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BUSINESS & ECONOMICS

The impact of chatbot technology attributes on customer experience: an example in telecom

Investigating the effects of humanlike design cues in chatbots
and customer's satisfaction

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Dissertation written under the supervision of
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Dissertation submitted in partial fulfilment of requirements for the MSc in
Management with Specialization in Strategic Marketing, at the Universidade
Católica Portuguesa, June 2019.

ABSTRACT

Title: The impact of chatbot technology attributes on customer experience: an example in telecom

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The implementation of Artificial Intelligence technologies by companies is changing the nature of interactions with customers and it is seen as a business opportunity. The automation of repetitive and ordinary work is now possible, resulting in an increase of the productivity, creativity, and efficiency of organizations. However, there should be a preoccupation to understand the importance of the customer experience with the introduction of these innovations, not only because people react differently to technology, but also to ensure the overall brand impact is positive.

The aim of this study is to investigate the chatbot perceived attributes impact in customer experience, by analyzing the effects of human-like design cues and customer satisfaction on this relationship, in the scope of telecommunications industry. In order to accomplish these goals, a cross-sectional online questionnaire was conducted.

Findings from the quantitative data analysis indicated that both perceived technology attributes studied, Ease of Use and Usefulness, impact positively the customer experience. Overall, the effect of the chatbot attributes on the experience is mediated by the customer's satisfaction with the chatbot and has no different effects depending on the presence of human-like design cues in the chatbot.

Key Words: customer experience, chatbot, customer satisfaction, telecommunications

SUMÁRIO

Título: O impacto dos atributos tecnológicos de um chatbot na experiência do cliente: um exemplo nas telecomunicações

Autor: Ana Rita Parcelas Quintino

A implementação de tecnologias de inteligência artificial por parte das empresas está a mudar a natureza das interações com os seus clientes e é vista como oportunidade de negócio. A automação de trabalho repetitivo e rotineiro é agora possível, resultando num aumento de produtividade, criatividade e eficiência por parte das organizações. Contudo, deve haver uma preocupação para perceber a importância da experiência do cliente com a introdução destas inovações, não só pelo facto das pessoas responderem de forma diferente à tecnologia, mas também para garantir que a marca sofre um impacto positivo geral.

O objetivo deste estudo é investigar o impacto dos atributos tecnológicos percebidos de um chatbot na experiência do cliente, analisando o efeito dos sinais humanos no design e a satisfação do cliente nesta relação, no âmbito da indústria das telecomunicações. Para tal, um questionário transversal foi aplicado.

Os resultados da análise de dados quantitativos indicam que os dois atributos tecnológicos estudados, Facilidade de Uso e Utilidade, impactam positivamente a experiência. De modo geral, o efeito dos atributos do chatbot na experiência é mediado pela satisfação do consumidor com o chatbot e não tem efeitos diferentes dependendo da presença de sinais humanos no design do mesmo.

Palavras-chave: experiência do cliente, chatbot, satisfação do cliente, telecomunicações

ACKNOWLEDGEMENTS

Firstly, I would like to show my deepest appreciation to my supervisor, professor Gonçalo Saraiva. Thanks to the seminar rules, I had the opportunity to attend the first two sessions in the other side of the world, which enable me to start my thesis right away without compromising this journey. Thank you for all the patience and availability for answering all my questions and most of all, for guiding me in the past months.

Also, I am very thankful to all the respondents who take time to participate in the online survey questionnaire, as for the amazing feedback I received through this process. Thank you to all my friends, athletes and their families for always supporting and encouraging me in my academic life.

Finally, I am very grateful for my family. I cannot thank my parents enough for their effort and hard-work. Sometimes depriving themselves was the way to give me the opportunity of studying in one of the most prestigious universities of the world. I may not say this a lot, but I will be always thankful for this. Thank you, Jorge, for encourage me and remind me what matters the most. I am grateful for the unconditional support and patient you all have with me.

I feel happy, blessed, grateful for this journey, and ready for what comes next.

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GLOSSARY

ACAs – Animated conversational agents

AI – Artificial intelligence

ASP – Automation social presence

CASA - Computers are Social Actors

CEM – Customer experience management

CRM - Customer relationship management

DCAs - Disembodied conversational agents

ECAs – Embodied conversational agents

HL – Human-like

ML – Machine-like

MO - Market orientation

OCE - Online customer experience

PU – Perceive Usefulness

PEU – Perceive Ease of Use

RQ – Research Question

SPSS – Statistical Package for the Social Sciences

TA – Technology Attributes

1. INTRODUCTION

1.1. Background

Interactions between brands and individuals are evolving very fast. Businesses are now facing the challenges of a new era powered by natural language technologies: the conversational commerce. With a combination of rich visual interfaces and artificial intelligence (AI) technologies, brands can scale relevant, personal, and helpful interactions with customers (Wilson, Daugherty, & Bianzino, 2017), improving overall customer service. Hence, the use of these technologies is seen as a business opportunity since the automation of repetitive and ordinary work leads to an increase of the productivity, creativity, and efficiency of organizations (Marutitech, 2018).

Messaging apps are the preferred method of communication for consumers and the fastest growing channel for branded conversations, allowing brands to build meaningful and lasting customer relationships (Kapler, 2018). Nowadays disembodied conversational agents (DCAs) in the form of chatbots are a reality on social media and messaging apps. Over 100,000 chatbots have been created in less than one year on Facebook Messenger alone (Johnson, 2017), with the aim of execute tasks as simple as sending airline tickets, or as complex as giving health, financial or shopping advice (Araujo, 2018). Although these agents have the capacity to proactively engage customers and involve them in the experience (Köhler, Rohm, de Ruyter, & Wetzels, 2011), little is known about the impact they have in users' post-interaction attitudes. Therefore, this study aims at studying the influence chatbots have on customer experience, in one specific industry: telecommunications.

The telecommunications industry remains of crucial importance to the society and customers are very unhappy with the service provided for various reasons. Portuguese telecom companies were presented with 104.000 complaints in 2018, increasing 3% in comparison to 2017 (Anacom, 2019), becoming the sector with the largest number of companies and complaints in the top five (Portal da Queixa, 2018). Additionally, when looking at portability numbers, the scenario is also negative, as in 2018 the total ported numbers was 4,5 million. This value is increasing since 2001, and in the last ten years the portability numbers more than tripled (Anacom, 2019), showing customers' dissatisfaction and the telecom companies' difficulty to retain those overtime. According to a McKinsey report, this situation could be resolved with a better customer support, since telecommunications companies with successful Digital customer care (eCare) strategies typically realize considerable benefits, not just in the form of lower costs,

but also in the achievement of enhanced customer satisfaction, richer differentiation, and higher brand advocacy (Banfi, Gbahoué, & Schneider, 2013).

Previous studies shows that online agents function as important elements within a firm's social marketing and communications strategy (Köhler et al., 2011). These agents can be either embodied or disembodied. Most of the research in this area lied on embodied conversational agents (ECAs) (Ben Mimoun & Poncin, 2015; Ben Mimoun, Poncin, & Garnier, 2017; Holzwarth, Janiszewski, & Neumann, 2006; McGoldrick, Keeling, & Beatty, 2008). These are particularly relevant for service encounters and for online sales yet knowledge of DCAs performance is still lacking and their potential effects on company-related outcomes remain largely unexplored (Araujo, 2018). Therefore, this research aims at filling this gap by studying key chatbot attributes and its effect in customer experience.

1.2. Problem statement

The aim of this study is to investigate the chatbot perceived attributes impact in customer experience, by analyzing the effects of human-like design cues and customer satisfaction on this relationship, in the scope of telecommunications industry. Summarizing, the research problem for this research can be stated as:

How does the presence of human-like design cues in the chatbot and customer satisfaction impact the relationship between the perceived technology attributes of a chatbot and customer's experience, in a messaging app?

This problem statement can be expressed through the following research questions:

RQ1: What is a chatbot? What are the opportunities that this technology generates in a telecom business?

RQ2: What is the impact of a chatbot perceived technology attributes on customer experience?

RQ3: How does the presence of humanlike cues in the chatbot impact the relationship between the chatbot perceived attributes and the customer experience?

RQ4: How does the consumer's satisfaction impact the relationship between the chatbot perceived attributes and the customer experience?

1.3. Relevance

Consumers are demanding for easily accessible and high rewarding multichannel interactions with brands. eCare is the answer to this. (Banfi et al., 2013). Although offline brand

performance is essential, digital contexts can enhance company-customer connections, customer satisfaction, and shopping experiences (Chung, Ko, Joung, & Kim, 2018). As a result, it is important for brands to consider their marketing strategies, defining and planning possible digital touchpoints. Although the use of brands' mobile apps has exploded since 2008, "brand app fatigue" is starting to settle in (BenMark & Venkatachari, 2016). According to a study of comScore, the majority of Americans are downloading zero apps per month. Despite mobile apps still being on the spotlight in the digital world, the total time spent online is being dominated by a handful of core apps, mainly for utility or social networking and communication purposes (Social Media Week, 2017). Likewise, messaging apps now have the largest numbers of active users, having overtaken social media apps (Statista, 2015). As a result, marketers have in these platforms the opportunity to reach their customers in a more effective way. However, there are risks when implementing a chatbot, since when it isn't built based on user needs, it tends to frustrate users (Skerrett, 2017). Investigating the effect of a chatbot attributes, in a messaging app, on customers' experience, will help fill the research gap about the chatbot effectiveness in these platforms. Additionally, by introducing in the model the moderating effect of humanlike design cues, more information is provided to help marketing managers taking decisions regarding chatbot characteristics.

1.4. Research Methods

Both primary and secondary data will be used to answer the research questions. Since a diversity of academic articles were gathered about different components of this research topic, i.e. customer experience and customer satisfaction, secondary data will bring a good foundation for further primary data research. Regarding the chatbot topic, the scenario was different due to lack of secondary data from top journals on this topic. In order to collect additional data about chatbots, primary data was collected through a questionnaire containing a cross-sectional design to assess the effect on customer experience.

Two groups of respondents are exposed to a real chatbot of a no branded telecom provider on Facebook messenger, in which one group interacts with a human-like chatbot and the other group interact with a machine-like chatbot (absence of human-like cues). The questionnaire will further query for agreements about different statements for measuring satisfaction, and experience. Moreover, the demographics, smartphone usage habits and technology adoption, interest and chatbot knowledge were also measured.

1.5. Dissertation Outline

In the subsequent chapter, it is presented a literature review, followed by the hypothesis of the research. The literature review firstly explains the importance of the customer experience and its dimensions and secondly, the chatbot technology and the nature of its interactions, allowing a greater knowledge to connect both topics further on. The third chapter presents the methodology used to answer the research questions, including the design process of the survey. The fourth chapter consists in the results analysis, that is followed by the fifth and last chapter, containing the conclusions, as well as the limitations of the dissertation and suggestions for future research on the topic.

2. LITERATURE REVIEW

The subsequent chapter builds a theoretical framework for the research questions of this thesis. It summarizes, contrasts and criticizes the existing literature on relevant topics for understanding the context around the research purpose. It is subdivided in six parts. In the first part of the literature review, the concept of customer experience is explained as dependent variable, followed by explanation of the chatbot technology through a careful explanation of its various usage possibilities and technology attributes. Further, the third part is dedicated to the agent-mediated interaction by identifying the different design cues, i.e. the moderator effect. In the following part of the literature review the potential mediator is presented – customer satisfaction with the agent. The fifth part includes a global overview of the telecommunications industry. To conclude, a conceptual framework outlines the interdependencies between the variables and presents the multiple hypotheses to be studied.

2.1. Customer experience

Recent definitions confirm that customer experience (CE) is “the evolvement of a person’s sensorial, affective, cognitive, relational, and behavioral responses to a firm or brand by living through a journey of touchpoints along prepurchase, purchase, and postpurchase situations and continually judging this journey against response thresholds of cooccurring experiences in a person’s related environment” (Homburg, Jozić, & Kuehnl, 2017). These responses to a brand evolve not only direct contact, normally initiated by the customer (i.e. during purchase, use, and service), but also indirect contact, mostly unplanned (i.e. word-of-mouth recommendations or criticisms, advertising, news reports and reviews) (Schwager & Meyer, 2007). Thus, the theoretical basis of customer experience is found on the concept of the combination of all cues and touchpoints with an organization to create an overall experience (Payne, Storbacka, & Frow, 2008).

Previous studies show that a positive customer experience results in satisfaction, trust, revisit intention, repurchase intention and loyalty (Verhoef et al., 2009). Moreover, customer experience can promote the creation of an emotional tie between a firm’s brand and its customers, which in turn enhance customer loyalty (Gentile, Milano, Noci, & Milano, 2007). Hence, customer experience is seen as an important area of research.

Although it is a relevant topic for companies, most of them are not investing enough. The extent of the problem has been documented in Bain & Company’s survey to customers of 362 companies. Only 8% of them described the experience as “superior”, yet 80% of the companies surveyed believe that the experience they have been providing is indeed superior (Schwager &

Meyer, 2007). This problem could be surpassed with a better understanding of customer experience determinants and how to manage them coherently. From a theoretical point of view, Verhoef et al. (2009) recognized the CE determinants as the social environment, the retail atmosphere, the assortment, the price and promotions (including loyalty programs), and the service interface, which will be analyzed in this dissertation. He also argued that multi-channel environment customers' experiences in one channel (e.g., a store) may be affected by experiences in other channels (e.g., the Internet) as well. Moreover, the different components of the Customer Experience depend on the characteristics of a given product (Gentile et al., 2007), thus CE can be considered an extremely complex subject to analyze and measure. In order to simplify, this dissertation will only focus in the online channel, excluding other possible offline touchpoints of a telecom customer journey.

2.1.1. Online Customer Experience

Due to technological advances customers now have higher expectations within the online environment and expect a high-quality level of service (Grönroos & Voima, 2013). As a result, companies are expected to provide a better service, and invest more in customer experience management, especially in the online context. Hence, there is a need to comprehend online customer experience (OCE) concept and dimensions.

Earlier, OCE was explored from a cognitive view of online interaction by Novak, Hoffman, and Yung (2000), being defined as the cognitive state experienced during navigation, proposing several person-centered, cognitively-base determinants of OCE. In this study there were evidence of four variables impacting OCE: *interactive Speed*, *Telepresence*, *Challenge* and *Skill*. Further research (Rose, Clark, Samouel, & Hair, 2012) extended this work and included the affective state in the conceptualization of OCE. *Perceived control*, *Aesthetics* and *Perceived Benefits* were introduced as new variables due to the influence on the customer's affective state. However, the role of Skill and Interactive Speed are not supported by this study. A possible explanation for this may be that since the decade of the original work of Novak, Hoffman, and Yung (2000) the interactive speed of websites is consistently superior, and shoppers have gained skill over time (Rose et al., 2012). In summary, the customer engages in cognitive and affective processing of incoming sensory information from the online environment, which results in the impression created and stored in the customer's memory (Martin, Mortimer, & Andrews, 2015; Rose et al., 2012).

With the rapid change and evolution of stimuli presented in the online context, the concept of Online Customer Experience is still evolving. Recent research by Bleier, Harmeling, &

Palmatier (2019) claims that OCE comprehends the customer's subjective, multidimensional psychological response to a product's presentation online. This research extended Novak et al. (2000) and Rose et al. (2012) studies by arguing that this experience is not only determined by cognitive and affective dimensions, but also by social (i.e. social presence, Wang et al., 2007) and sensory (i.e. sensory appeal, Jiang and Benbasat, 2007) dimensions. Each of the four dimensions were introduced and defined by Bleier et al. (2019) as follows: *Informativeness*, or cognitive dimension is "the extent to which a website provides consumers with resourceful and helpful information" (Lim & Ting, 2012). It helps the consumer making a purchase decision, which involves thinking, conscious mental processing, and, usually, problem solving (Gentile et al., 2007). Informativeness captures the functional aspect and value of the experience to the customer (Verhoef et al., 2009). *Entertainment*, the affective dimension, reflects the immediate pleasure taken from the experience, regardless of its ability to facilitate a specific shopping task (Babin, Darden, & Griffin, 2002). *Social presence*, the social dimension refers to the warm, social and humanlike contact that a web page confers (Gefen and Straub 2003). Regarding this dimension and based on the prediction that in a near future technology will be unified into numerous service experiences, Van Doorn et al. (2016) highlighted technology's ability to engage customers on a social level as a critical advancement of technology. Specifically, he introduces the new concept of Automation Social presence (ASP). ASP is proposed to be the degree to which a machine (e.g. chatbot) can "make consumers feel that they are in the company of another social entity". Research has proven social presence plays a role in increasing pleasure and arousal during online shopping (Wang et al., 2007), as well as purchase intentions (Hassanein & Head, 2007). And lastly, *sensory appeal*, the sensorial dimension, denotes the way a web page stimulates the senses (Bleier et al., 2019). Although the limited scope of sensory experiences in the online environment, sensations can be evoked through imagery (e.g., pictures, videos) (Elder, Schlosser, Poor, & Xu, 2017). In this study all the dimensions will be studied except the last, due to the absence of pictures, videos, or any media that can cause sensory arousal in the chatbot designed.

There are two events that are known for their influence in the experience creation. Firstly, and according to Ling, Chai, & Piew (2010) past experience influence future online behavior, similarly to the offline context. Secondly, companies may not have total control of all aspects of the OCE formation (Verhoef et al. 2009), given that an interaction in online environment involve many external variables of which the e-retailer is unaware and cannot control (Rose et al., 2012). Additionally, Martin et al. (2015) posits *perceived risk* as other influencing factor,

concluding that customers who perceive high risks will have lower repurchase intentions. However, this effect may be annulled if they have had previously satisfying experiences (Pires, Stanton, Eckford, 2000; Wu & Chang, 2007).

2.1.2. Customer Experience Management

Retailers around the globe have embraced the concept of Customer Experience Management (CEM) with many incorporating the notion into their mission statements (Verhoef et al., 2009), as it is now seen as one of the most promising marketing approaches to address the present and future challenges of consumer markets (Homburg et al., 2017). CEM literature investigated various aspects such as how and to what extent an experience-based business can create growth in a company (Verhoef et al., 2009), or which useful capabilities organizations should possess (Homburg et al., 2017; Schwager & Meyer, 2007). Additionally, Homburg et al. (2017) filled a gap in research by conceptualizing CEM and introducing contingency factors, highlighting CEM's applicability across diverse industry settings. Other research by Otnes, Ilhan, & Kulkarni (2012), focused on the social-interaction aspects a service provider can use (e.g. language) to facilitate a specific type of experience.

CEM evolved from the early concepts of Market Orientation (MO) and Customer Relationship Management (CRM). While MO is a broader concept, being a key market-based asset (Rafat & Salama, 2017), CRM marks the start of mindset changing into customer centrism, upon when companies started to see customers as valuable individuals. However, this concept alongside with MO, do not provide an integrative view on cultural mindsets, strategic directions, and firm capabilities. Both concepts are further biased toward an exploitative, firm-centric focus on market performance and profit maximization (Homburg et al., 2017). Several research compare and differentiate CEM from CRM. Schwager & Meyer (2007) present in their study the key differences: subject matter, timing, monitoring, audience, and purpose. In summary, they differentiate CRM (i.e., knowing customers and leveraging that data) from CEM (i.e., knowing how customers react and behave in real time and leveraging that data) through time displacement factor. According to Verhoef et al. (2009), CEM differs from CRM by focusing on the current experience of the customer, rather than the recorded history of the customer. Thus, CEM is seen as an expansion of CRM and is defined as “the retailer’s strategy to engineer the customer’s experience in such a way as to create value both to the customer and the firm” (Verhoef et al., 2009). Homburg et al. (2017) identified CEM objectives as customer loyalty and long-term growth. In their study, several resources of CEM were identified to achieve such goals: cultural mindsets toward CEs, strategic directions for designing CEs, and firm

capabilities for continually renewing CEs. Regarding the firm capabilities, Homburg et al. (2017) emphasized four relevant firm capabilities for continually adapt and improve CEs, all referring to touchpoints: journey design, prioritization, journey monitoring, and adaptation. This is in line with (Payne et al., 2008) research that stresses the importance of each and every encounter between customer and supplier (i.e. touchpoint), and how together these encounters make a cumulative contribution to co-create value. Yet, Schwager & Meyer (2007) argue that not all touch points are of equivalent value, particularly when the core offering is a service, where the service-interactions are the ones that matter the most.

2.2. New technologies in business

Companies have been investing in technology with the goals of reducing the cost of customer support and improving the quality of the customer experience and firm profitability (Köhler et al., 2011). According to a Harvard Business Review questionnaire made to global companies, many are already using AI technologies to orchestrate the brand experience in the business processes, including in customer service operations (39% of companies) (Wilson et al., 2017). It is now possible for companies to provide full time customer support with online agents. These can be used in a strategic manner with the objective of socializing and educating prospects or customers (Köhler et al., 2011), thus achieve greater retailer satisfaction, more positive product attitudes, and greater purchase intentions (Holzwarth et al., 2006). One example of the AI technology being used by brands is the chatbot, also known as (disembodied) conversational agent. The concept and definition of this technology will be presented in the next section.

2.2.1. Chatbot technology - concept definition

A chatbot is an umbrella term for similar concepts such as chatter bots, virtual agents, and conversational agents (Van Eeuwen, 2017). Conversely, in the course of this dissertation some of the mentioned above terms might be used to refer to the chatbot. A Chatbot or conversational agent is a software that responds to natural language input and attempts to hold a conversation imitating a real person (Reshmi & Balakrishnan, 2016) by means of auditory (e.g. Siri from Apple) or textual inputs (Duijst, Sandberg, & Buzzo, 2017). In this dissertation the focus will be on chatbots that use only textual inputs. One of the most recent definitions defends that chatbots not only respond automatically to language text in a human-like manner, but also execute specific commands, where the instant responses usually consist of structured messages, images, links, or specific call-to-action buttons (Zarouali, Van den Broeck, Walrave, & Poels, 2018), allowing various types of media exchange between the DCA and the user in a dialogical manner, yet it does not allow for an embodied, real-time and dynamic physical representation

of the agent, except for a (static) profile (Araujo, 2018). The interaction is either initiated by the company giving information and advice or alternatively, initiated by the customer itself, where it is provided real-time information in response to individual questions (van Dolen, Dabholkar, & de Ruyter, 2007).

The first literature mentioning a chatbot appeared on 1950 by Alan Turing, an English computer scientist, with the question “Can machines think?”. He proposed the Turing Test, a method to measure whether it is an interaction with a human or a chatbot, and since then the evolution occurred (Figure 1). Some years later, in 1966, the first chatbot appeared – ELIZA - becoming the foundation for the structures of chatbots (i.e. keywords, specific phrases, preprogrammed responses) (Valverde, 2018). When compared to earlier versions, current chatbots have expressively better capabilities for maintaining conversations (Shah, Warwick, Vallverdú, & Wu, 2016) because of ongoing advances in AI and natural language processing (Araujo, 2018).

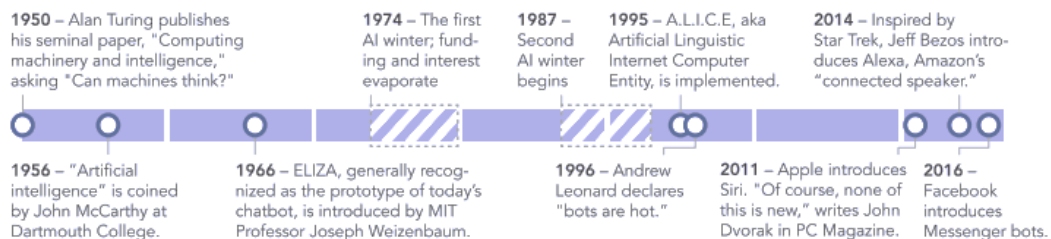


Figure 1 - Chatbot history (Etlinger, 2017)

2.2.2. Types of online agents – Chatbot versus Avatar

In the online agent’s universe, the literature is more extensive about the embodied agents (avatars) (figure 2) when compared with disembodied agents (chatbots) (figure 3). Many studies have focused on the impact of the avatar on user’s online experience (Chattaraman, Kwon, & Gilbert, 2012; Etemad-Sajadi & Ghachem, 2015; Holzwarth et al., 2006; Kohler, Fueller, Stieger, & Matzler, 2011; Wang et al., 2007) highlighting the avatar’s capacity to empower companies in the relationship management with current and potential clients. Moreover, avatars can improve the level of attractiveness of the website while reducing the costs and improving the productivity of a call center. Köhler et al. (2011) states that increasing the agent’s presence beyond the firm’s website may raises the awareness of the agent and foster the perception of the agent as a peer rather than merely a representative of a company. As avatars are mainly present in websites, chatbots might be seen as a possible solution to collect these benefits. This idea is supported through previous research on chatbots, as some have found the same outcomes for companies using these different type of agents. Chung et al. (2018) confirmed the chatbots

used by luxury fashion retailers are able to provide convenience and quality communication to customers, influencing positively perceptions of marketing efforts. This is in line with Zarouali et al. (2018) that evaluated the effectiveness of a chatbot within the Facebook messenger. Results suggest that both affective and cognitive determinants have a positive influence on attitudes towards the brand, and an indirect effect on patronage intentions (i.e. likelihood to recommend the chatbot). Furthermore, Araujo (2018) investigated the extent to which human-like cues used when introducing the chatbot to the consumer can influence customers' perceptions. Findings suggests that, when using human-like cues, chatbots can have a positive effect on relationship building, increasing emotional connection between the user and the company. These researches bring key insights not only for marketing managers but also for developing new studies in this area, since knowledge on chatbots' performance is still lacking and their potential effects on company-related outcomes needs further analysis (Araujo, 2018).

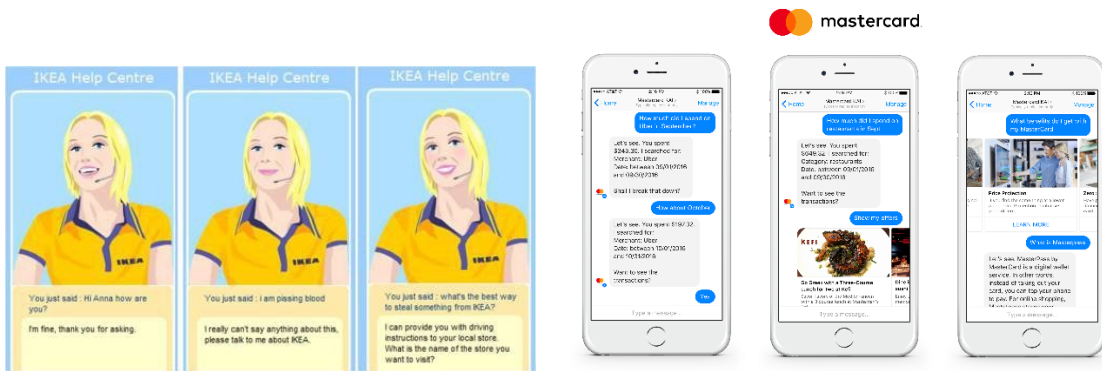


Figure 2- Avatar example (IKEA)

Figure 3- Chatbot example (Mastercard)

2.2.3. Chatbots in the context of app messaging

Since this study will focus on chatbots using textual inputs, it is appropriate to understand the platform where they can be used, which typically are messaging platforms. First, it is important to understand its origin for business practices. The new era of Conversational Commerce was enabled by three major market shifts: mobile-first consumer evolution, messaging platforms evolving to payment platforms and advancement of AI (Vassinen, 2018). Conversational Commerce is defined as an “automated technology, powered by rules and sometimes artificial intelligence, that enables online shoppers and brands to interact with one another via chat and voice interfaces” (Schlicht, 2018).

During the past years, conversational commerce brought advantages for both sides. For customers, conversational commerce provides convenience: they can chat with company representatives, get customer support, ask questions, get personalized recommendations, look

into reviews, and click to purchase within messaging apps (Shopify, 2016). The interaction is possible with a human representative, chatbot, or a mix of both. On the business side the automation of customer service messages is the key opportunity given by conversational commerce (Shopify, 2016) by leveraging all social channels to engage customers, creating a connected and frictionless experience (Etlinger, 2017). To succeed, conversational commerce should be managed as a new channel, likewise, a well-organized design of the customer experience is critical (BenMark & Venkatachari, 2016).

Additionally, this shift is motivated by the global adoption and evolution of instant messaging services. Messaging apps are becoming very popular, not only between individual users, but also for companies that are adopting the service. Today six of the top 10 global apps are messaging apps, used by 1.4 billion people worldwide and growing by 12% annually (BenMark & Venkatachari, 2016), with special attention to Facebook Messenger with 2.320 million monthly active users worldwide in the last quarter of 2018 (Statista, 2019). This exponential growth of messaging apps can explain the “brand app fatigue” that is settled in (BenMark & Venkatachari, 2016). According to a study of comScore, the majority of Americans are downloading zero apps per month. Despite mobile apps still being on the spotlight in the digital world, the total time spent online is being dominated by a handful of core apps, mainly for utility or social networking and communication purposes (Social Media Week, 2017).

As a result, marketers have in the messaging platforms the opportunity to reach their customers in a more effective way. Messaging apps allow a relationship maintenance with customers through continuous dialogues. Hence, when comparing to past practices as email marketing, brands are making follow-up conversations easier and more natural, increasing the opportunities to cross-sell, boost sharing, solicit input, and improve the commerce-support flow (BenMark & Venkatachari, 2016). Chatbots on messaging apps are the technology that allows these actions to materialize. They should be considered disembodied conversational agents (DCAs) on these platforms, as they communicate with users primarily via a messaging-based interface.

2.2.4. Chatbots opportunities and threats

Chatbots are a popular tool for marketing communication in social media, especially on Facebook. In spite of the raising popularity, these virtual agents have to be implemented in a careful way in order to avoid undesirable outcomes. The table 1 describes some benefits and downsides for both customers and business using the chatbot technology.

	Customer Side	Business Side
Benefits Literature: (Ben Mimoun, Poncin, & Garnier, 2012; Deloitte, 2016; Köhler et al., 2011)	<ul style="list-style-type: none"> Engage in a natural, friendly and easy-to-understand manner 24-7 service and support + instant response Likely to provide more comprehensive, up-to-date information - capability to search large data at high speed 	<ul style="list-style-type: none"> Interaction through familiar apps to customers (e.g. FB Messenger), thereby enhancing customer experience Chatbots don't suffer from human traits (mood swings, tiredness, etc) Higher revenues through cross-selling opportunities Non-embodied agents are more intelligent than the remaining embodied agents
Downsides (Deloitte, 2016)	<ul style="list-style-type: none"> Language is a complex instrument: chatbots cannot understand sarcasm, double-entendres and colloquialism 	<ul style="list-style-type: none"> Context understand challenge - analysis and understanding of internal process flows, customer journey maps and deep product/services information

Table 1 - Pros and cons of implementing a chatbot

There are risks when implementing a chatbot, since when it isn't built based on user needs, it tends to frustrate users (Skerrett, 2017). In fact, (Ben Mimoun et al., 2012) stated the negative gap between consumer expectations and agents' performance leads to agents' failure. Two mechanisms that drive this negative gap: expectation exaggeration and performance reduction. This might be related to experts' opinions indicating four categories of errors: failure to present (and define) the agent's limits, an overly humanized agent (whether in appearance or dialog), failure to listen to the consumer and inadequate interaction processes (too intrusive or too mechanical). Hence, it is of extreme importance the equilibrium between its functionality and aspect, to successfully meet customers' expectations.

Chatbot related literature is still growing but at the time it only tested the effect in the following company related variables: satisfaction with the agent or brand, attitudes towards the company or brand, emotional connection with the company, patronage intentions (i.e. likelihood to recommend the chatbot) and social presence (Araujo, 2018; Chung et al., 2018; Zarouali et al., 2018). As a result, one purpose of this dissertation – how does a chatbot perceived attributes impacts the customer experience – aims at filling this research gap. The existing literature about these topics is reviewed in the following subchapter.

2.2.5. Chatbot Technology Attributes

Conversational agents when completely automated and independent, can be considered as a Self-Service Technology, i.e. customers produce services for themselves without assistance from firm employees. In response to the increasing role of technology in services, researchers have begun to explore customer perceptions and usage of service delivery technologies (Meuter, Bitner, Ostrom, & Brown, 2005). For example, Dennis, Joško Brakus, Gupta, &

Alamanos (2003) highlight the relevance of Technology attributes considering it as important structural features influencing satisfaction.

One of the most reviewed, re-tested, criticized and extensively extended models created to understand the technology acceptance by user was the technology acceptance model (TAM) developed by David (1989). The model theory posits that the perceived ease of use and the perceived usefulness of a new technology influence customers' attitude toward using the technology, which directly influences behavioral intentions to use the technology (David, 1989). The author defines Perceive Ease of Use as "the degree to which the prospective user expects the target system to be free of effort" and Perceive Usefulness as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context". Going beyond the emphasis on attitudes and behavioral intentions in the services technology literature, this study is designed to extend the literature by focusing on customer experience. As foundation to this dissertation, the van Dolen et al. (2007) research that explored the potent combination of structural features - technology and chat group attributes – concluded that these attributes have a significant impact in fostering satisfying experiences for the customers. Although this study will not include group attributes since the chatbot includes only one-to-one dialogues, these findings combined with the previous presented literature about technology allows the first hypotheses to be elaborated:

***H1:** There is a positive relation between the perceived technology attributes of a chatbot and the customers' experience with the chatbot.*

***H1a:** There is a positive relation between perceived usefulness and the consumers' experience with the chatbot.*

***H1b:** There is a positive relation between perceived ease of use and the consumers' experience with the chatbot.*

2.3. Agent-Mediated interaction

An interaction occurs when at least two people or things communicate with or react to each other. The core of interaction is a physical, virtual, or mental contact, such that the provider creates opportunities to engage with its customers' experiences and practices and thereby influences their flow and outcomes (Grönroos & Voima, 2013). Positive interactions require brand associates (virtual or humans) to be courteous, helpful, and trustworthy (Dabholkar, Thorpe, & Rentz, 1996). Hence, direct interactions influence not only customers' value creation but also their future purchasing and consumption behavior (Grönroos & Voima, 2013).

Previous studies show that customer interactions with virtual service agents are similar to their interactions with real-world human agents designed for influencing purchase decisions, saving time, gathering advice, or gaining para-social benefits (Chung et al., 2018; Holzwarth et al., 2006). This is also confirmed by the Computers are Social Actors (CASA) paradigm. CASA is derived from the general theory of media equation, proposing that people demonstrate social reactions to computers and other media, treating them as if they were real people (Nass, Fogg, & Moon, 1996). The paradigm concentrates specifically on people's responses to interactions between humans and computers, and recently, it has been applied to user-chatbot interaction by Edwards, Edwards, Spence, & Shelton (2014). The findings show that users could not differentiate twitter bots from human users as these bots were perceived to be credible, attractive, and efficient in communication as much as humans. This may be the outlook on Twitter bots, and although users are unable to differentiate humans from bots, previous research on communication (human-human vs. human-chatbot) can be considered somehow perplexing. Hill, Randolph Ford, & Farreras (2015) reached two conclusions. First, people communicated with the chatbot for longer durations, but with shorter messages than they did with another person. Second, human-chatbot communication tend to have poorer vocabulary when compared with conversations among people and revealed greater profanity. These results suggest that language skills are being transferred to human-chatbot dialog, yet there are differences in terms of content and quality of such conversations.

Although some authors defend that chatbots can convey social presence, rejecting the notion of being a merely provider of product or transactional information (Bleier et al., 2019), it has been studied that users tend to be less open, agreeable, extroverted, conscientious and self-disclosing when interacting with AI than with humans (Mou & Xu, 2017). It follows that, although humans have difficulty to identify whether they are in a presence of a chatbot, whenever it happens, the language will be adapted. This raises the question of the possible advantages of incorporating human-like characteristics in a chatbot.

2.3.1. Human-like cues

In the world of marketing, a powerful mechanism for connecting with customers is brand anthropomorphism - the method of giving brand symbols people-like characteristics. Recurring to AI technologies, companies are taking this technique to other level obtaining good results so far. Araujo (2018) findings verify that chatbots with human-like cues have a positive impact on users' emotional connection with the company, providing evidence that "humanized" chatbots can have a positive effect on relationship building.

Previous literature on the topic has proposed that consumers may respond positively to social cues designed to characterize a firm representative during an online commercial experience (Wang et al., 2007). The research examining online agents in marketing has shown that the presence of basic social cues can influence customer satisfaction, enjoyment, and purchase intention (Köhler et al., 2011). Additionally, human-like cues are also relevant when agents are disembodied (Holtgraves, Ross, Weywadt, & Han, 2007), concluding that embodiment is not a requirement for an agent to be perceived as human-like (Araujo, 2018). Yet, Nowak and Rauh (2008) alert to the fact that anthropomorphic virtual agents may create higher expectations more difficult to meet, because they typically require complex technological features. When the expectations are not met, customers feel disappointment and tend to diminish their perceptions and evaluations (e.g., credibility, likeability). Therefore, it is crucial to have an equilibrium when designing the chatbot.

When analyzing the usage of human-like cues, (Burgoon et al., 2000) illustrated that, by increasing the anthropomorphic features of an interface, people feel more understood, as well as deriving more utility from the website. Concerning the chatbot panorama there is a gap in research regarding its moderating effect in the relationship between the chatbot technology usage and the customer experience. As previous research stated that the level of social presence attributed to virtual agents had a significant effect on trust of the website (Etemad-Sajadi, 2016), influencing the satisfaction with the service encounter (Verhagen, van Nes, Feldberg, & van Dolen, 2014), and it is known that chatbots with human-like cues (e.g. human name and human linguistic cues) are perceived with higher levels of social presence (Araujo, 2018), it can be expected that:

***H2a:** The relationship between the perceived technology attributes of a chatbot and the customer experience is moderated by the level of presence of humanlike design cues in the chatbot.*

***H2b:** The perceived technology attributes of a chatbot have a higher effect on customer experience if the level of humanlike design cues is high.*

2.4. Customer Satisfaction

The concept of satisfaction can be investigated in two diverse forms: the overall satisfaction and transaction-specific satisfaction. The first kind is defined as the customer's overall evaluation of the performance of an offering to date (Johnson and Fornell 1991) and it is historically associated with loyalty as behavioral intentions (e.g., the likelihood of repurchase and

recommend). The second kind, transaction-specific, defines customer satisfaction as an emotional response by the consumer to the most recent transactional experience with an organization (Oliver, 1993). Both types are important to be studied in the retail setting (Srivastava & Kaul, 2014), nevertheless in order to concentrate efforts on the impact of the independent variable – chatbot perceive attributes - the variable of satisfaction will be studied in the specific context, i.e. customer satisfaction with the chatbot.

Satisfaction is a critical outcome measure of face-to-face encounters, technology-based self-service encounters, and encounters in online environments (Bitner, Brown, & Meuter, 2000; Evans, Kleine, Landry, & Crosby, 2000). A bunch of research has analyzed satisfaction, and recently McLean & Osei-Frimpong (2017) evaluated the satisfaction with the experience within a live chat operator of a mobile phone network provider in the UK with the objective of understand the variables influencing the customer service encounter. The results varied with the purpose of use: when customers are looking for search support, it was found that the responsiveness of the agent, perceived wait time, perceived ease of use and perceived usefulness are the most important. However, for decision support, the variables influencing the satisfaction with the experience are the service agent' assurance, reliability and empathy, as well as information quality.

Further, van Dolen et al. (2007) investigated the influence of technology and group characteristics on customer satisfaction with online group chat and Chung et al. (2018) analyzed how e-service agents can affect communication quality and overall customer satisfaction for high-end SPA and luxury fashion brands that use chatbot for e-service. Both studies provide clear evidence of the importance of evaluating satisfaction in one specific touchpoint, in this case compound by chat interaction. Accordingly, the cumulative satisfaction of each touchpoint overtime results in overall satisfaction. This predictor is important across industries but especially in the telecom sector, as highly satisfied customers tend to demonstrate higher likelihood of repurchase and higher tolerance to price increases by their providers or price decreases by competitors (Turel & Serenko, 2006). Based on the previous finds it is predictable that:

H3a: The chatbot technology attributes have a positive relation with the customer satisfaction with the agent.

H3b: A higher level of customer satisfaction with the agent has a positive impact on customer experience.

H3c: The relation between the chatbot technology attributes and customer experience is mediated by the customer satisfaction with the agent.

2.5. Telecom industry overview

The services provided by the telecom industry form the foundation of our connected lives in the digital world. However, despite the importance of these services, the health of the telecom industry is threatened by multiple challenges including: declining core revenue stream, data monetization gap, falling value perception and rapidly changing consumer preferences (Rahul Malviya & Vyas Varma, 2012). Additionally, customer retention has come out to be one of the major challenges faced by telecom companies today (Joshi, 2014). This may be explained by the profound customers' dissatisfaction, reflected in the enormous numbers of complaints and constant change of mobile operator. Ultimately, these challenges are compounded by growing consumer expectations for the best possible customer experience.

On the business side, besides providing a service with higher quality, there is much more that can be done. Reinforcing options for having consumer support functioning entirely on digital channels can dramatically improve a telecom customer's satisfaction scores while simultaneously reducing costs (Banfi et al., 2013). In addition, the experience of each customer is crucial to build a relationship of trust. According to Rahul Malviya & Vyas Varma (2012), to ensure that customer experience improvement initiatives are linked to business objectives, telecom companies should adopt a unified framework to document the customer experience impact of these initiatives. This is in line with recommendations from (Homburg et al., 2017) who emphasizes the relevance of each touchpoint and the importance of conveying a journey design and monitoring closely.

As a result of the current challenges the industry is facing, this study aims at reaching key findings about the potential effects of a possible customer service digitalization via chatbots, thus enriching previous literature on this topic and giving managerial recommendations to telecom companies investing in virtual service agents.

2.6. Conceptual framework

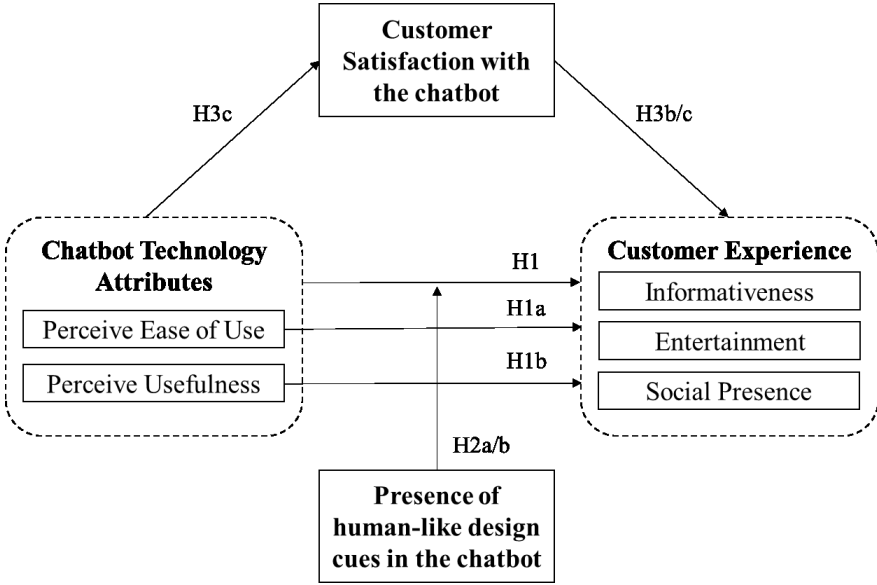


Figure 4 - Conceptual Framework

3. METHODOLOGY

This chapter presents and explains the methodology used to answer the research questions and to test the hypotheses defined in the second chapter. The research approach will be defined, followed by a detailed explanation of the primary data collection approach through the following subtopics: procedure and data collection, materials and survey structure. Lastly, a comprehensive description of measurement and data analysis methods is presented.

3.1. Research approach

The main goal of this dissertation is to understand the effect of a brand representative chatbot on customer experience. The selected approach to attain this goal is the deductive one by developing hypotheses and a research strategy designed to test the hypotheses (Saunders, Lewis, & Thornhill, 2011).

In this approach the first step was to review the existing literature and previous research about customer experience, conversational agents, customer satisfaction and human-computer interaction. This step allows an identification of possible factors impacting the effect that is going to be studied and develop hypotheses based on the findings. The second part consists in formalizing the research by putting together the conceptual framework, establishing a clear and structured vision of the factors that need to be investigated. It follows the next stage which is to confirm or reject the hypotheses. Explanatory research strategy was followed with the specific aim of establish causal relationships between the studied variables (Saunders et al., 2011), through quantitative methods. The previously mentioned factors were transformed to become researchable items, and then the data was collected and analyzed.

3.2. Survey Questionnaire

In order to answer research questions, primary data was collected and analyzed in the form of an online survey questionnaire. This method was chosen due to the possibility of collecting large amount of data in a small amount of time. Moreover, the survey can be used for both research types: descriptive and explanatory. The first consists in identifying and describing the variability in different phenomena through opinion and attitude questions. The second, explanatory research, enables the investigation and explanation of the relationships between variables, in particular cause-and-effect relationships (Saunders et al., 2011)

3.2.1. Procedure and data collection

An online survey questionnaire has been distributed in social media, mainly via Facebook and Instagram between the 25th of April 2019 and 6th May 2019. The survey was designed in

Qualtrics and it conveyed 2 distinct scenarios that were randomly assigned to all participants that had to answer to 19 questions in total. Snowball sampling and convenience sampling were used to contact participants to partake in the online questionnaire. Since there was no specification on the targeting sample, both Portuguese and English versions were available. To encourage participation, a gift card from a technology retailer was randomly awarded to one of the participants who provided the email at the end of the survey.

In total 232 responses were collected, of which 151 were considered valid. This may be explained by some technical problems with the IOS system when opening the provided links in the survey, plus the data privacy concern that lead to some dropouts when the chatbot asked for the contact number and the address, even though anonymity and confidentiality were assured in the beginning of the survey and right before the interaction. Additionally, the platform used to develop the chatbot required that the Facebook Messenger app was updated to the last version. When the app was not updated, respondents were redirected to a page to update the app. Nevertheless, the scenarios were evenly assigned to the respondents and finally led to a distribution of 70 respondents exposed to the machine-like chatbot stimuli and 81 respondents to the human-like chatbot stimuli.

3.2.2. Materials

3.2.2.1. Stimuli – Human-like chatbot vs. Machine-like chatbot

In order to study the effect of the chatbot on the customer experience and the impact that humanlike design cues and satisfaction gave on this relationship, a stimulus of a chatbot was randomly presented to participants. There were thought on three possible ways of introducing the stimuli were considered. The first was to ask respondents to answer statements about experience and satisfaction based on previous experiences with a chatbot, which had to be recalled on that moment. In this option, only those who had interacted with a chatbot before could be considered as valid answers, and each person would evaluate a different interaction/brand based on their experience, making it inconsistent. The second way was presenting a screenshot or a video of a chatbot interaction. It would mitigate some risks in relation to the previous option, but participants wouldn't experience the interaction by themselves and in the end, they would be evaluating the experience of someone else. The third, and chosen one, is the implementation of a real chatbot in which participants who have a Facebook or Facebook Messenger account had the opportunity to interact and experience how it really works, solving a real problem within the telecommunications sector. Introducing the

real chatbot as stimuli (Figure 5, Figure 6) was believed to be the best manner of collecting more authentic and real data about satisfaction and experience.

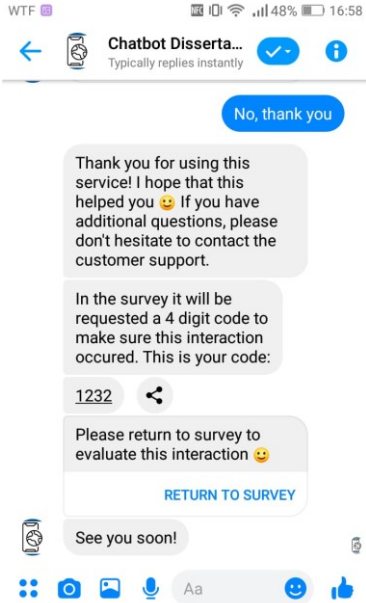
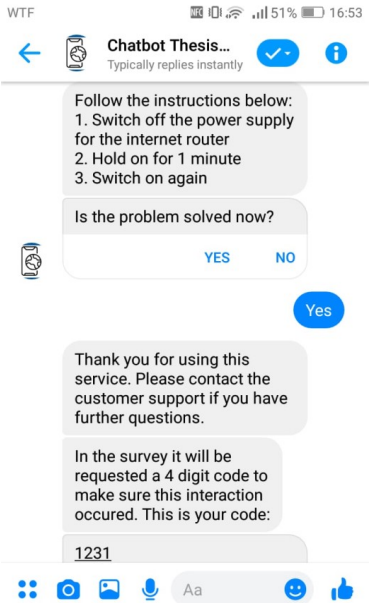


Figure 5- Machine-Like Chatbot (ChatbotX) Figure 6 - Human-like Chatbot (Ema)

3.2.2.2. Chatfuel platform

The chatbot was created in chatfuel.com, a platform that enables the creation of chatbots without needing programming skills (Figure 7). This is the leading platform for building bots on Facebook Messenger, used by brands as Adidas and Lego. The main advantage is the possibility of creating free unlimited chatbots in the same account. Four chatbots were created: machine-like chatbot in Portuguese and in English, and human-like chatbot also in both languages. The intelligence flow of the agents consists of a simple Q&A, menu-based and word-based rules. In order to structure the interaction, conversational flow diagrams were created for each type (Appendix 2).

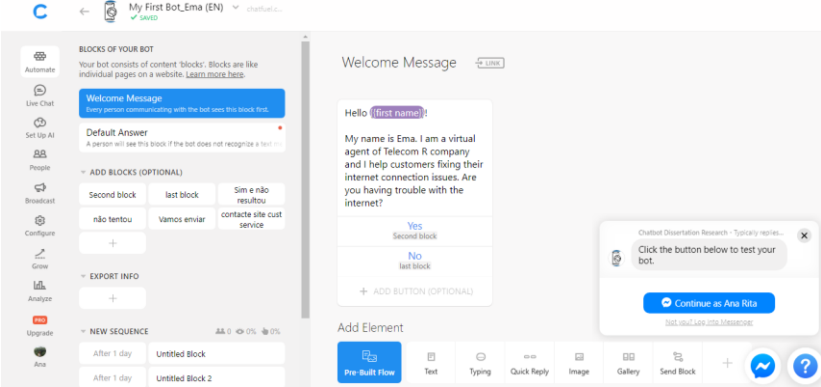


Figure 7- Chatfuel platform: dashboard

3.2.2.3. Human-like design cues

The anthropomorphic cues applied in the chatbot design and the differences between the two different stimuli are summarized in the table 2. It is based on the Araujo' (2018) research previously mentioned in the literature review. Considering that the focus of this dissertation is on exploring the effects of interacting with disembodied agents, the agents had non-embodied profile pictures, and interacted with participants only through text. Additionally, to eliminate possible brand bias regarding the telecom company, no brand name was mentioned.

	Human-like chatbot	Machine-like chatbot
Name	Human name (Ema)	Non-human name (ChatbotX)
Language	Informal, including emojis	Formal/computer-like language
Open&close the dialog	Dialogical cues associated with human-human communication (Hello; Goodbye)	Dialogical cues associated with human-computer interaction (Start; Quit)

Table 2- Differences in stimuli presented to respondents

3.2.3. Survey Questionnaire - structure

The survey questionnaire is composed by 3 distinct parts (Appendix 1). The first part is designed to acquire demographic information. Still on this part, questions related to mobile phone usage, including messaging apps used, and technology adoption and interest were asked. The last two questions in this part were related to the knowledge about chatbots and a question to determine if the respondent had previously interacted with a chatbot.

In the second part the stimuli (machine-like chatbot vs. human-like chatbot) is presented in a randomized way. Before that, a brief definition of a chatbot was presented to clarify those who were not aware of this technology. Moreover, respondents were asked to imagine the scenario they are at home and having trouble connecting the internet. Additionally, their telecom provider company has a new chatbot that resolves customers' internet connection issues and they are willing to try it. After this introduction, a link to a Facebook page is seen with a screenshot indicating where to click ("Send a message") in order to interact with the chatbot. It follows the interaction occurring in the Facebook Messenger, where an advice was given to respondents about a possible resolution of internet connection and lastly, if they answered that the problem persists, a contact number and address were asked so that a certified technician could fix the problem in their home. At the end of the interaction, the chatbot gives a 4-digit code to every participant to guarantee the interaction occurred completely, and a button saying

“Return to survey” appears to redirect respondents to the survey questionnaire. Only those who give the right code were considered as valid answers.

In the last part, already in the survey questionnaire, statements were presented for chatbot evaluation purposes. In the last question, it was given the space for respondents insert their e-mail if they desired to participate in the give-away (monetary incentive), which was not mandatory. On average the survey took 6 to 7 minutes to answer depending on the chatbot interaction flow.

3.2.4 Measurement

In the first part of the survey the measured variables included demographics (gender, age, nationality, level of education and occupation), mobile phone usage (hours per day), new technology adoption and interest and finally, chatbot knowledge and previous experience. After the interaction occurred, three constructs – perceived technology attributes, customer’s satisfaction and online customer experience - were measured.

The first construct to be evaluated was Technology Attributes, with two distinct features – Perceived Usefulness and Perceive Ease of Use – with 4 items each adapted to the telecom industry. This scale was adapted from Chen, Gillenson, & Sherrell, (2002) and Van Eeuwen (2017) where the Technology Acceptance Model (TAM) model was studied, explaining and predicting user behaviors in the business-to-consumer electronic commerce context (Chen et al., 2002).

In order to access the respondents’ satisfaction with the agent, a scale from Chung et al., (2018) was adapted and used. There were several options in previous researches to measure satisfaction, however this was the more appropriate to this study it already refers to the satisfaction with the agent, accessing for example if expectations were met and whether the chatbot did a good job.

The next and last measured construct was Online Customer Experience (OCE), which consists of three dimensions: Informativeness with 2 items, Social Presence with 4 items and Entertainment with 3 items. As previously said on the second chapter, the fourth dimension of OCE proposed by Bleier et al. (2019) – sensory appeal – was removed from this survey since the designed stimuli/chatbot didn’t provide any image, video or sound that could evoke sensory feelings.

All the items were adapted from previous literature and measured in a 7-point Likert Scale, ranging from 1="Strongly Disagree" to 7="Strongly Agree" (Table 2). Control variables like demographics (i.e. gender, age, nationality and occupation) were collected along with the questions related to Mobile phone, messaging apps usage and New technology interest and adoption.

	Construct	Scale	Number of Items	Literature
Online Customer	Satisfaction	7-point Likert Scale	4	adapted from Chung et al 2018
	Informativeness		2	adapted from Luo 2002
	Entertainment		3	adapted from Hausman and Siekpe 2009
	Social presence		3	adapted from Gefen and Straub 2003
Technology attributes	Perceives Ease of Use		4	adapted from Chen, Gillenson, & Sherrell, 2002 and Van Eeuwen, 2017
	Perceived Usefulness		4	

Table 3- Measurement Model

3.2.5. Data Analysis

All the quantitative data collected was analyzed in the SPSS software. After cleaning the data, i.e. removing invalid answers and deleting outliers, both Frequencies and Descriptive Statistics were performed to characterize the sample, including topics such as demographics, mobile phone usage habits, new technology interest and adoption and lastly, chatbot knowledge and experience. Additionally, the reliability of constructs was assessed by analyzing Cronbach’s Alpha coefficient within the two groups. After that, in order to identify the effect size of the relationship between dependent and independent variables, a correlation analysis was conducted. An independent sample t-test was also applied to understand if there is a difference in the impact of the Human-like and Machine-like chatbot on the dependent variable – Customer Experience. Relations between variables are often more complex than simple bivariate relations between a predictor and a criterion (Fairchild & MacKinnon, 2009), therefore a multiple mediation analysis was conducted in SPSS using the Macro PROCESS (version 3.3) (Hayes, 2013) in order to test indirect effects between the dependent and independent variables. The Hayes’ Model 5 has been tested which includes a Moderator (W) and a Mediator (M) (Figure 8). On one hand, the moderator (W) normally explains how the independent variable (X) affects the dependent variable (Y) concerning different values of the moderator itself. On the other hand, a mediator (M) explains the indirect effect of and X on Y and as a consequence helps to explain the studied relationship between variables X and Y (Taylor, Mackinnon, & Tein, 2008). In this dissertation, the X and Y are the technology attributes of a chatbot (PU,

PEU) and the online customer experience correspondingly, the moderator of this relationship is the presence of humanlike design cues in the chatbot and lastly, the mediator is the satisfaction with the agent.

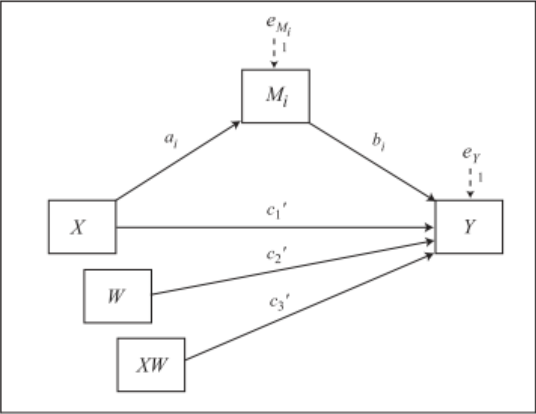


Figure 8- Model 5 from Hayes's PROCESS (version 3.3)

4. RESULTS

The next chapter aims at presenting the results from the data analysis of the quantitative data collected with the online survey questionnaire. The first topic consists in the sample characterization, followed by the reliability measurement and manipulation check. Lastly, a description and analysis of the statistical tests of the proposed hypotheses are presented, resulting in their acceptance or rejection.

4.1. Sample Characterization

4.1.1. Demographics

From all the participants that answer the entire questionnaire, 18 answers had been excluded as the 4-digit code was not the provided by the chatbot, obtaining a sample of 151 respondents. The demographic characteristics of these respondents is represented in the table 4, which is divided by the two groups (Machine-like stimuli and Human-like stimuli) approximately evenly distributed.

		Human-like chatbot	Machine-like chatbot	Total
Gender	Male	42,0%	37,1%	39,7%
	Female	58,0%	62,9%	60,3%
Age	13-17	0,0%	1,5%	0,7%
	18-24	86,4%	85,7%	86,1%
	25-34	4,9%	5,7%	5,3%
	35-44	3,7%	5,7%	4,6%
	45-54	4,9%	1,4%	3,3%
Nationality	PT	93,8%	92,9%	93,4%
	Other	6,2%	7,1%	6,6%
Occupation	Student	45,7%	38,6%	42,4%
	Working Student	11,1%	21,4%	15,9%
	Unemployed	6,2%	2,9%	4,6%
	Employed	37,0%	37,1%	37,1%
Education level	Less than Highschool	0,0%	1,4%	0,7%
	Highschool	45,7%	31,4%	39,1%
	Bachelor Degree	40,7%	52,9%	46,4%
	Master Degree/MBA	13,6%	14,3%	13,9%
Total	#Respondents	81	70	151

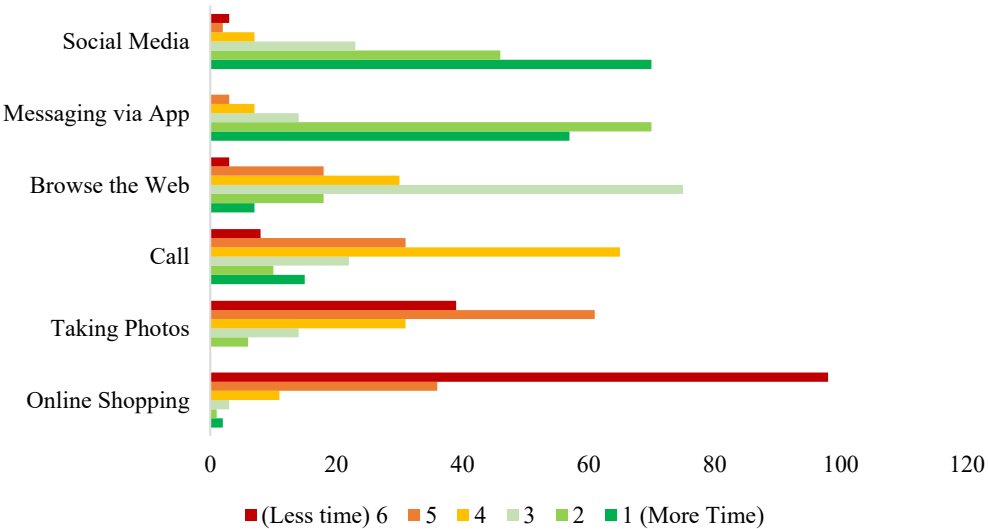
Table 4 - Respondents' Characteristics

In terms of demographics characteristics, the sample is mainly represented by people of the feminine sex (60%) aged between 18 and 24 (86%) with Portuguese nationality (93%). This

may be explained by the convenience and snowball sampling method used. Moreover, 60% of respondents are highly educated (i.e. finished bachelor’s degree or higher). In terms of occupation, 37% are employed and 42% are still studying. With these results, the sample cannot be considered representative of the population due to the lack of diversity. Despite this, the results in table 3 shows that the demographics of the respondents of the two groups are similar, indicating homogeneity of groups.

4.1.2. Mobile phone usage, including messaging apps

When it comes to mobile phone usage, only 3% spend less than 1 hour per day, while most of respondents (36%) spend between 2 to 3 hours daily, a quarter of them spend between 3 to 4 hours and 21% of respondents spend more than 4 hours per day on their mobile phones. The average of the sample is 3,5 hours per day. To understand the importance of texting in the instant messaging platforms, participants were asked to rank the activities according to their spent time on mobile phones (Graphic 1). Not surprisingly, social media occupies the first place, followed by messaging via app and browsing the web. Although social media is still the preferred activity to spend time on, the difference is minimal since 46% ranked social media first against 37% ranking messaging via app in first, reinforcing the justification of the chosen platform to test the chatbot – Facebook Messenger. Additionally, respondents were asked to select among a group of existent Instant Messaging platforms which they are active at. The most expressive results go to WhatsApp and Facebook Messenger of which 96% and 95% of respondents were active on these platforms, correspondingly.



Graphic 1 – Mobile phone activities based on time expenditure

4.1.3. New technology Interest and Adoption

To better understand the level of interest in new emerging technologies as well as the involvement in new technology adoption, respondents rated both items on a scale from 1="Not interested at all"/"Not involved at all" to 5="Highly interested"/"Highly interested" (Table 5). Most respondents show a high or a very high level on both interest in new emerging technologies and involvement in new technology adoption. However, there are several facts to consider: the mean between interest and adoption is different (4,11 vs. 3,89). This difference reflects the importance of distinguish attitudes and behavior, as defended in the TAM model previously mentioned. Moreover, once the most representative group of the sample is aged between 18 and 24 years old, it was expected that the interest and adoption of new technology is high. Besides the significant growth in technology adoption in recent years among older generations (Jiang 2018), millennials and younger generations are still leading tech. adoption due to their ability to use, apply and understand different technologies quickly (Mcavoy, 2016).

	New emerging technologies (level of interest)	New Technology adoption and usage (involvement)
Low	2,6%	5,3%
Medium	19,2%	27,2%
High	42,4%	40,4%
Very High	35,8%	27,2%
Mean	4,11	3,89
Std. Deviation	0,805	0,865

Table 5 -Respondents' level of New Technology Interest and Adoption

4.1.4. Chatbot knowledge and experience

The level of chatbot knowledge was also investigated (Table 6). Two questions were made, the first regard the general concept of a chatbot, and the second related to the functionality understanding - both using 5-point scale (1="Very Low"; 5="Very High"). When self-evaluating the general concept of a chatbot, only 10% consider having high knowledge, contrasting with 15% stating a very low knowledge and almost a third of respondents (28%) stated they have low knowledge. In terms of functionality understanding, 16,6% know very little and 27,8% have low level of knowledge. Comparing the means of the two items, both are below average (2,88 and 2,85), even though some brands already use this technology as customer service agent in Portugal.

Additionally, when accessing for previous experience, 61,6% of respondents have already interacted with a chatbot in the past, 19,2% have never interacted and the remaining 19,2%

couldn't tell. At this point in the survey no definition or stimuli was given to participants, explaining this relatively low percentage.

	General Concept	Functionality Understanding
Very Low	15,2%	16,6%
Low	28,5%	27,8%
Medium	19,9%	21,2%
High	25,8%	23,2%
Very high	10,6%	11,3%
Mean	2,88	2,85

Table 6 - Respondents' Knowledge about chatbots (concept and functionality)

4.2. Reliability Measurement

Even though all items used in the survey were adapted from previously literature, a Cronbach's Alpha was conducted to measure the internal consistency of the constructs with more than one item, providing a measure of the scales' reliability used among this sample. Before being able to run the CA test, the negative items (disagreement) had to be recoded into positive (agreement) to make them comparable. The results indicate a Cronbach's Alpha reliability coefficient of more than 0.7 in every construct, in most cases the value is close to 0.9, meaning the items are very reliable to predict the variable (Hair, Black, Babin, & Anderson, 2010). The only exception was the Perceive Ease of Use in the machine-like group with a coefficient of 0,68. In order to improve the construct reliability, one item was removed resulting in a new acceptable coefficient of 0,737. The Table 7 summarizes the Cronbach's alphas for the constructs used.

Construct	Human-like	Machine-like	Number of items
1. Customer Experience	0,850	0,910	8
1.1. Informativeness	0,927	0,870	2
1.2. Entertainment	0,889	0,887	3
1.3. Social Presence	0,875	0,916	3
2. Satisfaction	0,889	0,907	4
3. Technology Attributes	0,822	0,823	7
3.1. Perceive Ease of Use	0,811	0,737	3 (1 removed)
3.2. Perceive Usefulness	0,866	0,838	4

Table 7 - Cronbach's alpha for constructs used

4.3. Manipulation Check

An independent sample t-test was conducted to check if the manipulation of the stimuli was successful. Since all the participants exposed to a chatbot evaluated the Social Presence level

(OCE dimension), the independent sample t-test is the appropriate to access if the two agents are significantly different. The results demonstrate that the means of the two variables are significantly different ($t(130.915)=2,848, p<.05$). This indicates that the human-like agent has higher levels of social presence (obtaining a mean of 4.98 on a 7-point Likert scale, assuming that 7 expresses the highest and 1 the least level of SP) when compared with the machine-like agent (obtaining a mean of 4.29 on the same scale). Hence, it can be concluded that the manipulation was successful.

4.4. Results from the Hypotheses Testing

4.4.1. The relation between technology attributes and the customer experience

A correlation analysis was performed in order to test the validity of H1a and H1b. The hypotheses suggest the existence of a positive relation between perceived usefulness and experience, likewise between perceived ease of use and experience. The statistical test used was Pearson Correlation to measure the strength and direction of linear relationship between pairs of metric variables. In terms of perceived ease of use, the results indicate a significant and positive relation with customer experience, including the three dimensions - informativeness, entertainment and social presence ($r=0.291, p<.001$). Thus, H1a is supported by data. Similarly, the same statistical test was applied to test the relation between perceived usefulness and customer experience, showing also a statistically significant correlation ($r=0,591, p<.001$). Hence, H1b is also confirmed. However, it is important to denote that while the correlation of PEU and experience is small ($r<.3$), the correlation of PU and experience is considered strong ($r>.5$).

4.4.2. The influence of level of satisfaction with the agent

A Pearson correlation was conducted in order to test if the technology attributes of a chatbot (PU and PEU) have a positive correlation with the satisfaction with the agent (H2a). Before conducting the test, the two technology attributes were recoded into one single variable. The results support the hypothesis H3a, showing a statistically significant, strong correlation between the tech. attributes and the satisfaction with the chatbot ($r=0.647, p<.001$). Additionally, it was proposed that a higher level of customer satisfaction with the agent has a positive impact on customer experience (H3b). Prior applying the statistic test, the customer experience dimensions were aggregated being recoded a single variable - customer experience. The Pearson correlation test indicates also a statistically significant and strong correlation between satisfaction and experience ($r=0,694, p<.001$), confirming the hypothesis H2b.

4.4.3. Mediation and moderation model – PROCESS Model 5

In order to test the hypotheses related to the mediator – satisfaction with the chatbot – and the moderator – presence of humanlike design cues – the Model 5 of the PROCESS (version 3.3) developed by Hayes (2013) was applied with a 95% level of confidence where 5000 bootstrap samples were considered. The matrix procedure can be found in Appendix 5. The results from this regression-based analysis show that all paths from the model are significant (Table 8 and Figure 9) therefore the significance of the direct effects is established, with the exception of the interaction between Human-like design cues (W) and the TA (X) ($p>0.05$). As the interaction parameter is not significant, the presence of human-like design cues cannot be considered as a moderator in this model, rejecting the H2a. As a result, the H2b stating the chatbot TA have a higher effect on customer experience if the level of humanlike design cues is high is also not validated, once one cannot say anything about moderation by qualitatively integrating a pattern of results of hypothesis tests for conditional effects (Hayes, 2013). I.e. this hypothesis could only be tested if the interaction $X*W$ was statistically significant.

Path	Coefficient	df	t-value	p-value
a1	0.94	149	10.3551	,0000
b1	0.56	146	7.0316	,0000
c1'	0.34	146	2.9377	,0038
c2'	0.32	146	2.5655	,0113
c3'	-0.24	146	-1.3477	,1798

Table 8 - Model 5 Statistics

In terms of mediation, the chatbot technology attributes (PEU, PU) predicts the satisfaction with the chatbot, likewise the satisfaction with the chatbot significantly predicts customer experience. Moreover, results indicate there is a significant mediation since the indirect effect is significantly different from zero (i.e. bootstrap values do not cross zero). Although the significance, satisfaction with the agent can only be considered a partial mediator since the direct effect of X (tech. attributes) on Y (customer experience) is also significant ($b=0,34$, $t(146)=2.94$, $p<.005$).

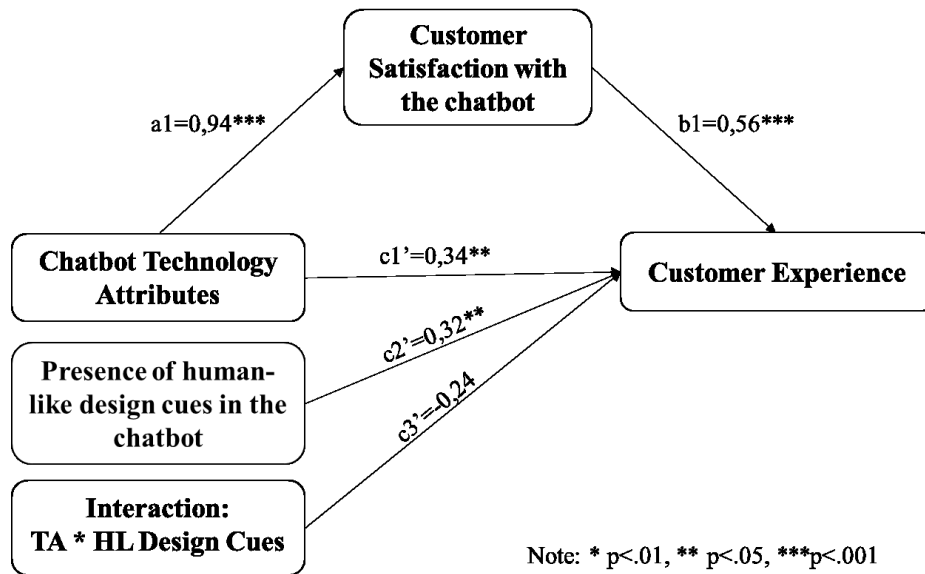


Figure 9 - Model 5 from Hayes' PROCESS with regression coefficients

4.5. Hypotheses Testing overview

The results indicate that both H1 and H3 are significant and validated. On the contrary, the hypothesis 2a and 2b cannot be confirmed due to non-significance. The figure 10 summarizes the results from the fourth chapter.

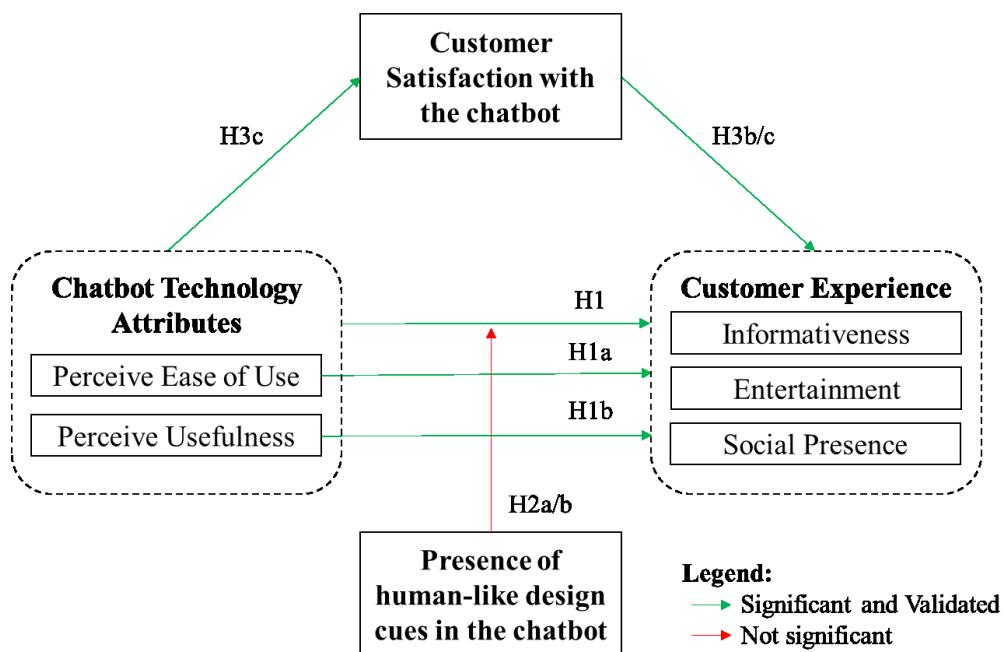


Figure 10 - Conceptual Framework with hypothesis results

5. CONCLUSIONS AND LIMITATIONS

The aim of this study was to investigate the impact of a chatbot technology attributes on customer experience and how this relationship can be explained by the level of human-like cues in the chatbot and the customer satisfaction with the chatbot. A cross-sectional quantitative online survey was conducted to analyze the problem statement and generate insights for marketing managers in the telecom sector. The following chapter presents and discusses the main findings of the study and draws final conclusions. Lastly, academic and managerial implications will be presented, followed by the research limitations and recommendations for future research on the topic.

5.1. Main Findings & Conclusions

The main goal of this dissertation was to understand the chatbot effect on customer experience, through the analysis of some perceived technology attributes, and investigating other factors that could impact this relationship in the telecom industry. This is particularly important for two reasons: the telecom industry is lacking differentiation in the service provided by all companies, alternatively, differentiation could be achieved by providing a superior customer experience to the customers. The second reason is related to the trend of using chatbots in the customer service areas, not always achieving the quality standards that customers are expecting, resulting in disappointment. Thus, the complex relationship between the customer experience and chatbot attributes were investigated.

5.1.1. Chatbots technology opportunities in the telecom industry

The scope of this research focused on the chatbot technology, in the context of telecom industry. Therefore, the first research question aimed at combining two distinct topics: the first – to understand this technology and the possible opportunities within its usage, and the second – to understand how the telecom sector is behaving in general, investigating challenges and possible strategies to fight them. Thus, the ultimate goal with this research question was to understand if one specific challenge in the telecom industry could be surpassed or transformed into an opportunity with the chatbot adoption.

#RQ1: What is a chatbot? What are the opportunities this technology generates in a telecom business?

To answer this research question, secondary data was collected in the form of academic articles and consultancy companies reports. Responding to this RQ, it can be stated that a chatbot is a software that responds to natural language input and attempts to hold a conversation imitating

a real person (Reshmi & Balakrishnan, 2016). When looking at the telecom panorama, customers are very unhappy with the service provided for various reasons reflecting the difficulty to retain those overtime. This situation could be resolved with a better customer support, since telecom companies with successful eCare strategies typically realize considerable benefits, not just in the form of lower costs, but also in the achievement of enhanced customer satisfaction, richer differentiation, and higher brand advocacy (Banfi et al., 2013). In summary, it is clear that the telecom customer support area can benefit from the chatbot implementation.

5.1.2. The Chatbot perceived Technology Attributes

The second research question, more specific to the problem statement resolution, is focused on the relationship between the perceived technology attributes of a chatbot and the customer experience.

#RQ2: What is the impact of a chatbot perceived technology attributes on customer experience?

The results indicate a positive and significant relationship between these variables. One of the most significant findings is the relative strength of the usefulness-experience relationship compared to the ease of use-experience relationship. The usefulness has a stronger positive impact in experience when compared with the ease of use. This conclusion is in line with previous research about technology acceptance and usage (David, 1989), founding that usefulness was significantly more strongly linked to technology usage than was ease of use. Answering the research question, the chatbot perceived technology attributes have a positive impact on customer experience, even though the provided benefits, when performing a task with the chatbot, contribute more for a better experience than the extent of effort to conclude it.

5.1.3. The impact of the Human-like design cues presence

The third research question is related to the moderator in the proposed model, focusing in the effect of the presence of human-like design cues in the chatbot in the relationship between the chatbot attributes and the customer experience.

#RQ3: How does the presence of humanlike cues in the chatbot impact the relationship between the chatbot perceived attributes and the customer experience?

Literature (chapter 2.3 – Agent-Mediated interaction) showed that presence of human-like characteristics could potentially moderate the relationship mentioned above. The regression-

based model indicates that the effect is not significant as expected. This means that the perceived easiness and usefulness, when the chatbot had human-like characteristics, did not lead to a better customer experience. In spite of this, when the manipulation check was performed (independent sample t-test), the two designed chatbots (human vs machine) were perceived differently in terms of social presence, with the human-like chatbot obtaining a higher rate as expected, being in line with Araujo (2018) research. Although social presence was one of the dimensions considered in customer experience, the cues applied to the chatbot were not enough/ significant to impact the relationship between chatbot technology attributes and customer experience. This may be explained by the fact that users are more comfortable with relatively more human-looking interfaces when the task involves socially sensitive topics (Lee, 2010). As the scope of this research was the telecom industry, the task setting (support with internet connection) lacked subject sensitivity.

5.1.4. The impact of the consumers' satisfaction with the chatbot

The fourth and last research question focus in a potential factor influencing the relationship between the chatbot attributes and experience.

#RQ4: How does the consumer's satisfaction impact the relationship between the chatbot perceived attributes and the customer experience?

The direct effects from perceived technology attributes on the satisfaction and from satisfaction on customer experience are significant and high, being in line with literature. The results from the correlation test indicates that the technology attributes have a positive impact on the customer' satisfaction with the chatbot. The effect is impressively high, with an almost linear relationship. In terms of the effect of satisfaction with the agent on customer experience, the effect is also significant but less strong.

The Model 5 from Hayes' PROCESS was used to test if the mediator is significant in the proposed model, resulting in the expected result – the customer' satisfaction with the chatbot is considered a significant mediator between the chatbot attributes and the customer experience. This implies that the customer satisfaction with the chatbot explains the relationship between the perceived chatbot technology attributes and the customer experience. In detail, the perceived technology attributes lead to a better customer experience because the level of satisfaction with the chatbot is high.

However, satisfaction can only be considered as a partial mediator, since the multiple regression model demonstrates that CE is not only explained by the indirect effect through the satisfaction but also by the direct effect of the perceived chatbot attributes.

5.2. Academic Implications

After extensively reviewing previous research in all topics related to the study at hand, it was noted that, although in past literature there has been a great effort to understand the impact of conversational agents on company outcomes and customer attitudes, most reviewed literature was limited to the embodied type (avatars). Similarly, when focused on disembodied context (chatbot), mainly comparisons between human-human and human-agent interaction as well as customer satisfaction were investigated.

There was a lack of literature validating the relationship between the perceived technology attributes of a chatbot and customer experience, in the telecom industry, as well as how customer satisfaction and anthropomorphic design cues impact this relationship. Therefore, this thesis contributes to the body of knowledge, by filling the gaps of previous research, recognizing the rise of this technological marketing tool and investigating its importance to the positive experience creation for all telecom customers.

5.3. Managerial Implications

Utilizing chatbot technology in the instant messaging apps is a relatively new marketing tool, and the results of this study provide telecommunication managers with information for strategic directions. The findings should be useful for companies considering implementing a chatbot and also for those who are struggling managing this technology. In this study strong evidence was provided that highly satisfied customers with the chatbot have a better experience, thus it is relevant to understand what satisfies these customers.

There is a clear importance of perceived technology attributes as a determinant of satisfaction and experience proven in this research, therefore both usefulness and easiness should be considered when designing a chatbot regardless of its function. However, usefulness has a higher impact on CE than ease of use. Accordingly, users are willing to cope with some difficulty of use in a system that provides critically needed functionality (David, 1989). As a result, telecom managers should focus in the chatbot functionality and make sure customers understand it and subsequently convey simplicity for customers to interact and solve a specific problem.

Contrasting research of Araujo (2018), the language type and the design cues in the chatbot influence the social presence levels. Yet, it doesn't influence the relationship between the perceived attributes and the customer experience. It follows that managers should focus in the chatbot attributes and functionality rather than conveying a human-like presence, if the goal is to provide a better experience.

In conclusion, implementing a chatbot is highly recommended not only to save costs in the call center support area, but also to improve the customer experience. However, there are some aspects that should be carefully thought in order to avoid undesirable outcomes, such as the chatbot simplicity and functionality for customers.

5.4. Limitations and Further Research

In spite of the valuable findings and insights described above, as this research is part of a master thesis, timeframe and resources are limited. Therefore, some limitations should be considered when interpreting results and conclusions.

Firstly, this study is subject to sample bias as respondents are mostly highly educated Millennials contacted by means of non-probability and snowball sampling. Additionally, the relatively small sample size implies limitations with regards to external validity resulting in the impossibility to generalize the findings to the entire population. Other audience and measurement instruments could be used in future research to gain a deeper understanding about chatbots and customer experience. Additionally, it is possible that a social desirability bias is present through the tendency of respondents to answer questions in a manner to be seen more favorably by others, rating their technology interest and adoption higher than it really is. The use of indirect questions such as projective techniques could have been used instead to mitigate this effect (Fisher, 1993).

Secondly, the absence of a control group in the survey questionnaire could not permit a meaningful evaluation of the real chatbot technology attributes effect on the customer experience, as planned at first. Future research should take this in considerations in order to minimize the effect of all variables except for the independent variable.

Thirdly, due to the visible lack of reliable data referring to the chatbot technology, the literature review subchapter 2.2 was developed based on academic articles, consultancy reports but also on some blog articles written by experts in the subject. Furthermore, some of the statistics presented about chatbots and brand app fatigue were studies of the US population. While the last point is less problematic since the population is being considered more and more globalized,

the first point can affect the applicability of the insights. However, it is relevant to mention that all the hypotheses were developed based on the high-quality academic articles.

Lastly, both machine and human types of chatbot designed to this study could only be exported to the Facebook Messenger, where participants were asked to complete a task and evaluated the experience with a fictitious online telecommunications company. Even though this design aimed at maximizing the validity of the study, future research should refine these results by accessing how conversational agents may affect the customer experience of actual companies, to which consumers may already have preexisting expectations and attitudes (Araujo, 2018).

In general, the chatbot technology is a recent field of study and to overcome some of the mentioned limitations, future research should be conducted. Since the included variables this study only explains the variance of customer experience by 53%, future research could include more attributes variables to extend this model. Although the importance of the customer experience defended by all kinds of research, it is known that companies seek to increase profits, and even though the experience itself is related with loyal relationships, a behavior variable (e.g. purchase intention) should be studied, in order to give tangible and practical results to company managers. Moreover, this research should be extended to other industries setting, since the conclusions drawn within this telecommunications example cannot be generalized.

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7. APPENDICES

Appendix 1 - Survey questionnaire items

 CATOLICA LISBON BUSINESS & ECONOMICS

English ▾

Dear participant,

Thank you in advance for filling in this survey for my Master Thesis. There are no right or wrong answers in this survey and your responses will be treated anonymously. Please read the questions carefully and answer truthfully.

This survey contains 3 parts:

- 1) Questions about technology adoption and smartphone usage and demographics
- 2) A chatbot simulation in Facebook Messenger, in which you need to have an account to complete the task
- 3) Return to survey and evaluate the interaction with the virtual agent.

If anything is not working well or if for any reason you are not able to finish the three parts please let me know! Only the complete answers are valid to the study.

As a reward for your time, I will give-away a 15€ Gift Card from FNAC. At the end of the survey you can enter your email for a chance to win.

Thank you again!
Ana Rita Quintino

→

English ▾

What is your gender?

Male

Female

What is your age?

Under 12 years

13 - 17 years

18 - 24 years

25 - 34 years

35 - 44 years

45 - 54 years

55 - 64 years

65 years or older

What is your nationality?

Portuguese

German

Italian

Spanish

French

Other

What is your occupation?

Student

Working Student

Unemployed

Employed

Retired

What is the highest education level you have received?

Less than high school degree

Highschool graduate or similar

Bachelor Degree

Master Degree/ MBA or similar

Doctoral Degree/ PhD

→

English

How much time do you spend on your mobile phone on a daily basis? (approx.)

Less than a hour

Between 1 and 2 hours

Between 2 and 3 hours

Between 3 and 4 hours

More than 4 hours

Please rank the follow activities according to the time spent on your mobile phone.

Messaging via app

Browse the web

Social media

Calling

Online shopping

Making photos

What messaging apps do you use?

None

Whatsapp

Facebook Messenger

WeChat

QQMobile

Skype

Snapchat

Viber

Telegram

LINE

How would you rate your level of interest in new emerging technologies? (where 1 = Not interested at all; 5 = Interested a lot)

1

2

3

4

5

How would you rate yourself in terms of new technology adoption and usage? (where 1 = Not involved at all; 5 = Involved a lot)

1

2

3

4

5

How would you rate your knowledge of chatbots in instant messaging apps?

	None at all	A little	A moderate amount	A lot	A great deal
General concept of chatbot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Functionality understanding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Have you interacted with a chatbot before?

Yes

No

I can't tell



English

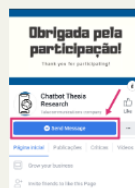
Now you are going to interact with a chatbot - an artificial agent designed to simulate intelligent conversations with humans.

Imagine the following scenario: You are at home and you are having trouble in connecting the internet. Additionally, your telecom provider company has a new chatbot that resolves customer network issues and you are willing to try it.

Please remind that this is a fictitious scenario and any personal data provided to the chatbot will not be used for other purposes besides this specific study.

Copy the link below and open it in another page - it will redirect you to the chatbot. After that, when in the facebook page, please click on the blue button that says "Send Message" to start. (see the picture below)

<https://www.facebook.com/Chatbot-Thesis-Research-1071498436372365/>



English

Please write down the 4 digit code the chatbot gave you at the end of the chat.



English ▼

Please indicate your level of agreement with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This chatbot would make easier to communicate issues to the telecom provider.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This chatbot enables me to communicate issues more quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This chatbot enables me to communicate issues more effectively.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This chatbot would be useful for resolve telecom customer support issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think it was easy to use this chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning to use this chatbot would be easy for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would find it difficult to use this chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It would be easy for me to become skilful at using this chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am satisfied with the chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot did a good job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The chatbot did what I expected.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am satisfied with the experience of talking with the chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statements regard the interaction you just experienced.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The information I obtained from the chatbot is useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think the information obtained from the chatbot is helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your level of agreement with the following statements regard the interaction you just experienced.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There is a sense of human contact in the chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a sense of human warmth in the chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a sense of human sensitivity in the chatbot.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The interaction with the chatbot was:

Not Fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Fun
Not Enjoyable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Enjoyable
Not at all Entertaining	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very Entertaining

English ▼

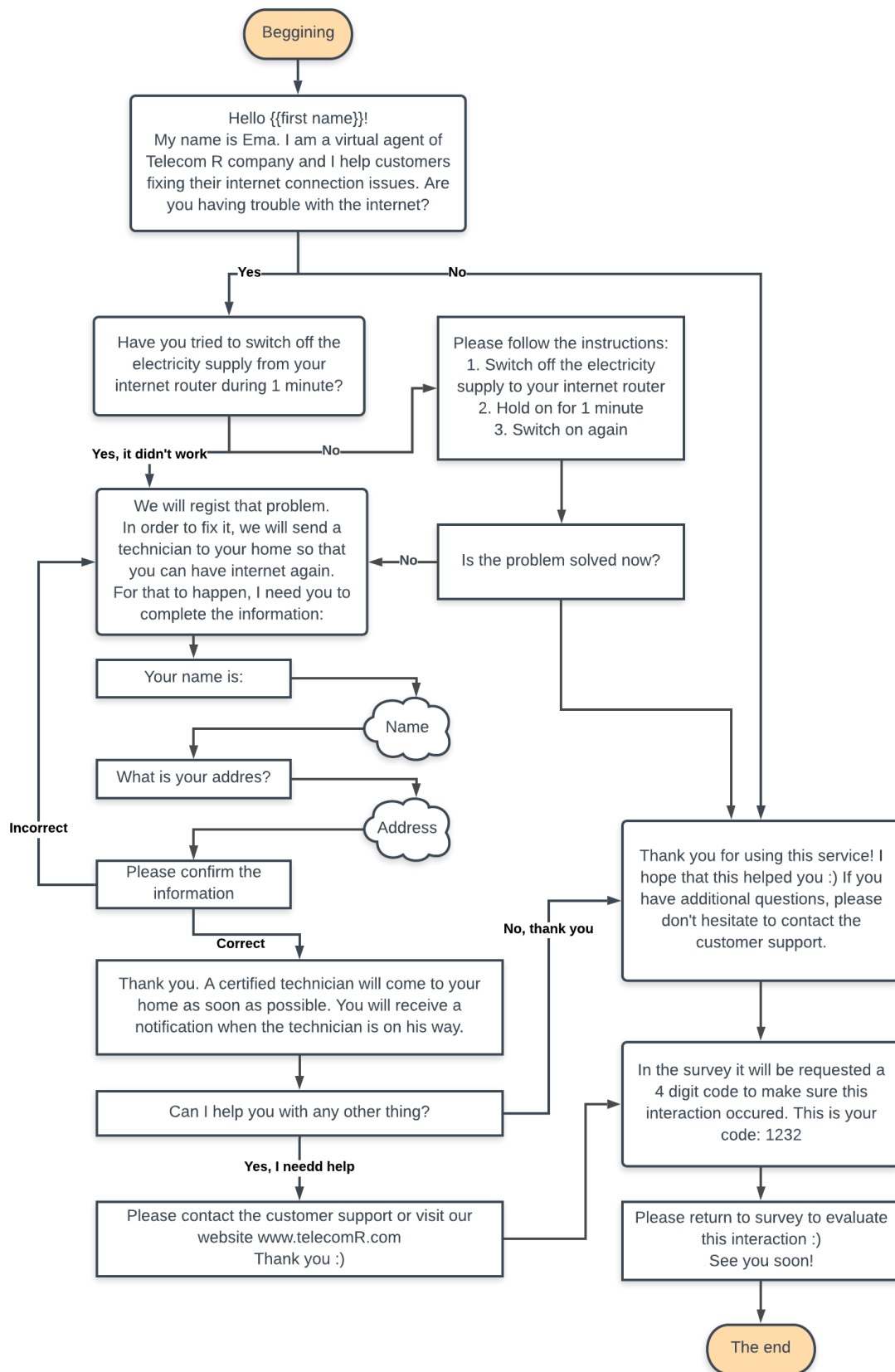
The survey is now over! Click on the "next" button to make sure your answer is recorded. Thank you so much, it means a lot to me.

I would like to remind you that your answers and the information provided to the chatbot are going to remain anonymous and confidential.

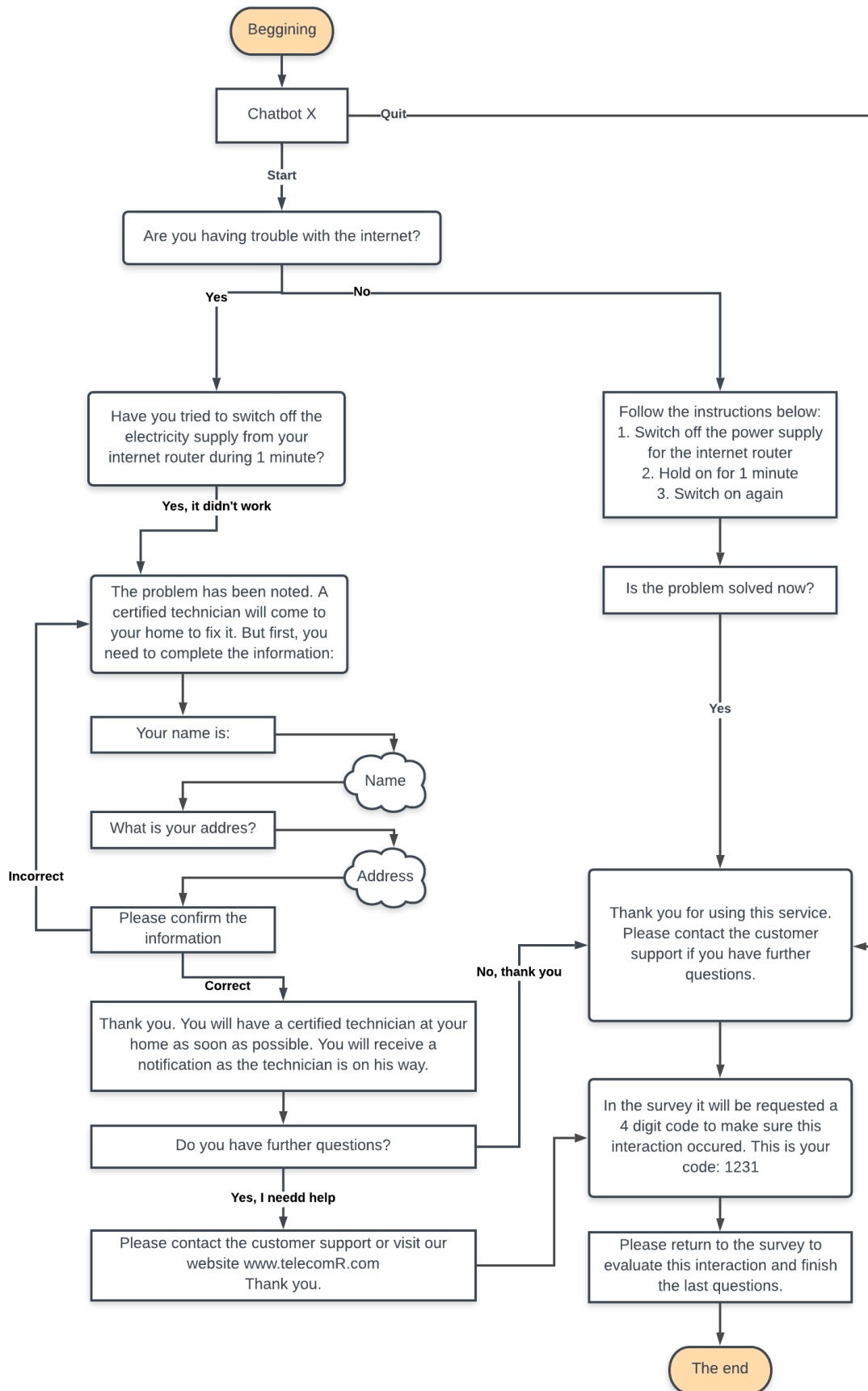
Please enter your email if you wish to participate in the give-away of the 15€ voucher to use on FNAC.

Appendix 2 - Conversational Flow Diagrams

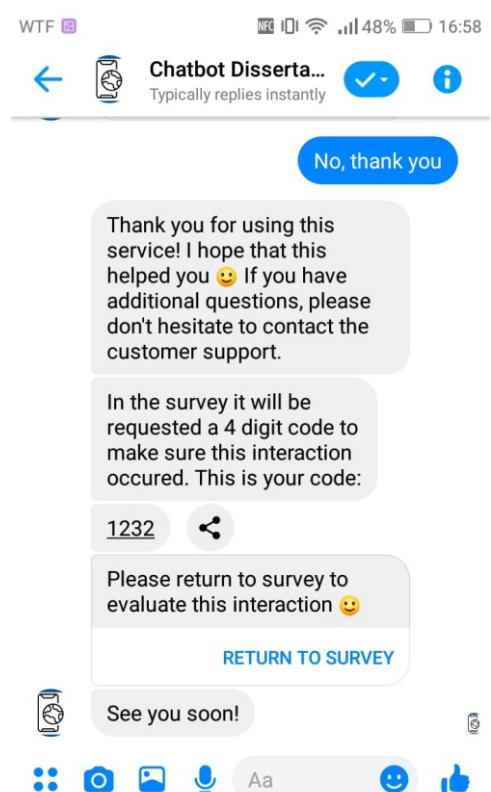
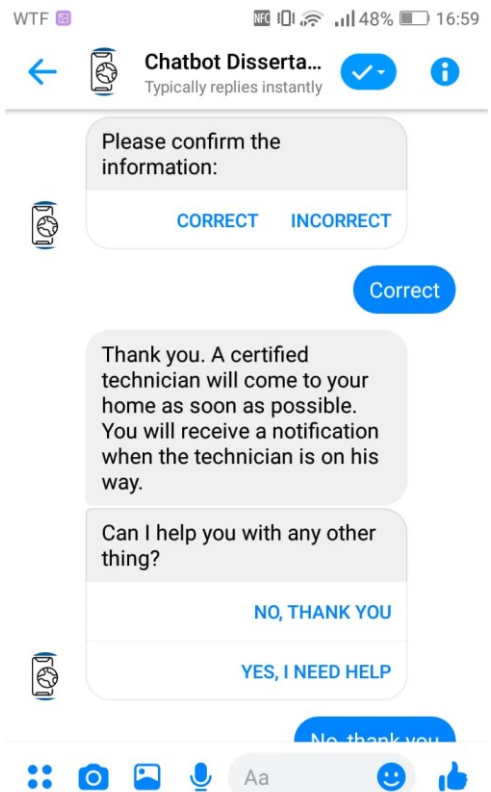
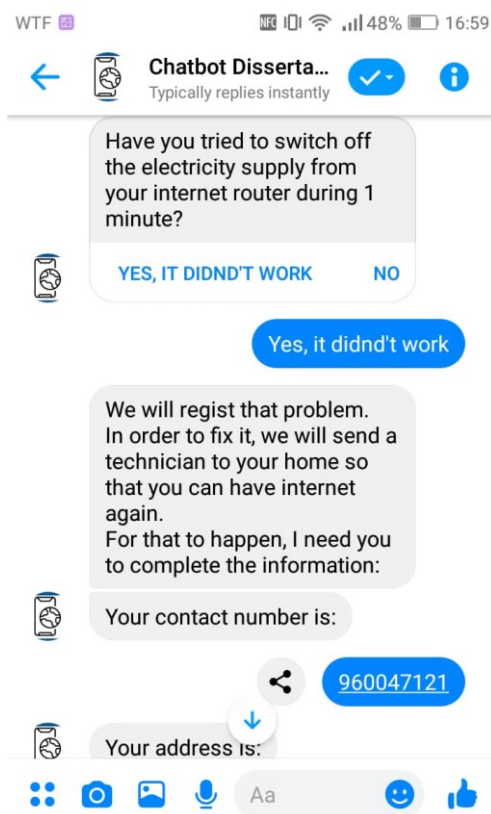
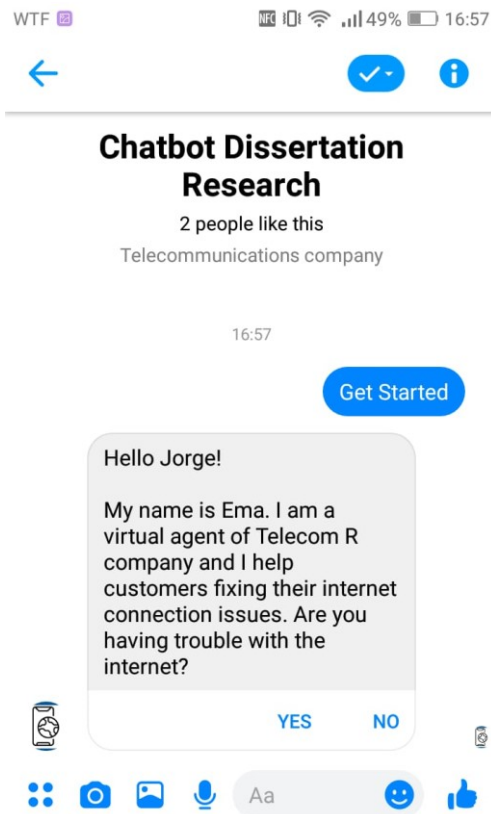
a) Ema (link: <https://www.messenger.com/t/283668579247971>)



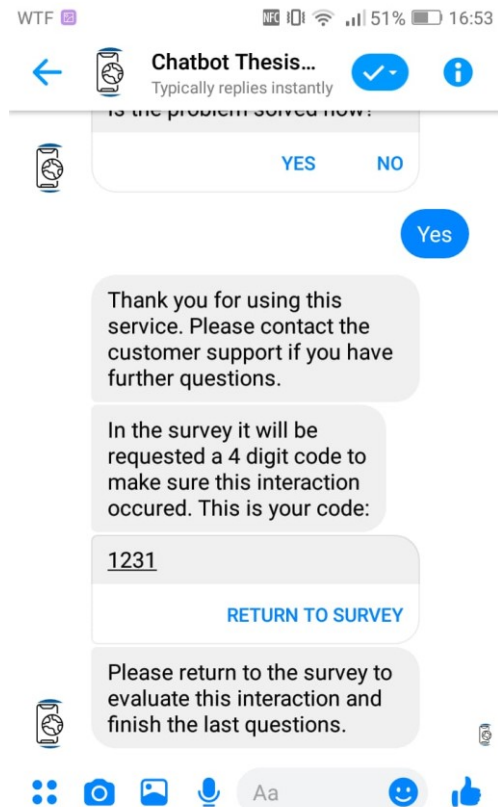
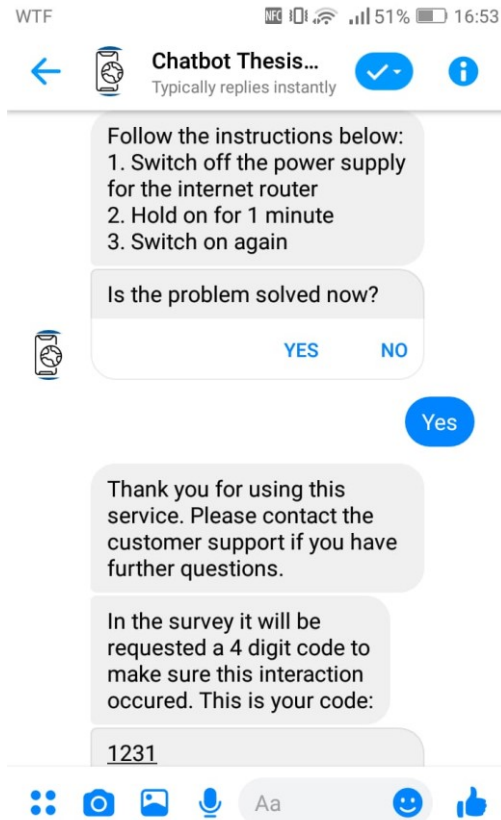
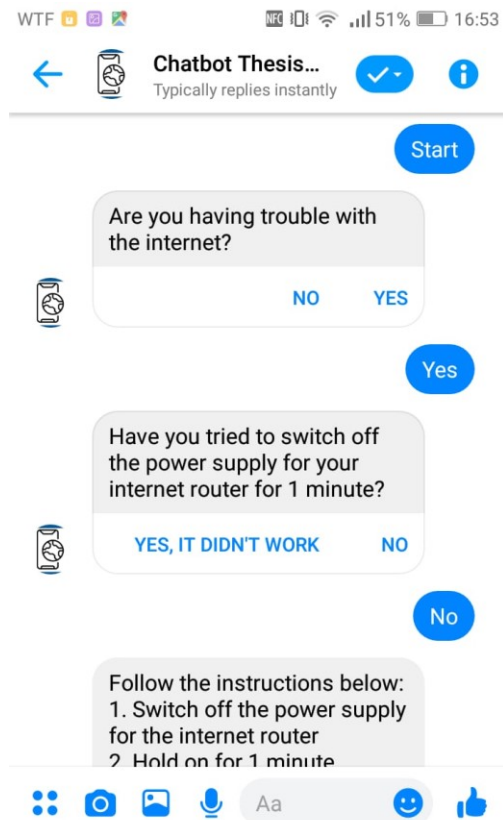
b) Chatbot X (link: <https://www.messenger.com/t/1071498436372365>)



Appendix 3- Human-like Stimuli



Appendix 4 - Machine-like Stimuli



Appendix 5- Result Matrix PROCESS Model 5

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 5
Y : CustExp
X : TechAttr
M : Satisfac
W : HumanLik

Sample
Size: 151

OUTCOME VARIABLE:
Satisfac

Model Summary	R	R-sq	MSE	F	df1	df2	p
	,6469	,4185	,6255	107,2272	1,0000	149,0000	,0000

Model	coeff	se	t	p	LLCI	ULCI
constant	,2091	,5329	,3924	,6953	-,8439	1,2622
TechAttr	,9396	,0907	10,3551	,0000	,7603	1,1189

OUTCOME VARIABLE:
CustExp

Model Summary	R	R-sq	MSE	F	df1	df2	p
	,7280	,5300	,5611	41,1563	4,0000	146,0000	,0000

Model	coeff	se	t	p	LLCI	ULCI
constant	-1,0185	,7606	-1,3391	,1826	-2,5217	,4847
TechAttr	,4631	,1583	2,9250	,0040	,1502	,7759
Satisfac	,5581	,0794	7,0316	,0000	,4013	,7150
HumanLik	1,6990	1,0370	1,6383	,1035	-,3506	3,7485
Int_1	-,2374	,1761	-1,3477	,1798	-,5854	,1107

Product terms key:
Int_1 : TechAttr x HumanLik

Test(s) of highest order unconditional interaction(s):	R2-chng	F	df1	df2	p
X*W	,0058	1,8164	1,0000	146,0000	,1798

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Conditional direct effect(s) of X on Y:	HumanLik	Effect	se	t	p	LLCI	ULCI
	,0000	,4631	,1583	2,9250	,0040	,1502	,7759
	1,0000	,2257	,1306	1,7276	,0862	-,0325	,4839

Indirect effect(s) of X on Y:	Effect	BootSE	BootLLCI	BootULCI
Satisfac	,5244	,1043	,3328	,7367

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
5000

NOTE: Variables names longer than eight characters can produce incorrect output.
Shorter variable names are recommended.

----- END MATRIX -----