users*

The independent samples *t*-test found no significant difference between BFSI users and other chatbot users with regards to the importance of ‘Interpret commands accurately’  $t(39.19) = 0.67, p = 0.51$ , ‘Execute requested task’  $t(38.06) = 0.22, p = 0.82$ , ‘Flexible in interpreting knowledge’  $t(46.60) = 1.08, p = 0.29$ , ‘Able to maintain a discussion’  $t(43.18) = 1.07, p = 0.30$ , ‘Activation’  $t(45.79) = 0.72, p = 0.48$ , ‘Number of services available in the chatbot’  $t(46.08) = 0.66, p = 0.51$ , ‘Containing dependable information’  $t(34.07) = 0.47, p = 0.64$ , ‘Possibility of rating the chatbot’  $t(37.37) = 1.49, p = 0.15$ , ‘Contains breadth of knowledge’  $t(48.36) = 1.68, p = 0.99$ , ‘Robustness to unexpected input’  $t(38.61) = 0.26, p = 0.79$ , ‘Transparency’  $t(43.89) = 0.61, p = 0.55$ , ‘Protect and respect privacy’  $t(46.66) = 0.05, p = 0.96$ , ‘Safe from intrusion’  $t(40.21) = 0.67, p = 0.51$ , ‘Ease of use’  $t(33.61) = 0.55, p = 0.59$ , ‘Quick replies vs free text’  $t(50.99) = 1.26, p = 0.22$ , ‘Available at all times’  $t(46.35) = 0.18, p = 0.86$ , ‘Accessibility’  $t(50.85) = 1.35, p = 0.18$ , ‘Need of an account’  $t(44.09) = 0.04, p = 0.97$ , ‘Realness of the chatbot’  $t(47.87) = 0.59, p = 0.56$ , ‘Create an enjoyable interaction’  $t(50.17) = 0.35, p = 0.73$ , ‘Read and respond to moods’  $t(46.35) = 0.18, p = 0.86$ , ‘Personalized suggestions’  $t(38.83) = 0.75, p = 0.46$  and finally, ‘Productivity’  $t(42.10) = 1.80, p = 0.08$ . Therefore, it may be concluded that BFSI and other chatbot user perception of importance does not differ on these attributes. BFSI users and other users agree on the importance of 23 attributes. Table 3 below displays the results of the *t*-test, with the mean, standard deviation, number of participants and significance value of both groups, designated to each attribute.

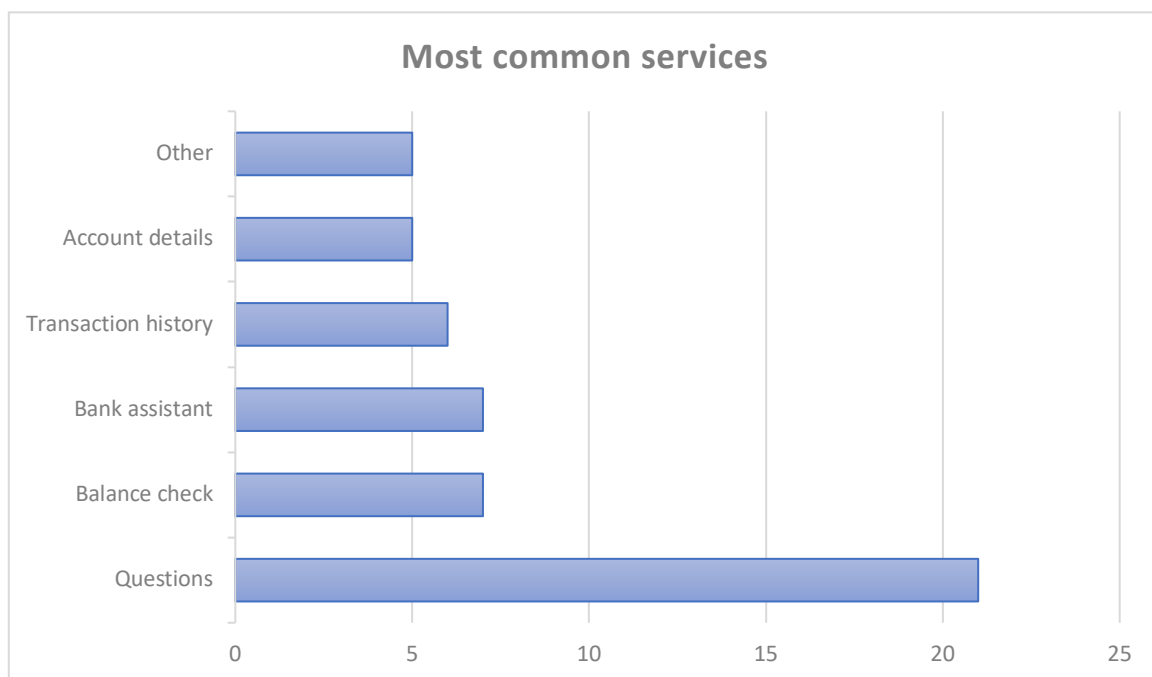
*Table 3.* Mean (*M*), standard deviation (*SD*), number of participants (*n*) and significance (*p*) of the independent samples *t*-test for perception of importance of quality attributes between BFSI and other chatbot users (1= Not at all important, 5= Extremely important)

	BFSI users			Other users			Sig.
	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>p</i>
Interpret commands accurately	4.13	0.67	31	4.27	0.83	22	0.505
Execute requested task	3.10	0.70	31	3.05	0.90	22	0.824
Flexible in interpreting knowledge	3.84	0.69	31	3.64	0.66	22	0.285
Able to maintain a discussion	3.19	0.98	31	3.50	1.06	22	0.290
Activation	2.39	1.02	31	2.59	1.01	22	0.474
Number of services available in chatbot	3.84	0.86	31	3.68	0.84	22	0.510
Containing dependable information	4.26	0.45	31	4.18	0.66	22	0.642
Possibility of rating the chatbot	2.23	0.92	31	2.68	1.21	22	0.145
Contains breadth of knowledge	4.10	0.94	31	3.68	0.84	22	0.099
Robustness to unexpected input	3.48	0.72	31	3.55	0.91	22	0.794
Transparency	3.26	1.13	31	3.45	1.18	22	0.547
Protect and respect privacy	4.19	0.83	31	4.18	0.80	22	0.959
Safe from intrusion	4.81	0.60	31	4.68	0.72	22	0.509
Ease of use	4.03	0.61	31	3.91	0.92	22	0.587
Quick replies vs free text	3.13	0.96	31	3.41	0.67	22	0.215
Available at all times	4.23	0.88	31	4.18	0.85	22	0.856
Accessibility	3.87	1.20	31	3.50	0.80	22	0.184
Need of an account	4.35	0.76	31	4.36	0.79	22	0.968
User interface	2.74	1.18	31	3.77	1.11	22	0.002
Use of emojis and pictures/gifs	1.68	0.91	31	2.82	1.26	22	< .001
Realness of the chatbot	2.90	1.14	31	2.73	1.03	22	0.560
Create an enjoyable interaction	3.42	0.92	31	3.50	0.74	22	0.726
Convey personality	2.16	1.10	31	2.86	1.13	22	0.029
Read and respond to moods	3.00	1.10	31	2.86	1.17	22	0.669
Personalization options	2.26	0.96	31	3.41	1.10	22	< .001
Personalized suggestions	3.39	0.84	31	3.59	1.05	22	0.457
Responding immediately	2.45	1.09	31	3.05	0.95	22	0.040
Productivity	4.39	0.80	31	3.95	0.90	22	0.078

### ***Most common services banking chatbots fulfil to users***

To summarize the open-ended question of the survey on what purposes BFSI users turn to banking chatbots for, the following bar chart was created. Figure 2 below displays the most common services banking chatbots fulfil to users. As figure 2 below shows, the most commonly mentioned service was asking questions or gathering information, appearing 21 times. This mostly entails general questions, however, respondents also mentioned questions regarding currency rates, contact information, loans or insurance. Moreover, seven respondents mentioned checking their balance, and seven mentioned using banking chatbots to contact a live agent. Six respondents mentioned using BFSI chatbots to follow up on their transaction history, while five mentioned checking and editing account details, or other activities related to their personal account. Lastly, five mentioned other services, such as deblocking credit cards, help logging in, transactional errors or other problems.

*Figure 2.* Frequency of banking chatbot services mentioned



## Discussion and Conclusion

The following section of the paper is intended to discuss the main findings presented above with regards to existing literature on the field. It specifically aims to compare the results of the current study to the findings of Meerschman & Verkeyn (2019) in order to highlight differences found, whilst also addressing the research question and hypotheses previously stated. Conclusively, it addresses potential limitations and fetches recommendations for future research.

The purpose of the study was to examine potential differences in the perception of chatbot attributes between users of banking chatbots and users of chatbots in general. This was done using a survey that contained statements of the 28 most prominent attributes collected by Meerschman & Verkeyn (2019). Respondents were tasked to evaluate the statements on a 5-point Likert scale, while also providing valuable data specific to banking chatbot usage.

Surprisingly, the main findings of the current study are the five differences found in perception of attribute importance. The first of such differences occurred with ‘personalization options’, which entails the extent to which a chatbot can be personalized by users (Meerschman & Verkeyn, 2019). Users of other chatbots found this attribute to be more important than users of banking chatbots, which is not in line with findings of Meerschman & Verkeyn (2019). In their study, this attribute was categorised as ‘unexpected but good addition’, meaning users in general found it to be of some importance (Meerschman & Verkeyn, 2019). However, results of the current study established that ‘personalization options’ is given less importance by BFSI users. This leads to the conclusion that presence of this attribute in a banking chatbot might not affect UX positively. It implies that this attribute might not require as much attention from banking chatbot developers as other attributes, considering the low importance BFSI users assigned to it. It is also imperative to note that this attribute was earlier categorised as hedonic, on Hassenzahl’s (2018) pragmatic and hedonic model.

The second difference in perception occurred with ‘user interface’, which refers to whether the interface of a chatbot is attractive or not (Meerschman & Verkeyn, 2019). This was found to be more important to users of other chatbots than banking chatbot users. This is also not in line with findings of Meerschman & Verkeyn (2019), as it was categorised in their study as ‘the more the better’. This entails that users in general assigned an increased importance to the attractiveness of user interface. On the contrary, ‘user interface’ was shown

to be of less importance to BFSI users. Hence, presence of this attribute, or simply put, an attractive looking interface, might not impact BFSI UX positively. Therefore, developing an attractive user interface of a banking chatbot may not be of high priority, as to the low importance expressed by BFSI users. On Hassenzahl's (2018) pragmatic and hedonic model, this attribute is again, hedonic.

Another difference in perception of importance was observed with regards to 'use of emojis and pictures/gifs'. This attribute refers to whether a chatbot uses emojis, pictures or gifs when interacting with users (Meerschman & Verkeyn, 2019). This attribute was shown to be of higher importance to users of other chatbots when compared to their BFSI counterparts. This does not correlate with findings of Meerschman & Verkeyn (2019), as they identified this attribute as 'unexpected but good addition', meaning users in general find this attribute to be of importance. In contrast, banking chatbot users clearly expressed a lower importance of whether a chatbot uses emojis, picture or gifs when interacting. This entails whether a banking chatbot uses emojis and other visuals, may not affect UX positively in the BFSI segment. Therefore, development of this attribute does not require high priority, due to the low importance expressed by BFSI users. Using the model of Hassenzahl (2018), this attribute was identified as hedonic.

The fourth difference occurred with attribute 'convey personality', which essentially means whether a chatbot has a distinct personality (Meerschman & Verkeyn, 2019). Users of other chatbots were shown to display a higher importance to this attribute compared to BFSI users. This is not in line with findings of previous literature, as this attribute was identified as 'unexpected but good addition', meaning users in general do find chatbot personality moderately important (Meerschman & Verkeyn, 2019). Regardless, banking chatbot users' perception of importance was shown to differ significantly, as they did not find this attribute as important. Thus, a banking chatbot possessing distinct personality may not affect UX positively, due to the low importance to its users. This attribute is pragmatic according to Hassenzahl (2018).

Finally, the last difference in perception was observed with 'responding immediately'. This attribute refers to whether a chatbot displays a typing animation prior to giving an answer (Meerschman & Verkeyn, 2019). Users of other chatbots found this attribute to be more important than BFSI users. This contradicts findings of Meerschman & Verkeyn (2019), who categorised it as 'unexpected but good addition'. Therefore, they identified this attribute to be moderately important to users in general. On the contrary, BFSI users displayed a lower level of importance towards this attribute. Accordingly, a BFSI chatbot

displaying typing animation might not impact UX positively, as to the low importance shown by its users. This attribute is pragmatic in nature according to Hassenzahl (2018).

Furthermore, such findings correlate with hypothesis 2, that in case of different perceptions, they will predominantly relate to hedonic attributes. Hypothesis 2 held for ‘personalization options’, ‘user interface’ and ‘use of emojis and pictures/gifs’, as they were hedonic.

However, ‘convey personality’ and ‘responding immediately’ were pragmatic attributes. This shows that regardless the nature of an attribute, users of different segments may still evaluate them differently in terms of importance.

Moreover, to address the rest of the attributes, results showed no difference in perception with the remaining 23 between the two groups, which correlates to findings of Meerschman & Verkeyn (2019). Both studies indicate that these 23 attributes are equally important to users of different chatbots, hence, their development in the BFSI segment is just as important as in other segments. This finding is also in line with hypothesis 1, as BFSI users did in fact predominantly agree with users of other chatbots on attribute importance.

Additionally, the open-ended question of the survey yielded vital information to BFSI chatbot usage. It was observed that users mostly turn to BFSI chatbot in case of questions, which is in line with previous literature that chatbots today mostly serve as a means of answers to queries (Chung et al. 2020; Franco, 2021; Janssen et al. 2021, 2022; Karri & Kumar, 2020; Meerschman & Verkeyn 2019; Sanamandra, 2021). Checking transaction history, credit balance, account details, contacting a bank agent and various problems are all uses BFSI chatbot fulfil to users. This is an interesting finding to both BFSI organizations as well as chatbot developers looking to understand what purposes their chatbot may be used for.

Regardless the findings, several potentially limiting factors exist to the current study, that need to be addressed. Time was quintessential to the study, hence, data collection from the survey was limited. Moreover, only 60 responses were collected, meaning generalizability of findings may prove low. Given more time, and potentially more responses, generalizability could have been more robust and different results might have been observed. Furthermore, chatbots are prone to change, as technological advances and development are demanded by the global economy. Therefore, the main attributes utilized in the study may not prove applicable in the near future. Additionally, the original paper of Meerschman & Verkeyn (2019) utilized the Kano method for data analysis, however, this study did not. Having used the Kano method might have yielded different results than an independent samples *t*-test. Another potential limitation was the fact that the study was not conducted in partnership with

a BFSI corporation. Survey distribution may have been faster as well as more precise in reaching the desired audience with the aid of, not only a chatbot developer but a financial company. Researcher contacted the Dutch bank ABN AMRO as well as Rabobank for further survey distribution, however, the communication attempt was ignored.

Multiple recommendations for future research were formulated. As mentioned, the survey was completed by 60 persons, hence, future studies could potentially conduct the research with more respondents, further strengthening the generalizability of findings. Furthermore, given that the current study only looked at chatbots in the BFSI segment, researchers could also opt to investigate chatbots in other areas, such as retail or healthcare with this framework. Expanding knowledge on how these chatbot attributes perform across various other segments could shed more light onto overall chatbot usage and user experience, while also guiding development. As the global market demands continuous development in any segment, chatbots are no exemption. At the time of writing this thesis, a sensationally advanced chatbot by the name of ChatGPT appeared on the market, with cutting-edge AI technology. Further research on chatbot attributes will prove to be crucial, as they experience constant development, hence, chatbots of the future may possess different attributes than chatbots at the time of this study. Moreover, future studies could segment respondents into more specific categories to gauge different types of end-user experiences and needs. By observing possible correlations between simple demographic information and chatbot attribute preferences, future development could be much more specific and tailored to users. This would provide invaluable data on how user preferences or experiences vary in terms of demographic information. Additionally, researchers could also execute a conjoint analysis for added insight. A maxdiff conjoint analysis would be most appropriate to measure which attributes are deemed more important by users.

Although findings of this study mostly correlate with Meerschman & Verkeyn (2019), they demonstrate that the importance of the most prominent chatbot attributes does in fact vary in terms of UX. Meaning users of a specific segment may find attributes more, or in this case, less important than users of other chatbots. Conclusively, the generalising statement that the most prominent chatbot attributes are equally important among specific and non-specific users is biased. This study demonstrated that chatbot attribute importance differs, to an extent, between users of different segments. However, it also validated findings of Meerschman & Verkeyn (2019), as BFSI users predominantly agreed with users of other chatbots on attribute importance. Therefore, there are in fact attributes users of different segments agree upon. Findings of this study and Meerschman & Verkeyn (2019) could



potentially serve chatbot developers as a guide to understanding which attributes are more likely to have a significant influence on UX. The findings of this paper specifically, could also serve developers in the BFSI segment on which attributes users think of as less important, ultimately, affecting their UX. The current paper established how banking users think of chatbot attributes, in contrast to users of other chatbots, hence, findings could serve to help maximize BFSI chatbot UX.

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## Appendix A. Survey

The survey used can be accessed via this link on Qualtrics:

[https://radboudletteren.eu.qualtrics.com/jfe/form/SV\\_eRot1bOLzhiDQuq](https://radboudletteren.eu.qualtrics.com/jfe/form/SV_eRot1bOLzhiDQuq)

### Survey introduction



Chatbot attributes: Tell us what you think!

As part of a bachelor's thesis at Radboud University in the Netherlands, this survey is intended to capture your perception on certain chatbot attributes. It consists of 8 parts, each representing a set of chatbot attributes. Please indicate how important these attributes are for you personally. Prior to these parts, you will be asked to indicate what purpose(s) banking chatbots fulfil to you. There are no wrong answers!

Your responses are anonymous, and you cannot return to previous questions. The survey will take approximately 5-10 minutes to complete.

In case you have questions or wish to be further informed please send an email to: [patrik.teasdale@ru.nl](mailto:patrik.teasdale@ru.nl) or call/message: +36301955068

Thank you for your participation!

I agree to participate

I do not agree to participate

## Demographic information



How old are you?

What is your gender?

Male

Female

Non-binary

Prefer not to state

What is your highest level of education?

Masters' degree or higher

Bachelor's degree

Highschool

What is your nationality?



## Group division



Have you ever used the chatbot of a bank or any other financial institution?

Yes

No

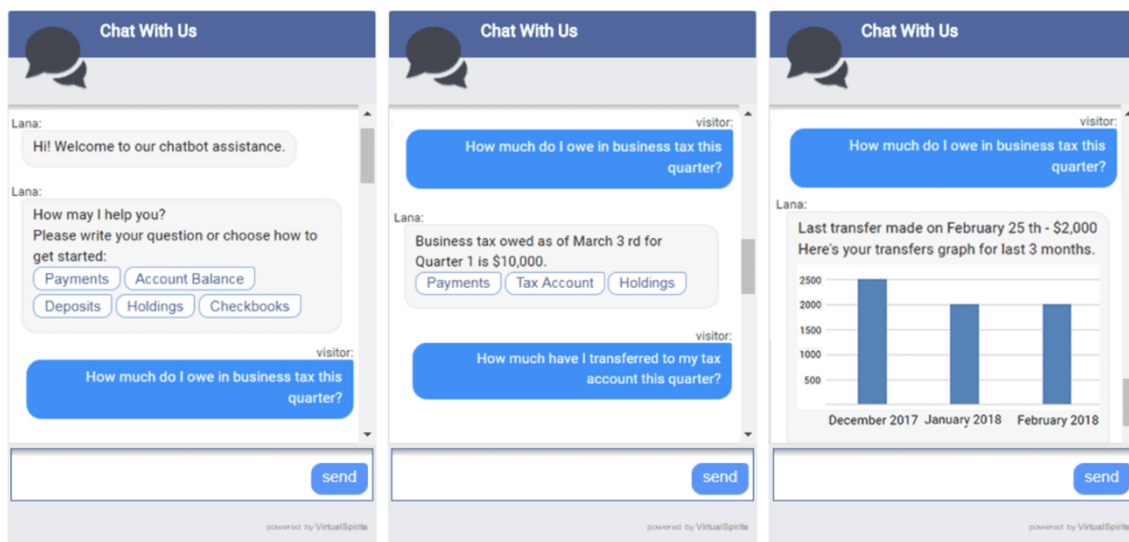
No, but I have used chatbots in other domains



## Example



This is what an interaction with a financial chatbot may look like!





## Services



What service(s) do you use financial chatbots for? Multiple answers may be provided.



## Functionality:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Chatbot interprets commands accurately	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot suggests additional services to the one that was requested	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It recognizes any user request, independently from formulation and typos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot can maintain a discussion by remembering previously entered inputs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot can initiate a new conversation by itself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It has the ability to perform more than oner service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trustworthiness:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The responses of the chatbot are up-to-date, correct. They form a reliable source.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot asks for a rating of its performance after the conversation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot knows at least as much as an expert in the same industry/service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot is robust to unexpected input	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot provides the identity of the organization which receives all my inputs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Safety:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
If the chatbot asks for my personal data, it tells me for which purposes it will be used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal data given to the chatbot can be reached by unknown third parties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Efficiency:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The chatbot is self-explanatory in its use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot mainly provides predefined input such as quick replies to let the user interact with it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot is available at all times	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot can be reached from different platforms such as Facebook, the website and WhatsApp	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I need an account to conduct a chatbot conversation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Graphical appearance:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The chatbot user-interface has a good looking layout	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot adds emojis, pictures, gifs... to its answers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Humanity:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The conversation with the chatbot can be distinguished from a conversation with a human	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot interacts in an enjoyable way	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot has a distinct personality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot recognizes and responds according to my mood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Empathy:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The chatbot can be personalized by the user	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot makes recommendations based on your data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Responsiveness:

Please rate the following statements based on their importance to you:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
The chatbot displays a typing animation before it gives an answer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot provides results faster than its alternatives, such as websites, mail and live chats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Appendix B. Statement of own work****Statement of own work**

Sign this *Statement of own work* form and add it as the last appendix in the final version of the Bachelor's thesis that is submitted as to the first supervisor.

Student name: Patrik Teasdale

Student number: s1039596

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- a. I hereby declare that I am familiar with the faculty manual (<https://www.ru.nl/facultyofarts/stip/rules-guidelines/rules/fraud-plagiarism/>) and with Article 16 "Fraud and plagiarism" in the Education and Examination Regulations for the Bachelor's programme of Communication and Information Studies.
- b. I also declare that I have only submitted text written in my own words
- c. I certify that this thesis is my own work and that I have acknowledged all material and sources used in its preparation, whether they be books, articles, reports, lecture notes, and any other kind of document, electronic or personal communication.

Signature: Patrik Teasdale

Place and date: Amsterdam, The Netherlands 20/12/22