Chatbots_ will they ever be ready?

PRAGMATIC SHORTCOMINGS IN COMMUNICATION WITH CHATBOTS

SANDRA TÕNTS 2019

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Minu vanaemale, kes ei väsinud minuga
eal talvist metsa joonistamast

Thank_ you

Thank you, Professor Pillan, for guiding me on this journey.

Thank you, Merilin & Kristiina, for your valuable thoughts.

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Abstract_

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Over a long period of time, human-human communication has evolved from gestural origins without much of a structure to a natural language that enables successful and complex conversations. Despite engaging scholars for an undetermined time, communication has been thoroughly studied since the 20th century. What has been noted by various philosophers as well as linguists ever since, is the importance of the pragmatic layer. Similarly, different researchers have recently proposed the adoption of the pragmatic layer to the Web and human-computer interaction. As that sort of communication is expected to evolve and become more conversational, as well as allow negotiations, it is evident that conversational interfaces, such as chatbots, play an important role in this act.

Chatbots are not the fruits of recent developments as the first improvements date back to the 1960s. Yet, modern advancements in Artificial Intelligence and Natural Language Processing, as well as the popularity of Instant Messaging platforms, have contributed to the recent rise of chatbots. For example, it has been stated that 25% of customer service and support operations will run through chatbots or other virtual customer assistants already in 2020. Despite these optimistic numbers and the extreme endorse in 2016, the hype of the chatbots has started to fade and communication with them is often

seen as failing. However, it is believed that the era of chatbots has simply not yet arrived. Thus, designers should find solutions to make the interaction more meaningful and support the success of this future communication tool, before it is too late.

The current study aimed to look beyond technical deficits and focus on investigating the users' perceptions about the experience with a chatbot. Especially so in terms of pragmatic aspects of communication in order to understand how the shortcomings influence the overall experience. Therefore, it was critical to: first, understand human-human communication; second, study the benefits as well as drawbacks of existing chatbots. Followingly, 15 participants were recruited for a qualitative research, with the aim to gather thoughts and impressions of the experience. The results of the thematic analysis pointed at shortcomings in five different pragmatic topics. As a final step, the current work first offers suggestions to better some aspects and therefore the overall experience of chatbots. Second, coming from the results, the research expresses a rather discouraging opinion about the future of chatbots and questions if they will ever be good enough.

Abstract_
it

La comunicazione interpersonale si è evoluta nel tempo passando progressivamente da gestualità poco strutturate a un linguaggio naturale che permette lo svolgersi di conversazioni articolate. Nonostante abbia a lungo affascinato gli studiosi, la comunicazione ha iniziato ad essere oggetto di analisi approfondite solo a partire dal ventesimo secolo. Ciò che vari filosofi e linguisti hanno notato da allora è l'importanza dello strato pragmatico. Analogamente, diversi ricercatori hanno recentemente proposto l'adozione dello strato pragmatico al Web e all'interazione uomo-macchina. Essendo questo tipo di comunicazione destinato ad evolversi e a diventare colloquiale, oltre a permettere interazioni sempre più avanzate, è evidente come interfacce come i chatbot abbiano un ruolo importante in questo ambito.

I chatbot non sono il frutto di recenti sviluppi: i primi esemplari risalgono agli anni sessanta. Tuttavia, l'evoluzione dell'Intelligenza Artificiale e dell'elaborazione del linguaggio naturale (NLP), giunta alla popolarità delle piattaforme di messaggistica istantanea, hanno contributo alla crescita dei moderni chatbot. Per esempio, si stima che già nel 2020 il 25% delle attività di servizio e supporto al cliente saranno effettuate da chatbot o altri assistenti virtuali. Nonostante l'ottimismo di questi numeri e l'eccitazione del 2016, l'hype attorno ai chatbot sta

iniziando a svanire e il loro utilizzo nella comunicazione sta iniziando ad essere percepito come un fallimento. Tuttavia, molti sostengono che l'era dei chatbot non sia semplicemente ancora arrivata. È quindi compito del designer trovare una soluzione che renda questa interazione più significativa e di supportare il successo di questo nuovo strumento di comunicazione, prima che sia troppo tardi.

L'obiettivo di questo studio era di andare oltre le limitazioni tecnologiche e di concentrarsi sull'analisi della percezione che gli utenti hanno della propria esperienza con un chatbot. In particolare, soffermandosi sugli aspetti pragmatici della comunicazione, in modo da comprendere come questi limiti influenzino l'esperienza generale. Pertanto, è stato fondamentale: primo, comprendere la comunicazione uomo-uomo; secondo, studiare tanto i vantaggi come gli svantaggi dei chatbot moderni. Successivamente, 15 partecipanti sono stati selezionati per uno studio qualitativo, con l'obiettivo di raccogliere opinioni e impressioni su questa esperienza. I risultati di questa analisi tematica hanno evidenziato limiti in cinque differenti categorie di pragmatica. A conclusione, questo studio offre suggerimenti per migliorare alcuni aspetti della globale esperienza con i chatbot. Inoltre, come evinto dai risultati raccolti, la ricerca esprime un parere decisamente scoraggiante riguardo al futuro dei chatbot e pone in dubbio la loro efficacia.

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once science fiction, now a reality

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There are numerous science fiction movies, books and comics about aliens landing on planet Earth and taking over the world. Yet, it is not usually mentioned that it has actually already happened. Twice, to be more clear.

To explain the rationale - humans themselves were once the unknown aliens. The early ancestors "landed" on Earth, not knowing anything about life and circumstances here, yet they vigorously started to take over the world. It can be assumed that at first they had problems understanding each other and thus, after a while, started to communicate with gestures (Tomasello 2008). Since language itself leaves no traces, it is hard to define when exactly did humans start to use regular language with structure and order. However, being one of the most important means that allowed humankind to evolve from mysterious aliens into native humans, communication has been studied for elusive time and countless researchers have been captured since the ancient days. More thoroughly, though, has communication been studied from the 20th century - first, various definitions and variables tried to comprehend the complex nature of communication; different models discussed the process of communication; and diverse philosophers went even deeper into the entity layers. Consequently, next to syntactics and semantics, pragmatics was defined as one of the three groundsels of communication. It defines the way people use language in everyday communication and how they understand what is actually meant by what has been said - how the language is used in communication and understood by the communicators (Leech 1983). These days, people manage to have meaningful, yet complex discourses intraculturally, as well as interculturally - over millions of years, humankind has become a long way from being the bizarre, strange aliens.

As mentioned, aliens landing on planet Earth has happened twice and the second time was not that long ago. Namely, in the 1990s, alien breed called computers started to invade all of the households and ever since, it has been one great mission to make people and computers understand each other. First, it was managed through Command Line Interfaces (CLIs) but as they were complex to handle and caused cognitive overload for casual users, Graphical User Interfaces (GUIs) were born. As the century changed, so did the interac-

tion - it moved from personal desktops to World Wide Web, allowing communication with other human beings through Computer Mediated Communication (CMC) and a bit later to smartphones, allowing access to information every time and everywhere. Thus, the amount of information has grown immense and finding exactly what one needs has become a complex activity. In order to simplify that action, an interest for Conversational User Interfaces (CUIs) and the desire to facilitate Human-Machine Communication (HMC) in natural language, is ever-growing. Similarly to human-human communication, adoption of pragmatic layer to the Web has been suggested by many researchers recently. It would allow agreements and modified shared meanings (de Moor, Schoop et al. 2006), negotiation and human collaboration. Therefore, it is apparent that the future of Human-Computer Interaction (HCI) will be conversational and CUIs, such as chatbots, will play an important role in this act.

To make computers less alien-like and converse with them like humans do among one another, several scholars have been discovering various ways. The first successful attempts trace back to the 1960s when a chatbot called ELIZA was born in MIT labs and enabled humans to text with computer in natural language.

Despite recent advancements in Artificial Intelligence (AI) and Natural Language Processing (NLP), almost 60 years later the chatbots still fail to deliver meaningful and helpful conversations. However, due to the information overload, mentioned earlier, as well as the popularity of Instant Messaging (IM) applications, chatbots have become desired tools and it is believed that their time has not yet arrived (Graham 2017).

Cathy Pearl, Google's Head of Conversation Design Outreach, suggested: *"[...] AI is this buzz-word and everybody thinks you have to have AI to have a successful conversational system, which [...] is certainly something to strive for [...] But I think some people forget that you can have a very effective, important conversational systems without a lot of AI."* (Crowley 2019).

Similarly, the current work emphasizes the importance of finding ways to design chatbots in a better way while looking beyond technological shortcomings.

Prior researchers (Jain et al. 2018) have worked on user interface elements to better convey the context to the communicators. Also, Valério et al. (2017) analyzed and evaluated the different techniques that chatbots apply to inform the user about its competencies. The academic community (for example Mou, Xu 2017; Thies et al. 2017; Go, Sundar 2019) has extensively explored human-like aspects, the anthropomorphism of chatbots. These studies, similarly to the current one, base the research on the fact that humans take computers as social actors (Reeves, Nass 1996).

What is more, Steven Pinker (2011), a well-known cognitive psychologist, linguist, and professor at Harvard University, brought the reason why people understand language much better than computers - it is the third interface standing between language and the mind, the pragmatics.

Given the above, the current work finds it crucial to apply the study of human-human communication to Human-Machine Communication, and even more so, the pragmatics in detail. Of course, researchers have used pragmatics before, for example En and Lan (2012) applied Politeness maxims to design the dialogue with a robot, and similarly, Hall (2018) suggested to use Gricean maxims for interacting with chatbots. However, to the knowledge of the current work's author, thus far, no other study directly investigated the pragmatic aspects of human-chatbot communication to understand how they influence the overall user experience. Therefore, the study poses the research question:

How do users perceive the pragmatic shortcomings in communication with chatbots?

The current thesis aims to answer the research question and thus give a contribution to improving the user experience in the field of chatbots. Hence, after the main question is answered, another two opposing challenges, that zoom out from the narrow scope and see the study in a broader perspective, will be investigated. Therefore, it is believed that users, designers as well as companies who wish to implement a chatbot, benefit from the research. In addition, the work can be seen as a framework to facilitate similar studies that combine thorough theoretical background with innovative fields, and analyse the results in light of thematic analysis method.

"... AI is this buzz-word and everybody thinks you have to have AI to have a successful conversational system, which ... is certainly something to strive for ... But I think some people forget that you can have a very effective, important conversational systems without a lot of AI."

CATHY PEARL, GOOGLE'S HEAD OF CONVERSATION DESIGN OUTREACH

The thesis consists of 7 chapters.

The **1st chapter** aims to give a brief introduction to the research topic, address the relevance of the field at the given moment and bring out the problem to be explored. Also, a short overview of the expected contribution is given.

The **2nd chapter** will go deep with human-human communication - what is it, how people communicate and why do they succeed in communication. Hence, the description starts from the surface of the problem while attempting to define communication and moves towards the core while seeking to understand why people manage to communicate successfully. Therefore, several pragmatic theories are illustrated to facilitate the latter study.

The **3rd chapter** will focus on human-computer communication - how has it evolved and where it is now. The relevance of the field is described in a more thorough way. Therefore, conversational interfaces, especially chatbots and the corresponding state of the art will be discussed.

The **4th chapter** will describe the methodology of the current work. Thus, stating the question that needed to be answered, how was the qualitative research conducted, who were the participants of the study, which tools were used to help facilitate the in-depth interviews, and how was the final data analysed.

The **5th chapter** will give a thorough overview of the results. The final themes of the analysis will be described in detail.

The **6th chapter** will discuss the results of the study. The interpretations are given, as well as implications are discussed. After addressing the research question, another two questions are answered to give an understanding how the research fits into the state of the art. Finally, limitations of the work are addressed.

The **7th chapter** will conclude the study and present final ideas about the overall research.

Evolution of human communication_

from primal gestures to meaningful discourse

In order to understand human communication thoroughly, it is needed to dive deep into history. What makes the task complex, however, is the matter that there is no proven theory of how communication originated.

It has been stated that language started to evolve in the Stone Age, around 1.75 million years ago (Uomini, Meyer 2013). What is more, Tomasello (2008) discusses the hypothesis that human communication had a gestural origin with cooperative intentions. Whereas some researchers (Hauser, Yang et al. 2014) have claimed that the wealth of thoughts is accompanied by a lack of proof, with no explanation of how and why our linguistic computations and representations have developed.

Additionally, archaeological explorations continue the discussion with alternative theories. The oldest cave paintings found, were drawn as early as 38800 B.C., and around three millenniums later these paintings started to tell a story - this has been seen as an evidence of spoken language (Mark 2011). It is hard to tell when exactly communication took off in the form of speaking since the speech itself leaves no footprints.

However, seen as the first revolution of human communication, written language emerged ca 3500-3000 B.C. in Sumer, southern Mesopotamia (Mark 2011). Figure 2.1 illustrates that writing did not appear for a long time in the history of communication. And at first, the ability to read as well as write was reserved for elite, but with the emergence of printing and mass distribution, these competencies crossed the borders and social

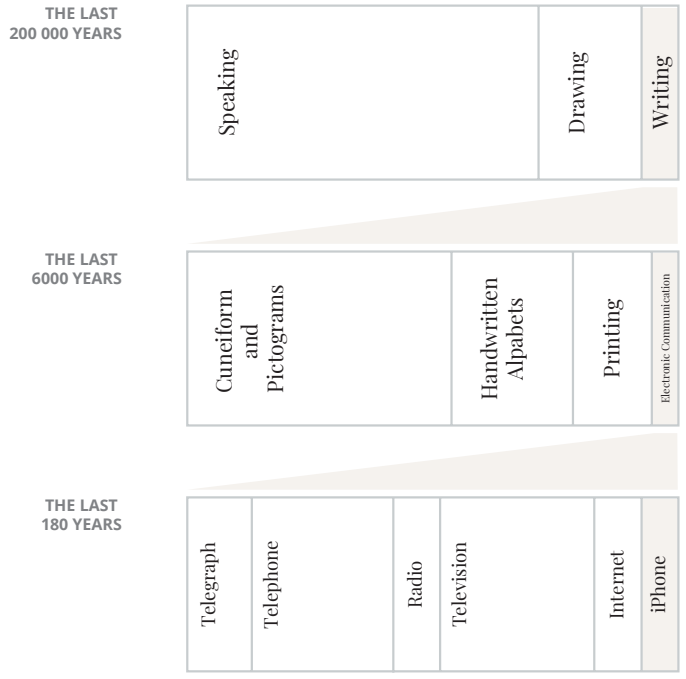


FIGURE 2.1_ DEVELOPMENT OF HUMAN COMMUNICATION (ADAPTED FROM: HALL 2018)

classes. As an additional result, great technological developments started to loom: photography, radio, TV, computers, the Internet, and lastly, the mobile web (Hall 2018).

These days, all of the everyday activities go side by side with communication. It is an innate feature of human beings, and they do not pay much attention to it. As a result, the importance, as well as the complexity of communication is often overlooked. But untangling and understanding it completely is a hard task.

WHAT IS COMMUNICATION?

As seen, communication has been around and studied for an undetermined time. But only in the 20th century, it came to the spotlight and scholars started to research it as a substantial field (Littlejohn, Foss 2010). Also, they started to define what communication actually is, yet, as it turns out, this is another complex task.

Fiske (1990) affirmed the difficulty and pointed out that everything can be put under the communication umbrella - from television to literary criticism, from hairstyle to art, etc. He saw this as one of the problems why it is so hard to define communication: *"[...] can we properly apply the term 'a subject of study' to something as diverse and multi-faceted as human communication actually is?"* (p. 1).

In efforts to define communication, three points for the conceptual division were identified by Frank Dance (1970). First, the level of observation. Meaning that the definition can be neither too general, nor too restrictive. As the second level, he brought out intentionality. Some definitions count only these messages that are sent and received purposefully, others do not include that limitation. Littlejohn and Foss (2010) brought an example where the definition of communication includes intention: *"Those situations in which a source transmits a message to a receiver with conscious intent to affect the latter's behaviors."* To illustrate the distinction, a definition that does not require intent: *"Human communication has occurred when a human being responds to a symbol."* The third level is the normative judgment. Some definitions define whether the communication was successful, effective, or

accurate - the thought was changed successfully; others do not set such bars. Following is an example with the normative judgment: *"Communication is the verbal interchange of a thought or idea".* Whereas the definition *"the transmission of information"* does not contain the level - information was sent, but it is not known if it was received.

West and Turner (2010), on the other hand, first propose a general definition: "*Communication is a social process in which individuals employ symbols to establish and interpret meaning in their environment.*" Coming from that, they suggest a framework for defining communication. They bring out five relevant key terms - social, process, symbol, meaning and environment. As *social* they note that people and interactions are apparent in the course of communication. The second term, *process*, suggests that communication is dynamic and on-going, continually changing. *Symbol* is a label or representation of something. *Meaning* is what the communicators draw out from the message. And finally, *environment* is the situation or context of the communication.

Clevenger Jr (1991) found that the problem to define communication for scholarly or scientific purposes roots from the fact that the verb *"to communicate"* is well defined in the general dictionary and therefore is not easy to define for scholarly purposes. What is more, it is also one of the most elaborated terms of the English language. About 40 years ago, Frank Dance found more than 120 definitions, and scholars have suggested many more since (Griffin 2011). Cambridge Dictionary (2019) defines *"communication"* as: "*the act of communicating with people*" and "*a message or a letter*" - both being very broad and even including the word 'communicating' itself. Merriam-Webster Dictionary (2019) gives six different definitions for *"communication"*, one of them perhaps the most accurate for the present work - not too broad, neither too narrow: "*a process by which information is exchanged between individuals through a common system of symbols, signs, or behavior*". The definition is not limiting communication as only face-to-face and it emphasizes the importance of a common system, including behavior. Whereas it is assumed that the term individuals does not imply to human beings only.

Another fact worth noting, emphasized by Littlejohn and Foss (2010),

is that communication differs within various cultures. As mentioned before, scholars started to study communication in detail in the 20th century. The field attracted researchers all over the world: in the States as well as in Europe, Asia, and Africa. That being said, it is clear that they are not only culturally very different, but the history of communication theory differs as well. At first, the States followed rather quantitative methods, whereas Europe was influenced by Marxist perspectives and critical/cultural qualitative methods. Over time, both of them started to use mixed approaches, thus scholars started to disparate non-Western and Western communication theory. Although, being very different: for example, non-Western theories focus on unity and wholeness, whereas Western theory centers the person and individualism. Yet, it cannot be forgotten that there are also similarities between different cultures and more importantly - not all people are the same within one culture, not even in one community (West, Turner 2010). Communication is not *"one-size-fits-all"*, it is such a complex and broad field and cannot be scaled down on any single model - done so, it will offer a limited view of communication that ignores nuances. *"[...] Our goal cannot and should not be to seek a standard model that applies universally to any communication situation."* (Littlejohn, Foss 2010, p. 8).

There are diverse theories about whether or not it is possible to clearly define what communication is, as well as how to do it. But what is seen as an important factor by numerous scholars (Fiske 1990; Littlejohn, Foss 2010; West, Turner 2010; Griffin 2011), is that the definition needs to help the researcher in continuing with the work, guiding the research and answering the questions relevant for one's study.

HOW DO PEOPLE COMMUNICATE?

It is well-known and apparent to everyone that communication is a crucial and highly valuable part of everyday life, not only to speak one's thoughts but to work against loneliness, stay healthy, feel loved and be part of the community - to be fully human (Hargie, Dickson 2004). Yet, as noted, this obvious aspect of the commonplace is extremely difficult to explain within one sentence. Therefore, a more detailed look is needed for understanding how people com-

municate.

USING VERBAL AND NON-VERBAL CUES

The most apparent way of communicating is through the use of words, known as verbal communication. To be more precise, verbal communication is seen as an expression of information via language that consists of words and grammar (The Business Communication 2013). It can either occur face-to-face or be mediated via TV, phone, computer or other media. Therefore, also writing is introduced as verbal communication.

Non-verbal, on the other hand, is often overlooked and seen as a secondary form of communication since it does not include any words. Although, as discussed, thousands of years ago the early humans first started communicating through non-verbal behavior. What is more, non-verbal communication is often essential when conveying information and making judgments about others (Hargie, Dickson 2004). Birdwhistell (1955) even claims that up to 65% of the information in communication is received non-verbally.

This form of communication consists of actions that are distinct from speech (Mehrabian 2017), thus different movements and emotions are determined, such as facial expressions, gestures, posture or other movements with the body, to name a few. Further, also paralinguistic and vocal phenomena, such as speech errors and pauses, speech rate, duration and many more, are included.

To be more clear, Table 2.1 shows the division of verbal and non-verbal communication. Moreover, as can be seen, both verbal and non-verbal communication can be vocal as well as non-vocal.

	VERBAL COMMUNICATION	NON-VERBAL COMMUNICATION
Vocal	Spoken words	Paralanguage (pitch, volume, speaking rate, etc.)
Non-vocal	Writing, sign language	Body language (gestures, facial expressions, eye contact, etc.)

TABLE 2.1_ DIVISION OF VERBAL AND NONVERBAL COMMUNICATION

What needs to be emphasized, however, is that isolating verbal and non-verbal communication is not as simple as it might seem in Table 2.1 - they are intertwined and connected, both of them supporting the other in order to forward the meaning (Hargie, Dickson 2004). For example, complex communication phenomena, such as sarcasm is seen as non-verbal communication, yet also in this case verbal and non-verbal behaviors combine inconsistently to convey the actual meaning of the message (Mehrabian 2017; Bugental, Kaswan et al. 1970). Therefore, both forms are performing side-by-side, and are part of the same system.

Although being tightly linked, there are diverse studies that discuss the dominance of one of the communicational forms. Archer and Akert (1977), for example, found that people who are paying attention to non-verbal behaviors and not only to verbal cues, recognize emotions much more precisely. They studied people who were either watching a video or reading a text of an interview with two players after a basketball game. The participants had to answer which one of the players won. And surprisingly, the people who only read the text were much more mistaken with their answers. Whereas the ones who watched the video with facial expressions, movements as well as the differing tone of voice, returned the right answer more often. Similarly, other researchers (Zuckerman, Lipets et al. 1975) found that in order to understand how a person is feeling, non-verbal cues play a considerably more important role - and not only the tone of voice but genuinely focusing on one's facial expressions. Finally, in addition to the mentioned as well as many other researchers, also Bugental et al. (1970) found non-verbal cues to be more effective in terms of communication.

Therefore, all of the studies illustrated, can be arguments for arising misunderstandings in the instance of sending emails, or text messages, and consequently even more while conversing with inanimate chatbots.

FOLLOWING SEMIOTIC RULES

Given the fact that communication can be either verbal or non-verbal, it is necessary to understand how people perceive what has been said or what was meant with the utterance.

As previously mentioned, verbal communication includes the language of

words and grammar. In order to understand what is said or written, as well as meant by these words, some rules are needed. Otherwise, it would be extremely complex to understand what is meant with a word such as plant, and all the different forms, for instance, paltn, naplt etc, could have the same meaning. Even worse, anything or any word could be determined as plant.

Likewise, as Littlejohn and Foss (2010) indicate, the same goes for non-verbal cues. For example, when a person lifts one hand - depending on the overall context and other signs, such as emotions or words, it can mean different things: to greet, to stop, to show one's presence, etc.

that it is the third interface standing between language and the mind - the pragmatics

Therefore, to make both verbal and nonverbal communication comprehensible as well as meaningful, three different semiotic levels (Morris 1938) have been defined:

1. Syntactics. This component of the triad is seen as a study of *what and how is communicated*, hence taking care that the utterance is structured in the correct way. To be more precise, it consists of the rules that dictate how to compile words in order to make a valid sentence. Continuing with the example: if the word plant is used in a sentence, such as *"Yesterday I bought a beautiful plant,"* then grammar is needed. Therefore, syntactics handles with the structures of symbols, such as words.

2. Semantics. The component illustrates *what is meant* with the word or action in a specific situation. Dictionaries can be seen as semantic reference books since they explain what a word represents (Littlejohn, Foss 2010). For example, as already illustrated, a word plant according to Cambridge Dictionary (2019) represents "*a living thing that grows in earth, in water, or on other plants, usually has a stem, leaves, roots, and flowers, and produces seeds.*"

3. Last but not least, pragmatics. The component indicates *what is done,* focusing on the context, the activity, and behavioral effects. To be more precise, that

level addresses how the signs, such as words, make an impact on people's lives and help them to carry out actions. What is more, people use more than actual meanings of words, thus pragmatics explains how the language is used in communication (Leech 1983), how people use the language in different contexts and therefore understand each other. For example, a sentence *"I name it Lilly"* illustrates an action of naming the plant, knowing the earlier context and what is meant by it, as well as a consequence - the plant is carrying a name, Lilly.

What is relevant in terms of current work, is what Steven Pinker, a well-known cognitive psychologist, linguist, and professor at Harvard University, brought out in an educational video (Pinker 2011). He posed a question: "*So why do people understand language so much better than computers? What is the knowledge that we have, that has been so hard to program into our machines?*" He suggests that it is the third interface standing between language and the mind - the pragmatics. Thus adds a humorous example of a person telling a robot to give him a hand. Instead of offering to help, what is actually asked for, the robot truly takes off its robotic arm.

In everyday communication, humans use vast storage of knowledge about human behavior, human interaction and relationships to understand language and what is actually meant by what has been said. This is the challenging segment of programming - perhaps, to speculate in advance, yet another source of the problem when communicating with chatbots.

PERFORMING IN A PROCESS

Subsequently, after illustrating verbal and non-verbal communication as well as how people make sense of what is said or expressed, it is relevant to zoom out and continue with focusing on the bigger picture and clarifying the overall process - how communication takes place. In order to understand communication as a process, recognize the main elements, relationships and interactions between them, as well as comprehend the depth and complexity, many models have been developed over the years.

Since the present work does not aim to acquaint all of the models illustrat-

ing communication processes, only relevant studies for the current paper will be introduced. To start with, the first model created by Shannon and Weaver will be discussed. Additionally, to illustrate the evolution of such models, three other outstanding configurations will be introduced. The current work appreciates and mainly relies on the evolution proposed by West and Turner (2010) since it supports the remaining of the work.

PROCESS AS ACTION

The model that emerged in 1949, also known as Mathematical Theory of Communication, is acknowledged as one of the main seeds out of which Communication Studies has evolved (Fiske 1990). In addition, it is recognized as a groundwork for many subsequent models (Johnson, Klare 1961). The reason for calling the model also Mathematical Theory of Communication, in addition to the Shannon-Weaver model, comes from the fact that the authors were not social scientists, but instead engineers working at Bell Telephone Laboratories in the United States. Therefore, they studied radio and telephone technologies and aimed to develop a model explaining how information passed through various channels (West, Turner 2010) and how these channels could be used most efficiently (Fiske 1990). Despite seeming highly technological, the model has claimed to be equally applicable to human communication. Even more so, Johnson and Klare (1961) noticed the early model as a provocation for social scientists to define their thoughts and theories of communication in the form of a model.

Shannon and Weaver describe communication as a linear process, alternatively arrow communication (Hargie, Dickson 2004). Meaning that communication goes in one direction. In reality, communication is rarely as simple as a one-way process (Burton, Dimbleby 1998), yet it has been seen as a good point to start.

As illustrated in Figure 2.2, the first component in the process is an information source that generates a message to be communicated. Therefore, the transmitter forms the message into a signal and sends it through the channel to the receiver. Again, the receiver needs to translate the received signal into a message, in order to deliver it to the destination. What is important, the signal might be disturbed by noise and therefore the delivered message could differ from the initial message - the meaning could be dis-

tinct in the opposing ends. Further, communication could fail if the communicators do not realize the split between the two messages (McQuail, Windahl 2015).

To make it applicable to human communication and not only for technology, the model has been humanized by many authors (Chandler 1994; West, Turner 2010). Thus, information source and transmitter are addressed as the sender and additionally, receiver and destination are turned to as the receiver. What is more, in human communication the messages can be words, sounds, actions or gestures, therefore as stated earlier, verbal or non-verbal. The channel can include different senses - visual, tactile, olfactory, as well as auditory. Finally, the noise is anything that was not intended by the information source, by the communicator. West and Turner (2010), as well as Lunenburg (2010), similarly contrast four types of noises as:

1. Semantic. Taking into consideration jargon, slang and other specialized languages, used by groups or individuals. For example, complex medical terms used by doctors can have no meaning to patients.

2. Physical. An external noise that exists outside of the receiver. For instance, wind blowing in the background.

3. Psychological. Meant as communicator's prejudices and biases toward another or the message. For example, listening to political statements of a politician who one does not support, is seen as psychological noise.

4. Physiological. Involving biological influences on communication. Such as one or both of the communicators being hungry or tired.

On the one hand, as already mentioned, the model has been extremely valued and seen as an important cornerstone for the whole field of Communication Study. Daniel Chandler (1994), a British visual semiotician, has stated that the model has gained popularity thanks to being simple, general and quantifiable. Owing to these advantages, many academic disciplines found it utile, thus attention was also drawn on human communication and its theories.

On the other hand, the straightforward model includes several lim-

itations. To start with, it assumes that there is only one message in the channel at a given time, as well as that the communication has a defined beginning and end (West, Turner 2010). As already stated, communication is rarely, if ever, a one-way process. What is more, there is an absence for: content and meaning; context; relationships between communicators; and time (Chandler 1994). Therefore, keeping these restraints in mind, other models were created.

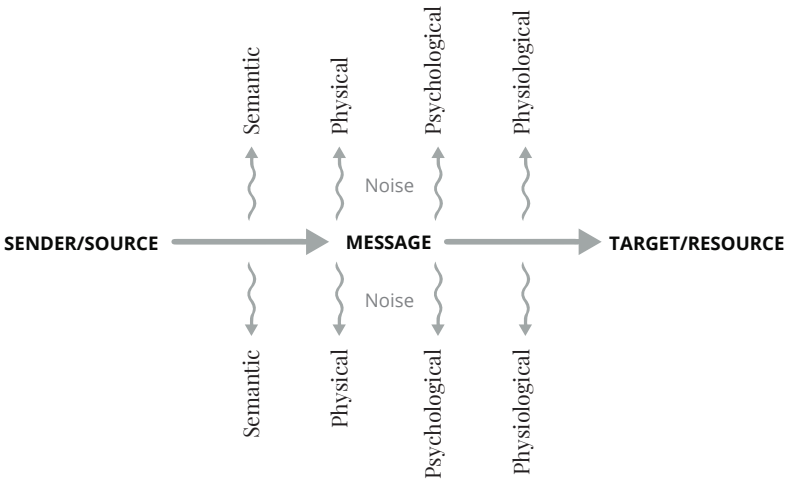


FIGURE 2.2_ SHANNON-WEAVER MODEL (ADAPTED FROM: WEST, TURNER 2010)

PROCESS AS INTERACTION

Coming from the fact that the linear model only examined communication in one way, five years later, in 1954, Wilbur Schramm suggested investigating the relationship between the sender and the receiver. Different researchers have given various names to that model, such as Circular Model (McQuail, Windahl 2015) or The Interactional Model (West, Turner 2010). Whilst the names differ, the primary point remains - communication is a two-way process - respectively illustrated on the model in Figure 2.3.

Therefore, the main difference from the Shannon-Weaver model is that communication is a process that flows from the sender to the receiver, and followingly, from the receiver back to the sender - the meaning is achieved through the exchanged feedback. In addition, being a circular model, it suggests that communication is an on-going process, without beginning or end. The person can be

either sender or receiver, but not both at once (West, Turner 2010). What is more, if Shannon and Weaver focused their attention on the channel delivering the message, then, in this case, the author emphasizes the importance of the actors (McQuail, Windahl 2015) - the sender and the receiver. Therefore, in order to work successfully, the model depends highly on the feedback between the mentioned actors, being either verbal or non-verbal, calculated or not. Feedback displays if the message is received and if the meaning was perceived in the way it was implied by the sender. However, the feedback is given only after the message has been received, not while it is still ongoing (West, Turner 2010).

What West and Turner (2010) additionally emphasize is the importance of the field of experience. Meaning, that each person, the sender as well as the receiver, bring their own past experiences to the communication and thus it can either work for or against a successful communication.

Similarly to the Shannon-Weaver model, also Schramm has gotten critical feedback for his work. First, as can be anticipated, feedback does happen while the message is still being delivered - it can be anything, even smile serves as feedback. Therefore, the implication that the sender cannot be the receiver at a given moment, and vice versa, is incorrect (West, Turner 2010). What is more, McQuail and Windhal (2015) see another error in the fact that the model suggests that the communicators are equal. Again, not the case in everyday communications.

Since Schramm's circular model still included some limitations, the evolution in terms of communication models did not stop.

PROCESS AS HELIX

Since the preceding model is a circular interpretation of communication, it seems as if the communication always comes back to the point where it started (McQuail, Windahl 2015). Hence, in 1967 Dance's Helix Model, proposed by a communication professor Frank E. X. Dance, was born. As the name suggests, the communication process is similar to a spiral (Figure 2.4) - dynamic and nonlinear, circular and progressive (Rafaeli 1988).

What is more, communication is evolving, and how communication will develop and what will be addressed later, is dependent on what is communicated at the moment (He-

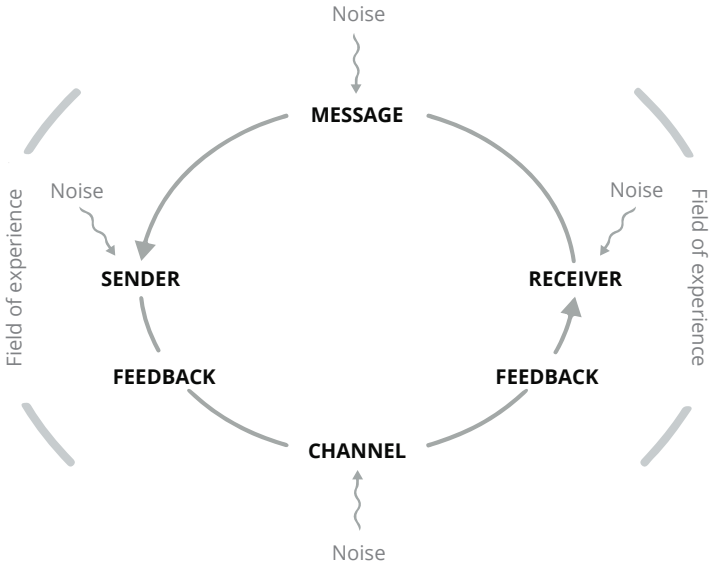


FIGURE 2.3_ INTERACTIONAL MODEL (ADAPTED FROM: WEST, TURNER 2010)

lical Model of Communication 2013). Also, there is no specific time for interacting, thus the sender and the receiver are changing feedback actively as well as continually, to foster shared meaning. With time, the relationship between actors will develop as the illustrating circles will grow bigger, sometimes more, other times less (McQuail, Windahl 2015), but the communication and its elements are ever-changing (West, Turner 2010).

Despite being a rather simplistic model to illustrate communication, the main benefit as well as addition, compared to the models listed above, is the reminder that communication is dynamic and evolving over time (McQuail, Windahl 2015).

PROCESS AS TRANSACTION

To take a step even further, one of the most helpful communication models in understanding face-to-face communication is the Transactional Model - studied by Watzlavick et al. as well as Barnlund at the beginning of the 1970s (Lyon 2017). Different from previous models, the Transactional Model (Figure 2.5) emphasizes the concurrent sending-receiving process (West, Turner 2010) whereas the sender can be the receiver at the same moment. What is more, transactional communication is also cooperative, thus participants are mutually responsible for the effectiveness of the communication and, more importantly, the meaning is built together - it is cumulative and grows as the verbal or

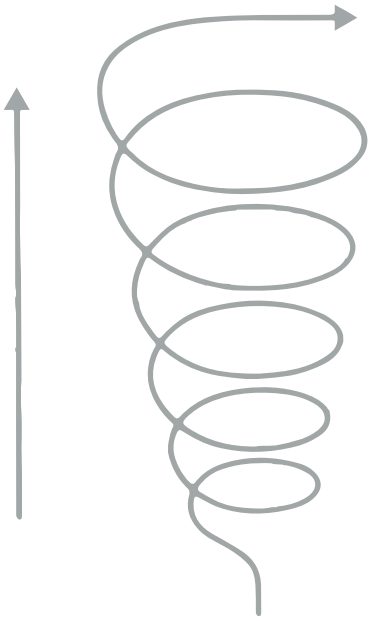


FIGURE 2.4_ DANCE'S HELIX MODEL (ADAPTED FROM: MCQUAIL, WINDAHL 2015)

non-verbal cue is added (Barnlund 2007). It can be said, that the meaning is negotiated and comes through the interaction - such that if communicator A is describing a situation and communicator B cannot understand some aspect, therefore indicating it with a baffled face, A will return to further explain the aspect such that B can understand - people do not understand each other right away, but have to work towards mutual interpretation.

Field of experience played a role already in Schramm's Model, however, in the Transactional Model experience overlaps among the communicators - illustrating the process of understanding - the more the experiences overlap, the more there is an understanding between the communicators. What is more, Lyon (2017) believes these shared and unshared experiences shaping the communication between people. Also, he brings out that the model suggests the dimension of context - every time one communicates, the communication happens in a certain environment (such as school, home, etc) - whereas this context also shapes and influences the way the messages are sent and received. Finally, he points to the relationship aspect - meaning that how something is said, is important, and it is perceived through the relational dynamic.

The models illustrated, have shown the evolution of communication models and they emphasize the components of communication to keep an eye on. For example, different kinds of noises should be addressed, the communicators' diverse fields of experience cannot be underestimated as well as that the relationship should be evolving, and both sides working to build joint meaning.

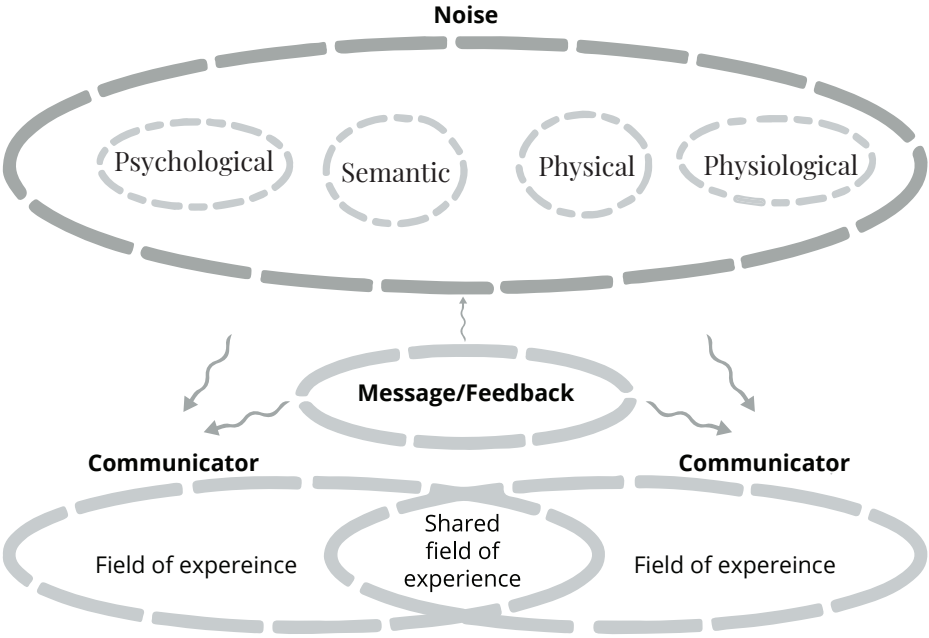


FIGURE 2.5_ TRANSACTIONAL MODEL (ADAPTED FROM: WEST, TURNER 2010)

WHY DO PEOPLE SUCCEED IN COMMUNICATION?

Thus far, the history and matter of human communication have been discussed, both in detail as well as an overall process - understanding what communication is and how people communicate - it is time to address why people manage to participate in the communication successfully and accomplish to deliver the shared meaning.

Of course, as probably every human being has experienced, as well as how has been illustrated so far, communication is a complex activity and therefore might fail every now and then. Communication happens unconsciously and people do not think much about it, therefore negative effects may occur. What is more, it has been examined, that disruption happens due to various types of noise elements entering the communication process (Lunenburg 2010). Different kinds of noises were discussed in the previous chapter. To recall, communication can break down as communicators are using an excessive amount of jargon or speak different languages, have opposing views or simply lack atten-

tion, encounter distractions or irrelevance, to name a few. It is the task of the communicators to be conscious of these and many other hurdles, as well as attempt to decrease the poor influence it might have on the communication.

As already mentioned, Steven Pinker (2011) stated that communication between humans and computers often fails due to a lack of pragmatic competence. Humans are the primary examples of, generally, strong communication and they achieve it through the use of everyday language. Taking these facts into account, the author of the current work finds it appropriate to address pragmatics, the analysis of real language usage, in order to understand successful communication.

Before going in detail, it is important to recall what pragmatics stands for. As Korta and Perry (2019) declared: "*Pragmatics deals with utterances, by which we will mean specific events, the intentional acts of speakers at times and places, typically involving language.*" British linguist, academic and author, David Crystal, stated (2014): "*[...] the definition of pragmatics it's the study of the choices you make when you use language. The reasons for those choices and the effects that those choices convey.*" He added: *"[...] pragmatic perspective is really essential because pragmatics answers the question 'why?'"* Meaning by that, pragmatics in general deals with the question of *why are people using the language the way they use it*. Coming from the analysis of different perspectives answering the overall question of *why* while addressing successful communication, the current paper gives the response through introspective theories and ethnographic studies.

INTROSPECTIVE THEORY

In human communication and its uncountable diverse circumstances, it is often vital to choose words in order to not cause misunderstandings, hurt somebody or get into a conflict. Accordingly, many researchers have studied what should be said to get the real meaning delivered in a successful and favorable way. Thus, several theories and principles have been proposed. In the current paper, as already seen in the case of communication models, the cornerstone theory, with its lasting influences on modern pragmatics, and some of the theories evolving from that one, are listed.

To start with, Herbert Paul Grice, a

“Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged.”

HERBERT PAUL GRICE, PHILOSOPHER

well-known philosopher of language and one of the early initiators of the field of pragmatics (Wilson, Sperber 2005), emphasized the difference of what the speaker says and what is meant by the saying (Korta, Perry 2019). He proposed a standard for harmonious human relationships, the Cooperative Principle: *"Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."* (Grice 1975, p. 45). To rephrase and simplify, Grice aimed to indicate that people should say, as well as do what is needed. For example, if one asks for two bottles of milk from a marketer, the marketer should act accordingly and not give four, since it is not expected.

As Grice himself saw the principle rather general, by echoing Kant he found four categories to define more specific maxims to favor the principle:

COOPERATIONAL MAXIMS

1. Quantity - as the amount of information to be provided. The contribution should be as informative as required. Thus, not more informative than required.

2. Quality - means that the contribution should be true. One should not say something s/he believes to be false or for what s/he lacks enough evidence.

3. Relation - simply expects one to be relevant.

4. Manner - as the speaker should be clear. Not to include vagueness of expressions and neither ambiguity. One needs to be brief and orderly.

What the author points out, is that the maxim of *quality* is the primary one. In fact, the other maxims are relevant only if that one, the *quality*, is satisfied.

Also, he did not mean that people always think of and follow the maxims, but rather saw these assumptions as a critical base for communication (Spencer-Oatey, Jiang 2003).

However, many of the researchers have found the Gricean maxims misguiding. To illustrate, Frederking (2004) even claims: *"They are in fact harmful, because they form a misleading taxonomy."* Additionally, he suggests that all the maxims and the main principle could be reformulated very generally as *"Do the Right Thing"*.

Slightly less critical, Wilson and Sperber (1981) appreciate the work of Grice and his contribution to pragmatics, but likewise, notice some shortcomings. First, they see that the contrast between what one says and means is not as evident as Grice claims it to be. Secondly, the researchers believe that it is not enough to know the maxims in order to clarify irony and metaphors, although Grice seems to argue that the maxims are enough. Finally, Wilson and Sperber see the need for only one maxim.

Accordingly, the Principle of Relevance was born. Although it does not exactly follow the Cooperative Principle, neither does it contradict with it - since the authors still see conversation as a collaborative activity (Wilson, Sperber 1981). The primary idea of the principle is that the utterance itself raises expectations for being relevant (Wilson, Sperber 2002). These expectations are as accurate and predictable as needed, to automatically guide the hearer towards the intended meaning. To go more in detail, Wilson and Sperber (1996) formulated the principle of relevance as: *"Every act of ostensive communication communicates a presumption of its own optimal relevance."* Thus, the researchers indicate that communicators do not need to follow the principle, as they see happening in the case of Gricean maxims, people do it automatically and therefore never violate it.

behavior, verbal and non-verbal, influences communication

Similarly to the Cooperative Principle, Wilson and Sperber's book *"Relevance: Communication and Cognition"* and thus the Principle of Relevance, have received criticism. Seuren (1986), for example, sees the Gricean approach more favorable for the fields of pragmatics and cognitive science in general. Additionally, he claims the book by Wilson and Sperber to be a revision of Gricean pragmatics, stating critically: *"This book, however, offers nothing remotely like a properly developed Gricean perspective, and it is more likely to confuse experimenters than to enlighten them."*

Similarly to the latter opinion, another acknowledged linguist, Geoffrey Neil Leech also decided to work in conjunction with the Cooperative Principle, rather than criticizing it (Spencer-Oatey, Jiang 2003). Although seeing the Cooperative Principle use-

ful, he believed it not to be sufficient. Therefore, he additionally described the Politeness Principle and six correlating politeness maxims (Leech 1983):

1. Tact - (a) Minimize cost to the other. (b) Maximize benefit to the other. _Meaning, the duty of other people should be minimized, so they would feel less obliged. While the conversation should prioritize the interests, desires, and needs of others. Such as: *"Would you like to use my pencil?"*

2. Generosity - (a) Minimize benefit to self. (b) Maximize cost to self - Differing from the first one, this one instead focuses on the speaker and hints at selflessness. For example: *"I do the dishes, you sit back and relax."*

3. Approbation - (a) Minimize dispraise of the other. (b) Maximize praise of the other - Meaning that one should avoid negative criticism and subtly glorify the other. For instance: *"You are a genius! The performance was outstanding!"*

4. Modesty - (a) Minimize praise of self. (b) Maximize dispraise of self - One should emphasize the blame of oneself. Such as: *"I'm such a fool, I didn't take any notes in the class! Did you?"*

5. Agreement - (a) Minimize disagreement between self and other. (b) Maximize agreement between self and other - The maxim focuses on agreements and advises to keep away from disagreements. A: *"I love this cake"* B: *"Yes, it is delicious, but it would be even better with raspberry jam, don't you think?"*

6. Sympathy - (a) Minimize antipathy between self and other. (b) Maximize sympathy between self and other - Similarly to the latter maxim, one should focus on sympathy and prevent antipathy: *"I am very sorry to hear about your dog."*

The Politeness Principle (or as Leech himself states, PP) comes together from all of the maxims, although initially, for better understanding, the maxims have been simplified to sub-maxims - previously marked as (a) and (b). Thus, Leech suggests reformulating and using only sub-maxim (a). For example, the first maxim

should go accordingly: *"Minimize the expression of beliefs which express or imply cost to other,"* and adds: *"[...] and the other maxims should be similarly expanded. In that they recommend the expression of polite rather than impolite beliefs, all of them come under the PP."* (Leech 1983).

What is more, seen as the greatest difference and beneficial factor compared to Gricean maxims, is the personal effect that politeness maxims bring to communication. Therefore, the outcome is more natural and includes the attitude and behavior of the communicators, while the Gricean maxims suggest more structured and impersonal communication (En, Lan 2012).

Not only Leech but long before, even prior to the comprehensive rise of pragmatics itself, the authors of the book *"Pragmatics of Human Communication"* already brought behavior and attitude to the center of attention in human communication. To the extent that they even saw the terms behavior and communication being synonymous, at least for the pragmatic concepts (Watzlawick, Beavin Bavelas et al. 1967). The researchers stated: *"[...] Thus, from this perspective of pragmatics, all behavior, not only speech, is communication, and all communication - even the communicational clues in an impersonal context - affects behavior."* (p. 22). Meaning, that behavior, verbal and non-verbal, influences communication and communication, likewise, changes behavior.

The authors brought five axioms for successful communication, therefore noting that miscommunication can occur if some of these are not respected (Watzlawick, Beavin Bavelas et al. 1967; Watzlawick, Beavin 1967):

1. In the presence of another, all behavior is communicative. Meaning the impossibility of not communicating - one cannot not communicate. Activity or inactivity, both carry meaning and act as communication.

2. There are many levels of information in every communication, and one always pertains to the relationship in which the communication occurs. Meaning that communication relies on the relationship between communicators. For example, if a friend says to the other, "*You are a total fool!*" and it can be taken as a joke without stating

so, the utterance might not be perceived as a friendly one, in other circumstances. Therefore, the relationship itself is a communication about the content - known as metacommunication.

3. A stream of communicational events consists of a series of overlapping stimulus-response-reinforcement triads. Meaning that in human communication, the relationship is highly dependent on the punctuation of the partners' communication procedures. For example, two countries may endlessly discuss which one is dangerous for the other. Since country A arms to protect itself against country B, country B considers that move as a threat and therefore does the same. Now, country A has even more proof, that country B is aggressive and so on. Thus, each participant's behavior is the cause as well as an effect of the other's attitude.

4. Human beings communicate both digitally and analogically. Fundamentally, the authors mean verbal and non-verbal communication. And add that verbal language is highly complex and powerful, but lacks the relationship parameter, that the analogic language provides in a semantic form.

5. All communicational interchanges are either symmetrical or complementary. That depends on whether the communication is based on equality and the communicators are equivalent in terms of power. Alternatively, the communicators are not equal and one guides the other - such as mother and child.

AXIOMS OF COMMUNICATION

The axioms listed emphasize highly the relationship between communicators as well as the behavioral effects. It is important to pay attention to the context as much as to the content of the message, otherwise, the communication might fail.

What applies similarly to all the listed theories about successful communication, is that none of them truly employs thoroughly to diverse cultures or languages other than English. The meaning of utterances changes not only interculturally, but also intraculturally and additionally within time and space - therefore more thorough studies with people need to be

considered to understand successful communication.

ETHNOGRAPHIC STUDIES

Coming from the mentioned diversities of different cultures, as well as varieties within one, several theories have evolved as a result of ethnographic studies. Therefore, a couple of proposals are included, to illustrate a more thorough and thoughtful approach to why people manage to communicate successfully, how is it perceived and achieved among people within real-life contexts.

Since the latter introspective theory by Watzlawick et al. focused highly on the behavior of the communicators, it is reasonable to continue with a similar matter - the conversational style. Deborah Tannen is a professor of linguistics and a well-known author, mainly interested in everyday communication and how it influences relationships. Similarly, in her book *"Conversational Style"* she investigates how people communicate and how different people either succeed or fail to communicate with one another.

Tannen (2005) discusses the conversational styles of people. She finds that anything said, is said in style - at a certain rate, at a certain pitch and amplitude, with certain intonation, at a certain point in an interaction. The author examines many scholars and therefore points out that the styles - or the aspects of everyday talk - vary between people, being dependent on gender, culture, ethnicity, age, class, regional background, and self habits.

After analyzing six different people with unique styles, whereas having either more or fewer characteristics and linguistic devices (such as rhythm, surface linguistic features, and contextualization) similar to others', some conclusions were made. What is critical to notice while answering the question *why do people succeed in communication?,* is one of Tannen's findings: *"When people's devices matched, communication between or among them was smooth. When they differed, communication showed signs of disruption or outright misunderstanding."* (Tannen 2005, p. 184).

Another researcher, anthropologist Dell Hymes, was similarly interested in everyday communication, particularly within different cultures (Littlejohn, Foss 2010). For this reason, he initiated the 'ethnography of

communication'. Additionally, Hymes can be seen as a forerunner in differentiating *langue*, the linguistic code, and *parole*, the actual speech - by doing so, he aimed to move away from examining language as an abstract model, to addressing speech in ethnographic fieldwork - language that is not only correct in grammatical (linguistic) point of view, but correct in socio-cultural context (Johnstone, Marcellino 2010).

Alternatively to Tannen, Hymes proposed an ethnographic framework that concludes all the various factors that are involved in communication, not merely focusing on the behavior of communicators. He believed these elements to be relevant in understanding how communication achieves its goals (Wardhaugh 2006).

His SPEAKING framework involves (Johnstone, Marcellino 2010):

SPEAKING FRAMEWORK

- (S)etting includes the time and place, physical aspects of the situation such as the arrangement of furniture in the classroom;
- (P)articipant identity illustrates personal characteristics such as age and sex, social status, relationship with each other;
- (E)nds, meaning the purpose of the event itself as well as the individual goals of the participants;
- (A)ct or sequence of how speech acts are organized within a speech event and what topic/s are addressed;
- (K)ey or the tone and manner in which something is said or written;
- (I)nstrumentalities of the linguistic code i.e. language, dialect, variety, and channel i.e. speech or writing;
- (N)orm or the standard socio-cultural rules of interaction and interpretation;
- (G)enre or type of event such as lecture, poem, letter.

If the communication aims to be successful, Wardhaugh (2006) claims, the speaker needs to pay attention to all of the eight factors listed above. Also, the researcher adds: *"Speakers and listeners must also work to see that nothing goes wrong. When speaking does go wrong, as it sometimes does, that going-wrong is often clearly describable in terms of some neglect of*

one or more of the factors." (p. 249).

Given the above, starting from the surface of the problem while attempting to define communication and moving towards the core while seeking to understand why people manage to communicate successfully, it is rather safe to say that communication is a highly complex activity - difficult to designate how it initiated and troublesome to give an ideal definition. What is more, thus far there is no one perfect model of how communication works as a process, yet it does so every day from year to year and even century to century. However, the communication and the mediums keep rapidly changing and today, humankind is facing the era of getting everything done by conversing with computers. As millions of years ago, the early humans started to communicate with each other, first with gestures and simple commands, later with the help of natural language, communication with computers has evolved to the point where natural language is firmly becoming the desired form of interaction.

So far, human to human communication has been analyzed. The following chapter will address the matter of communicating with computers.

Development of chatting computers_

once science fiction, now a reality

As stated in the previous chapter, communication has been orderly studied since the antique times but came to the spotlight in the 20th century with the immense developments in the field of technology - the emergence of photography, radio, TV, computers, the Internet, and later the mobile web. As Pearce (1989) described: *"New technologies of communication have empowered communicators to do more, faster, at greater distances, and with less effort than ever before, and they have greedily been put into play by those who would speak, write, listen, eavesdrop, monitor, organize, inform, persuade, educate, or entertain."* What is more, he adds that as generations evolve, the communication will span even faster and reach further, with less effort and declined deformations of messages - what used to be not only impossible but unthinkable for the elite, is now achievable for everyone. Similarly, Bojaxhi et al. (2017) bring out that what 20 years ago seemed like an acceptable material for science fiction movies, is now a reality.

Although, being of great help in everyday life, the various communication mediums also bring drawbacks. For example, everyday expectations and experiences are influenced by primary groups (friends and family), secondary groups (school, religious institutions, and government) as well as mass media (Srivastava, Chaudhury et al. 2018). Therefore, in addition to being an informational source and reflecting public values and attitudes, mass media, as well as communicational technologies, shape these values and attitudes. In addition, people can be connected all the time within a click or swipe, yet never before in the history of humankind, have there been so many suicides, divorces, and depressed people (Bojaxhi, Vrapi et al. 2017). To illustrate, disconnection is noticeable everywhere - on the streets people are scrolling on their phones rather than observing the surrounding environment, listening to headphones rather than talking to each other, taking snaps for memorizing rather than living in the moment.

However, as stated and widely known, the developments in communication technology carry great benefits. Some of them being evident in everyday communication, such as people having the possibility to stay close even when physically separated by thousands of kilometers or simply the speed and easiness to read the news. Other benefits might not be

that evident, for example, the influences of the American TV show *16 and Pregnant*. The reality series by MTV screens the difficult life of teenagers after having a baby at an early age and consequently, the show actually decreased the rate of unwanted teen pregnancy (Kearney, Levine 2015).

Furthermore, the developments in the technological field have not only advanced communication among human beings but have brought along the need and ability to communicate with the technology itself. Meaning, there has been a shift from computer-mediated communication (CMC) to human-machine communication (HMC) (Gunkel 2012). For example, in order to send an email to a fellow, one must first "communicate" with his or her technological device, or even more so, when one literally asks for information straight from the computer. Yet, it brings up questions. How one perceives communication with a tool? Is communication with and through computers even possible? Is such communication instinctive?

Trying to find answers to similar questions, Byron Reeves and Clifford Nass, in their research at Stanford University, constructed an equation: media = real life (Reeves, Nass 1996). The statement comes from a research project called Social Responses to Communication Technologies and according to the researchers: *"[...] individuals' interactions with computers, television, and new media are fundamentally social and natural, just like interactions in real life."* (p. 5). Meaning that people follow the same interpersonal interaction rules with technology, that they use when communicating with one another. The research includes 35 experiments, on the grounds of social science findings, aiming to prove the proposed equation. To illustrate, the researchers conducted a study where they gave different personalities to two computers - one being "dominant" and the other "submissive". First, the participants of the study easily grasped the designed personalities. Second, to deepen the study, the researchers paired half of the students with computers with similar personalities (dominant and dominant, submissive and submissive) and another half with the oppo-

"When media conform to social and natural rules, however, no instruction is necessary."

REEVES & NASS, 1996

site ones (dominant and submissive). As a result, according to Watzlavick's communication axioms, mentioned in the previous chapter, the students in a symmetrical relationship appreciated their technological devices more than the ones who had complementary relationships.

One of the most important findings coming from all of the experiments, highly valuable for the current study is: *"If human-media interactions are social and natural, then there are a number of unexpected ways to improve the design of media. [...] When media conform to social and natural rules, however, no instruction is necessary. People will automatically become experts on how computers, television, interfaces, and new media work."* (Reeves, Nass 1996, p.8).

HOW HAS COMMUNICATION WITH COMPUTERS EVOLVED AND WHERE IS IT HEADING TO?

Similarly to human-human communication, for a better overview of human-computer communication, it is vital to go back to the beginning. In 1890, Herman Hollerith designs a punch card system in order to calculate the census - he manages to do it in 3 years and saves the government $5 million (Zimmermann 2017). In 1933, Telex messaging network comes out with a mission to distribute military messages and soon develops into a worldwide network of text messaging (Computer History Museum n.d.). In 1936, Alan Turing, an English mathematician and computer scientist, presents an idea of a universal machine that computes anything that is computable - inspiration for the modern computer concept is born (Zimmermann 2017). In 1946, John Presper Eckert and John W. Mauchly build ENIAC, *"the first general-purpose electronic computer"* with memory and arithmetic capabilities (Frangoul 2018). These and many other dates illustrate the beginning of computer history. Although, the beginning as such, more important to the current work is the start of the human-computer interaction (HCI) field in the early 1980s.

Until the late 1970s, roughly the only people who communicated and interacted with the computers were the information technology professionals (Carroll 2013). Therefore, they saw the need neither to focus on how the users interacted with computers nor to

develop any other interaction form than the Command Line Interface (CLI). Technically, being a text-based interaction, they only used a keyboard to type in complex commands in order to view or manipulate the files. The computer was seen as an information processor (Nielsen 1993).

As computers started to turn into tools (Nielsen 1993) and personal computing advanced, bringing computers into home contexts with regular users from diverse backgrounds, there was an emerging need to make the symbiosis between man and machine (Grudin 2012), the necessity to understand and better empower users (Carroll 2013). Thus the Graphical User Interface (GUI) was born. Nielsen (1993) suggests that if so far the user interfaces were function-oriented and users needed to type in the command, followed by the arguments to actuate the function, then starting from the late 1970s and early 1980s, the interaction turned object-oriented. Therefore, the users started to first access the object of interest and then adapted it by operating on it - the interface was turned inside-out, compared to CLI. For example, for deleting a file called Document in CLI, the user needs to first write the deleting command rm and then the file name Document. In the GUI, on the other hand, the user first accesses the file Document through graphical icons or other visual elements and simply chooses the function, from the list of commands appropriate for this object, delete or drags it into a graphical trash bin. Although for the experts, the GUI worked slower than CLI (Grudin 2012) and even today, many developers and other professionals, still make use of the efficiency and utility of giving commands to the computer. Similarly, Carroll (2013) claims that GUIs were actually not that easy to learn and use in the beginning, people were simply not used to this kind of interaction and it did not familiarize any regular everyday interactions. Yet, being obvious these days, it is no more a problem, rather a cultural background or even an innate ability, to either double click or drag. By the mid-1980s, the evolution of the local area networking and the Internet brought change into HCI, the computers turned into communication channels - users were now communicating with other people through computers (Carroll 2013).

One step further, in 1989 Tim Berners-Lee invented the World Wide Web. As he states: *"The Web is simply defined as the universe of global net-*

work-accessible information. It is an abstract space with which people can interact [...] Its existence marks the end of an era of frustrating and debilitating incompatibilities between computer systems." (Berners-Lee 1996). Therefore, the goal of the Web was to be a place for shared information, through what people, as well as machines, could communicate - the interaction moved from desktop to web.

Consequently, Web 1.0 was born. As Berners-Lee himself suggested, the first implementation of the web was "read-only" and its role, in general, was rather passive - people could view the information provided by static web pages (Solanki, Dongaonkar 2016). Thus, similarly to the first communication model by Shannon and Weaver, mentioned earlier, also the first generation of the Web hosted a one-way communication (Maida 2018).

Web 2.0, a "read-write" Web, was introduced in 2004 by Dale Dougherty and Tim O'Reilly. With the new approach, the websites moved from being static content providers to a more dynamic model (Solanki, Dongaonkar 2016), whereas the users could interact more freely (Aghaei, Nematbakhsh et al. 2012) and generate content themselves. Web 2.0 gave the world social media, as well as blogging, chatting, sharing video content, and other online interactivity forms that became popular and have managed to stay so until today (Solanki, Dongaonkar 2016).

Although Web 2.0 kept evolving, the inventor of the World Wide Web, Tim Berners-Lee proposed a new layer for the web - Semantic Web. *"In this version of the Web, sites, links, media and databases are "smarter" and able to automatically convey more meaning than those of today."* (Shannon 2006). Additionally, John Markoff (2006), The New York Times journalist, suggested a term Web 3.0 that takes the next step, such that the Web would be less of a catalog and more like a guide. Berners-Lee stated: *"People keep asking what Web 3.0 is, [...] I think maybe when you've got an overlay of scalable vector graphics - everything rippling and folding and looking misty - on Web 2.0 and access to a semantic Web integrated across a huge space of data, you'll have access to an unbelievable data resource."* (Shannon 2006). Thus, he illustrates the Semantic Web as an additional meaning segment of Web 3.0. What is more, while the earlier web versions are seen as a layer

of Syntactic Web (Liu 2007; Weigand, Paschke 2012), which scenarios are focused on the users interacting with other users or technologies, Semantic Web focuses on scenarios where electronic agents take the burden off the user and interact with other users or electronic agents, on behalf of the user (Hornung, Baranauskas 2011) - thus, machines are thinking, not merely following the commands.

The main goal of Web 3.0, together with the Semantic Web, is to link the existing data and share it among different databases, to provide more effective exploration to the users. For example, when the user buys plane tickets to New York, the system automatically suggests restaurants to go to or hotels to stay in - in 2019, the described scenario of Web 3.0 is an obvious part of everyday interactions.

Another obvious scenario and yet one more alternative - Web 3.0 is also known as the Mobile Web 3.0 (Jamison 2012). Thus, the main elements illustrating it: the connectivity (always and everywhere), location awareness, and small screens, to name a few. The focus of HCI moved from web to mobile - design took a new direction, heading towards Mobile First.
The more recent side of Web 3.0, that so far has not yet managed to dominate, is the Decentralised Web. In June 2016, at the Decentralised Web Summit, Berners-Lee pointed out: *"The web was designed to be decentralised so that everybody could participate by having their own domain and having their own webserver and this hasn't worked out. Instead, we've got the situation where individual personal data has been locked up in these silos. [...] The proposal is, then, to bring back the idea of a decentralised web. To bring back power to people."* (Hodgson 2016). In a few words, the idea is to make the web once again reliable, private and fun.

Even though Web 3.0 is still ongoing and speculations on when did it actually start are actively continuing, there are already rumors about the Web 4.0 (Aghaei, Nematbakhsh et al. 2012). Almeida (2017), in order to bring some clarity into the topic, brings out several definitions, or rather ideas, that have been stated for Web 4.0 since 2009. The results of his study revealed: *"[...] Web 4.0 covers a set of multiples dimensions. Each of these dimensions offers a distinct, but simultaneously comprehensive, view of the Web 4.0 paradigm,"* adding that social computing - social networks, Internet of Things, Big Data, Artificial

Intelligence, and Machine to Machine - will be the key players in the upcoming Web-era. Thus, it is obvious that the future will be social - already today and even more in the future, Conversational User Interfaces (CUI) will provide a new way to interact and communicate.

Additionally, there are already speculations about Web 5.0 and 6.0, along with the others. The current work does not aim to look so much ahead into the future, yet, before studying the CUIs in detail, there is one final interesting layer of the web that still needs to be addressed. Namely, the Pragmatic Web.

As it goes for the semiotics, illustrated earlier, it can be similarly stated in computer science - pragmatics lies beyond semantics. That was noted by Singh, in the early 2000s, whereas he emphasized: *"[...] just as the syntactic aspects have not died off when the semantics is considered but have instead become more rigorously defined, so too will the semantics flourish as the pragmatics expands."* (Singh 2002).

As de Moor et al. (2006) state, the amount of information is ever-growing and it became difficult to find information needed, the Semantic Web introduced the basis for allowing more efficient information use. Not only by providing a set of linked documents but managing the data in collections of knowledge stores with meaningful content and additional logic structures. However, the authors of the Pragmatic Web Manifesto bring out - if the Web aims to be a thoroughly communicational tool, Semantic Web is not sufficient for agreeing and modifying the shared meaning. That is where the Pragmatic Web comes to help as its vision is to: *"[...] augment human collaboration effectively by appropriate technologies,"* as well as *"[...] improving the quality and legitimacy of collaborative, goal-oriented discourses in communities."* (p. 76).

Therefore the aim of the Pragmatic Web is to define how and why, in relation to the context and intended purposes, the information is used (Liu 2007) - the main position belongs to the processes and the context, in which the data is used, not to the data itself (Singh 2002). What is important, the scenarios include users as well as electronic agents and primary topics are about contextual-

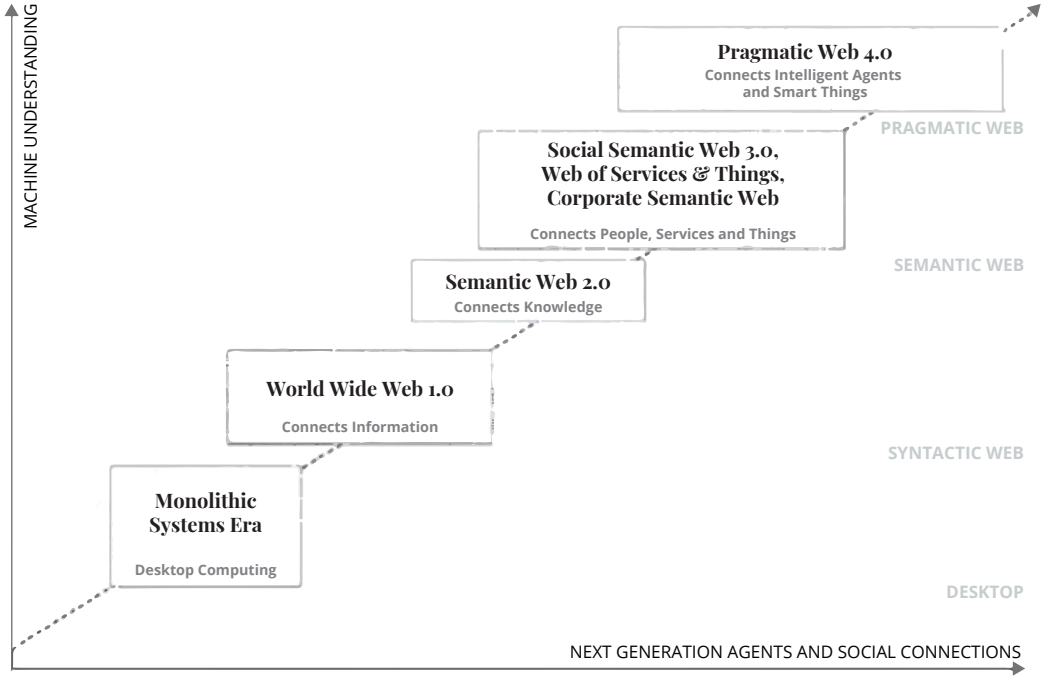


FIGURE 3.1_ DEVELOPMENT OF THE WEB (ADAPTED FROM: WEIGAND, PASCHKE 2012)

ized meaning, meaning negotiation and practices of virtual communities (Hornung, Baranauskas 2011). Weigand and Paschke (2012) add that the Pragmatic Web can be seen as a view of the Internet that acts as a platform for communication and coordination - messages are viewed in the context of an interaction. As a result, Hornung and Baranauskas (2011) hypothesize that when taking up the Pragmatic Web approach, the human-computer interaction will result in data and services that are relevant for the users, and correlate with their actual needs, whereas providing the flexibility of use.

Given the above, Figure 3.1 illustrates the developments of communication with computers over the last few decades. In order to understand the evolution of interaction and communication with the computer, the past developments and future predictions for the system itself, have been demonstrated.

As mentioned, initially the experts were communicating with computers by giving tricky commands through CLIs on their desktops. When computers started to emerge as everyday tools, the GUIs were designed. With the dawn of the Web, the interaction moved from desktop to web - at first to syntactic web-pages and later on

to semantically connected meaningful data. The next step was the appearance of small computers, better known as smartphones, and the interaction moved from web to mobiles - information got accessible everywhere and every time. Today, as the amount of data in the web has gotten elusive and users long to access data on the go, new means are researched to make the communication even faster, more natural as well as relevant to the users. Thus, the Web is moving towards communicational and collaborative future - the Pragmatic Web. The rising interest in conversational interfaces can be seen as one hint.

WHAT ARE CONVERSATIONAL INTERFACES?

In 2016, Conversational Interfaces or Conversational User Interfaces (CUIs) started to be in the center of focus in every other article about technology or innovation. Chris Messina (2016), a well-known product designer with a background in Google and Uber, stated: *"2016 will be the year of conversational commerce"*. In an interview for Business Insider, Satya Nadella, Microsoft's CEO claimed: *"[...] pretty much everyone today who's building applications, whether they be desktop apps, or mobile apps, or websites, will build bots as the new interface"* (Weinberger 2016). Mark Zuckerberg envisioned them as a substitution for apps, or at least as a fresh alternative (McMillan 2016).

Before analyzing if the predictions thus far have come true, it is crucial to understand what Conversational Interface prefigures. Generally, an interface is conversational when it allows the user to interact, hence achieve a result, while communicating with the system in natural language (Choque-Diaz, Armas-Aguirre et al. 2018). McTear (2017) identifies as CUIs the interfaces using speech, text, touch, and various other input and output methods. However, when touch, gestures, and other cognitive aspects, such as facial expressions are used in an interaction, diverse researchers (Liu 2010; Loureiro, Rodrigues 2011) refer to these as Natural User Interfaces (NUIs). To illustrate more, these interfaces have been divided as Spoken Dialogue Systems (SDSs), Voice User Interfaces (VUIs) or Virtual Private Assistants (VPAs) - such as Apple's Siri or Amazon's Alexa,

with what users can interact while speaking. Also, Embodied Conversational Agents (ECAs) are addressed as using animated characters with gestures, facial expressions, posture, and speech. Last but not least, chatbots or chatterbots are the interfaces that converse with the human through text, similarly to human-human text messaging.

As illustrated, Conversational Interfaces come in many forms with diverse purposes. Yet, since the current work cannot cover all the different forms of Conversational Interfaces, the text-based chatbots are in specific interest here.

CHATBOTS IN FOCUS

THE ORIGINS

Chatbots as such, are not new concepts in general - Alan Turing first asked the question *"Can machines think?"* in 1950 (Gunkel 2012). Despite the growing popularity in recent years for goal-based chatbots that support the user in achieving a specific goal, the first attempts to build them trace back to the 1960s, into the MIT labs. Namely, Joseph Weizenbaum built chatbot ELIZA, a Rogerian Psychotherapist, in 1966. Yet, it did not have a goal as such (for example, to help the user order food), but to simply keep conversing with a human (Weizenbaum 1966). Although ELIZA was using pattern-matching technique and did not actually understand what the human was saying, it was an inspiration to many latter chatbots and especially the ones tricking the user into thinking that they are talking to other human beings (Abu Shawar, Atwell 2007).

As technology has evolved, chatbots have started to get smarter - to actually understand the human language and therefore learn from the utterances. There are chatbots, such as Microsoft's XiaoIce in China, that does not necessarily solve the user's problem, like most chatbots these days, but instead aims to be social - a virtual companion to chat with (Shum, He et al. 2018), likewise ELIZA was built more than 50 years ago. In contrast to ELIZA, mentioned chatbot learns every day how to be more human, using AI framework with deep learning techniques (Spencer 2018).

Since the current work does not aim to redesign or propose new and effective solutions to the technology, a brief overview of the building components has been given. From here, the work

To build an intelligent chatbot that is effective, following is needed (Bianchini, Tarasconi et al. 2017):

- Natural language processing (NLP). For understanding the human intent, it is crucial to process human language. Thus, the development of NLP algorithms is essential to create an intelligent chatbot.
- Machine Learning (ML). For learning and combining the NLP algorithms by observing past conversations and their outcomes.
- Context and State Awareness. The component managing the conversation (Dialogue Manager System - DMS) should consider the context as well as the state of the conversation. The state depends on the information collected before and, instead, the follow-up actions depend on the context. Jain et al. (2018) illustrate the state as intent and entities - goal and its variables. For example, if the user says: *"I want to order Coca-Cola,"* the intent is to order a drink and the entity is Coca-Cola. The chatbot answers: *"Ok, anything else?"* whereas the user replies: *"Make it large and add ice."* Thus, the context is still ordering the drink, while large and add ice can be related to Coca-Cola. Without the context, large and add ice are new entities without intent.
- Natural Language Generation (NLG). For deciding the content of the information and how to display it to the user. The intelligent system should be both proactive (e.g. remind about the restaurant booking) as well as adaptive (e.g. change the attitude following the domain, user's mood, and sociolinguistic variables).

will continue to describe the reasons why chatbots have come an important point of interest in the recent years, despite having been around already from the 1960s.

THE FITTING CIRCUMSTANCES

"We're in the midst of a once-in-a-decade paradigm shift. Messaging is the new platform, and bots are the new apps. The shift radically changes end-user experiences and developer frameworks and inevitably will change business models, how we monetize, and how we advertise." (Sheth 2016).

The announcement mediated in VentureBeat, a source for the latest technology news, seems to be right since

the popularity of messaging apps is ever-growing. Four out of ten most popular smartphone applications in 2018, with the highest number of monthly active users throughout the whole world, were instant messaging apps as illustrated in Table 3.1 (App Annie 2019).

As of July 2019, the applications ranked in the mentioned list, host billions of people in a month (Figure 3.2). Namely, every month there are 1.6 billion active users on WhatsApp, 1.3 billion in Facebook Messenger, WeChat has more than 1.1 billion monthly users and QQ 823 million (Clement 2019b).

The fact that messaging platforms are so popular, gives a great starting point also for chatbots. According to Gartner, coming from less than 2% in 2017, 25% of customer service and support operations in 2020 will run through chatbots or other virtual customer assistants (Moore 2018). In May 2018, Facebook announced that after 2 years in action, its bot platform hosted more than 300 000 chatbots (Johnson 2018). In addition to instant messaging applications, chatbots can be found performing in other standalone apps or operating on various websites to support customers.

WORLDWIDE BY MONTHLY ACTIVE USERS	
1	Facebook
2	**WhatsApp Messenger**
3	**Facebook Messenger**
4	**WeChat**
5	Instagram
6	**QQ Mobile**
7	Alipay
8	Taobao
9	WiFi Master Key
10	Baidu

TABLE 3.1_ TOP APPS 2018
(ADAPTED FROM: APP ANNIE 2019)

THE BENEFITS OF USE

There are different reasons, in addition to the popularity of real-time messaging apps, behind such good indicators. To start with, perhaps most importantly, chatbots provide an interaction that is natural for hu-

man beings - just like people use language to communicate with each other, they also want to use it to interact with computers (Abu Shawar, Atwell 2007). One might question if texting is as natural - Deborah Tannen (2013) stated that *"text"* and *"talk"* are not two different entities, but *"overlapping aspects of a single entity"*: discourse, or communication. She adds, joining other researchers, that the use of social media and messaging applications is not much different from what has always been done with speech in social interactions - she sees it simply as doing something old in a new way. Additionally, it was reported that chatbots are equally desirable for age 18-34 and age 55+ (Drift 2018). Since the interaction is natural, it has the potential to improve online experiences for consumers, regardless of age and proficiency in the use of technology. People are used to keeping private relationships via texting, this personal communication can extend also to services and businesses and, additionally, users can be in charge of the communication themselves, since they have the freedom to respond, mute or even delete the thread (Klopfenstein, Delpriori et al. 2017).

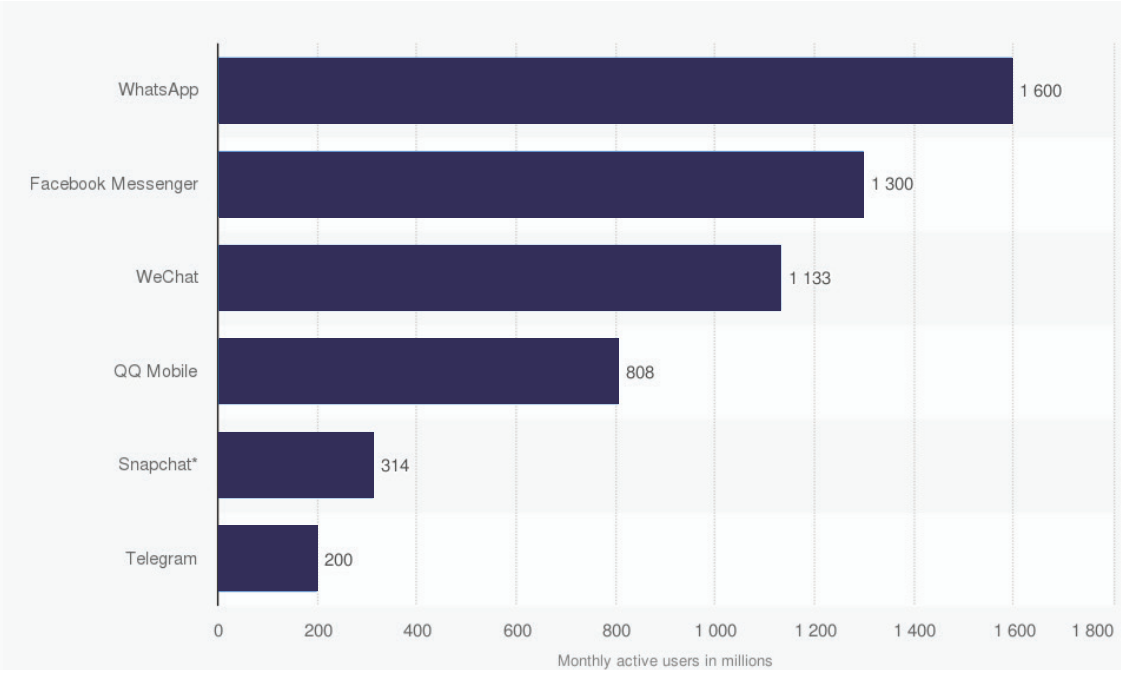


FIGURE 3.2_ INSTANT MESSAGING APPLICATIONS' MONTHLY ACTIVE USERS (ADAPTED FROM: CLEMENT 2019B)

Second, the benefits include the utility and simplicity. McTear (2017) points out the fact that users do not need to download an application to use chatbots. That is, of course, when the chatbot is not implemented as a feature of an application. He adds another advantage for chatbots, specifically for the ones running on messaging applications - since the users are already familiar with messaging applications and they function in the same way across different operating systems, such as iOS and Android, there is consistency - users already know how the interface looks like, how to use it, and developers do not need to build various versions. What is more, users can approach chatbots 24/7 and the chatbots on messaging platforms keep the history, thus the user has the freedom to turn back to explore past information (Klopfenstein, Delpriori et al. 2017). Also, the overall approach results to be more personal since the companies, for example, can gather the information necessary for providing customized offers targeted directly to this user, at the right time (Zumstein, Hundertmark 2017).

Another important factor for users is the UI. As already mentioned, there is consistency throughout different platforms - thus, the user does not need to discover nor learn, as is the case for diverse applications and websites. Although the term chatbot hints for chatting, just as humans send pictures, audio files, videos or emojis to stimulate the messages, there are the same options available for chatbots. It is true, they do not include much of GUI in general, but even a static link can be sent in a more appealing way than a simple URL, such as formatted cards. Also, various options can be displayed to the user through carousel elements. To keep the communication going and, hopefully, on the right track, *quick reply* buttons are often given to suggest the messages that the user can send to the bot. Finally, many of the chatbots allow the user to access a menu for immediate navigation.

To go more in detail with domains, chatbots are used to control mental health for example. One such, called Pocket Skills was designed to support Dialectical Behavioral Therapy (DBT). As the study showed, after 4 weeks all the participants had considerable improvements in depression, anxiety, and DBT skills use (Schroeder, Wilkes et al. 2018). Similarly, another study was conducted on the Wysa app, that aims to build mental resilience and promote mental well-being using a

text-based conversational interface. After a 2-month period, significant improvements in severe depression symptoms were noted for the users who used Wysa often, compared to the ones who did not use it as much (Inkster, Sarda et al. 2018).

In addition, chatbots offer access to services for everyday utilities to make users' lives easier. It is possible to order food, manage e-commerce purchases, book plane tickets, order a taxi and so on.

So far, the benefits of chatbots have been illustrated - most of the chatbots these days are meant to help to facilitate people's lives and their interactions with computers in a natural manner.

In a study conducted in the USA by Brandtzaeg and Følstad (2017), that aimed to learn the main motivations for employing chatbots, it was evident that people are mostly (68% of the participants) willing to use chatbots for productivity purposes. 20% of them said that they would use chatbots for entertainment. What is more, 10% thought of chatbots as a novelty technology and the curiosity drove them to test chatbots' abilities. And similarly to the latter, another 10% of participants, saw them as an opportunity to avoid loneliness - for social and relational purposes.

Although, it is important to note that the aim of chatbots should never be to substitute a human being or imitate the conversation perfectly (Abu Shawar, Atwell 2007).

THE ASPIRE TO ADVANCE THE DESIGN

To generate new and valid results, yet to not reinvent the wheel, the state of the art of designing chatbots needs to be discussed. First, it is vital to address the rationale behind the fact - 2020 around the corner, chatbots have not taken over the world as promised at the beginning of 2016.

Despite having countable benefits in the use of chatbots and the possibility to be a powerful tool, there have been many disagreements in the issue of usefulness lately. As the current work started the topic of Conversational Interfaces with pointing out various encouraging opinions - such as Mark Zuckerberg seeing the chat-based chatbots highly favorable and especially so for *"born-to-chat millennials"* (McMillan 2016) - it is time to

consider the opposing thoughts that have started to loom. Even the very same article in The Wall Street Journal emphasized the fact: *"But first, they'll need to get a lot smarter."* Wired, a magazine focusing on emerging technologies and their influences on politics, culture, and economy, asserted that: *"No, Facebook's chatbots will not take over the world"* (Simonite 2017). In addition, it has been stated that 70% of Facebook Messenger chatbots are failing (Gilliland 2017) and in general, 65% of consumers still prefer to talk to human agents (Audet 2018). Finally, USA Today reported in 2017 the thoughts of Forrester Research analyst, saying that it is still the very beginning for chatbots and it will take more than five years until they will start providing meaningful experiences (Graham 2017). The various arguments in popular publications do not stop here.

chatbots are equally desirable for age 18-34 and age 55+

As can be noticed from the articles, one strong argument goes for the need to make the technology better. No doubt, it is one of the main reasons why communication fails and despite recent advancements with social chatbots, such as Microsoft's XiaoIce mentioned before, human-level intelligence is not yet fully understood. Also, it will still take some time to be effective, whereas the main challenges in the AI field include: empathic conversation modeling, knowledge and memory modeling, interpretable and controllable machine intelligence, deep neural-symbolic reasoning, cross-media, and continuous streaming artificial intelligence, and modeling and calibration of emotional or intrinsic rewards (Shum, He et al. 2018).

However, XiaoIce can engage users in rather long conversations, understand their needs and build an emotional connection while giving advice and offering support. XiaoIce can understand human emotions and act on them, recognize the content of a picture, comment on it, and even create poems.

Similarly, in March 2016, Microsoft launched Tay, a chatbot on Twitter to engage and entertain people mostly between the ages 18-24 with playful and casual conversation (Hunt 2016). The more people chatted with it, the smarter it got. Seen as one of the greatest failures of chatbots, Tay became a racist chatbot with unbear-

able tweets in less than 24 hours. It was smart enough to learn from users what to say, but irresponsible for doing so since it did not have any filter.

Another example of a "too intelligent" chatbot is IKEA's Anna, that retired in 2016, after being one of the first chat-based virtual assistants on the market. IKEA told BBC: *"If you try too hard to be natural, it diverts from the real purpose of it, which is about giving the right answer as fast as possible."* (Wakefield 2016). Meaning, Anna failed since it could not do the online assistant chores and thus answer the direct questions. Instead, it tried to sound highly human-like and forgot its business purpose.

As can be seen, technology is not the only substantial component of a well-working chatbot, thus other properties need to be designed appropriately as well. Therefore, various scholars have addressed diverse issues and challenges. McTear (2017), for example, posed general questions about: the design of multi-turn conversations, as well as the clarifications and follow-up queries; how to approach the context where the conversation takes place; the handling of other pragmatic elements, such as indirectness; as well as behavioral factors.

To start with, Zumstein and Hundertmark (2017) affirmed the fact that chatbots are not completely novel and people are aware of them, although not many use them on a regular basis. They assume that users are still used to familiar communication channels (such as phone, email, app or website) and it will simply take more time to get comfortable with chatbots. What is more, they suggest that implementing them on instant messaging platforms might not be the best idea and in the research they discovered that users would prefer the chatbot to be integrated into an existing app, rather than on Facebook Messenger or other similar platform. Despite the popularity of instant messaging, as well as having some digital distribution websites, such as the AppStore or Google Play for apps, the discoverability of chatbots on messaging platforms remains a critical issue (Klopfenstein, Delpriori et al. 2017).

To go more domain-based, chatbots are seen as highly beneficial help in terms of monitoring the mental health of a user. However, physicians do not believe that chatbots are advanced enough to provide help in terms of complex decision-making

tasks and medical experts' opinions are still crucial (Palanica, Flaschner et al. 2019). In general, Klopfenstein et al. (2017) advise to deliberate the use of them - not all applications and services are suitable to be displayed via chatbots.

One great trouble the users are having, is comprehending the context and understanding each other. Thus, Jain et al. (2018) addressed the issues with it and designed an interface that displays the context (chatbot constantly displays how it is understanding the user at the moment) and allows the user to edit or remove it. The study showed that users preferred the chatbot with the additional feature as they found it easier to use, intuitive, mentally less demanding, as well as faster. What is more, chatbots should include a well-designed onboarding, therefore inform the user about the possible functionalities and following interactions as well as offer alternatives (Klopfenstein, Delpriori et al. 2017). Similarly, Valério et al. (2017) analyzed and evaluated the different techniques that chatbots apply to inform the user about its competencies.

In terms of communication, similarly to the study mentioned earlier, where Reeves and Nass (1996) were proving an equation of media = real life, a more recent study specifically about chatbots was conducted. Mou and Xu (2017) studied the differences in social communications between human-human and human-chatbot interaction. Opposing to the media equation, they found that humans showed more socially desirable characteristics while chatting with other humans, in contrast to chatting with a chatbot. Meaning, if the users are aware of speaking to an AI, they will, for example, be less open as well as use a more limited vocabulary. On the other hand, similarly to Reeves and Nass, the study showed that people like interaction with a chatbot more when its personality is similar to theirs. What is more, Thies et al. (2017) found that the bot's personality even defines the interactions and the topics of conversation.

Additionally, Go and Sundar (2019) found that the identity cue of the chatbot, being either a human-like picture or an illustrational icon, influences the expectations for the performance. This supports also many other scholars (for example Klopfenstein, Delpriori et al. 2017; Ciechanowski, Przegalinska et al. 2019) who have emphasized the importance of not hiding the fact that the user is

talking to a computer, otherwise, the expectations will be higher and the resulting satisfaction lower.

Even more, Klopfenstein et al. (2017) argue that the term "chatbot" itself sets high expectations. Since today many of the existing bots are not simulating natural language and the users are giving inputs with preserved utterances, known as quick replies, people cannot really "chat" with them. Thus, they propose a term "botplication" to use for these sorts of bots. They advise to appreciate the simplicity and effectiveness - avoid using natural language, and employ quick replies if possible. They emphasize that due to natural language, it is easy for the users to "get lost" since they do not know which commands or syntax to use to achieve a desired goal. Similarly, Zue and Glass (2000) also argue if chatbots should mimic natural human-human communication, or stay in a more structured, or one might say robotic, level. Ciechanowski et al. (2019) studied the effects of "uncanny valley" - the negative impacts that appear when interacting with a computer that is highly similar to a human agent, such that it becomes hard to distinguish. They expected the emotional and physiological responses to be most intense when interacting with an avatar, instead of a simple text-based chatbot - thus the uncanny valley effect would be stronger. This came out to be true - people saw the experience more positive as well as pleasant when talking to a chatbot. Meaning that they were physiologically aroused when interacting with an avatar that tried to imperfectly imitate a human being.

What is more, Heo and Lee (2018) describe a case study for the Naver TalkTalk chatbot platform. Initially being a common natural language chatbot, it was soon developed into a card-based one. The rationale is that people did not know what to talk with the chatbot and saw it rather inconvenient. The authors state that chatbots do not work only with natural language and providing suitable scenarios to the users is crucial. Doing that, the response rates increased significantly.

Analysts and various technology experts have ensured that conversational interfaces have come to stay - the need for them is growing constantly as humankind races towards the Pragmatic Web. In the excess of data, the service providers dream of letting the users speak with computers in a conversational manner, to facilitate easier information finding and

“Can machines think?”

ALAN TURING, MATHEMATICIAN & PHILOSOPHER

more meaningful experiences with their services.

There are numerous benefits to using chatbots. Due to the usage of natural language and familiarity, everybody would be able to use technology and access information in an easy way. Chatbots aim to make everyday life more productive and smooth. What is more, these conversational interfaces could be of great help when dealing with loneliness or other mental health questions, to name a few.

Despite great arguments as well as favorable predictions a few years ago, chatbots have not obtained a wide usage. Thus, researchers discuss the shortcomings of chatbots, mainly technological, yet also the ones concerning UI. Many others have tried to understand the communication as well as the humanness of chatbots, anthropomorphism, and the extent it should cover. The understanding of how communication works between humans and chatbots, as well as how to make the interaction better, have been studied in diverse ways.

Coming from the state of the art, current work argues that there is a need to understand how users perceive the communication and which are the main pragmatic shortcomings behind the notion.

Metho_
dology

The methodology of the current work consists of a detailed overview of qualitative research - what was the question that needed to be answered, how was the study conducted, who were the participants, which tools were used to help carry out the study, and how was the final data analysed.

RESEARCH QUESTION

As the theoretical framework described, within millions of years human-human communication has once overcome the same hurdles as human-computer communication has outpaced in the last few decades. Similarly, people started communicating with each other by pointing and giving simple commands, initially without much of a structure. Ever since, human communication has been studied and more thoroughly so, from the 20th century. Different philosophers and linguists have analyzed successful communication and thus discovered one groundsel being the pragmatic layer.

Recently, various researchers have proposed the adoption of the pragmatic layer also for the Web. Coming from the fact that the amount of data has become immense, interaction is expected to evolve to become more conversational and allow negotiations. Thus, it is evident that conversational interfaces, such as chatbots, play an important role in this act.

Despite being extremely endorsed in 2016, the hype of the chatbots has started to fade and communication with them is often seen as failing. Yet, it is believed that the time of chatbots has not yet arrived, thus designers should find solutions to make the interaction more meaningful to support the success of this future communication tool.

As mentioned in the previous chapter, people perceive computers as social actors and texting is claimed to have the same communicational values as speech. Therefore, the current study finds it appropriate, similarly to other researchers (for example Gnewuch, Morana et al. 2017; Zue, Glass 2000) to base the entity of human-chatbot interaction on the grounds of human communication.

Many researchers have studied the technological drawbacks, others have focused on the anthropomorphism of chatbots. To the knowledge of current work's author, no other study so far,

has focused on how users perceive the experience directly from a pragmatic point of view. Of course, researchers have used pragmatics before, for example En and Lan (2012) applied Politeness maxims to design the dialogue with a robot, and similarly, Hall (2018) suggested to use Gricean maxims for interacting with chatbots. Likewise, current work aims to look beyond the technical deficits and investigate the pragmatic aspects of human-chatbot communication to understand how they influence the overall user experience. Thus, the aim is to find an answer to:

How do users perceive the pragmatic shortcomings in communication with chatbots?

PROCEDURE OF THE STUDY

Coming from the research question and the desire to get to know users' thoughts and impressions of the experience, as well as address their real needs, in-depth semi-structured interviews (Appendices A1) were conducted (Nielsen 2010) to carry out the study. The use of a qualitative research method enabled to address not only *what* the participants thought, but additionally drew attention to the aspect of *why* did they think so - thus, not only did it give *answers*, but it also gave *reasons* to these answers. Since the aim of the work was to provide a descriptive outcome and investigate communication, it was beneficial to similarly study the problem in a communicative and descriptive manner - hence, the qualitative research.

The data was accumulated through open-ended questions to allow exploration, favor freedom to express thoughts, and not lead the participant in any targeted direction (Rosala 2019b). Additionally, the use of semi-structured format enabled the researcher to ask follow-up questions to understand the views more thoroughly and collect additional information. Yet, it is crucial to note that the core of the interview needed to stay the same for all of the participants, in order to allow analysis and comparison of the data.

The interviews were carried out online and primarily through Skype. That enabled screen, video, as well as audio recordings, to support immediate playback and, as mentioned,

analysis by the researcher in the later phases. On the one hand, seen as a benefit, the participants were able to stay in familiar environments, separated by the screen and participate in a way that is common throughout the world for personal and business matters - video calling. Perhaps it helped them to feel more comfortable and less as an object of investigation throughout the whole interview. On the other hand, the researcher was not able to fully read the body language of the participants as well as minor connection problems occurred. These were the drawbacks that the author of the current work needed to take into consideration and that would not have been the case for face-to-face interviews.

Also, since qualitative research and in-depth interviews are time consuming, it needs to be considered that fewer people were analysed and the results cannot be generalized to a wider population, as would be while carrying out a quantitative study. Yet, once again, the chosen method allows in-depth understanding of the participants' thoughts and perceptions. Additionally, coming from the requirements, the research was prepared and carried out by one facilitator only, thus the results might have been different with the diverse skills of various researchers.

To empower the study, in addition to the open-ended questions, the interview included a minor hands-on usability activity with an existing chatbot, "Eddy Travels". That was seen as a vital part, since it was not known or compulsary that the users had had an experience with a chatbot prior to the study. What is more, human memory is faulty and people cannot remember the details of the previous usage (Nielsen 2010). Thus, a brief application of the chatbot was necessary. This gave a slight opportunity for data triangulation (Nielsen 2010), since it allowed a glimpse into behavioral insight rather than attitudinal judgement - thus, answered a question of *what people do* rather than *what people think* (Rohrer 2014).

Finally, in order to be adamant about the success of the study and to ensure it helps to answer the research question, pilot interview was conducted. The party was not aware of participating in a pilot and was not treated any differently. This was simply completed to adjust the interview questions and add additional clarifications, prioritize them, as well as understand the approximate dura-

tion, and guarantee smooth run for the final study (Schade 2015). It turned out as valuable interview with equally important insights.

WARM-UP AND THE TASK SESSION

Each study began with a warm-up session. First, it was important to go through the users' rights and instruct them to think out loud throughout the study in order to get deeper insights. To get the participants to do so, they were reminded that there were no right or wrong answers and that the facilitator was not testing their knowledge. Therefore, it ensured to the participants that there will be no judgement and they can think freely and open up. Additionally, it was crucial to go over the fact that the participants would be well aware of the recording of the session and retention of the recordings.

Followingly, introductory questions were needed to help the participants open up and get them into the mindset of the topic. This part of the study was used as a transition to the central topic - chatbots. To start with, a little information was asked about how did they usually plan their travels. The interview continued with the description of participant's everyday technology use as well as the knowledge of and relationship with conversational interfaces in general, such as Siri. Finally, the participant was lead to the core topic of chatbots and the previous usage as well as experiences was examined.

After the introduction, the usability session took place, whereas the user was given a task to search for their next trip's flights with "Eddy Travels" chatbot that they had heard about, from a friend. The given task was rather broad to allow the user to explore around, not restrict the investigation of other functionalities (such as looking for a hotel or inquiring an insurance) and not to influence the overall experience. The main purpose of the task was, as mentioned, to allow the participant to have a fresh experience with a chatbot to express oneself more broadly in the consecutive, fundamental part.

TOPIC SPECIFIC SESSION

Followingly to the introduction and a brief hands-on usability session, the interview aimed to address the issues that helped to find answers to the main research question. Since the objective of the study was to discov-

er the overall perceptions and concerns about pragmatic shortcomings in communication with chatbots, the open-ended questions in the semi-structured interview were guided through pragmatic theories acquainted in the theoretical part of the current work. Similarly, the questions were divided as discussion points about cooperation, behavior and conversational style.

What is more, since the current work addresses the human-computer interaction on the grounds of human-human communication, it is interesting to see that the absence or weakness of pragmatic skills in human beings is detected as autism. Thus, some of the open-ended questions in the distributed topics were additionally inspired by American Speech-Language-Hearing Association's *"Social Communication Skills – The Pragmatics Checklist"* (Goberis 1999) that helps the parents to detect the symptoms of autism in their kids.

the absence or weakness of pragmatic skills in human beings is detected as autism

As stated, the interviews conducted were semi-structured, thus the facilitator took the questions prepared as an interview guide and applied versions coming from the orientation and the participant of the ongoing study. Although, it was important to receive answers to all of the substantial matters to enable final analysis.

COOPERATION

First, as seen in the theoretical part, one of the initiators of the field of pragmatics, Paul Grice, stated the Cooperative Principle, saying: *"Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange in which you are engaged."* (Grice 1975, p. 45). What is more, in order to fulfill the principle, Grice defined 4 maxims: quantity, quality, relation and manner. Hall (2018), the author of *"Conversational Design"*, saw these as powerful guides in order to create more human-centered interactions and additionally brought out what happens if these maxims are violated (Figure 4.1).

Similarly, the current study drew on the above-mentioned maxims to define questions about understanding the proactiveness and its necessity to the user. This section's questions are illustrated in Table 4.1.

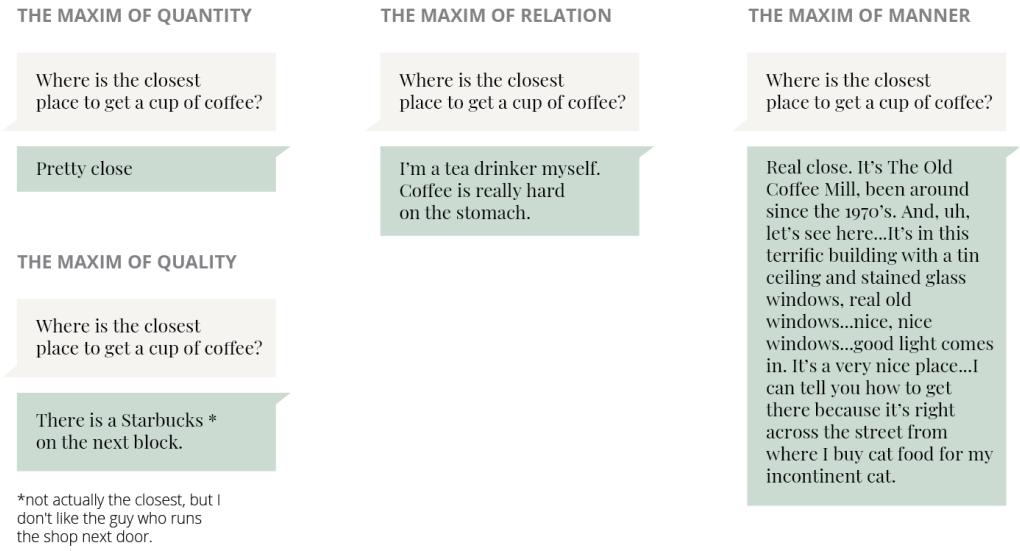


FIGURE 4.1_ VIOLATING GRICEAN MAXIMS (ADAPTED FROM: HALL 2018)

BEHAVIOR

To dig deeper into the pragmatic layer and address other parameters, the study aimed to enquire about the behavior of the chatbot. To do so, two other theories from the theoretical framework were considered.

First, Watzlawick, Beavin and Jackson (1967) addressed the issue with behavior, stating that *"all behavior is communication"* (p. 22) and brought 4 additional axioms, about relationship and verbal-nonverbal communication for example, that define the success of communication.

Similarly, Leech saw another behavioral aspect of successful human communication - politeness. He defined 7 maxims and differently from the Gricean ones, the politeness maxims add more personal value to the communication, they are seen as more natural and are overall believed to describe the behavior of the communicator (En, Lan 2012).

Coming from these theories, following questions in Table 4.2 were considered in the interview.

CONVERSATIONAL STYLE

Finally, the overall conversational style was discussed to understand how the participants perceived the utterances' styles and if the chatbot

meets users' expectations similarly among various cultures.

Since Tannen (2005) found that anything said, is said in style - at a certain rate, pitch and amplitude, with particular intonation, at a precise point in an interaction - it was found as an important point to the current study. As she suggested, successful communication among people is highly dependent on the matching of these devices.

Table 4.3 illustrates the main questions asked concerning conversational style.

COOL DOWN SESSION

To finish the interview and indicate the ending of it, some closing questions were asked.

In general, it was requested to rate which one of the discussed parameters (cooperation, behavior, and conversational style) were appreciated the most and which the users perceived as weak.

What is more, the participant described the negotiation with the chatbot, if they came to a mutual understanding or they considered the communication failed? Finally, the users were asked if they would use the chatbot again.

THE PARTICIPANTS

In total, 15 participants were interviewed, 10 of them women, and 5 men. Coming from time as well as resource restrictions, non-probability sampling method was used - meaning, not every member of the population had a chance to be chosen (*Non-Probability Sampling* n.d.). Since the research itself was qualitative and aimed to develop an initial understanding of the problem, the chosen method proved appropriate. However, it needs to be emphasized that statistical assumptions about the whole population cannot be drawn (McCombes 2019) using non-probability sampling, in contrast to probability sampling.

Conversational interfaces are seen as means to make technology and information accessible as well as usable for everyone - chatbots are equally desirable for ages 18-34 and 55+ (Drift 2018). Therefore, not only young tech-savvy users but also older people with lower technological competencies would have been suitable participants for

GENERAL	WHAT WOULD YOU SAY ABOUT THE HELPFULNESS AND COOPERATION/PROACTIVITY OF THE CHATBOT? HOW WOULD YOU COMMENT THE EFFORT COMING FROM THE PARTIES? DESCRIBE THE INITIATIVE OF THE CHATBOT. WHAT ABOUT THE CHATBOT'S ABILITY TO KEEP THE CONVERSATION GOING? IN TERMS OF MISUNDERSTANDINGS?
QUANTITY	DESCRIBE THE AMOUNT OF THE INFORMATION PROVIDED (TOO MUCH, TOO LITTLE, SUFFICIENT). WHAT DO YOU THINK ABOUT THE LENGTH OF THE CHATBOT'S STATEMENTS? WOULD YOU SAY THE CHATBOT WAS TOO INFORMATIVE OR RATHER NOT ENOUGH?
QUALITY	HOW WOULD YOU DESCRIBE THE QUALITY OF THE MESSAGES? WHAT MAKES THE MESSAGE TRUE OR QUALITATIVE FOR YOU? WHAT WOULD YOU SAY ABOUT THE CLARIFICATION PROCESS IF THE CONVERSATION GOES "WRONG"?
RELATION	WHAT DO YOU THINK ABOUT THE RELEVANCE OF THE MESSAGES? EXPLAIN THE APPROPRIATENESS OF THE MESSAGES? ARE THE STATEMENTS RELATED TO THE TOPIC?
MANNER	HOW ABOUT THE CLARITY OF THE MESSAGES? EXPLAIN THE UNDERSTANDABILITY OF THE STATEMENTS. DO THEY MAKE SENSE? WHAT DO YOU THINK ABOUT THE ORDER? WHAT WOULD YOU SAY ABOUT THE ENDING OF THE CONVERSATION? (DOES IT FEEL LIKE IT "WALKS AWAY"?)

TABLE 4.1_ IN-DEPTH INTERVIEW: COOPERATION

TABLE 4.2_ IN-DEPTH INTERVIEW: BEHAVIOR

BEHAVIOR	HOW WOULD YOU COMMENT THE ATTITUDE AND BEHAVIOR OF THE CHATBOT? EXPLAIN THE RELATIONSHIP WITH THE CHATBOT. IS IT LIKE TALKING TO A FRIEND OR RATHER NO? HOW WOULD YOU DESCRIBE THE EVOLUTION OF THE CONNECTION? IS THERE ANY AT ALL? DO YOU PERCEIVE INACTIVITY AT SOME POINTS? DOES IT CARRY ANY MEANING TO THE COMMUNICATION? WHAT WOULD YOU SAY ABOUT NON-VERBAL COMMUNICATION IN THIS CASE?
POLITENESS	HOW DID YOU PERCEIVE THE POLITENESS OF THE CHATBOT? IS IT IMPORTANT? WHAT WOULD YOU SAY ABOUT THE AUTHENTICITY, NATURALITY OF THE CHATBOT?

TABLE 4.3_ IN-DEPTH INTERVIEW : CONVERSATIONAL STYLE

CONVERSATIONAL STYLE	HOW WOULD YOU DESCRIBE THE CHATBOT'S CONVERSATIONAL STYLE? DOES IT REMIND YOU OF SOMEBODY IN REAL LIFE? DESCRIBE THE CHATBOT'S USE OF WORDS. (GRAMMATICAL - FORMAL, RATHER EVERYDAY TALK - CASUAL) HOW WOULD YOU COMMENT ON THE APPROPRIATENESS OF THE LANGUAGE? EXPLAIN HOW THE CHATBOT CHANGES ITS REACTIONS AND ENTHUSIASM THROUGHOUT THE CONVERSATION? WHAT WOULD YOU SAY ABOUT THE CHATBOT BEING FUNNY OR SERIOUS?

the study.

Nevertheless, including older and less technologically competent participants was unfortunately not feasible, since the tools used implied the knowledge of English language. Thus, the population studied can be seen as rather frequent technology users - all of them asserted using technology, particularly smartphone and laptop/computer, throughout the whole day. However, the author of the current work aimed to include participants with diverse IT and technology competences - such as high- and mid-level. The skills were estimated by the author prior to the study, hence they did not carry an actual objective. Yet, it is believed that operating according to mentioned structure and engaging different participants, resulted in additional multifaceted outcomes.

coming from the drawbacks of non-probability sampling and to increase the reliability of research findings, heterogeneous sampling was used

As mentioned, the participants were chosen according to anticipation about their technological competencies and diverse backgrounds, initially aimed by the researcher, in order to collect versatile results. Therefore, the technique used for non-probability sampling method was purposive. Purposive sampling occurs when the researcher relies on his/her own intuition while choosing the participants (Purposive Sampling n.d.). Furthermore, coming from the drawbacks of non-probability sampling and to increase the reliability of research findings, heterogeneous or maximum variation sampling was used. It aimed to provide maximum variability within the results, thus, as already mentioned, the participants chosen had diverse characteristics within their technology use as well as general background. Given the above, the participants were mostly acquaintances or friends of the current work's author, hence, it is believed that the participants adjusted to the interview faster, as well as felt more comfortable, than it would have been in the case of random sampling, for example.

The participants were mostly millennials, therefore the age range was from 25-42 years, with a mean age of 28,2 years. The occupations varied from university students to diverse professions. Not all of the participants had had a prior experience with chat-

CODE	AGE	SEX	OCCUPATION	TECH COMPETENCE	EXPERIENCE WITH CHATBOTS
P1	33	F	IT Analyst	Works in IT, uses laptop throughout the whole day, especially on working hours. On smartphone manages mostly emails and other communication.	Has tried to build one herself. Usually avoids them as she knows that these are programmed to answer some specific questions. Rather relies on her own capabilities.
P2	27	F	Design Student	Is interested in technology connected with her interests (combining art and technology). Uses every day quite a lot, smartphone around 2 hours and computer 6-7 hours a day.	Has prior experience, but says that: *"[...] if I have to, I'm writing there, of course."* Mentions a good prior experience, but prefers to talk with a *"thinking human being"*.
P3	26	F	Design Student	Coming from the background, needs to be aware of and try out new currents, especially in her field of interest. Uses technology all day long - ca 3 hours on the phone, 7-8 hours on the computer.	Has used a couple of times - brings out good experience with a bank application.
P4	25	F	Event Executive	Considers herself rather tech-savvy and quick adapter. Finds technology engaging. Uses full days at work, therefore tries to use less for personal matters.	Has noticed these on many websites, but has used mostly for customer service. Has had some good experiences as well as bad ones.
P5	25	F	Economics Student	Finds herself being on good terms with technology. Coming from previous work experience and general interests, actively follows technology news - not only about consumer technology, but also science and B2B. Listens to podcasts on technological innovations etc.	Has not really used chatbots, although has noticed these on various websites, for example. Does not consider chatbots adding much value.

CODE	AGE	SEX	OCCUPATION	TECH COMPETENCE	EXPERIENCE WITH CHATBOTS
P6	25	M	Design Student and Web-Designer	Is used to working with technology and mentions that he needs to be aware of it. Enjoys organizing everyday workflows with technology as well as trying out new solutions. Has a device in his hands throughout the whole day.	Is aware of them, but has not used.
P7	31	M	Purchasing Business Controller	Does not consider himself as the most advanced, but likes to keep up with the technology news. Uses computer throughout the working hours, therefore tries to use less in the evenings.	Has started to notice them on websites and brings out a good experience as well as a bad one.
P8	25	M	Design Student	Tends to implement technology in his daily life as much as possible, owns several devices and gadgets that he uses around 80% of the day.	Has used only for routine purposes, such as contacting telecommunication company. Prior experience has not been that good.
P9	25	F	Cost Estimater and Purchase Manager	Considers the experience with technology *"quite good"*. Follows some technology news websites and stays updates through co-workers.	Has had minor experience and mentions it being *"weird"*.
P10	27	M	Design Student	Manages technology properly, but due to current budget, cannot afford the latest technology. Keeps up with technology news regularly and uses it all day, everyday.	Has had some experience and recalls it not that good. But also brings an example of a good one.
P11	25	F	Product Designer	Very passionate about technology and coming from the profession, even more so. States that she uses too much technology, not only at work, but also in personal life.	Recalls using several ones, but since she has understood a maneuver for skipping the chatbot and getting straight to the human agent, she regularly uses the shortcut.

CODE	AGE	SEX	OCCUPATION	TECH COMPETENCE	EXPERIENCE WITH CHATBOTS
P12	28	M	Business Intelligence Consultant	Uses technology on a daily basis and says *"it's always there"* since he also works in the IT field. Nevertheless, does not consider himself keen on technology.	Mentions rather the ones to call with, not text-based chatbots.
P13	34	F	Purchase Manager	Relationship with technology is medium, or a little less. Yet, she manages all of the everyday things. Does not really follow tech-news. Uses technology throughout the day, for work and private matters.	Has encountered these in web stores, but never really used one.
P14	25	F	Auditor	Also considers herself as medium user, not very professional. Since she works with laptop, technology is almost always there, around 70-80% of the day. For private matters, she uses it mostly as a tool of communication.	Mentions the chatbot on Ryanair website, but has not had any good experience thus far.
P15	42	F	Controller	Says that she is not very tech-savvy and uses mostly smartphone for everyday things.	Has encountered some on companies' websites, but rather the ones with human agents. Does not have prior experience with chatbots as such.

TABLE 4.4_ PARTICIPANTS OF THE STUDY

bots and the ones who did, generally commented on the experience as not enjoyable. For a more thorough overview and smoother discussions in the upcoming chapters, all of the study's participants are illustrated in Table 4.4.

While recruiting, the participants were briefly informed about the topic of the interview, as well as their rights were listed. It was ensured that prior knowledge of the field or any specific skills were not important to participate in the study. Thus, that minimized the risk for an unsuccessful interview and helped to encourage participation.

THE CHATBOT

In order to help users draw opinions straight from a mutual experience and help to facilitate the interview, an existing chatbot was used. The chatbot employed, is called "Eddy Travels" (Figure 4.2) and the primary goal is to help users find plane tickets. Additionally, the chatbot offers support in discovering hotels, searching for a restaurant or booking an insurance. "Eddy Travels" is accessible through various instant messaging platforms and is powered by Skyscanner, a well-known online travel agency.

First, the reason for choosing a chatbot operating on the instant messaging platform, is foremost for the fact, as described in the theoretical part, these platforms are highly popular among various users. For the current study, the participants were initially guided to use the chatbot through Facebook Messenger, since all the participants had an account and a possibility to access the chatbot via Facebook. What is more, the high number of chatbots on this specific platform, shows the popularity among developers as well. Facebook aims to become a network where people can achieve everything (such as order food, ask for a taxi, etc) and their ever-growing amount of monthly users, illustrated on Figure 4.3 (Clement 2019a), is firmly supporting these predictions. Thus, it was seen as an appropriate facilitation platform for the study.

the designers of this chatbot have done solid work and have made the right choices that please the users

However, during the in-depth interviews, it became obvious that many of the participants do not use Facebook Messenger that much anymore and prefer other instant messaging applications such as Whatsapp or Telegram. Therefore, the task was modified likewise and it was not mandatory to use Facebook to interact with the chatbot. It is important to note, however, that some user interface elements differ among these platforms, for example, carousel is not used on Whatsapp and Telegram. Yet, as the study did not aim to evaluate the usability, it was not seen as a harmful effect for the results.

Second, as it came out from the research conducted by Brandtzaeg and Følstad (2017), the main rationale for using chatbots is productivity. Therefore, it was seen as a crucial variable

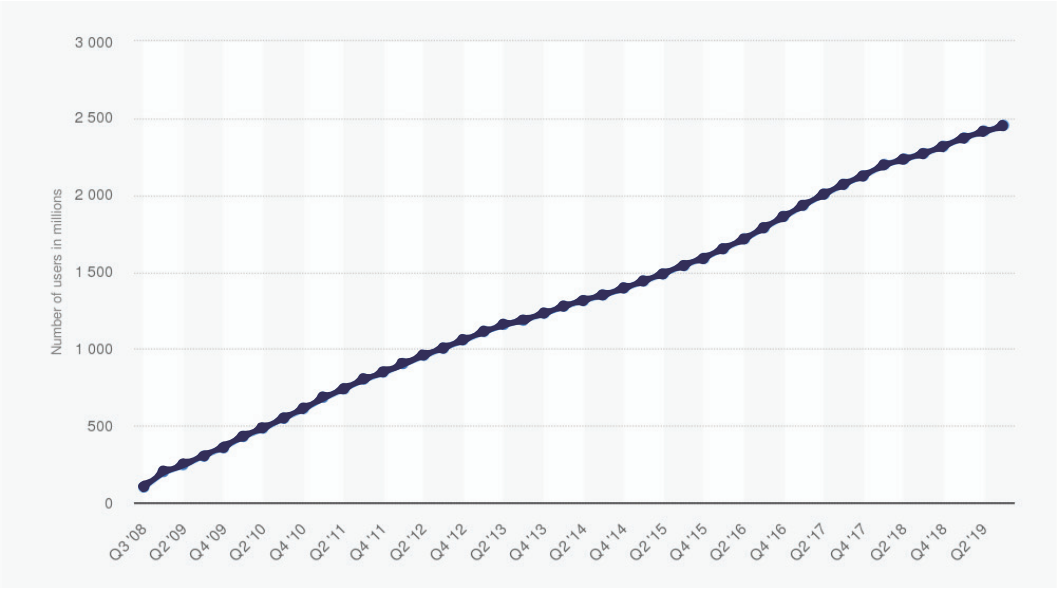


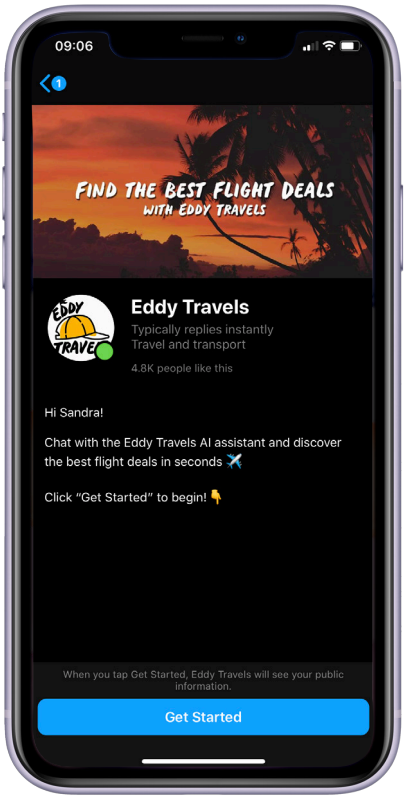
FIGURE 4.3_ FACEBOOK'S MONTHLY ACTIVE USERS (ADAPTED FROM: CLEMENT 2019A)

for the current study and "Eddy Travels" a suitable medium. Additionally, as the modern world's people are travelling more and more, the topic was seen as fitting for all the participants - hence the choice in the category of travelling.

What is more, according to botlist.co, a third party database that displays bots currently available on several platforms, the chosen chatbot ranks 4th in the overall list of chatbots on Facebook Messenger and the 1st for the travelling category, as of November 2019, after being on the market for nearly a year. Thus, it is believed that in general the designers of this chatbot have done solid work and have made the right choices that please the users. It is worth mentioning that only one chatbot was used in the current study, to not create comparison while using several chatbots, since that was not the aim of the study.

Finally, in terms of the interaction, "Eddy Travels" supports both, quick replies as well as natural language inputs. While most of the chatbots on instant messaging platforms at the moment are operating only through quick replies, the possibility to use both is an additional benefit for using the mentioned chatbot.

Thus, coming from the reasons listed, "Eddy Travels" was seen as an appropriate chatbot to support the study.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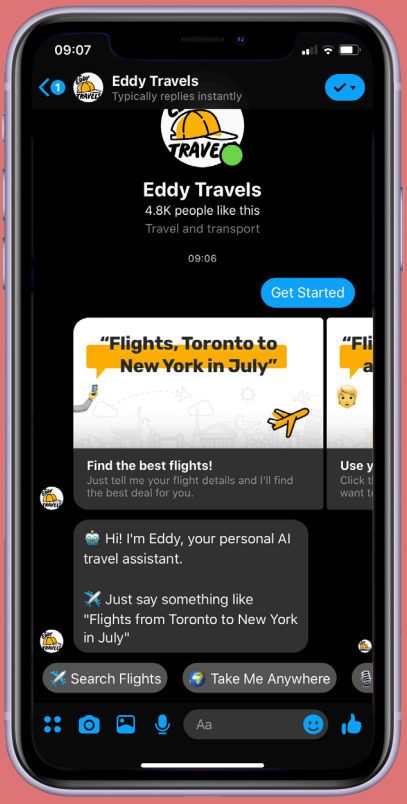
FIND THE BEST FLIGHT DEALS
WITH EDDY TRAVELS
Eddy Travels
Typically replies instantly
Travel and transport
4.8K people like this
Hi Sandra!
Chat with the Eddy Travels AI assistant and discover the best flight deals in seconds ✈️
Click "Get Started" to begin! 👇
When you tap Get Started, Eddy Travels will see your public information.
Get Started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Typically replies instantly
Eddy Travels
4.8K people like this
Travel and transport
09:06
Get Started
"Flights, Toronto to New York in July"
Find the best flights!
Just tell me your flight details and I'll find the best deal for you.
🤖 Hi! I'm Eddy, your personal AI travel assistant.
✈️ Just say something like "Flights from Toronto to New York in July"
✈️ Search Flights
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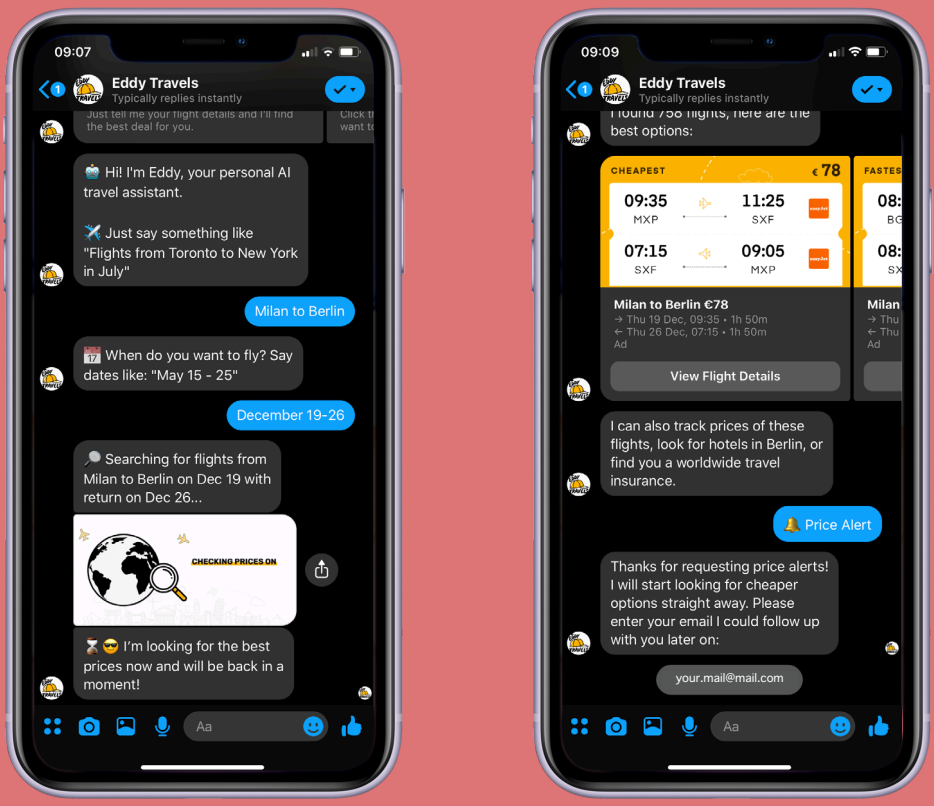


FIGURE 4.2_ EDDY TRAVELS: MESSENGER CHATBOT

DOCUMENTATION AND DATA ANALYSIS

As mentioned, the data was collected through 15 remote interview sessions via Skype, with the average duration of 50 minutes. However, coming from the nature of the interviewees, the timespan ranged from 35 minutes to 1 hour and 7 minutes, the shortest being the pilot study. As mentioned, after the pilot study, the questions were adjusted as well as clarifications were added. After completing all the in-depth interviews, deep analysis proceeded.

Coming from the qualitative method and in-depth interviews that aimed to explore profound effects, as well as participants' thoughts and impressions on the experience of using a chatbot, the data was analysed using thematic method. Braun and Clarke (2006) define thematic analysis as: *"[...] a method for identifying, analysing, and reporting patterns (themes) within data."* (p. 79). Or to go more in detail, Norman Nielsen Group's website defines it as: *"Thematic analysis is a systematic method of breaking down and organizing rich data from qualitative research by tagging individual observations and quotations with appropriate codes, to facilitate the discovery of significant themes."* (Rosala 2019a).

Thematic analysis is one of the most common methods for analysing semi-structured interviews and its main benefit relies on the flexibility **– it can be used for explorative studies, where the patterns are not clear prior to the interviews and also for more deductive studies, where it is more apparent what the researcher is looking for (Mortensen 2019).**

In the current work, some patterns were already foreseeable before the study, as the interview questions were conducted using pragmatic theories, however, it was important to keep an open mindset and allow new patterns to evolve directly from participants' insights. Since the current work focused on bringing clarity to the perception of pragmatic aspects and the overall experience, the aim was not to generate fixed theory as would have been the case with grounded theory analysis. Also, as the objective was to produce qualitative, descriptive outcome and there was no need to quantify the data in any way, thematic analysis was seen in favor of content analysis (Vaismoradi, Turunen et al. 2013).

The following chapter will give a thorough overview of how thematic analysis was conducted and the results drawn, but before going into detail, it is crucial to go over the main steps that were taken. These phases are first and foremost guidelines, not rules, and it is important to adjust the instructions to the research in hand (Braun, Clarke 2006, p. 87):

1. Familiarizing with the data gathered - transcribing, reading and re-reading, starting to note initial ideas;

2. Generating initial codes - coding interesting aspects of the data in a systematic manner, collecting data relevant to each code;

3. Searching for themes - concluding the codes into potential themes and gathering all data relevant to potential themes;

4. Reviewing themes - investigating if the themes work in relation to the coded extracts (Level 1) as well as to the entire data (Level 2), putting together a thematic 'map' of the analysis;

5. Defining and naming themes - continuing with the analysis to clarify the specifics of each theme and the overall story, defining and naming the themes clearly;

6. Producing the report - final analysis of the data gathered, relating back of the analysis to the main question of the research and literature, writing a report of the analysis.

Resul_
ts

In order to answer the posed research question -

How do users perceive the pragmatic shortcomings in communication with chatbots?

- and assure the reliability of the results, it was crucial to follow a systematic approach. Therefore, as mentioned, thematic analysis method was used. To facilitate a profound study, the author of the current work first transcribed all the interviews from the recordings. It was seen as a valuable point for the researcher, since it allowed to start familiarizing with the data.

ANALYSING DATA

The analysis continued with the help of NVivo, a qualitative data analysis software. First, all the interviews were read and re-read, whereas valuable quotes and phrases were highlighted and given preliminary labels (Figure 5.1).

As a next step, all of the labels were analysed, similar ones joined and the combined groups were given a code. Again, the codes and corresponding labels were re-investigated - during the process, some of the codes were re-named, others disappeared or, coming from the relationships between one another, merged once again. Finally, themes started to emerge (Figure 5.2).

To define the themes, it was crucial to keep in mind the research question, as the aim was to find an answer to it. For a more thorough overview and to foster recognizing significant patterns, the author took a break to come back to the codes and themes with a fresh mind (Rosala 2019a) and settle the final themes.

DEFINING THE THEMES

Coming from the method of analysis and the objective to describe the themes that were apparent already before the study, as well as to discover new patterns, the results illustrate five definite themes (Table 5.1). The in-depth interviews directly addressed cooperation, behavior and conversational style, since these are the topics deeply described in the field of pragmatics. However, two other pragmatic aspects by Hymes - ends and so-

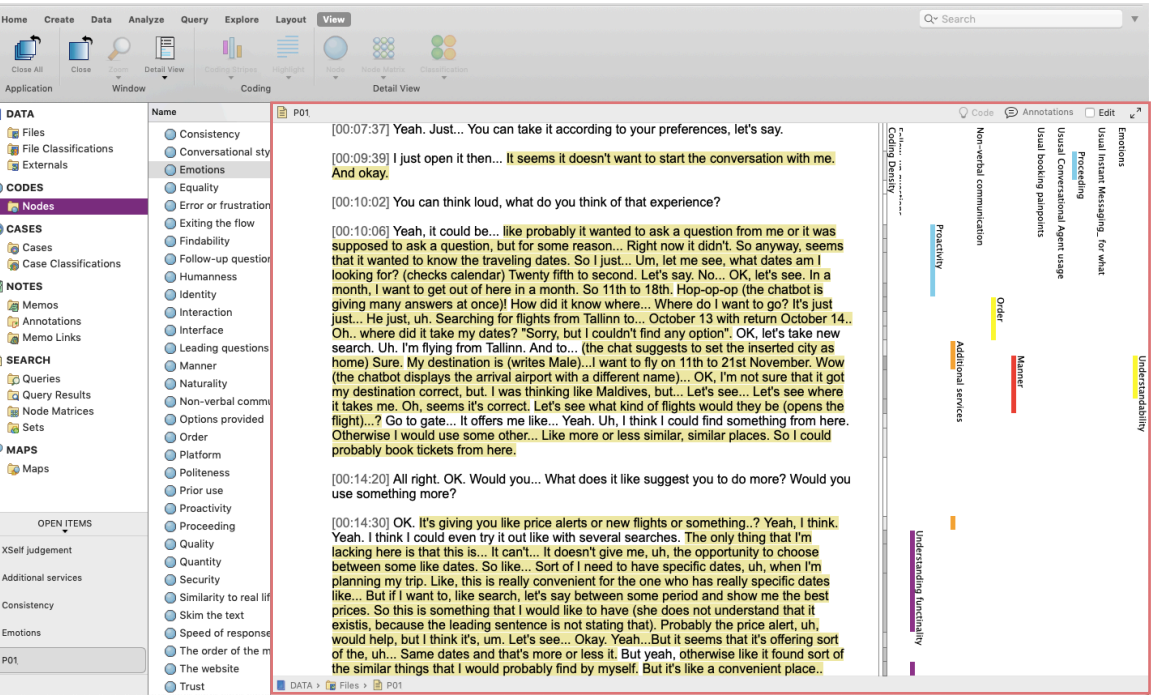
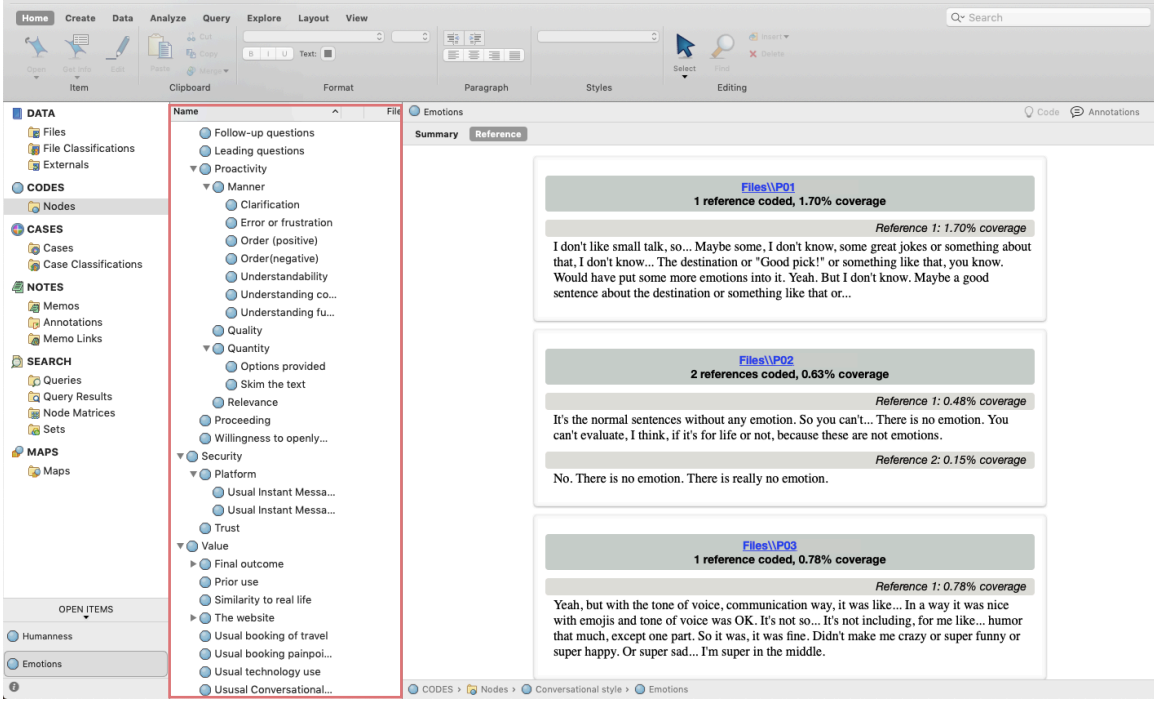


FIGURE 5.1_ LABELING THE QUOTES, NVIVO SOFTWARE

FIGURE 5.2_ COMPILING THE THEMES, NVIVO SOFTWARE

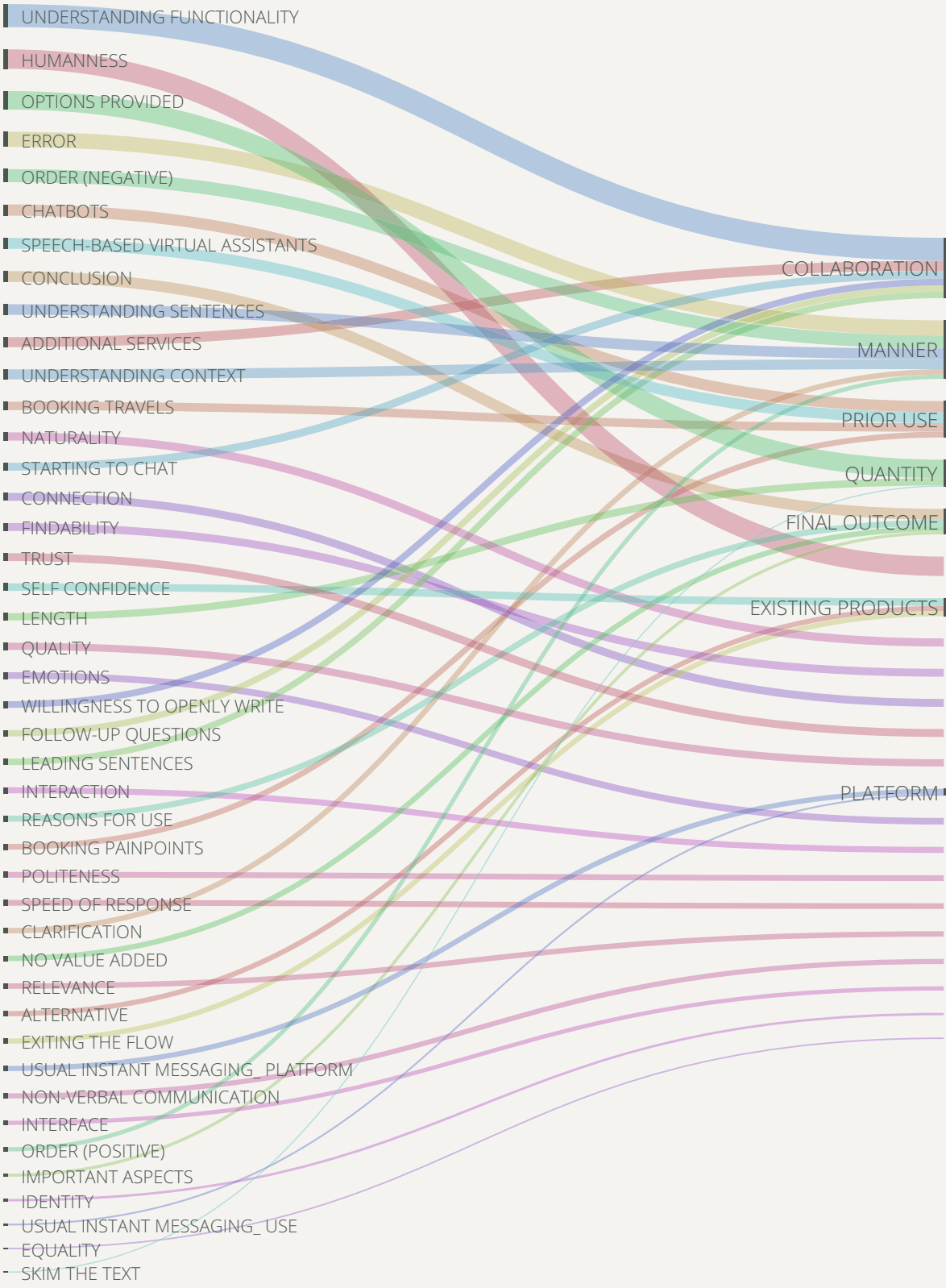


cio-cultural rules - emerged from the interviews and were seen as equally important answering the research question.

To be more clear, the data analysis is illustrated on Alluvial Diagram in Figure 5.3. In the remainder of the paragraph, all five themes will be addressed in detail.

THEME	DESCRIPTION	FREQUENCY
Cooperation	The topic concerns chatbot's proactivity in general, how the conversation gets started and how it proceeds. Also, all of the Gricean cooperational elements - quantity, quality, relevance and manner - were addressed.	589
Ends	The current theme regards the overall value of the chatbot, when the users feel the communication failing, when they see it succeeding. What is more, it illustrates how the users perceive chatbot in the Web environment. Coming from Hymes' theory, it is a theme of purposes, goals and outcomes.	263
Behavior	Since *all behavior is communication*, as stated in the literature review, different aspects of chatbot's behavior are listed. Such as politeness, non-verbal communication, humanness, etc.	191
Conversational Style	The theme concerns with Tannen's approach of *how things are said*. Meaning, the use of words, emotions, and speed, to name a few, are analysed.	157
Socio-Cultural Rules	Last but not least, current topic addresses an issue, or according to Hymes a norm/standard, that is critical for today's users: security and how the data will be used.	85

TABLE 5.1_ FINAL THEMES


UNDERSTANDING FUNCTIONALITY
HUMANNESS
OPTIONS PROVIDED
ERROR
ORDER (NEGATIVE)
CHATBOTS
SPEECH-BASED VIRTUAL ASSISTANTS
CONCLUSION
UNDERSTANDING SENTENCES
ADDITIONAL SERVICES
UNDERSTANDING CONTEXT
BOOKING TRAVELS
NATURALITY
STARTING TO CHAT
CONNECTION
FINDABILITY
TRUST
SELF CONFIDENCE
LENGTH
QUALITY
EMOTIONS
WILLINGNESS TO OPENLY WRITE
FOLLOW-UP QUESTIONS
LEADING SENTENCES
INTERACTION
REASONS FOR USE
BOOKING PAINPOINTS
POLITENESS
SPEED OF RESPONSE
CLARIFICATION
NO VALUE ADDED
RELEVANCE
ALTERNATIVE
EXITING THE FLOW
USUAL INSTANT MESSAGING_ PLATFORM
NON-VERBAL COMMUNICATION
INTERFACE
ORDER (POSITIVE)
IMPORTANT ASPECTS
IDENTITY
USUAL INSTANT MESSAGING_ USE
EQUALITY
SKIM THE TEXT
COLLABORATION
MANNER
PRIOR USE
QUANTITY
FINAL OUTCOME
EXISTING PRODUCTS
PLATFORM

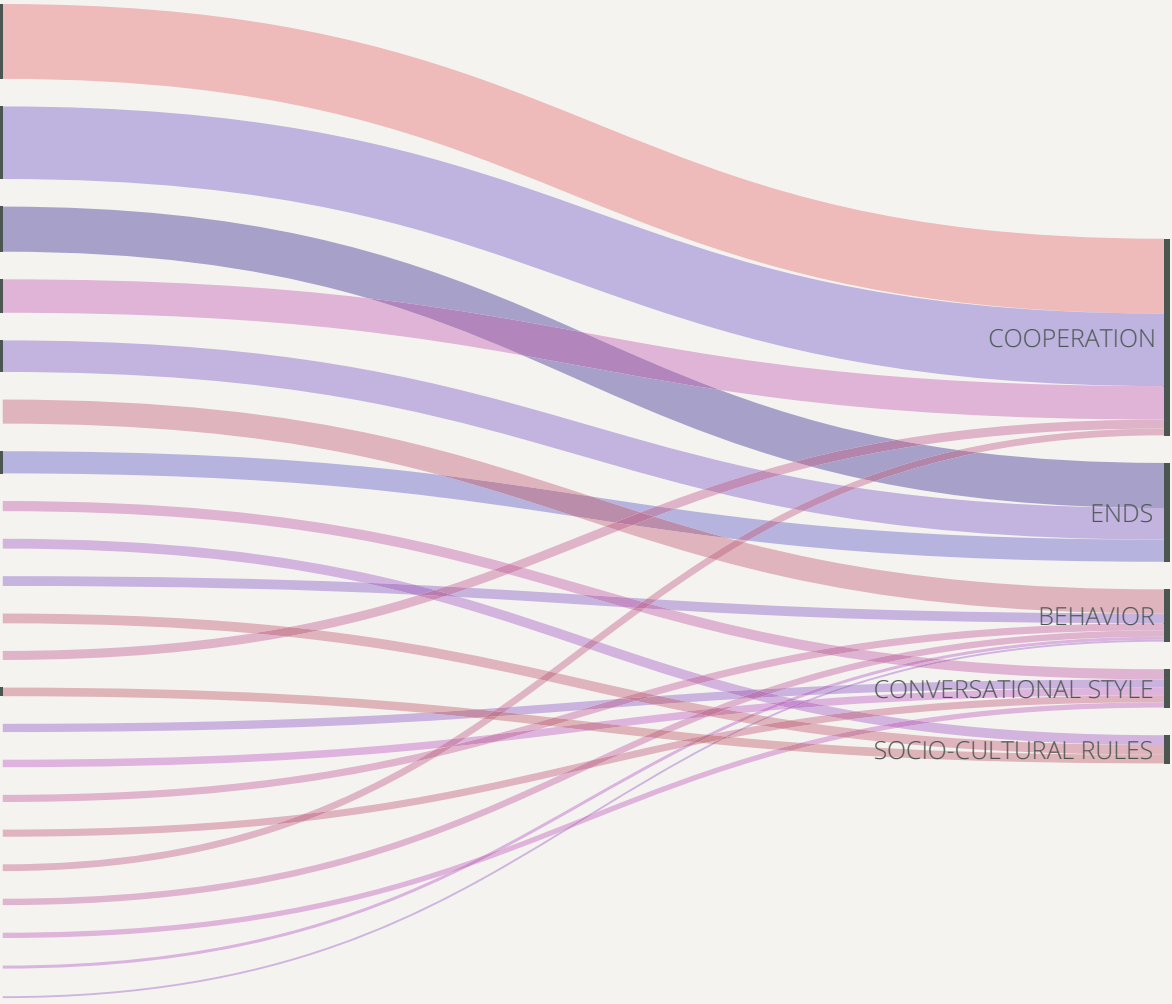


FIGURE 5.3_ ALLUVIAL DIAGRAM: PRIMARY LABELS, CODES AND FINAL THEMES

COOPERATION - WORKING TOGETHER WITH THE USER

The most frequently mentioned theme throughout all 15 interviews, was the matter of cooperation. The various sub-topics that were mentioned under this theme were: collaboration in general, manner, quantity, relevance and quality - as illustrated on Figure 5.4. To better understand the results, an overview of the sub-topics is given.

COLLABORATION - BEING WELCOMING AND PROACTIVE

Current sub-topic concerns collaboration in general (Figure 5.5), how the users perceived the initiative coming from both parties, themselves as well as the chatbot.

To start with, since the first four participants were asked to interact on Facebook's platform, the users started straight from social media. It was hard to understand how they should start and they wandered around the Facebook feed for a while. Although, not much changed when the participants were free to explore the chatbot through Google and the official website (eddytravels.com). One was wondering if a link in the Facebook feed should be clicked, others stated:

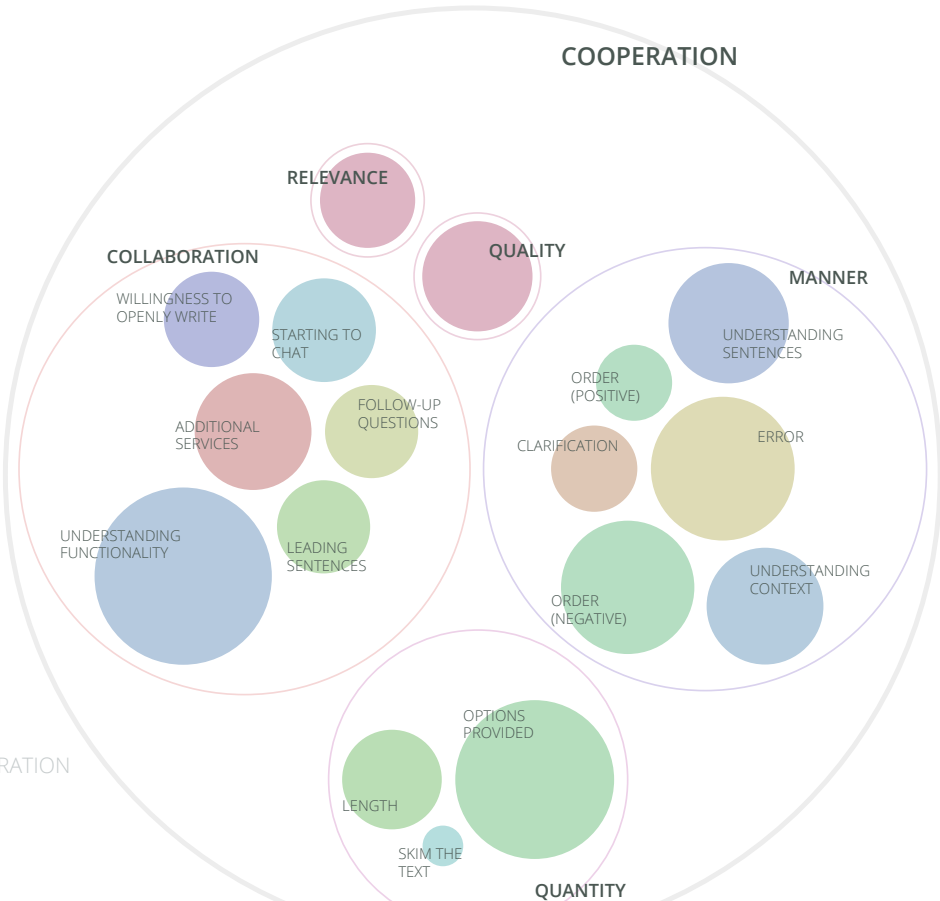


FIGURE 5.4_ COOPERATION

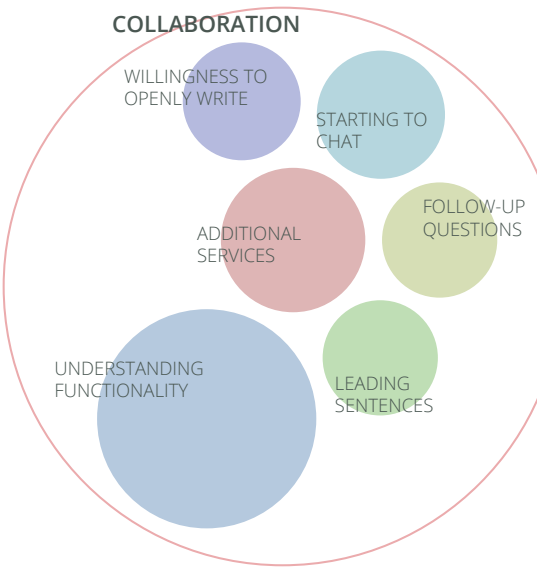


FIGURE 5.5_ COOPERATION: COLLABORATION

- "So should I send them a message? No... The thing is, I cannot understand how it works." (P3)
- "[...] I think it is confusing, the website. I... Like, for example, here, I don't really understand, does it want me to go to like click here (the different IM platform's links) or does it want me to, like, click here (the section down, with different options)?" Adding later: "I feel like they weren't very clear about what... That they are a chatbot and what it does. If you go on the Website, then it just says it's an AI travel assistant..." (P5)

What is more, participants were also doubting if they should start the conversation themselves. P1 and P12 stated that they were expecting the chatbot to start the conversation. P5 described:

- "I just open it then... It seems it doesn't want to start the conversation with me." (P1)
- "Like here I had to say something myself first before they said something. I feel it could have been more clear if they had an opening line... Like Hi... it came only after I said something." (P5)
- "I guess I should start the conversation.." (P12)

After opening the chat and getting the first message from the chatbot, users mostly understood what they can do with the chatbot. P5, P6 and P14 claimed that even though the chatbot did not explain how to use it, they had no hard time understanding what they can do with it. At first, P15 did not understand what AI stood for and pronounced it as al. However, one participant stated:

- "But there was no that much information...Like, how can I say? Meeting point... Let's say, he just says the: "Hi, I'm Eddy, your personal AI assistant." Yeah. But in which sense? Like how can you help me? Maybe if you gave me a bit more information about yourself, to trust you, I mean. And to understand your ability or capability." (P3)

Followingly, users noticed that the chatbot was trying to push them to write in a way that is understandable for it. P12 points out doing exactly what the chatbot told him to do. Starting a new search, P7 stated that he did not remember how he was supposed to write and scrolled back in order to do it correctly. Also, P9 deleted part of the utterance after writing it, to type it exactly how the chatbot had suggested, even adding the spaces the same way for "December 26 - January 7". P1 was confused if she could look for a longer travelling period and similarly P14 doubted if she should know the exact date, since the leading examples were relatively stating only one ("Say dates like: May 15 - 25") or the other ("Just say something like flights from Toronto to New York in July"). Overall, the participants had opposing thoughts about the leading utterances:

- "So "Just say something like flights from Toronto to New York." This manipulates me pretty well. I write what he exactly wants me to write, as a phrase." (P2)
- "At the beginning I felt a bit like… yeah, but why you are leading me? But then I saw in the second section actually it's like better to lead me, because otherwise if it's not understanding me, it's a bit like making me mad about it." (P3)
- "And I like how they tell you, like examples of what to say. So you kind of... Because, you know that it's a bot. So then it just gives you kind of an understanding of what the bot will understand when you write. Which will help you out... Like if you start writing something really long or crazy, then you already... Your expectations have been managed, you know, like that you need to keep it simple and so on." Although, after encountering an error, the participant noted: "[...] I thought I understood the way it wants me to write." (P4)
- "At the same time, it wasn't that difficult to get what I was trying to ask. I mean, I follow the example. I can imagine that there are like a hundred-millions different kind of ways to search for the same kind of results. Even just typing LON to MIL..or something like that is very different from writ...typing down a sentence that is that specific and I did it just because it was

"It didn't really care if I found it or not"

suggesting me to do that. So even that is not that natural as if I'm checking with a person." (P11)

Vast majority of the participants were mentioning the lack of in-depth questions. Meaning, they did not mind when the chatbot was providing additional services and were rather expecting it, but the chatbot stayed very superficial and did not bother to ask the users to further understand their needs to find a fitting flight. P6 simply expected the chatbot to ask for feedback. Whereas some other participants commented in more detail:

- "[...] what I would like to have is some kind of suggestions maybe that, you know: "Are the travel dates flexible? I found like X amount cheaper tickets if you would travel..." like I don't know.... For example, either from other airport.. Like near airports... Or some other dates or something." I don't know maybe some proactive conversation or suggestions." (P1)
- "[...] if the price was high... Would it be able to ask me: "Do you mind not between 20 and 25, but 21 and 25 or 26" So it could be more like... Since you're there to help me. Maybe you can ask like this... Or like: "Do you have any other dates that I can help you to check? Is it good for you?" like after the action, instead of telling to me that I can also track prices of these flights or find the world-wide travel insurance. Maybe I... I was expecting like: "Is it fine for you? Or do you have any, you know, any other dates to check? What can I do for you more?"" (P3)
- "I feel like it would have been maybe a bit more useful if it's like, "oh, how do you find these options?" And then like asks you more details, for example, like "which of these options do you like the most?" Or like, "do you want to look at other things? Maybe some other days, or some other locations..."" (P5)
- "I would expect him to be like "Did you find what you were looking for? Do you want to set, to change dates? Do you want to look for cheaper flights in similar dates? Do you want to put the maximum... Do you want to look for flights that only have no stops or just one stop?". [...] it just shows me the flights and then it says, "OK, that's it. You can look for another flight". It

didn't really care if I found it or not." (P12)

What is more, when the users did not answer anything to the chatbot, it often stayed inactive itself. P5 and P10 claimed that at one point the chatbot did not do anything and P10 adds that it was like being like a situation when people are chatting and not knowing what to say, therefore simply closing the conversation. P13 felt that the chatbot had left since she did not use the microphone to talk, as the chatbot suggested with the previous message. Some other participants commented on it followingly:

- "[...] it asked me like "what's your check-out date?" and then that's it. The conversation ended. It didn't ask me like "Hi, I'm still here for your... Did you get confused? I can help you." To push me a bit like to interact with the service..but, I think that the conversation ended up. It's been 15 minutes and I'm not saying anything. [...] If I say... Communication failed because of the last step, because it just stopped. So I don't know what happened." (P3)
- "And then also here it suddenly stopped to talk. You know, I had to wake him up again. [...] I don't expect you to just hang on and say nothing until I say everything again. If there is something you don't understand, if I wrote instead of clicking. OK, tell me "please click" or, you know, say something, but don't just be there waiting for something." (P12)
- "I haven't answered or replied to this text that he texted me. So maybe some time later he could write me that "Hello. What did you mean with this?"" But adding: "Someone might be like, oh, it doesn't communicate to me anymore. Like, I don't want to do this anymore. I will rather go to a website. But then again... Someone would feel like frustrated that... What do you want from me? I'm still just thinking... so yeah, it could be like two ways." (P14)

The final thought, the fact that someone might feel overwhelmed if the chatbot is too pushy, lingered from several other participants' thoughts. P9 said that the chatbot was very active and others added:

- "There is no ending to the conversation. I mean, even if I'm satisfied with what I learned, [the chatbot] is keeping prompt-

ing me suggestions, what I can do next, what I can do next, what I can do next." (P6)

- "I think it's not ended at all. Because, I feel that it is still hanging there for me [...] but maybe I don't want it to have a proper closure because I'm just asking a question if I want to have an answer." (P8)
- "I can see the effort in trying to make the conversation... Like keep going with the conversation, although. Why should I? [...] So the fact of having and keep going with the conversation is very weird because immediately I have something that is pushing me outside." (P11)

As the latter thought indicates, most of the participants were not so willing to write with the chatbot, thus were not very collaborative themselves. Their answers were short, or even orders, like P6 noticed himself giving. And if they had additional questions or doubts, they were not initiative to openly write to the chatbot themselves. The participants often had second thoughts about what would happen if they wrote, even doubting if they can write at all. For example, P15 returned to the website hoping to be able to select a different function for searching restaurants and did not address the favor straight from the chat. Additionally, other thoughts that illustrate the participants' mindsets in a precise way:

- "I mean, I don't know what would happen if I would say, like, "I need cheaper tickets". Is it going to do something? [...] Also dollars [...] I don't know a conversion rate to this. Can you change this? Can I say I don't want dollars? Pounds... wait, let's try this..." (P4)
- "I think like right now, I'm also kind of stuck.. Because basically I feel like [...] "Ah..maybe I don't want to receive this email. So what should I do now?" Because the only option given is like my email. So I'm just trying to... Maybe I just regret, I don't want your emails, but how can I do that without, you know, leaving the conversation." (P10)

MANNER - BEING CLEAR AND NEAT

Current sub-topic goes further and concerns in more detail about the clarity of messages - if something was misunderstood or vague. Also, the brevity and order was addressed. Diverse subtopics are illustrated of Figure 5.6.

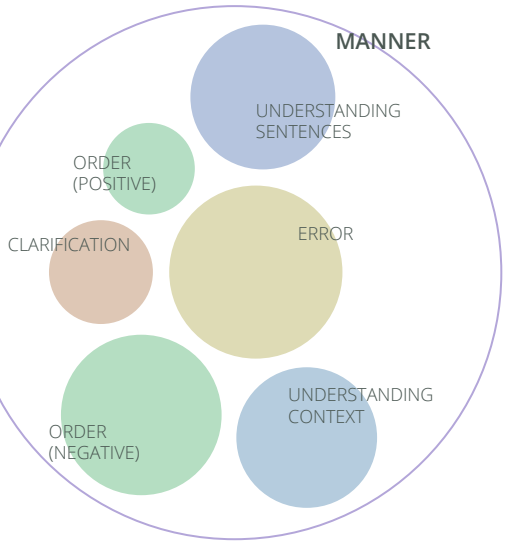


FIGURE 5.6_ COOPERATION: MANNER

In general, the participants had no hard time understanding what was the chatbot saying or what was it expecting from them. They used the words "clear" and "straightforward" when they were asked about the clarity of the messages. P8 noted that even his mother, who does not trust technology in general, would easily understand what had been said.

Still, the participants did encounter misunderstandings. P10 and P13 initially misunderstood the welcoming carouselle that informed the chatbot's functionalities and thought of it as an advertisement. P2 and P3 had problems understanding what was wrong if they typed the departure point as "Milano" (not "Milan", as is correct in English). As the chatbot answered "I could not find any airports around there. Try different city". Hence, P2 was wondering if there were no direct flights and changed the search to Rome, P3 typed Bergamo instead, saying that it was her fault. Some users entered the destination as an island or archipelago, such as "Bali" or "Maldives", yet the chatbot changed the name according to the official location where the airport was. P9 did not mention it, yet scrolled back to look for the correct name "Denpasar" for the airport in Bali, to indicate it correctly the second time around. P1, however, commented on the misunderstanding after the chatbot stated the destination as "Male":

- "OK, I'm not sure that it got my destination correct [...] I was thinking like Maldives, but... Let's see... Let's see where it takes me. Oh, seems it's correct. [...] The airport name was something different, so I was a bit confused at that, where is it taking me?" (P1)

It is clear that several participants were confused by what is meant with "the best options". They either did not notice the "cheapest" and "fastest" tags on the cards, as was the case for P12 and P13. Or did not understand what these tags stood for, as P11 was wondering if the tag "cheapest" stood

for the whole section or one flight. Another user commented followingly:

- "Well, best dates... Best options... So I don't know what that means, really [...] I'm thinking that maybe I missed it... I'm looking for the best prices now. Yeah. So I guess it's chooses the best prices. Yeah, I don't know... The absolutely cheapest then, it must be." (P15)

Also, the users mostly appreciated that the chatbot gave the context of the talk with emojis, GIFs or actually stating it with words. For example, if the chatbot wanted to know about travelling dates, it put an emoji of calendar or if it was searching for flights, it sent the text with an emoji as well as a GIF. It was clear to the participants and it ensured to them that the chatbot was in the right direction. However, drawbacks encountered when the chatbot had changed the topic, whereas the context for the user stayed the same:

- "OK, but it didn't understand I'm looking for Barcelona, so it changed directly the topic. OK, so maybe my expectation was like.. still I keep going. I didn't close the channel..." (P2)
- "Track prices... Please make your flight search, OK? So I have to do the search again. Flights what I search for. It's not really comfortable. [...] I would have preferred to have any way to reprompt the chatbot with like track prices about my last search, instead of being suggested to start all over again... what do you need? I felt like, OK, we were talking for the last five minutes. Now it's like I have in front of me a complete new assistant that didn't have any contact with me before" (P6)
- "I was expecting it to, you know, actually follow the context. I mean, I want to go to Rome, from Abu Dhabi, on these dates. Okay, you showed me these flights. But now show me only the direct ones and it didn't know what I was talking about." (P12)

What is more, when asked, the participants were generally content with the flow of the conversation and the sequence of the questions made sense. However, as already mentioned, the users got frustrated when the chatbot forgot the context and asked them to start again, and going even more in detail, various other problems occurred. First, P4 and P5 both encountered ignorance, when the

chatbot simply did not answer to one part of a question or to the question as a whole. Secondly, majority of the participants thought that the chatbot unexpectedly jumped to a new topic. P8 told that he lost the additional features, such as searching for a hotel or insurance, since the chatbot gave a lot of information at once and he was focused on the things that were more important at that point. P2 claimed that she was still looking for the tickets if the chatbot already suggested the travel insurance and similarly, P7, P8 and P15 stated that they would like to finish with the flights and then continue with hotel or insurance. P10 was likewise frustrated about the travel insurance, saying that it would be the last thing to think of. P12 adds that he did not expect to get the home airport suggestion when he asked for the flights, he would be more content to answer these questions when finished with the flight and concluded stating that the chatbot simply started spitting answers without much logic and. Likewise, P11, P12, P13 and P15 all mentioned the understanding of voice messages and how it was a wrong moment in the flow to jump back to the beginning after getting the flights. Thus, some of their comments go as follows:

- "Once it showed me the flight, the only thing it started to say is, OK tell me another flight. I mean, why would I look for another flight? [...] I didn't really need him to actually tell me again that [...] I can speak." (P12)
- "I already said where I want to go and the dates and then it goes back to "I can understand voice message" and tell me, you know, it's the same thing again. So I'm thinking I'm not getting anywhere." (P15)

"Well, best dates... Best options... So I don't know what that means, really"

Since the users encountered misunderstandings, they were asked how the chatbot dealt with these obstacles and how they got back on track. The process was not rated as a good one and P1 said she tried to push the conversation in the right direction herself. Whereas P4 claimed that the chatbot got too confused and referred her to a human agent, thus did not resolve the situation itself. P12 stated that in the worst case the chatbot's solution was okay to ask the user to try to rephrase to get back on track. Other comments from the participants include:

- "So if you are forcing me like to say again and again Milano, Mi-

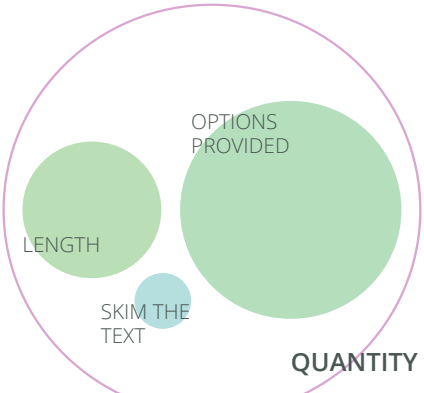
lano... Like this or forcing me to think about it like there is nothing in Milano ...where is? Ah, OK Bergamo. It's not so... it's not so engageable." (P3)

- "He doesn't know how to answer me to this, [...], it says, okay, let's clear it all and start all over again...What do you need? I mean, it's clear, it's not making me... I appreciate that it's not making me insist on the error. But as I told you before, probably I'd rather want to... to reprompt some part of the previous conversation, because I probably want information about the same travel." (P6)

QUANTITY - BEING INFORMATIVE YET CONCISE

The sub-topic addresses the issues about quantity of information (Figure 5.7) - if it was sufficient, too much or too little.

FIGURE 5.7_ COOPERATION: QUANTITY



Most of the users appreciated the fact that the statements were not too long, yet neither too short and abrupt, rather fairly sufficient, easy to read and concrete. Also, they stated the information being enough and the things that they would look for while searching for plane tickets. However, some of the participants still perceived the utterances as too long, too many in a row or simply repetitive, stating:

- "At some point I felt that there's too much text. So I had to scroll back. And then because it popped me like four different things in a row. So I had to go back and then see like what was there. [...] It could be that, you know, that the screen is small, but at the same time, you know, the phone screen isn't much bigger either. So if you're using the phone, then probably, you know, it would in anyways be better if you have like less text. [...] I think it was a bit too much for me. Let me see. Yeah. Like some kind of picture (looks at the GIF)... Why? Why is this? You know, either the picture "checking prices on skyscanner" or, you know, "I'm looking for the best prices for now". Yeah, I wouldn't need both of those." (P1)

- "Literally sent me like 10 messages in a row." (P5)
- "I find like the first two messages. The one "I'm searching..." So like a loading bar. And the following one. Are a bit redundant? Probably one is enough." (P11)

Even though many participants missed some of the utterances that the chatbot sent, since there were many in a row as stated previously, they mostly did not comment on it. However, some of the participants gave hints for the reason:

- "[...] and it's just a chatbot, so you don't really read everything they say anyways. Like, for example, in the last message, I just read maybe the first two words... Where it was like "I can understand voice messages" and then I stopped reading..." (P5)
- "I just thought maybe it's giving extra information, something like return results or something, just that I was drawn to the results itself. And so I didn't read it. [...] Thinking, okay, it's a chatbot... It gives you auto messages. Maybe you don't read them all." (P7)

"it's just a chatbot, so you don't really read everything they say anyways"

As the interfaces between various platforms differed, P11, using Telegram, mentioned that the amount of how many flights were compared, should have been stated. However, various other users, P5, P6 and P9, using Facebook Messenger or WhatsApp platforms, expressed their surprise. Others added:

- "[...] there are not eight hundred and forty flights going to Estonia. It's not possible. OK. I fly all the time and there are not that many flights to Tallinn. I can promise that!" (P4)
- ""I found 694 flights". I mean, I don't want you to list me 694 flights. I mean, I am expecting you to ask me, or at least... to have some kind of, you know, filtering. I'm not interested in 694 flights." (P12)

Having claimed analysing large amount of flights, the users encountered problems addressing the similarity as well as the displayed amount of the results. P12 and P13 were not content that they could only see two options. P4 complained that all of the flights were the

same airline's ones. Likewise, others commented:

- "[...] it sent me only the Ryanair link. So which means that it's for me the best option and it sent me. But maybe I would like to see also other opportunities or maybe I don't want to travel only with Ryanair. Maybe it could send me like one, two, three options, at least to see different companies." (P3)
- "Like it's a very poor list of results. [...] I would say it's it's interesting the fact that it showed me only one and only one airline also because it is saying the cheapest one is this one, but then it is showing the other two options. Why not showing another airline at least? [...] the fact that he's always replying with the best three. So I would say, why the best three and not like the best five or why not another way of me seeing the results?" (P11)
- "They're all about the same... Sixty. It's the range of ten... Around ten dollar difference. [...] I mean, it just gives me for some reason only between 6th and 13th. If I'm not mistaken now... December. I'm like wondering, is it only during that week, you know, it's about seven days, right? Between 6th of December and 13th of December, I can see here... Like is it like... what about the other days, is it only flying during one week? [...] I'm thinking that I if I put a whole month. It only gives me looks like, it seems like a week. Information about one week only. I would like to have like an overview more." (P15)

QUALITY - BEING ACCURATE AND HONEST

The sub-topic addresses the accuracy of the messages - if users encountered something that was not true or what they believed to be wrong.

Some users encountered distrust in terms of prices. Since P2 entered the chatbot through the feed of Facebook, clicking on the link where the price was already given, she mentioned that the first price must have been wrong. Similarly, being a frequent flyer of a requested route, P4 commented:

- "[...] I would never buy 300 dollar tickets to Estonia. [...] I know that the prices at the moment are a lot higher. That's why I haven't bought the tickets yet. But at the moment [...] I think on the 4th of January is like 120 or 125

euros. I think it was." (P4)

P10, on the other hand, used the quick replies of the chatbot and requested a flight from "Milan" to "Everywhere", whereas the chatbot told that there are no flights for that route and suggested to try again. The participant was frustrated by that and said that he never specified any specific route. P3 encountered disappointment when she chose "Places" from the quick replies and the chatbot had changed the context without her understanding, asking for the location, she understood that the chatbot was asking for an area inside the city, not the city itself. Therefore she got a reply: "I didn't find anything" and commented:

- "[...] how you didn't find anything? Like this is the wrong information, you could tell me like.. "You should also tell me the city"" (P3)

"if it's sold out why are you showing me this?"

In terms of supposing the correct variable and not specifying, the chatbot failed to deliver expected results. When P12 asked for a good weekend instead of a specific date, the chatbot automatically took the following weekend. Already being wrong by ignoring the good variable or assuming that it was the next weekend, it also failed by stating the weekend as Saturday and Sunday, although, for P12 weekend is Friday and Saturday as he lived in the United Arab Emirates. Other assumptions include:

- "[...] it sent me only the Ryanair link. [...] maybe I don't want to travel only with Ryanair." (P3)
- "It took Christmas as a specific date... That's not really what I was thinking about. [...] I was expecting something more in the way of "OK, I will show you more or less the flights to go and come back across Christmas"" (P12)

Finally, when the chatbot gave the users the links to proceed to the booking, it did not choose the flight that the user already selected. Therefore, the chatbot did not provide correct information and misunderstandings occured:

- "But since I knew already I was okay with that timetable and prices, I would rather jump to a further part of the flow if it's possible." (P6)
- "I asked for the flight details and it's taking me to another page, which again is giving me a list of the flights. And by the way,

there is no sign of the flight that I looked for [...] Okay, it's sold out. It's something that maybe we missed. So if it's sold out why are you showing me this?" (P12)

RELEVANCE - BEING CONSISTENT AND RELATED TO THE TOPIC

The sub-topic addresses if all the utterances were relevant to the chatbot or if users perceived chatbot talking about things that were not important in this case.

The users perceived everything as relevant, and the ones who got asked about setting the home airport or if the users were provided the additional services, they were mostly content with it. To illustrate:

- "[...] like is Tallinn my home city? So for the future searches and so on. Like something that it might... Shouldn't... Like it wasn't like necessary to ask. But yeah, maybe for the future so that it would be faster and easier." (P1)
- "Maybe the ending is a bit like "hey, we want to sell you more services", but I would expect that anyways because it's like free app. Like I wouldn't need them. And then the last post, this is more like information. But again, like I don't really mind that, because I understand why there's sending it. And I can just ignore it if it's not relevant." (P5)

ENDS - HAVING A PURPOSE AND STRIVING TOWARDS THE GOAL

The second most frequent theme detected addresses different purposes, goals and outcomes. Codes like prior use, website alternative and final outcome were discussed under the theme of ends, as seen on Figure 5.8, and are followingly described in detail.

PRIOR USE - ADDRESSING PAIN POINTS

The sub-topic (Figure 5.9) addresses the experiences users had before with conversational interfaces and chatbots in specific. Also it takes into consideration the usual booking process and pain points they go through.

When talking about chatbots, users were first asked about the usage of conversational interfaces in general, these days the most popular are the ones found in smartphones and at homes - such as Siri, Google Assistant, Google Home etc. Only one of the participants of the current study, P8, said

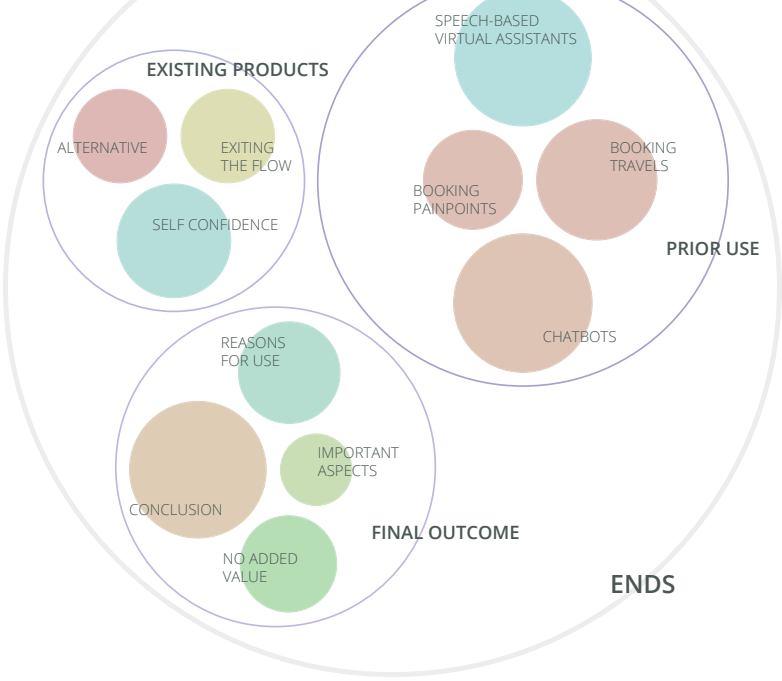


FIGURE 5.8_ ENDS

that he uses these interfaces a lot, but mainly at home, to listen to podcasts and music, track his daily appointments and productivity in general. Most of the participants, however, claimed to not use any of them regularly, just sometimes when they are on the go to ask it to call someone, for the meaning of a word, the name of a song or simply to goof around and try it out. P1 and P10 never saw the real good benefits that could help to facilitate everyday life, and latter even added that he deactivates Siri from his smartphone. Two of the participants claimed that their kids use it more and P15 even said that she talks to Siri to apologize to it since her kids were teasing it. Asking more in detail why they do not use it, the participants commented:

- "It's not engaging, because it's not understanding what I'm saying and... What is my expectation from a personal assistant is like... you're always with me, you're always in my pocket. Please know me and don't force me to say every time the same stuff. If I'm asking you every day some specific questions, you can be ready for this kind of question. So because it's not convincing me and I'm not using them." (P2)
- "I find that when Siri first came out, it was a bit useless. And I don't really need it... Like I'm happy to just type in the question myself. Alexa... I don't really feel comfortable with something recording passively in my home the whole time. So I don't really want to get one home." (P5)
- "If I have to look for something, I don't ask it because I can do it on the phone. And I don't have to wait, you know, for the answer. The answer maybe is wrong. I don't know. It's just quicker to

just look at it on the phone" (P12)

One participant, P5, saw it as useful for less tech savvy people and recalled a dinner where a 70-year-old French man took out his phone to ask Siri for information, it answered quickly and correctly. However, she claimed feeling much more comfortable Googling and being able to see the results and ones relevant to her. Other similar aspects stood out from the current study - P6 and P8 simply did not want to speak with it in public, and P11 stated:

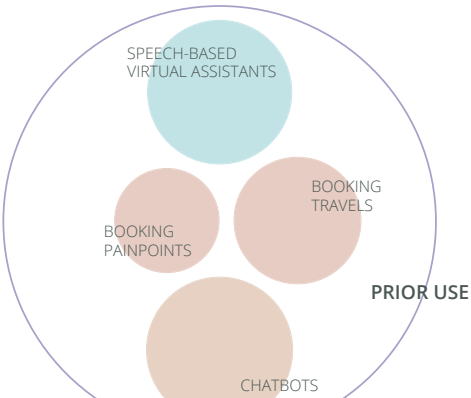
- "On my phone directly... I tend... I use [conversational agent] very rarely because I use my smartphone very often in public. So I tend to be kinda embarrassed in using it in front of other people.. [...] I don't want people to know what I'm asking to my voice assistant." (P11)

While using the chatbot during the study, a couple of them commented in favor of the speech-based interaction, that the chatbot supported. P3 said it is simply more natural and humanized for her, P15 saw its time-saving benefits in comparison to typing. Some other thoughts go as follows:

- "And the voice messaging thing seems like cool as well. Because I know a lot of people use WhatsApp under voice." (P5)
- "I don't have time to go to another application right now, because I'm in Google and maybe I'm walking or I'm driving, so it's nice that I can talk to it with the microphone... [...] no need to type, no need to select filters, no need to do anything [...]" (P12)

Since it could help understand the use and shortcomings of the chatbot, the facilitator asked about the usual planning of travels, as well as drawbacks of the flow. In general, all of the participants could relate to the field of travelling and are more or less regularly searching for flights themselves. Most of the participants frequently made use of Skyscanner, and they mentioned also Google Flights, Momondo, azair as well as various airlines, such as Ryanair, Alitalia, easyJet, Turkish Airlines, AirBaltic and Norwegian. Overall they asserted the existing flows being easy to use and the ex-

FIGURE 5.9_ ENDS: PRIOR USE



perience as rather good. Participants found it convenient to use the filters to find the most suitable flight for them and P3 asserted checking also the suggestions about what to do in the travel location, directly from booking websites. P1 claimed that since she is a great travel planner and thus, usually puts a lot of time into finding the best options. Also, others added that they usually check Skyscanner, but often cross-check with the official websites to make sure they get the best offer. The participants presented various diverse pain points, for one it was a trouble finding mutual times with friends or for the other it was rather the budget sharing while already travelling. Some had problems with the usability - even logging into the application or typing in the same information many times. Also, when purchasing tickets through metasearch engines, such as Skyscanner, it is difficult to contact someone when encountering problems with flights or even simply to trust it. It is evident, travelling is expensive and that makes users sensitive. Some pain points that came out from the study and can be useful to advance the chatbots:

- "[...] when you visit the Web site... Like after a couple of times, they're starting to increase the price. [...] Or like maybe you want to book two people... When you update the number of people, the website is showing you something different, some different offers. So in that point sometimes like, I want to ask to someone like, what is the problem?" (P3)
- "[...] I know what that Mondays and Friday and Saturday mornings are the high prices. So, you know, I'd still check, but I already know... I always end up flying on another day. But the idea something that you kind of have to click back and forth on the date bar there, instead of like having them side by side." (P4)
- "Well, I guess the travel search engines, they optimize either for how much time you want to spend traveling versus how pricey it is. So sometimes the cheapest option might not be the option I'm looking for because it has like a seven hour layover somewhere. So even if the algorithm pops up with results, then you might want to dig deeper and like actually look at what the result means. [...] Sometimes I want go to England first, then travel home, because it's cheaper than flying straight

from Paris to Estonia. But that's something that the skyscanner would never suggest me to do because it doesn't have friends in London that I'm happy to visit anyways." (P5)

- "But the first thing that I check always are like the dates, what is the cheapest price? And if there are like connecting flights, that the time between the flights would not be too long. That's like the most important thing that I check. That this is the most important thing that I want from the Web site. It would be easy to get that information on the site." (P9)
- "It happens so often that you find a good place, good price, but then you're going to make the check out of the payment and it starts to increase." (P10)
- "I tend to take a look at the flights many times in a month prior to the departure. So every time I'm kind of worried that the algorithm of the airline is kinda showing me, let's say like... defected prices. So I tend to navigate in incognito or from another computer. This is something that I tend to be kinda annoyed about." (P11)
- "Like maybe there is a pricing to 250 and then you go to the website and it's actually 400. But I don't know whose fault is that." (P12)

Another thing that disturbed some of the participants was the offering of additional services:

- "There are so, so many steps and with so many extra services offers to make up-selling and even if you know what, it's actually a lot of chaos and unneeded chaos" (P6)
- "[...] confused because there were so many offers that they offer like. So I got confused if I need to add all the bags there or should I not? It was too much and too complicated." (P13)
- "I can't really find useful information, [...] And then I couldn't find any information regarding the luggage. If the luggage I have.. Is it included or not? And then I tried to find the information." (P14)

To go to the core topic and talk about chatbots in detail, it is first worth mentioning that none of the participants had ever heard of that specific chatbot before. To go deeper, participants were first asked if they had noticed these bots somewhere and

if they had used them before. Most of them had had a brief contact with chatbots before and had noticed them popping up on various websites and applications. P1 claimed rarely using and even avoiding these. Similarly, P2 and P3 stated not using chatbots often and only if they had to, if there was no other option. P5, however, stated that she never bothered to use chatbots, she simply does not see any additional value.

According to the pessimistic opinions and even avoidance, the users were asked about the reasons why they did not want to talk with the chatbots. P2, P8, P11 and P13 jointly stated that they prefer to talk to real people, not computers. P8 added that it might come in handy with basic problems, but often the problem is too specific or sensitive. And P11 asserted, if it is not possible to talk to people, she relies on her own skills. Similarly, P1 and P5 agreed and added:

- "[...] because I know the logic behind it that they are they are programed to sort of answer some certain questions and then it seems to me that I'll probably get the answer anyways somehow. Like rather than putting my time into it and trying to explain them what do I need to know.. For me it seems that if the answer is somewhere in web, then I'll get it faster than trying to get the answer from the chatbot. (P1)
- "I don't know.. to me, this just seem like they're not really adding much value because. I have never used them myself, so I don't really know if they work well, but it feels like why do you even have one, shouldn't your website be self-explanatory enough? And then you never know if it's like robot you're talking to or if it's a real person. [...] If it's usually in the website you can find the information you need on average anyways. And if I can't find it, then I would never use to chatbots to ask. [...] I feel like if the website isn't good enough to explain it to me, why would a chatbot be? And then if the chatbot does do a better job, then I feel like there's something else wrong... Like if you need a chatbot to explain to people how to use your website, then you're not a very good product in the first place." (P5)

To take one step forward, users were asked about concrete examples and how had the experience been thus

far. There were both good and bad instances. P9 and P10 were mutually disappointed as the chatbot simply did not solve their problems. P4 mentioned an incident when the chatbot went crazy and always answered the same thing, similarly to P3 who added that in her case the repetitive answer was very long and general. P7 and P14 both recalled a likewise situation when the chatbot copied a long Frequently Asked Questions page. P11, however, claimed the experiences had been very poor in general, thus she had learned a trick to trigger the chat such that she was directed straight to a real assistant.

> "it seems that if the answer is somewhere in web, then I'll get it faster than trying to get the answer from the chatbot"

However, as mentioned, the participants had had also good experiences. P2 and P7 both recall positive conversations when their specific problems actually got solved, although, as it turned out, in both cases with the help of a human agent. Despite the interruption of a person, P2 felt that the chatbot was thinking along. Similarly, P4 recalls that if the chatbots are not able to solve the problem, she has been directed to a person. However, she has also had issues fixed directly by chatbots, but saw these problems rather easy. P10 also remembered a chatbot that has solved many of his problems. It is clear from the results, that the experience is good, when the user's problem gets solved and it does not matter if with the help of the chatbot or a human being, as stated by P7 and P10. Some additional thoughts about the topic go as follows:

- "[...] there is one which is like really specific.. Like which has basically all the chatting programmed in. So this is something that sort of fulfills my needs or this is easy. And it seems that it is good to communicate with it, because it sort of knows what will you say or how to act on each answer." (P1)
- "In the end I gave up, but it send me a notification like "Hi, still I'm here to help you". And in that sense, I felt a bit like.. Kind of a person is waiting for me there. And I didn't end it up, I didn't see I mean the point, like a cross or something, to leave the conversation. And I went back and I said like, "OK, but you're not solving my problem. So thank you so much, but you can end it up". And then it connected me

with the true people, let's say." (P3)

Despite protesting opinions, the participants claimed that if the chatbots will work better in the future, they can see the benefits. P3 stated that they will be useful for planning everyday things, such as trips. P2, P7 and P13 all assured that it would be a quick and convenient way to contact the services, without the need to email or call to a stranger.

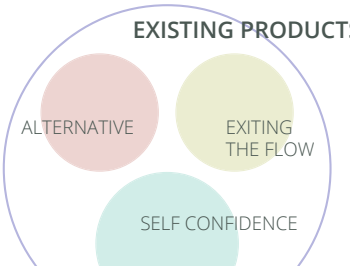
EXISTING PRODUCTS - ACKNOWLEDGING FAVORED ALTERNATIVES

The sub-topic (Figure 5.10) mentions the reasons why the participants perceive the website alternative better and more useful.

Throughout the interview, mostly all of the participants mentioned that they do not see any reason why they would use the chatbot as it was not really helping them and they were able to do the same thing by themselves - they were self confident and trusted oneself more. P4 simply preferred the usual approach, as did P2 who felt that going to Skyscanner was not burdening her. P1 stated that she would find similar things herself and P13 claimed to find even more information. Being content at first, but after encountering an error, P10 said he would have left straight away to do it again on Skyscanner. Some other opinions go as follows:

- "Maybe I trust myself more so I'd go with this Skyscanner rather than doing this." (P2)
- "Quickly put in, which literally takes me 10 seconds, you know - London any, to Tallinn or whatever it is and put the date in and that's it. Like it takes you the same amount of time. I don't need someone else to process that for me. [...], I don't need to talk to someone in Facebook Messenger conversation to another human to book my plane tickets. It's like it feels a bit dumb... I can go on a website and I could buy those tickets myself. I don't need someone else's help to book my tickets." (P4)
- "So far right now I would still say that I prefer the traditional way of searching just because I'm feeling like I'm faster than

FIGURE 5.10_ ENDS: EXISTING PRODUCTS



this. Probably just because I'm overconfident…" (P11)

Even if they would use, the participants mentioned that they would do a double-check anyway. P2 and P4 preferred to search again themselves to see if she could find a better solution. P11 and P13 simply stated that they would search for more results. P5 showed total distrust, stating:

- "Well, for me, even if it comes up with something and says the best price available, I'm sure I'm going to go and look myself anyways." (P5)

As mentioned, they prefered to use already well-known alternatives. To P2 and P5 it simply did not make sense to use a chatbot that was using Skyscanner, the platform that they would use themselves. P9 took the chatbot as an extra step to using the website. Other reasons they gave in the benefit of the websites:

- "Whereas if I'm on Skyscanner, I just put that in... it's one search and it's done. I don't have to keep going back to tell things to it." (P4)
- "I would never fly around this range and I would probably play around with the dates and see which dates are the cheapest." (P5)
- "I already know what I need to do and where to find it. And [the website it's not telling me other things... It's easier to roam. I don't know, it's faster to... Not easier! Not always easier, but faster to roam informations in the in full, for me... In the way I'm used to." (P6)
- "I would like prefer to go to Momondo and check it out myself, to see it like all the graphics, all the prices compared to each other." (P9)
- "[...] until now, there is no way why I shouldn't have gone to Google flight and did the same thing. And gotten the flights in a much nicer list and much easier to actually then go to the website of the company. [...] It didn't bring me anything else that I didn't have if I went to the Google Flights. And actually it's slower so far, because... OK, I put the dates... Let's assume that the dates are exactly 25 and 4th. But then, you know, I'm not really seeing all the flights. I'm seeing like two of them at the time and if I click, then I have to look for them again in this other website. And then maybe I will eventually get to the Etihad

page. And that's not what I really wanted to do. I want to just click here and get to the Etihad page, in which the flight was already selected, which is what Google Flights actually does." (P12)

- "I would already like go back to Skyscanner directly. I would prefer like Norwegian has, you have like a whole calendar and you can see the prices right away per day." (P15)

Some of them noticed the fact of using the chatbot only for a limited time. P11 saw the chatbot as an entry point to already familiar websites. Participants commented:

- "They expect you to click on it and like automatically sends you away from the chat app. So you only use the chat for like a few seconds in order to arrive to what are you looking for." (P5)
- "So the fact of having and keep going with the conversation is very weird because immediately I have something that is pushing me outside." (P11)

Finally, the participants were pleased to exit the chatbot and find something more familiar, as stated by P14 and P15. P5 and P9 were content with the overview of the dates and latter added that that was the place she could actually buy the tickets from. Others commented commented:

> "even if it comes up with something and says the best price available, I'm sure I'm going to go and look myself anyways."

- "Even if I was using this in the real life scenario, then I probably wouldn't keep asking it to change things. I think the point where they sent this link, I'd probably click on it and then do my changes in the filter, because it was clear that it couldn't deal with something. So it's just quicker for me to go in and make those filter changes." (P4)
- "It's good, I think... It goes out from the chat, [...] Now I understand if I'm going to this site, then it's something like... I understand it's some site that offers different tickets and this is like more understandable for me. It's like real offers." (P13)

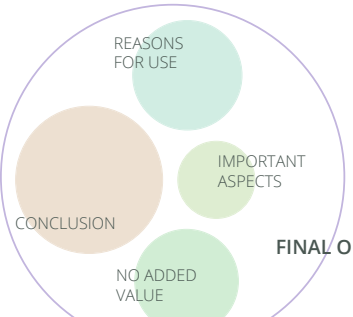
FINAL OUTCOME - ADDING VALUE

The current sub-topic (Figure 5.11) addresses the final thoughts of the users, what did they think was the most important while chatting with the chatbot, what were the benefits or what was missing - the final thoughts of the experience.

Some participants, such as P1 and P14, were positively surprised, since they received the results that they were expecting and they were content with. P1 would use it in the future to compare with one's own results, although, she mentioned the chatbot lacking of proactivity. P7 also mentioned that there was nothing missing, and praised the chatbot for asking additional information to make the experience better in the future. He appreciated the language the chatbot used and the way the results were visually simplified. Also P8 noticed the conversation being understandable for him, as well as less tech-savvy users, such as his mother. Similarly, he predicted using it more in the future since it was easy to handle and did not require too much engagement. What is more, he appreciated being able to use it from different platforms and devices. Likewise to others, P9 liked the use of language and felt that it was easy to talk with, she would return to use it if she would have questions about the flights while booking tickets. However, not all the participants were content with the outcome and most of them would not use it again. P11 simply thought that chatbots are not good enough compared to other solutions. P12 stated that the chatbot did not do what he expected and he could easily just close it without caring. P2 saw it as a fast way of throwing the options, yet would choose to do it by herself. P10 claimed being frustrated after encountering an error and would not use it ever again, he stated that he would even tell his friends not to use it due to his poor experience. Other participants answers after being asked if they would come back to use it:

- "I don't know, I don't really find like booking plane tickets...I don't need to have a conversation with someone, whether that's a bot or it's my sister, you know, like I don't need to have a talk about buying tickets. I just go to the website and put in my filters and... Which like takes me super short time. And I just

FIGURE 5.11_
ENDS: FINAL OUTCOME



look there. I don't need to go to the website, then go back to the bot to ask for changes, then go to the website after they give me the link again... like it's seems a lot more steps than necessary. [...] so I don't really see how it gives me a better ticket... buying ticket experience or whatever." (P4)

- "No. [...] I don't need it. It's not doing anything that I can't do. It is not really better than the stuff I'm doing at the moment. [...] I feel like it might be quicker when I've been there on an actual website rather than just like asking a chatbot every single question. [...] For me, it still feels like I'm talking to an online search engine. It doesn't feel any more intimate, than Googling or... [...] but it doesn't feel more like... More than just an internet search at the moment for me at least." (P5)
- "I don't know. I'm not used... I mean. I didn't feel to have something more than the way I usually search for these informations [...] And I don't really need to talk, to have a conversation to find this kind of information. [...] it is a form. [...] It's even in the same kind of experience of the search bars on the websites. [...] I think that the... That the feeling to talk with a machine is the thing that. It's the worst part for me," (P6)
- "No. [...] I would say that mission not accomplished. It's not... Yeah. I didn't get... I didn't get the information I was hoping for. [...] how the chat is up. This is like... it's not ready, I'm thinking. Like something is missing there" (P15)

The participants named several aspects what they sensed missing in the chatbot. P12 wanted to see some alternatives and to have a sort of negotiation. Likewise, P1 lacked of proactivity and added that the most important was to get an accurate answer, that also P12 mentioned. P10 agreed and stated that it was very frustrating to feel like the chatbot was not paying attention to what he was saying. Others commented on the conversational manner:

- "What is needed is the ability to elaborate more complex conversations where I can, where I don't find like copy and paste messages where I can, maybe I... I receive the same exact information, but I feel that he is giving this information to me

in a slightly different way based on how I am talking to it. This is the worst part for me to feel, to really feel the conversation to be artificial, since it's repetitive... since it's not, I mean, it's giving me relevant information, but it's not really answering to my way." (P6)

- "I think that the conversational manner of it, because he was pretty flat." (P8)

Another aspect that the participants brought out was the fact that the chatbot did not give any additional value to them, as clearly stated by P5, P6 and P11. P2, P4 stated that she could get the exact same information herself with the same amount of time. Others added:

- "[...] maybe my expectation was higher. Since they designed this system, I was expecting like it's gonna do more than me. So that's because he's there and I can ask... But actually... And then I saw that, no, if I'm going through the website, I'm going to do the same," (P3)
- "Like the one part where it does like do something different is that at the end wards it is like suggesting that like... extra services, but I feel like at normal agencies online would do the same." (P5)
- "It's just a website that it's using words instead of of textbox for me to filter. And I don't feel like it's more than this. [...] More than humanizing all this filtering, it is not really doing much more." (P12)

However, in addition to being more collaborative and asking follow-up questions, as mentioned before, some participants suggested a few aspects that could give the expected extra value:

- "Maybe if we can do like collectively, like, how can I say like... with 3 people, with this chatbot. Maybe it can be really useful. [...] Maybe it would be really, really useful for me while I was looking for an apartment around somewhere. Not only for traveling. I would like to use it, because like you don't know the language where you are living." (P3)
- "Might be even that you can include a fast track or something like that, like for instance if there is... I don't know, a longer layover, what could work for me, is like, you often think that the business lounge is gonna be so expensive, but actually some-

times in some airports it would be 30 euros or something, but it pops out: "But would you be interested to book, you will be staying in, for instance, Frankfurt for eight hours, the lounge is only 30 euros" or something. "Would you like the book that" or something like that? That would be cool like that... at least for me, that extra value that analyzes the travel specific case and offers me something extra that I might not have thought of myself." (P7)

- "Yes, maybe some sales or..." (P9)

On the other hand, P1, P5, P13 and P14 mutually saw convenience as an advantage. Similarly to P5, P7 and P12, who found the chatbot being quick. P5 added that one can simply open WhatsApp and get a first rough overview of the costs and options. She also mentioned the ease of use and saw the chatbot fitting for people who did not have much time and preferred to use an assistant when booking a travel. Although, she believed them being less price sensitive. P4, however, mentioned the chatbot useful for older people, who were not that tech-savvy. Additionally, P7 appreciated the fact that the chatbot pulls the information from various places, such that one does not need to go look on different platforms himself.

BEHAVIOR - BEING POLITE AND BUILDING CONNECTION

All behavior is communication, as stated in the literature review. Thus, different aspects of chatbot's behavior were investigated and are followingly given a detailed overview. Since behavioral codes were less frequent, the current sub-topic does not divide them into smaller parts and describes the various topics seen on Figure 5.12 under a common label of "Behavior".

To start with, many of the participants mentioned the chatbot as "humanized" and "human-like". P4 and P10, even mentioned that until one point, if they would not have known, they would have thought they were talking to a human being. P9 added that she thinks of it as a person, rather than a computer. P4 praised the fact that the chatbot was not hiding its AI-entity and did not pretend to be a human. P1 and P7 appreciated the smartness of the chatbot and P7 added that it felt like somebody was listening to him and correspondingly adapting. Similarly, P8 took it as a very intelligent

“I would say that mission not accomplished ... it’s not ready, I’m thinking. Like something is missing there”

P15, PARTICIPANT OF THE STUDY

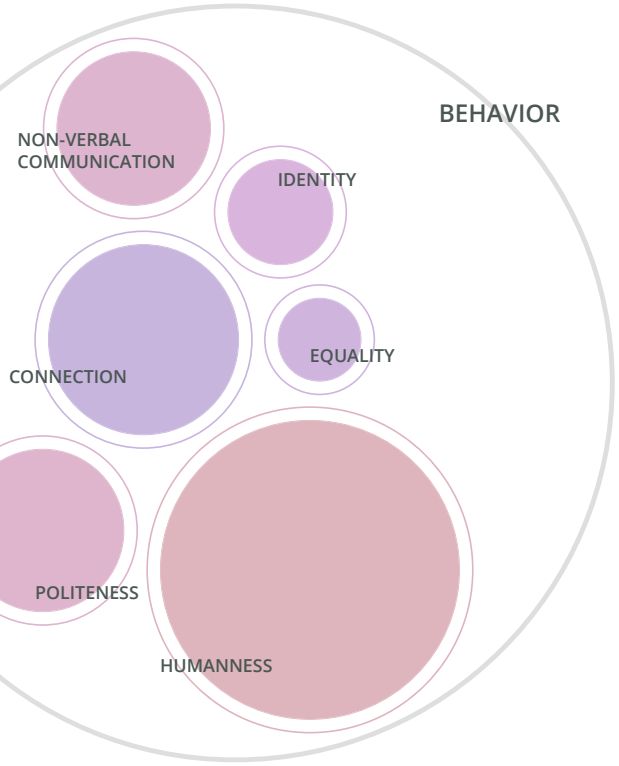


FIGURE 5.12_ BEHAVIOR

computer, though, not as a person. P15, on the other hand, said that the chatbot could be more intelligent. And P12 claimed that the chatbot was not doing much more than simply humanizing the filtering. Other users were frustrated by the facts that:

- "Just because of the... Even if I say Milano to Los Angeles. Asking me again where you're flying from. It's kind of a stupid question to me." (P2)
- "But after that it gives me the options and goes back to the same. Okay. "Hi, I'm Eddy." So it's like, okay do we start all over again? So, no, not like a person. No." (P15)

However, what made many of the users perceive it as "humanized", were the use of emojis that also resembled non-verbal communication to many of the participants. They mentioned the emojis adding a fun feeling, such as the emoticon with the sunglasses that attempted to give a cool impression. P1, P6, P8, P10 and P13 did not perceive any non-verbal communication, but some of them mentioned it lacking also in everyday chats with humans, so they did not really miss it either. P11, on the other hand, perceived the profile image as non-verbal information.

Similarly, P2, for example, mentioned the logo used and the perception it gave. She saw the attempt for a cool attitude and perceived the name "Eddy" as an effort to be more of a friend. Also P7 draw attention to the name and said he liked it. P12, on the contrary, saw the effort in using the real name, but mentioned that it did not take away the perception of a chatbot. Similarly to P2, P11 noticed the aspect of friendliness and thought a step forward, mentioning that probably the product is more targeted to young people, and coming from the design of the logo, maybe even directly to backpackers. She also reflected

the target from the fact that the chatbot mostly gave low-cost airlines as the options.

As mentioned, friendliness was mentioned by majority of the participants and they perceived the attitude nice as well as proper. They appreciated that the chatbot was not trying to be funny and make use of extensive humor or small talk. However, P2 and P3 would like to see the chatbot being even more friendly. Some of the users also commented the chatbot as respectful, yet straightforward. Latter being a quality that the participants valued a lot, since they do not need the chatbot to be too colloquial. Therefore, they perceived that there was a correct balance between formal and informal - since looking up a travel is a rather formal activity, the users want the chatbot to stay professional. However, P8 added that he would not want it to be more formal, since there is a lot of data to be handled and it would get too serious. P13, on the other hand, would like a more professional and polite approach. Similarly to the prior opinion, also P2 expected the chatbot to be more polite and P14 would like to have some more "please" or "kindly" when the chatbot is coming up to her. Other participants agreed the chatbot being polite enough, yet staying slightly informal - like talking to a friend of a friend, according to P3.

Finally, since most of the users perceived the chatbot being rather friendly, they were enquired about a connection and relationship they were building. P7 was rather positive saying that after a brief conversation, he could imagine that coming back next time the chatbot will remember his preferences, thus he started to feel sort of a connection. Whereas most of the other participants never felt any kind of connection. P4 added that she would not expect it from a tool and some others commented that it was just a question-answer flow, or as P5 stated, it felt like talking to a search engine. P11 and P12 told that they could simply close the chat without feeling bad about it. P3, P10, P12 and P15 all perceived the connection as growing in the beginning, but they mutually agreed that after a while it came back to the zero point. They commented it followingly:

Whereas most of the other participants never felt any kind of connection.

- "Actually like it could it be... but it didn't.. It gave me the insight.

Like, OK, it's like... Found 44 flights... Here are the best options, but only one option. And then it stopped. Like, it just..he just said to me, "I can also track prices of these flights" and so on. But then it's like stopped.. I was expecting more. [...] like "do you know what? I shared a post on Facebook, I'm going to send you. Maybe you can see best finding... or like the picture, like a best place in Barcelona" or something... I was expecting more like, you know, like a friend of a friend.. "Yeah, I was there! There was nice...or like stay around there, because it's like a really nice place or like there are many good cafes"" (P3)

- "[...] at first it was okay. You know "I'm Eddy..." a nice icon. "Tell me where you want to go"... Blah, blah, blah. And then I started to see that it's just spitting answers without much logic." (P12)

CONVERSATIONAL STYLE - INCLUDING EMOTIONS AND REDUCING EXERTION

The theme concerns with Tannen's approach of how things are said. Meaning, the use of words, emotions, and the speed of conversation are analysed. Similarly to the previous, the topic will be described as one.

Likewise to the perception of behavior and supposedly coming from that, also the conversational style was seen rather friendly and easygoing, casual everyday talk - however, keeping a slightly formal, business-client aspect. P5 labeled the language used as a normal Internet language. In general, the sentences were perceived as proper, likewise to the vocabulary used, as some stated:

- "I'm reading it and I can almost imagine someone just like standing next to me and casually telling me this." (P4)
- "I don't need to be a pilot to understand what it is telling me." (P6)

Also, the participants appreciated the use of emojis and how it helped to keep the text brief, yet more lively. It gave a feeling of a regular chat - simple and short. However, the participants did not distinguish any specific emotions or change of reactions. P8 even said that it was a rather cold conversation, from that perspective. P11 noticed the effort of using emojis, however, she did not perceive it

as very emotional. She added that the emoticons were used in a consistent way, thus presumed a use of script, such that every time the chatbot was mentioning flights, an icon of plane was displayed, etc. To make the conversation more affecting, P1 suggested:

- "Maybe some, I don't know, some great jokes or something about [...] the destination or "Good pick!" or something like that, you know. Would have put some more emotions into it." (P1)

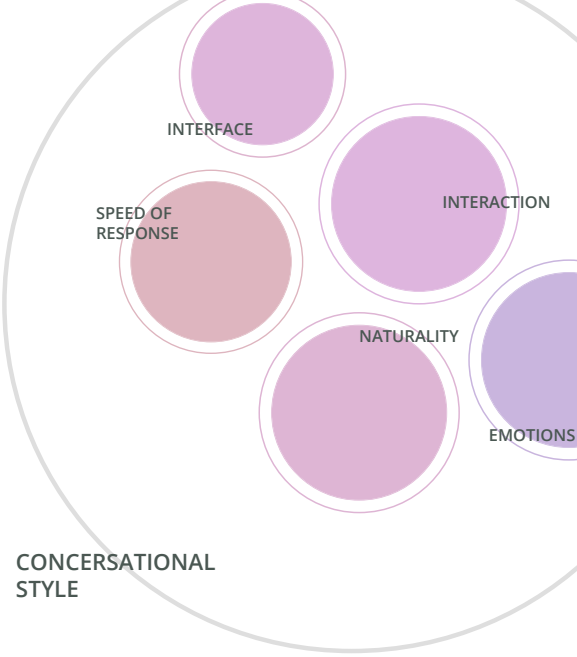


FIGURE 5.13_ CONVERSATIONAL STYLE

Coming from the lack of emotions, some of the users did not perceive it as a conversation at all, but rather an artificial dialogue with a machine. P6 claimed his own answers to be orders and P12 noticed that the chatbot's sentences were more human-like than his own. Their thoughts were as follows:

- "I mean it's not a conversation... For example, I just wrote like, "hey, bro". And yeah totally like, "I could not find any airports around there."" (P2)
- "It's not reacting to what I'm telling. It's just prepared to answer in a...in some way. [...] we are just moving on a path that is prepared for us and we don't need to.... Yeah, it's a lot... Guided a lot. How do I say... It's on track, it's an on-track conversation." (P6)
- "Maybe for my mother it's a conversation. But here... From my user perspective, it's just... I'm making a question, I'm asking an answer. And my past is that, I know that my question needs to be a word or something more than a word. And the way I think about that is because the chatbot is not saying "Hey-hello P8, these are the flights.." It's just like "These are the flights". It's more like a service." (P8)

However, to talk about the pace of the conversation, users noticed that the

chatbot answered very quickly and many appreciated the fact. However, P1 stated that the chatbot sent her four different things in a row, thus she had to scroll back and see what it said.

However, the participants did not distinguish any specific emotions or change of reactions.

Similarly, P14 suggested to give the information slightly slower. A participant even expressed scepticism:

- "It answers very, very quickly. I mean, I barely hit enter on the UK pound please and it already answered me. That's kind of crazy, is it reading as I'm typing...?" (P4)

In addition to chatting through free phrases, majority of the participants made use of quick reply buttons and appreciated the fact that they were able to use them. However, having talked with the chatbot through typing the whole time, P12 was frustrated when he faced a dead end as the chatbot expected him to click a quick reply button.

Other UI elements, that can be seen as characters of conversational style, were the cards that displayed the results of the flights. Mostly, the participants were content with the overview and appreciated the information that was given. P2 and P7 needed some time to understand the information about the layovers and similarly, P12 mentioned that more data, such as the location and duration, could be given about that. P2 praised the fact that the cards can be swiped, however some others, such as P12 and P13, had a hard time understanding it and thus criticised the comparison - it is worth noting that they were all on Messenger desktop views. Similarly, P5 on WhatsApp and P11 on Telegram, complained about the comparison since the cards were given one under the other and thus, they had to remember the details to analyse the results, stating:

- "It's like it's kind of hard to compare two different results. Maybe if they like formatted in one big picture rather than sending eight different pictures. I think it would have been much easier. But like... At the moment, I have to put in quite a lot of effort myself to understand what it sent me." (P5)

What is more, both of them were overwhelmed and expressed surprise when the chatbot sent the long list of options. Also, P11 noticed there were

always the same number of results displayed, making the conversation appear as following a pattern. She concluded the list of results as poor. Likewise, P12 demonstrated annoyance by the fact that he could only see 2 out of 694 flights, even after he found the possibility to use the carouselle.

SOCIO-CULTURAL RULES - FOSTERING SECURITY

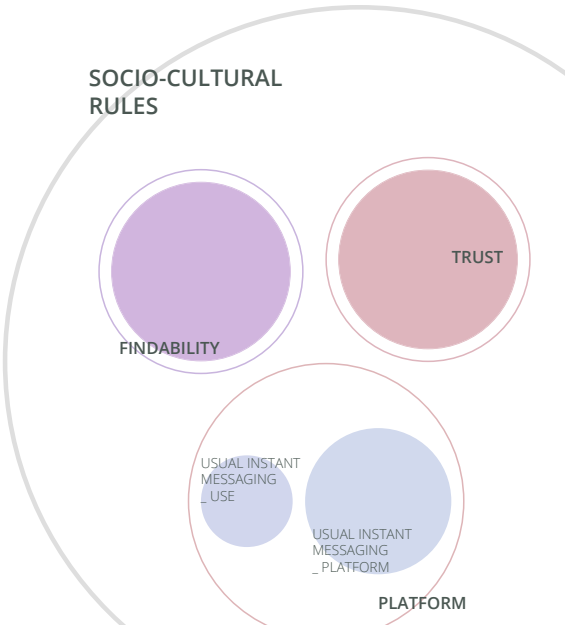
Finally, the current topic addresses an issue, or according to Hymes, a norm or standard (Figure 5.14) that stood out as equally important to the participants of the present study. As the least frequent topic, it will similarly be addressed as one.

To start with, all of the participants claimed using Instant Messaging applications regularly throughout the whole day. Mostly they used these apps for chatting with friends and family, some mentioned also contacting certain services via these apps.

While using the chatbot in the study, the participants clearly calculated the choice of which of the platforms they would use for that. Two of them, P13 and P15, did not expect to connect with a specific platform at all and supposed the chatbot to operate as a standalone. When there was a request to sign in to Messenger, P13 claimed that she would close after that and not sign in to the platform. Similarly, P5 stated distrust:

- "It does feel like a little more of a violation of my privacy. Because normally I use my chat to speak to real people and to speak with my friends and family, not to speak with businesses. I'm not too sure about that one. [...] like mentally the biggest obstacle is like opening it up on like WhatsApp, Messenger, Slack or something, because I feel like these are quite private platforms for me... Like I don't feel comfortable with... Like having a corporate com-

FIGURE 5.14_ SOCIO-CULTURAL RULES



pany or my WhatsApp or like on my Messenger. If it was on their own website then I would be fine with it. But for me, the fact that it wants to connect with my personal accounts feels like a bit of a violation." (P5)

What is more, the concern was deeper and she claimed that she would not like to share her Facebook details with those chats. P3 pointed out data leaking, similarly P5 believed the chatbot to keep the information and sell it to someone. They both claimed that they always think twice when sharing their personal details and try to keep it to themselves as much as possible. Likewise, P14 was worried if the data would leak somewhere. P6 was confused how the chatbot automatically knew his email when he was asking for price alert, but then replied himself by claiming that Facebook already knows everything about him. Another participant commented:

- "Though, I mind the fact that it's my Facebook's account linked to this bot and I'm not sure what history and data it's reading. And I'm just being very conscious lately about how different applications are using my data. So I feel like I would have gone from a website that is not linked to my Facebook account, it would have felt more safe for me in terms of my data being used… [...] I don't like that is through Facebook because I don't know how Facebook is going to use that data that I've given just to them now." (P4)

The general distrust against Facebook was apparent through the statements of many users and most of them claimed that they did not use the platform that much anymore.

Other than that, the users mostly trusted the chatbot itself, since it was asserting cooperation with Skyscanner, a website mentioned and used by most of the participants themselves. In addition, if the users knew the websites they were directed to they did not express any disappointment. However, they were very sceptical about the unknown references and they often mentioned never hearing of these sites before. Similarly, P11 brought out the factor of not knowing the chatbot itself:

"Though, I mind the fact that it's my Facebook's account linked to this bot and I'm not sure what history and data it's reading"

- "[...] it's more a question of trust. Meaning that if I knew that Eddy was already offering me really the best of the best. So the answer was very minimal and very narrow. So if it would be like, I know that Eddy is always showing me the best of the best, I would say "That's perfect! I'm not going to consult any other website."" (P11)

Similarly, P3 stated that she never heard of it and predicted that she would use it more when it was discoverable in social media channels, like Instagram. P14 likewise said that the initial push was missing, the marketing aspect. Finally, two suggestions to make people use the chatbot more, were given:

- "[...] because friends are saying that he's very accountable or that everyone is using it... Like in general, not just friends. [...] about the way he's designed. So maybe increasing the information about how many different results have been compared, how many other people have chosen to go for these three results that it is showing me [...]" (P11)

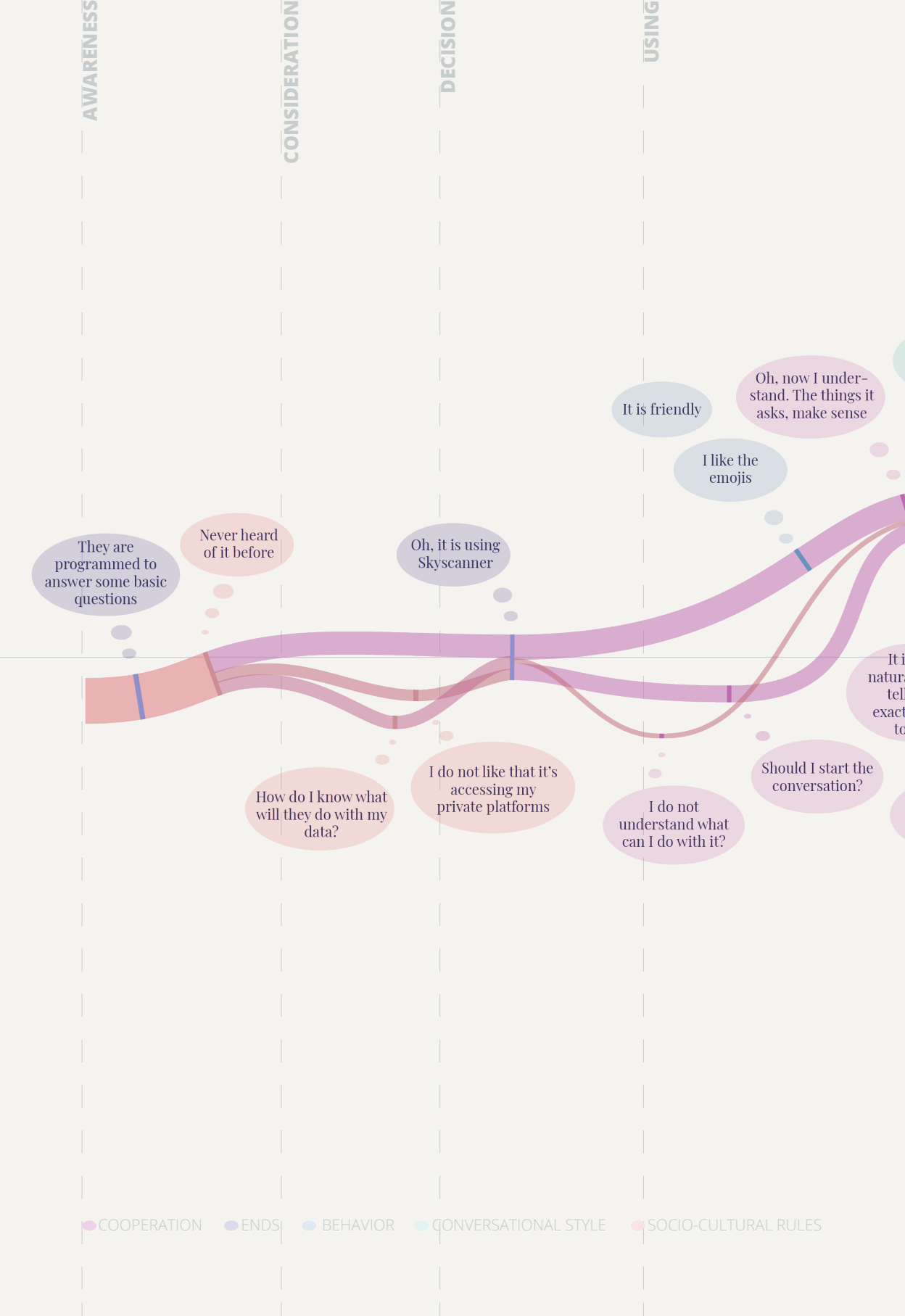
Discuss_
ion

Despite carrying numerous benefits for users, as well as for developers, the hype of chatbots has started to fade as they have not managed to find a way into people's everyday lives. The results of the current work illustrate agreement and further indicate that users either do not use chatbots at all and simply avoid them, or use them if they really have no other chance. Likewise to the findings of Jain et al. (2018), the analysis ensures that users just do not see any additional value to existing solutions and often believe themselves to be more skilled and trustworthy, since chatbots are mostly designed to answer a few basic questions. However, as the theoretical framework illustrated, it is believed that the time of chatbots has not yet arrived and technology needs to develop further and make them smarter. Some of the chatbots, such as Microsoft's XiaoIce, are already rather intelligent, however, still fail to deliver expected results. Therefore, the current work aimed to look beyond technological deficits and focus on the pragmatic aspects of the experience, thus asking -

How do users perceive the pragmatic shortcomings in communication with chatbots?

To the knowledge of the current work's author, no other study has directly addressed pragmatics - for example, En and Lan (2012) applied Politeness maxims to design the dialogue with a robot, and similarly, Hall (2018) suggested to use Gricean maxims for interacting with chatbots - yet, thus far no one has taken pragmatic theories as a base to focus on the existing experience and bring out related drawbacks. To jump ahead, it is safe to say that the shortcomings influencing the experience the most are: cooperation - how the chatbot and user manage to build shared meaning towards mutual understanding - and ends - how users perceive the value, purpose and goals of the interaction. Less, yet equally important are behavior, conversational style and socio-cultural rules. The experience is illustrated in Figure 6.1 and will followingly be described in detail.

To start with, the results indicate that before even getting to chatting, users are primarily attentive with choosing the Instant Messaging platform, since they see the chatbot violating their privacy as it wants to connect through users' personal messaging channels. Other than that, users find it hard to understand what the chatbot can do and if they should be the ones to initiate the conversation. Once they


AWARENESS
CONSIDERATION
DECISION
USING
They are programmed to answer some basic questions
Never heard of it before
Oh, it is using Skyscanner
It is friendly
Oh, now I understand. The things it asks, make sense
I like the emojis
How do I know what will they do with my data?
I do not like that it's accessing my private platforms
I do not understand what can I do with it?
Should I start the conversation?
COOPERATION
ENDS
BEHAVIOR
CONVERSATIONAL STYLE
SOCIO-CULTURAL RULES

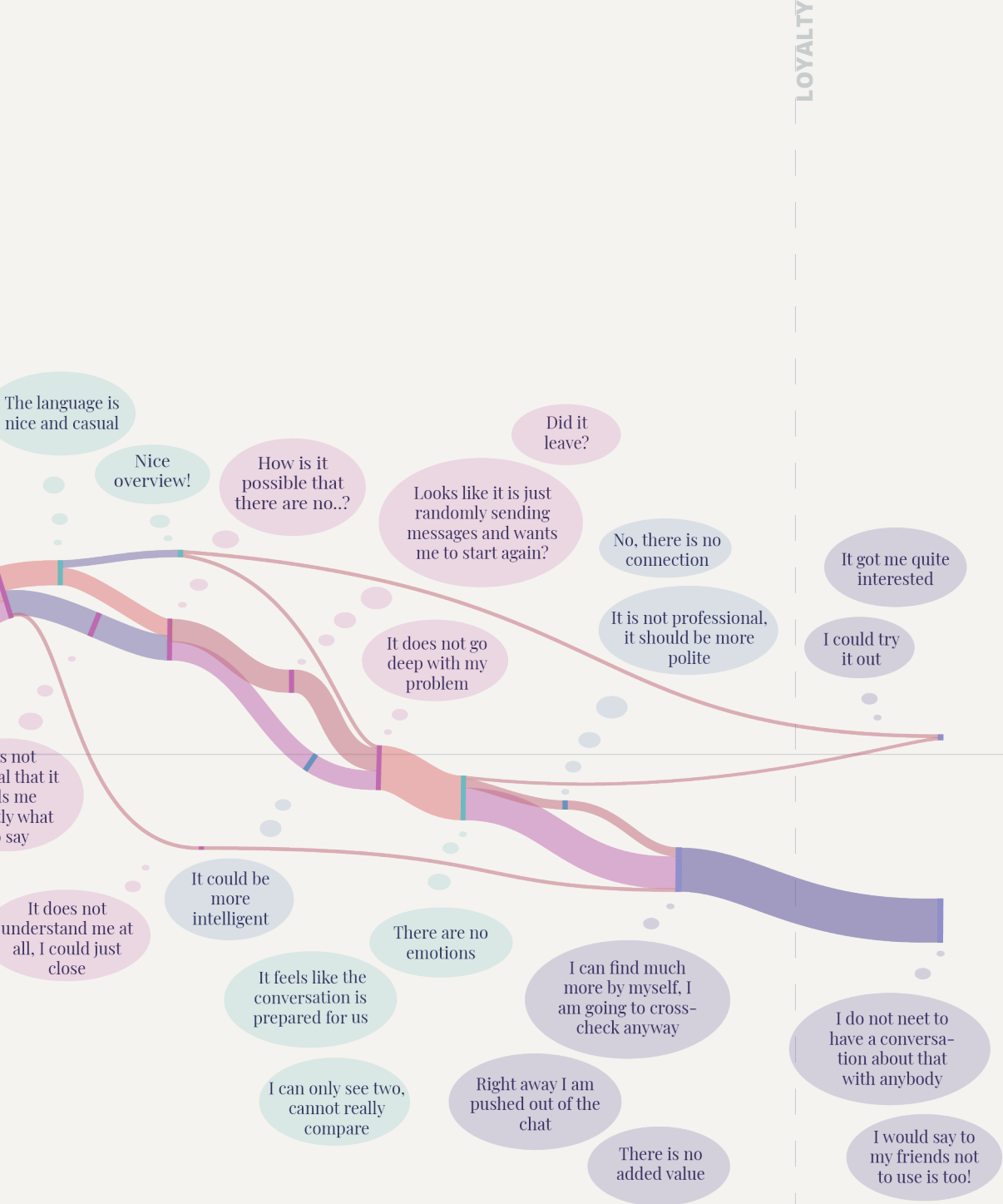


FIGURE 6.1_ USER JOURNEY

start the conversation and get the first message, the connection starts to grow and users get engaged, as the experience proves to be raising - conversational style is proper, the questions are relevant and make sense. As the analysis illustrates, however, users' engagement often quickly disappears, as the options are sent in a poor and monotonous list that additionally does not support comparison. What is more, users are immediately pushed out of the chat - acting simply as an entry point to another platform - thus, making users question why should they continue to converse at all. They get frustrated since the chatbot is not proactive, users expect it to go in-depth with their problems in order to help to find the best fitting solution - they simply expect it to care more. Contrary to that, the chatbot rapidly sends more messages jumping to new topics or back to the beginning, therefore handling the problem in a superficial matter and leaving users feeling that they did not get anywhere. Additionally, if the users do not answer to these messages, chatbot disappears unless users themselves do not push it to continue with the conversation. However, users do not write freely to the chatbot themselves and rather close the conversation than ask for further explanations and clarifications. The analysis confirms that most of the users are left disappointed since the time is spent but they need to redo the whole process by themselves to dive further into various solutions - once again, the chatbot has proven to be dull.

Additionally, as the study demonstrates, when the chatbot does not understand users' statements, it often misleads them with its utterances or makes users think about what went wrong, since the chatbot does not clarify the misunderstandings. As the results show, also the leading sentences that inform the user how one should converse with the chatbot (e.g. "Say dates like..."), are actually misleading. However, users were both for and against these - some state that it helps to meet their expectations, others find it unnatural. Latter goes also for the conversation itself as users perceive it being prepared and guided, therefore making it feel artificial. Coming from that, users claim to not read everything since they know that the messages are automatic as well as notice chatbot's texts arriving very quickly.

The results show an apparent lack of non-verbal cues as well as emotions. The chatbot behaves properly

- imitating humans fittingly, not in a bizarre way - yet the conversation appears flat. Also, chatbot's level of politeness differs among people - some see it as respectful, others not; some see it as friendly, for others it is therefore not professional enough. Some also mention the intelligence and smartness, whereas others do not agree and express opposition. The results firmly indicate, though, a lack of any connection whatsoever.

Finally, as the analysis confirms, it does not matter if the problem gets solved by the bot or an actual human being - the experience is successful when the problem gets solved and opposite when the problem is left unsettled. However, users are content with today's flows and are not willingly adapting to other solutions unless there is a clear added value. The websites are clear, easy to use and visualise information in a way that allows users to compare and edit in a rather easy way. Thus, they do not see the need to talk to someone about their travels and know that they can rely on their own capabilities. Further, they trust themselves more and would cross-check the results anyway.

It is clear that most of the participants are not happy with the outcome and would not use the chatbot again, as it seems unnecessary. The chatbot fails to bring either any additional value or even the expected results. Therefore, it still feels like a search engine, just slightly humanized - instead of clicking to choose the dates, one tells the dates.

Even before the study, cooperation, behavior and conversational style were expected to appear as themes, since these topics were directly addressed in the in-depth interviews. However, the analysis confirms an appearance of two other equally important pragmatic topics - ends and socio-cultural rules. Coming from the results that focused on finding an answer to the research question, the remaining of the discussion will zoom out from the specific problem addressing the pragmatics, and will reflect the results in the broader environment. Thus, stating two new questions and answering them with the support of current work's results as well as previous research and theory.

HOW TO BETTER CHATBOTS?

INCREASE DISCOVERABILITY AND ADD VALUE

First of all, current work agrees with Jain et al. (2018) and Klopfenstein et al. (2017) who all agree that discoverability is a great issue. If chatbots, especially the ones operating on Instant Messaging platforms, want to become more used, they first need to be easily **findable. The current results confirm that in order to start using these at all, users have to first merely come across chatbots either through social media platforms or friends.**

However, the reason why thus far chatbots are not widely displayed, might be due to the fact that they simply do not give any distinct benefits. Meaning, users get no additional value compared to the existing familiar solutions and therefore are not encouraged to use chatbots, as is also stated by Mou and Xu (2017). Therefore, similarly to Zumstein and Hundertmark (2017) the current work states that chatbots have to provide additional user-, as well as case-based values, such as: "You have a 6-hour layover in Frankfurt. The business lounge costs 30€, would you like to book a place there?". In addition, current work's author proposes **to discover potential additional values by learning about the pain points of already existing flows that the users are deeply acquainted with.**

SUPPORT DATA PRIVACY AND ENCOURAGE TRUST

The research provides a new insight into the relationship between chatbots and data privacy. Prior to the use of chatbots, it must be made very clear what data and how will it be used. Supposedly coming from various scandals in the previous years, such as Facebook - Cambridge Analytica one, users have become highly attentive with the trust towards Facebook and other social media platforms. Also, they think deeply about which personal details they are sharing. The results clearly indicate the distrust towards the chatbot and especially so as it is violating users' privacy operating on their personal platforms.

It is obvious that using Instant Messaging platforms gives a great advantage as the chatbot is able to store the

previous messages, is easily accessible and can learn from the user. However, the results agree with Zumstein and Hundertmark (2017) that using these platforms might not be the best **idea. Current work proposes to allow the user to choose if the chatbot accesses one's personal platform or uses a more general way, such as the website - as was expected by users in the current study.**

However, it once again comes back to the additional value issue - chatbot needs to give information that cannot be easily found otherwise or simply provide something extra.

What is more, as the results indicate, users have noticed chatbots popping up on various websites, yet avoid them. Therefore, chatbot's design has to provoke conversation and various alternatives have to be tested to understand how users trust the chatbot the most. An example to draw upon - after redesigning their chatbot into a full-screen conversation, Landbot website's conversion rate grew five times (Lomas 2018).

BE INITIATIVE AND EXAMINE THOROUGHLY

Once starting to use the chatbot, the results indicate that users expect it to initiate the conversation and as the interaction advances, there is a clear need for follow-up questions. The analysis shows that users want the chatbot to go in depth with their problems, therefore narrowing the final outcome such that it corresponds directly to users' needs. It is important to note that it has to be done in a way that users do not feel overwhelmed by the amount of questions. However, the results of the study show that users never mention the extensive amount of questions and do not mind answering to the chatbot, yet avoid asking further questions themselves. Similarly, Bernsen et al. (1995) acknowledge that system-directed dialogue fails if users themselves have to start asking questions - therefore, the system should be designed in a way that users do not need to ask for answers themselves.

What is more, the experiment brings new insight in terms of leading sentences (e.g. "Say dates like..."). Despite the need to guide the interaction, it is arguable if the leading sentences either work for or against their initial goal. The results show that these

sentences create misunderstandings at some instances and users perceive them unnatural. As mentioned, users avoid typing to the chatbot unless it is to answer a question. Leading sentences can be seen as one reason for that - if the leading sentence is missing, users do not know what to say as their expectations have been lowered by showing that the chatbot only understands specific sentences. On the other hand, users mention that with leading messages their expectations are managed and they understand better the chatbot's capabilities. The **use of the leading cues has to be consistent, however, the current work sees such suggestions as unnatural and misguiding, thus would recommend to ban the use.**

When it comes to handling errors, current results show that users are mostly trying to get over misunderstandings themselves - they are forced to think about what went wrong. However, it is believed and some also state doing it for interview purposes, therefore if they encounter these situations in actual circumstances, they would probably close the chatbot right away. Thus, as the user is mistaken or chatbot cannot understand what is meant, it should not give a general error message, such as answering: "I could not find in airports around there. Try different city," after the user types "Milano". The chatbot could either work like Google, for example, and ask: "Did you mean Milan?" or in the worst case admit that it does not understand and ask to rephrase. But it should definitely not lead the user to a totally wrong direction, making one think that there are either no direct flights and therefore change to "Rome", or that they should be more precise and say "Bergamo" instead, as happened in the current study. Moreover, if the chatbot does not know what the user means (e.g. by "good weekend"), it should not guess what has been tried to say - once again, the follow-up questions should direct the conversation back on the right track.

MATCH THE BEHAVIOR AND CONNECT THROUGH EMOTIONS

Finally, it is evident that the personality traits differ among people, ones perceive the chatbot as polite, for others it is not professional enough. Some see the casual conversational style fitting, others disagree thoroughly. As Nass and Reeves (1996) stated, people like computers with

similar personalities, thus it is seen as a proper explanation here too.

Everyone agrees, though, that overall conversation appears flat, with no emotions as well as no connection. Lee et al. (2017) propose to use personal information, such as age and gender, to improve personalized response generation method for classification and recognition of emotions. More towards future scenario, once the technology develops further, the chatbot has to become smart enough to provide even more personal experiences, since the current study did not see any specific patterns in terms of age and gender. However, a more thorough study is needed. In future, perhaps affective computing could be one way to understand which behavior and conversational style is expected at the given moment. Yet, as mentioned, users are highly attentive with sharing personal data, therefore it needs to be further discovered how would they react to affective computing and the usage of data that is needed for that.

However, more applicable today, coming from the main target of the chatbot, some sentences to foster emotions need to be added. Such as, "Nice choice! Barcelona is amazing at that time of the year." Jain et al. (2018) and Thies et al. (2017) suggest to enrich the conversation with humor, however, current results disagree. Perhaps coming from the seriousness of the field the used chatbot is operating in, booking plane tickets.

It is evident that the chatbot should understand users to provide the best experience and build connection. Today, perhaps it could be done through sentences the user writes as well as through additional data, such as age and gender, as proposed by Lee et al. (2017). It must be understood which approach suits the user the most at the given moment - more casual or more professional, more friendly or more polite. Users are different and "one size" does not "fit all".

ARE CHATBOTS WORTH BETTERING?

Thus far the discussion has focused on providing valuable practical implications for the community to combine or enhance the chatbot on one's online platform. However, as a final thought, the research questions the necessity of these conversational interfaces in general and asks if they will ever be good enough to provide a useful alternative to the existing solutions.

First, perhaps there is a reason why people do not use many offline services anymore (such as travel agencies) and prefer to take care of everyday matters online and by themselves. As the results ensure, participants do not need nor want to talk about booking flight tickets or hotels - they are happy to take care of the instances themselves as it is quick and familiar. However, as the offline services still exist, it means there is still a demand. Therefore, perhaps chatbots should be aimed for a very specific target. For example, less tech-savvy users could benefit from the use of chatbots, since they do not feel comfortable using regular websites and find these sites difficult to understand.

Similarly, when Graphical User Interfaces first came, they worked slower than Command Line Interfaces for the expert users and even today, many developers and other professionals still make use of the efficiency and utility of giving commands to the computer. Today's casual users are already good and efficient enough with GUIs and work their way around various websites rather quickly, thus they might not be the suitable target. Therefore, as the first milestone, chatbots should first aim to fulfill the needs of the users who find GUIs difficult to use and then move on to satisfy more complex needs of tech-savvy users.

However, as one participant in the study brought out, elderly, for example, might benefit more from speech-based conversational interfaces, such as virtual assistants like Siri, as it proves to be quick and clear. There is no need to type on a small screen or read the tiny text. As it was for the 70-year-old French man, he trusted the first answer the virtual assistant gave and had no problem talking to it in front of other people. Whereas the participants of the study, who represent mostly young millennials, firmly claim that they do not feel comfortable using such agents in public and, additionally, these interfaces most-

ly do not correspond to their complex needs. Thus, they rarely use Siri or Google Assistant for simple tasks, such as asking it to call someone, look for the meaning of a word or the name of a song, simply goof around and try it out.

As stated, it is obvious that most of today's websites or applications provide a rather satisfying user experience - or at least a couple of ones that are favored by users - and unless there is a clear additional value, users do not see the need to use yet another new way. Even more so, results indicate that they do not mind surfing the web - might be that it gives them the feeling of being in control. What is more, opposing to Jain et al. (2018) who stated that users were dissatisfied when the chatbot passed on the control to an external interface, the results of the current work illustrate that users felt relief arriving to an already familiar environment, the websites. That might have occurred due to the complexity of the field, searching for flight tickets. Perhaps designers should focus on advancing the already existing alternatives - making websites and applications more "conversational" by adding storytelling characteristics and making flows easily understandable. Also, as can be seen over the development of the Web, the information has become immense and therefore the services provided depend on personal searches or interests. The approach continues to evolve and possibly could be done within existing solutions and there is no need for a chat interface to provide these personal results.

Current work agrees with Klopfenstein et al. (2017) and argues that perhaps not all services are even suitable to be displayed via chatbots, as some simply need to deliver lots of information and additionally have to foster comparison. Otherwise, if only one final result is displayed, it needs to fit the user completely, coming from the adjustments and indicated variables. Overall, the user has to be able to trust the system fully. However, as the results indicate, users always doubt and feel that if someone is providing them something, it is influenced by other hidden variables, as one participant brought out. For example, if the user visits a retail store, there are two options to either ask for help or look oneself - if one decides to ask for help, s/he might feel that the options

perhaps chatbots should be aimed for a very specific target

are influenced by other metrics (e.g. the shop wants to get rid of last season's collection). The final decision comes down to time as well as capital and the same goes for chatbots. The study confirms that one trigger for the user could be time as well as price insensitivity. However, today's casual user adapts well to new websites and is therefore already rather quick. Also, user trusts oneself with current technologies a lot and would cross-check the provided solutions anyway.

The study agrees with Shum et al. (2018) stating that it will be incredibly challenging to design a chatbot that can fully understand users and the surrounding context to serve their specific needs. **Therefore, before starting to implement chatbot to online platforms, one should reconsider if the service is suitable and if there is a real need or simply a desire to implement innovation – the new solutions that are still working in an insufficient manner, make the overall experience even worse.**

Therefore, perhaps the existing solutions should be advanced to support different users in finding important information fast and in a visually appealing way. Once the user's expectations are fulfilled in a familiar way, perhaps one is ready to make innovation and design a fully functional chatbot.

LIMITATIONS

The study portrays a very beginning in understanding chatbot's user experience through different pragmatic theories. Therefore, not all pragmatic approaches were included and the research addressed only some of the philosophies of the field. The work aimed to cover different theories, yet not go too broad as the goal was a profound research on one topic, rather than the entire field.

The study is limited to show results only for a small sample size, who are mostly millennials and rather frequent technology users – thus, the results are not generalizable for all age groups as well as all technology competencies. Also, a larger number of participants is needed to identify more expansive trends. However, due to the use of heterogeneous sampling method, it is believed that the results can be used to illustrate similar us-

ers - at least within European region, similar age and technology competencies.

What is more, since the field is continually evolving, as can be illustrated by the fact that many of the chatbots disappeared within the time of research (from April to November 2019). Thus, the study reflects the state of the field at the time of the study, in autumn 2019.

Seen as one of the biggest limitations, the study used one existing solution operating on various Instant Messaging platforms. Thus, the results might have differed in the use of another chatbot. However, the choice was made carefully: its high ranking in botlist.co proved that the designers have done an overall decent job; the field of application is productivity-driven, as is the trend of use of chatbots. Moreover, as the task was rather open, to foster exploration and not influence the experience in any way, not all users went through the same flow. Yet, as the chatbot is not yet very eventful, mostly all of them encountered the same instances as well as functions. Therefore, it is believed that the recommendations could apply to chatbots' design more generally.

Conclus_
ion

Ever since the second batch of aliens, aka computers, "landed" on planet Earth and started to invade the households, humans have tried to communicate with them – first through commands, later via graphical interfaces. The recent trends, however, are pushing to find a way to converse with computers in natural language, through Conversational User Interfaces, such as chatbots. To facilitate this movement, the current research aimed to find out how users perceive pragmatic shortcomings in communication with chatbots.

Based on qualitative thematic analysis of 15 in-depth interviews, five pragmatic themes clearly stood out. The results indicate that the first and most evidential one is cooperation - users simply expect the chatbot to care more and go deep with their problems, not give superficial answers. Therefore, it should ask more, not jump to new topics or back to the beginning. Following, ends is another important matter – users expect the chatbot to give additional value, not do the same things that the users themselves can do. It explains the willingness for adopting chatbots and users' mental models. The third pragmatic aspect is behavior – users do not perceive any connection with a chatbot, opposing to all human-human communication. Additionally, the level of friendliness and other behavioral characteristics varied a lot from participant to participant. Fourth, conversational style – users do not distinguish any emotions. They see the use of emojis, but perceive the language as normal Internet language. Therefore, the chatbot appears as a regular search engine, yet slightly humanized. Last, but not least, are socio-cultural rules. Meaning, in today's state of affairs where data is changed or sold, users value their privacy and appear highly attentive in trusting the chatbot and the platforms it works on.

Current work addressed the topic in the perspective of pragmatics since it is important groundsel in human-human communication, helping to understand what is really meant by what has been said. Also, it can be seen as one of the characteristics that helped humankind to outgrow the alien status over millions of years. What is more, to the knowledge of the current work's author, no other study thus far directly applied pragmatics in investigating the user experience of chatbots. Thus, various

founding pragmatic theories were researched and then employed in facilitating the in-depth interviews to understand if pragmatic variables affect the experience. If not, there is no need to spend resources on advancing these aspects of communication and developers can continue to advance Artificial Intelligence, Natural Language Processing and other crucial technologies. However, as illustrated, several pragmatic shortcomings were identified.

Coming from the results that intended to provide an answer to the main research question, the research eventually zoomed out from the specific problem focusing on pragmatics and addressed the results in the broader environment.

Therefore, with the assurance of previous research as well as the results of the current study, the research aims to contribute in improving the user experience in the field of chatbots – several suggestions were made to advance the design of chatbots. It is necessary to increase both, the discoverability as well as the added value – users have to have easy access and high motivation to use these tools. Data privacy has to be addressed – users should know precisely what data and why will be gathered. A chatbot needs to put more effort into personal approach – users must feel that the solutions are corresponding to one's needs and are not general ones, thus further questions, as well as feedback, must be inquired. What is more, if errors encounter, again chatbot has to deal with it, not just give a general answer pushing the user further from the real problem and causing an even bigger frustration. It has to help the user, for example as Google does with its: "Did you mean…?". Finally, the overall attitude has to foster mutual connection, such as in human-human communication. Thus, the conversation cannot appear flat and should, for example, include emotions through the messages the chatbot sends – not only emojis but rather with utterances, such as: "Nice choice! Barcelona is amazing at that time of the year." Ideally, the chatbot should change the level of politeness, friendliness and other characteristics, according to the user, since the results show a clear disparity in the issue.

Having proposed the aforementioned growth opportunities, another rather opposing thought stood out from the results. Namely, the results indicate a strong distrust against chatbots and

Having proposed the aforementioned growth opportunities, another rather opposing thought stood out from the results. Namely, the results indicate a strong distrust against chatbots and not only in the matter of results but in the overall practicality.

not only in the matter of results but in the overall practicality. Perhaps chatbots will not be the next main interfaces and will not substitute apps on smartphones, as Mark Zuckerberg predicted. Perhaps not all services are even suited to be displayed in such a narrow context. Or perhaps users have become skilled at using modern technology and they do not need to talk to anybody, being it either a computer or a human being, when going through familiar flows. Perhaps chatbots should focus on fulfilling the needs of a very specific target group and enhance the lives of less tech-savvy people who do not feel comfortable using regular websites and find these sites difficult to understand. However, maybe other CUIs, such as virtual assistants, are already a better solution and fit the needs of this target.

Computers are far from reaching the status where they are no longer bizarre aliens, however, taking the fact that human beings took millions of years to develop a well-working system to communicate in natural language in a meaningful way, it is only normal as computers have not been around even for a century. Even more so, as shown in the very beginning of the work, writing has existed for a very limited time compared to speaking and drawing, thus writing with computers might follow the same evolution.

The current work aimed to give a contribution to this science-fiction scenario by taking inspiration from human-human communication and therefore studying the pragmatic aspects of human-chatbot interaction. However, only time will tell if these aliens are worth talking to via chatbots - it is all dependent on people, the creators of these bizarre aliens. It depends whether the openness, needs and expectations of users will force science and technology to look towards chatbots. It depends whether organisations, designers and developers will advance the solutions such that users will have the motivation to look towards chatbots.

FUTURE RESEARCH

Based on these conclusions, future research should apply the proposed suggestions and consecutively study the outcome in a similar matter to allow comparison and understanding if the suggestions are as relevant as they appeared to be in the current analysis. Therefore, future research should further analyse if bringing additional value, for example, would make users appreciate chatbots more as an alternative to the already existing solutions and the information they carry or would they still rely on their own competencies.

Moreover, a very interesting next step would be to understand how the experience and the pragmatic aspects are perceived by users who are not that technologically competent. Therefore, older people could be seen as perfect participants for future studies.

Another research could focus on studying the differences in the characteristics of behavior and conversational-style. As the study confirmed, users perceived these characteristics, such as politeness and casual talk, in a different way. It would be interesting to see, if these characters match to the user's ones, perhaps the experience could be better as well.

Also, despite thorough research, the author had no previous knowledge in the field of pragmatics. To better understand the implications of these results, future studies could benefit from the deep knowledge of linguistic experts – both, for pre-, as well as post-study phases – for development and analysis. Additionally, other approaches and theories of the pragmatic filed could be included.

Another aspect that has not received much attention, is the final thought of the research – whether chatbots are useful at all. Distinct research could investigate the issue and understand if there is an actual need for them or more advanced technologies have banned the use of chatbots. Not even smartphone-based virtual assistants, but AI-based avatars, next-generation chatbots – for example, Soul Machines™ allows to create Digital Humans and converse with them.

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Appendic_
es

A1_ INTERVIEW GUIDE

Warm-up session_ Questions to get the conversation going in the mindset of the topic:

- Can you tell me your name, age, and your occupation?
- If you travel abroad, how do you usually plan it - look for flights etc? Have you experienced any pain-points throughout the process? If yes, could you give me an example?
- a. Describe your relationship with technology.

  a.1 Do you follow tech-news etc?

  b. How much do you use technology on a daily basis? What are the main applications and websites that you use?

  b.1 If the interviewee does not mention instant messaging applications: What about instant messaging applications?

  b.2 Which ones do you use?
- Do you know about conversational agents, such as Siri or Google assistant? If so, how often do you use them? Tell me about the last time you...
- What about chatbots with what it is possible to chat using text? Have you used them? If so, which ones and how has your experience been?
- Where do you notice the chatbots the most?

Task session_
You want to search for flight tickets for your upcoming trip. You heard from a friend about a chatbot called “Eddy Travels” and decided to give it a try.
The participant is observed while doing so. Also they do not get stopped after achieving the goal to allow exploration.

Topic specific session_ Questions concerning pragmatics: as presented in the body of the work, in the chapter concerning methodology.

Cool down session_ Questions concerning the overall experience:
Would you say that you came to the mutual understanding or that the communication failed? Why? If failed, at what point?

How would you describe negotiation in this case?
What do you think of this chatbot? Would you use it again?
What might keep people from using it?
How would you describe the situation in real life? Does it remind you to something?

A2_ INTERVIEW TRANSCRIPTION

All of the transcriptions can be found in the following folder:
https://drive.google.com/drive/folders/19eAAjfnvg9FIXNh_QAjxcHx-BrJZ64M8z?usp=sharing