Empathetic Companions:

Enhancing episodic dispositions
in emotional experiences
by establishing empathy with AI.

CANSU HIZLI

Müslüm   Maslo   One   Sam
Odin   Connie   Doggy   Lumi
Fully Woody Watson Coffee
Winston   Squad   Amigo
Heyoua   Hilbert   Addy   Karl
The fellow Venus Coni Buddy
Bestie Bro Bud Joey Simon
Masie Nini Peach Layla Good
man Dottor Watson Ernesto
Pecora   Dear   Säde   Arthur
Steven Star Jarvis Lora Artù
Ufo   Carmen   Plato   Jimmy
Dude Gandalf TinTin Mydog
Edipo Lila Rollo Pertev Mom
Pepper Bud Lisa Ciao Oliver
Addy Lossif Stalin Caipirinha

Dedicated to the best companion: Panki

A childhood memorabilia.

"

"A human being is a part of a whole, called by us "universe", a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest... a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty."

Albert Einstein

POLITECNICO
MILANO 1863

SCUOLA DEL DESIGN

EMPATHETIC COMPANIONS

Enhancing episodic dispositions in emotional experiences
by establishing empathy with AI.

Master Degree in Digital and Interaction Design
Research Thesis

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Abstract: English

Artificial Intelligence is increasing their usage and becoming more prominent in our lives. People are mostly preferring to use virtual assistants to reduce the complexity of their daily basis and make faster the process to directly reach the result. Smart artificial assistants have already the potential to make someone's life easier but at the same time, they are not active devices as expected. In addition to that, with the increase in the use of these intelligent devices, many problems are occurred related to trust. According to a new report from Microsoft based on consumer adoption of voices and virtual agents, 41% of voice assisting users were concerned with trust, confidentiality and passive listening. Researches are focussing on emotional intelligence and empathy in artificial intelligent agents to make these assistants more like personal companions to be able to establish more trustful interactions. Along with empathy, relationships between human and the machine will be redesigned in more transparent and trustworthy ways with reducing the complexity of technology. These relationships will be able to create more personal, emotional and empathetic experiences and have an impact on individuals for improving their self-growth, awareness and courage. The aim of this research is shaped to understand the expressions of emotions and empathy with psychological, cognitive and social theories, emotional intelligence in terms of personal and social competence, interactions between human and machines, the role of design in artificial intelligence and empathetic companions to build trustful companionships and interactions with digital products.

Abstract: Italiano

L'utilizzo di intelligenza artificiale è in costante aumento e sta diventando sempre più importante nelle nostre vite. Gli utenti preferiscono principalmente utilizzare gli assistenti virtuali per ridurre la complessità delle loro attività quotidiana e accelerare il processo per raggiungere direttamente un semplice risultato. Gli assistenti intelligenti e artificiali hanno già il potenziale per semplificare la vita di qualcuno, ma allo stesso tempo non sono dispositivi attivi come previsto. Allo stesso tempo, con l'aumento dell'uso di questi dispositivi intelligenti, si verificano molti problemi legati alla fiducia. Secondo un nuovo rapporto di Microsoft basato sull'adozione da parte dei consumatori di assistenti vocale e virtuali, il 41% degli utilizzatori di questi era preoccupato per la fiducia, la riservatezza e l'ascolto passivo di questi dispositivi. Le ricerche si stanno concentrando sull'intelligenza emotiva e l'empatia negli assistenti artificiali intelligenti per rendere questi più simili a compagni personali per essere in grado di stabilire interazioni più affidabili. Insieme all'empatia, i rapporti tra uomo e macchina saranno riprogettati in modi più trasparenti e affidabili con la riduzione della complessità della tecnologia. Queste relazioni saranno in grado di creare esperienze più personali, emotive ed empatiche e avere un impatto sugli individui per migliorare la loro crescita personale, consapevolezza e incoraggiamento. Questa ricerca è stata progettata per andare comprendere l'espressioni di emozioni ed empatia attraverso teorie psicologiche, cognitive e sociali, intelligenza emotiva in termini di competenza personale e sociale, interazioni uomo-macchine, il ruolo del design nell'intelligenza artificiale e compagni empatici capaci di costruire relazioni di fiducia e interazioni efficaci con i prodotti digitali.

Introduction

Artificial Intelligence (AI) is a powerful science to help people with their basic needs and create new experiences. In today, AI is using in many fields as a tool to shape someone's actions and reach the expected goals within the easiest possible way (Holbrook, 2017). People need to take care of machine's intentions, aims and competences to know their limitations, understand the machine abilities and communicate with them in a better way (Bodegraven, 2019). On the other hand, with emotional intelligence also machines will have possibilities to comprehend the user's goals, motivations, and pain points. Bringing the AI to more human-centred will create a room for intelligent agents to manage the unpredictable situations in a better way which means that in time machine will learn from the user, and the user will learn from the machine.

Virtual personal assistants are one of the most common examples to see AI in the shape of the interaction to reflect human behaviours like smart speakers as conversational AI and domestic robots. According to TechCrunch, in 2018, the smart voice AI industry was a crucial landmark with nearly 41% of US consumers owning an activated voice speaker, a growth of 21.5% compared to 2017 (Perez, 2018). This intelligent agents already have the potential to make our lives much easier on our basic daily needs. Besides, while these agents aiming to complete the goal, during the learning process they are not only being a part of the experiences but also they are learning from experiences and interpreting the information autonomously like making predictions, suggestions or recommendations on the light of reaching the goal.

Every human has different communication skills, social abilities, and thoughts while they are following social norms. With the rising usage of the technology, people, especially from the young generation, started to have socially and emotionally inactive positions not only in human to human and also in personal communications and interactions. Knowing the different characteristics regulate someone's emotions with understanding emotions better, the meaning of AI will change and the virtual agents will be more like a companion with different personalities to increase self-awareness on individuals. According to this statement, AI must leave its passive role and become a design material to shape user experiences rather than defined as a tool. Thus, emotionally intelligent agents will provide improvements on social interactions and increase their efficiency on acceptance, success and trust (Fan et al., 2017).

In time AI agents will build emotional connections with users and improve interactions between humans and machines to have more trustful relationships. With this consideration, they will be able to understand better the personal needs and know the user's openness and closeness situations to create more trustful relationships and reshape the user experiences more personally.

This master thesis project investigated how we could establish trustful relationships with digital empathetic companions through developing personalities. The first part of the thesis contains a detailed description of the emotions and power of empathy and explanations of personality models and traits that are designed and implemented to construct onboarding experiences for the first meeting moment with companions. The thesis also provides a method for testing and evaluating the personality of the model. The second part of the thesis consists of an experiment to investigate whether personality has an improved effect on the user experience to create trust with an empathetic companion through onboarding experiences. The experiment found that to create trustful experiences, the companion personality, which is built using personality frameworks, had a significantly improved effect on user experiences.

1

Emotions and Power of Empathy

Expressions of Emotion

Antonio Damasio, a Portuguese-American neuroscientist, talks in his essay about the relationship between emotions and their brain substrates. He claims that: "Feelings are the sensors for the match or lack thereof between nature and circumstance. And by nature, I mean both the nature we inherited as a pack of genetically engineered adaptations, and the nature we have acquired in individual development, through interactions with our social environment, mindfully and willfully as well as not. Feelings, along with the emotions they come from, are not a luxury. They serve as internal guides, and they help us communicate with other signals that can also guide them. And feelings are neither intangible nor elusive" (Domasio, 2004, p.15).

Emotions are described as abrupt distresses and passage agitations induced by acute anxiety, shock or happiness. On the other hand, they were described as mental feelings and affinity as separate from cognitions or volitions like pain, willingness, hope and so on. These definitions are the basic dictionary descriptions and they are reflections of several experiences, in basic, the way of showing someone's feelings. According to Darwin, the English naturalist, geologist, and biologist, the speech or the expressions of emotions in itself, is definitely relevant for the well-being of the human race (Darwin, 1872). The fundamental message by Darwin was the evolution of emotional expressions and adaptation. Hess and Thibault explain Darwin's emotional phrases to explain these expressions as a significant communicative function and also as a portion of an emotional mechanism which protects or prepares the body for action. The expressive behaviour which is described by Darwin as a part of the emotional state is the expressions of emotion that reproduce their communicative value from being external manifests of an inward state. These are some important highlights from his book of 'The expression of the emotions in man and animals' in terms of being validated intercultural observations and the first evaluation research which later they initiated the scientific observation and the researches related to emotional expressions (Hess and Thibault, 2009).

Moreover, According to Cannon, the emotion was seen as just a somatic reaction (Cannon, 1927) and the emotion has been defined as a state of mind by the Dictionary of Cognitive Psychology (Oatley, 1994). Moreover, Dantzer classified emotions as solely cognitive and described the visceral and cognitive elements as a part of the mental representation of emotional experience (Dantzer, 1989).

Theories of Emotion

Emotions are linked to a variety of psychological events, including motivation, personality and temperament. The main motivational theories are classified into categories which they are physiological, cognitive, neurological and social.

Source: Zhou, 2019

Evolutionary Theory: Basic Emotion Model

In emotional literature, one of the most ubiquitous ideas is that some feelings have a unique position and generally they referred to as basic, primary and fundamental emotions (Ortony and Turner, 1990). The structure of basic emotions clearly shows difference and peculiarity in regards to the overall notion of feelings. This perspective claims to be a tiny amount of so-called main feelings generally consisting of fear, rage, happiness, sorrow, surprise and displeasure (Celeghin et al., 2017). Indeed, there are several different theories, approaches, variable taxonomies about primary emotions. Since all the approaches are different than each other, there are some considerations that developed based on the

Darwinian approach. This approach indicates feelings by means of some automatic processes, which they have evolved and been chosen due to their adaptive quality (Tooby and Cosmides, 1990). Moreover, they can regulate the communication with the proximal setting and at the same time with providing efficient reactions to the appropriate survival scenario, both instrumental and communication (Shariff and Tracy, 2011).

Perspectives on emotions C1.1

| BASIC EMOTION | APPRAISAL | PSYCHOLOGICAL CONSTRUCTION | SOCIAL CONSTRUCTION |

Above the line (left to right): MacDougall, Buck, Ekman, LeDoux, Levenson, Arnold, Frijda, Lazarus, Leventhal, Schachter & Singer, Barrett, Russell, Solomon, Harre

Below the line (left to right): Davis, Damasio, Roseman, Ellsworth, Wundt, Mandler, Mesquita, Panksepp, Tomkins, Scherer, Clore & Ortony, Harlow, Duffy, James, Averill

Source: Gross and Barret, 2011

Psychological Construction Theory

Some theories of psychological construction argue against emotional innateness. These theories advocate the consideration that various feelings arise from different building processes. According to this approach, fundamental psychological activities like perception, attention and memory are combined to produce an emotional significance that affected by social and linguistic factors (Barrett and Russell, 2015). In this theory, emotions are not described special in terms of formal, functional and causative states of mind like cognition and perception because dedicated mechanisms do not cause of the emotions. Instead of this, the continuous and consistently modified constructive method with more fundamental which consists of non-emotional components, considers all mental states to emerge. Many research studies focus on one or more elements of the mind and leave the emotional notion behind them (Gross and Feldman Barett, 2011).

One of the well-known example related to the physiological construction theory belongs to the physiologist William James and Carl Lange which calls as the James-Lange theory of emotion. They enounced that emotions arise because of physiological events of responses. Physiological reactions occur when someone sees that the external stimulus which they lead to physiological responses. So, these reactions depend on the way of how someone interprets physical responses. For instance, imagine a scary scenario and

a person is so frightened and trembling because of the fear. The James-Lange theory explains this situation that a person feels afraid because she/he is trembling, not the reason that a person trembles because she/he is afraid (James, 1884).

Another psychological theory is the Cannon-Bard theory which is not focusing on the same aspects as the James-Lange theory on several principles. According to Walter Cannon, emotional physiological responses can be encountered without feeling these emotions like the same as someone's heart can beat not because they are afraid, just because of physical activities like training (Cannon, 1987). In accordance with this theory, feelings are proposed as a result of physiological reactions when the thalamus gives a signal to the brain in response to stimulation. After thalamus sends signals, the brain gets these signals that stimulate emotional experiences. So, both emotional experience of physical and psychological come into existence at the same time instead of forming each other (Friedman, 2010).

Cognitive Construction Theory

This theory explains emotional phrases as still labelled to privileged mental states that are distinctive in their shape, form and trigger from other mental conditions. However, this theory does not label different cognitive processes like anger, sadness, fear and other phrases of emotions. Evaluations are like a series of buttons, which cause the biologically fundamental mental reactions in certain habits, either by stereotypes or by a powerful, almost inevitable tendency to interact in a certain way with the world. In a contextually delicate manner, emotions are considered to be tightly organized responses. Emotions are linked to responding trends, which do not always take a place but instead they are described as arrangements to connect in a specific manner to the world (Gross and Feldman Barett, 2011).

This model says that emotions are methods to experience the environment. In this respect, emotions are more and more seen as emerging actions while evaluation models continue to assume that emotions are functional conditions (Barrett et al., 2007).

One of the examples related to the cognitive construction theory is Schachter-Singer theory which also known as two-factor theory. According to this theory, a person must determine the cause of the excitement and identify it as emotion after occurred the physiological arousal. A stimulus contributes to a physiological reaction, which is interpreted and marked cognitively and contributes to an emotion (Schachter and Singer, 1962). As a small brief, we can say that for the two-factor theory of emotion, a person needs to define the excitement to feel emotion instead of just feeling excited by reason of interaction between physical excitement and how a person labels this excitement cognitively (Cherry, 2019). This situation can be explained more clearly with an example. According to Schachter and Signer, if we imagine a person will likely recognize the feeling as fear if she/he encounters heart beating or wet hands during a significant moment like

a math test and this moment might be called as anxiety. When they experience the same physical signs in a different special moment like dating with someone for the first time, these reactions might be interpreted as love or excitement (Schachter and Singer, 1962).

In addition to this environment plays a role to shape physical responses besides the situational changes. If we imagine a person walks through to her/his car during the evening and realize that suddenly another person appears and quickly comes close. In accordance with the two-factor theory, this person might feel frightened because of the perception of the strange person. Firstly, they will realize the appearance of the strange person that comes through them, then feeling the heartbeats and shaping the emotion as fear because of the rapid heart rate. If this situation happens during the day instead of evening, a person can see an elderly woman that suddenly appears. In this scenario, the perception of physical reactions might be related to more curiosity or concern about the woman needs help or not rather than being afraid (Cherry, 2019).

Social Construction Theory

For this theory, emotions are considered to be cultural artefacts or socially prescribed activities, comprising cultural and cultural variables and restricted by the role of the individual and the cultural background. Especially in psychology, some models of social models treat social configurations like models designed to trigger basic emotional responses, and early evaluation models designed to trigger cognitive-emotional principles (Gross and Feldman Barett, 2011). This theory perceives emotions as socio-cultural products and focuses on the effect of human social interactions instead of natural effects. In addition, this theory describes emotions as cultural achievements rather than identifying them as inner mental states like other methods. In so far, social requirements and limitations are transferred through cognitive processes. These transactions are viewed as learned instead of being given by nature in contrast to certain assessments so that these understandings differ from culture to culture. Also, the cognitive and behavioural elements of emotion are believed to co-evolve according to local, cultural meanings and are mainly regarded for their social role (Gross and Feldman Barett, 2011).

According to Averill, Professor Emeritus in the Psychology Department at the University of Massachusetts and past President of the American Psychological Association's Division of Theoretical and Philosophical Psychology, as a philosophical doctrine, social constructionism often stands in contrast to reality. Reality occurs in numerous variants but the truth occurs independently of human ideas and wants is what the variations have in common and so, it needs to be discovered. In comparison, social constructionism affirms that a particular moment and location always relates to human situations. Also, Averill claims that cultural convictions and guidelines are one of the main values by means of which mental syndromes are structured and understood behind a social constructionist strategy (Averill, 2017).

Averill claims that the knowledge of being out of command is an understanding of what we do but more accurately, this is an understanding of the position of our culture on our behaviour (Averill, 1982). Many examples of behaviour are found that interpret a person's actions in this way. He talks in his book, the social construction of emotion which later on is edited by, arranging the behaviour is the part of the responsibility of the social function of emotions. As stated in his book, anger helps someone to regulate interpersonal relations by setting up and imposing limits of what is considered correct and improper. In exchange for a stable relationship, romantic or enthusiastic affection permits someone to willingly give up from their financial and social liberty. (Averill, 1985).

Aside from social functions, culture has a crucial role in social constructions and more importantly, culture offers the content of emotion-generating assessments. Our evaluation contents are cultural although the evaluation process is describing as a biological adaptation. So, different cultures and personalities create a variety of emotions. While some actions make a person angry, it can create different feelings on another person who belongs to a different culture. Being aware of the position of the culture in our lives helps to understand our emotional actions, reactions and brings a broader understanding of emotional social functions (Cornelius, 2000).

To sum up, emotion under the social construction theory is slightly identified differently than other theories. According to social constructivism, emotions are recognized in the fields of neural phenomena and nervous system subsystems, particular cognitions and behaviour in terms of interpersonal, cultural and social events. Thus, emotions are better described with respect to organisation or analysis in a manner a more inclusive level.

Emotional Responses

Emotions are determined in three states as episodic dispositions, cognitive arrangements and social transitional functions. These three overlapping elements or values that assist us to comprehend how mental reactions are arranged into consistent syndromes. Averill explains these distinctions with an illustrated example (fig. C1.2) which shows emotional syndromes, mental structures, emotional states and emotional responses (Averill, 1991).

Episodic Dispositions (Emotional States)

Emotional states are designed as methods of willingness for intervention triggered by assessments of artefacts or circumstances are conceptualised. Episodic dispositions identify someone's emotional states at the moment that emotions appear at the same time. These stated emotions are not permanent feelings, they appear and then disappear according to the situations that explaining the circumstances of the person. Also, they show variety in many aspects that it can depend on the personality of a person, culture

and cultural effects on a person, different situation and conditions which they have an effect on creating emotions and so on.

An emotional state, more formally, is a quick-term, reversible (episodal) inclination (disposition) is a characteristic of an emotional syndrome, to respond is an emotional state. This explanation looks simple but it can create misunderstandings in a manner of formulating emotional episodes that are often recognized by allowing part of a syndrome to represent the entire syndrome (Averill, 1991). We can explain this condition to understand better with a common example. If we imagine a person's sweaty hands, the general definition is frequently used as a stand-in for anxiety, as a grin for rage, and so on for other emotional syndromes. On the other hand, these emotional reactions like fear, anger and other emotional conditions can be expressed in many different ways. For instance, sweating hands can be a sign of anger as well as happiness and excitement or stress. As mentioned before, these reactions might change according to person, culture, conditions, environment and so on.

Grade an Emotional Egg: Emotional Responses into coherent syndromes — C1.2

Transitional Social Roles — emotional syndromes

Cognitive Schemas — mental structures

Episodic Dispositions — emotional states

Emotional Responses

Feelings

Expressive reactions

Instrumental acts

Verbal behavior

Physiological arousal
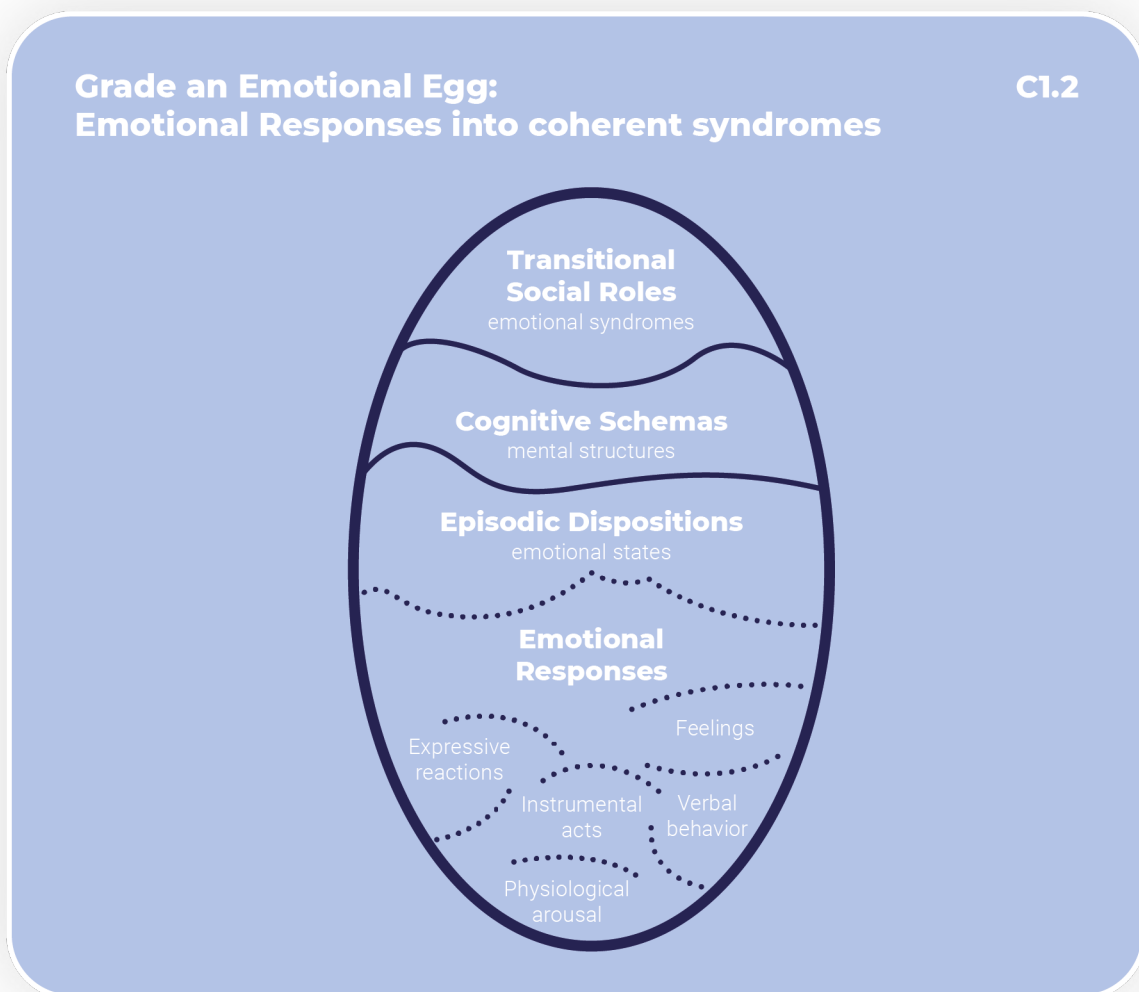
Source: Averill, 2017

Moreover, a person can react in a number of ways in accordance with the emotional syndrome when he or she is in episodic disposition. This condition calls as episodic disposition because of 'episodic' defines a temporary situation with a specified initiation and 'disposition' identifies the state of emotions and willingness to react and in accordance with the individual and circumstances (Averill, 1991).

In addition to this, during his interview, Averill also emphasises the schematic analyzes express aspects of the individual. Schemas are one way to characterize structural factors that allow mental arrangements. With a few exceptions, emotions are considered as social phenomena. One of the roles of emotional notion is to provide social transitions to create a connection between individuals and societies which can only be approached socially (Averill, 2017).

The most researched subject in emotional sociology was likely the impact of emotional standards on knowledge and speech (Gordon, 1990). Building upon Sartre's traditional differentiation (Sartre, 2001), the writers design emotional experience as comprising two feasible kinds of awareness, namely the first and the second. Reflective (second-order) experience of emotion means awareness of direct experience (first-order) of emotion. For any emotional state, the specific content that defines the possible secondary emotional experience depends on the way a person handle the required experience in the first order. As pointed out with this statement, just some of the emotional experience can include also the reflective experience (second-order). However, every emotional state involves emotions in the first order (Aranguren, 2016). Whereas all emotional conditions imply some emotional experience, it is not possible to deduce from the emotional state of itself the particular content of the emotional experience (Frijda, 1986).

Empathy

What is Empathy?

Empathy usually defined by the emotion researchers as a capability to understand another person's emotions, feelings and thoughts. The witnessing of another's emotional state, learning from another's situation, or even reading can contribute to empathy and spontaneous sharing (Keen, 2006). It is a way to look from the same window to perceive how someone might feel and think of different situations and actions. Also, empathy helps people on the way to regaining their human traits and strengthens their emotional connections to other people and interactions between them. It creates a thought to understand better other people situations.

It should be not forgotten that empathy and sympathy are different than each other even if empathy is believed to be a pioneer for sympathy in terms of mirroring someone else's inevitable emotions and feelings. Mainly, sympathy is a way to share someone's emotional situations or understand these situations and try to help them with this understanding or be happy with them. For instance, when someone lost their family member, one of their friends will feel sorry for their loss and share the same feelings with them. So, they will understand the emotional situation of their friend and share their feelings.

For contrast, according to Keen manifestations of moral emotion, also known as empathic anxiety, therefore, they are associated with pro-social and altruistic behaviour. It should be noted that empathy leading to compassion is, by default, a different approach, while an over-awakened empathic reaction that causes personal distress, which is a disincentive and self-oriented, leads to a discrepancy between one another's challenging status (Keen, 2006).

More scientifically, with deep historical research on empathy, fundamental aspects of empathy are found on dogs and even rodents among our primate family. Empathy is connected to two separate pathways in the brain, and scientists have hypothesized that some elements of empathy can be traced to represent neurons, cells in the brain that flame in the same way that others fire when we experience someone else performing an action. Moreover, researches have also shown inherited empathy, although studies show that individuals may improve or restrain their empathic abilities (What is Empathy, 2019).

According to Frans de Waal who is a Dutch primatologist, empathy is usually considered as an entirely human characteristic that appears to be seen by humans but also it reveals something from apes and it is shown by other species as well (Waal, 2005). As Wall claims, we can say that empathy is not only peculiar to humankind and also involve other life forms. In addition, also people have the empathy to the imitated characters like we are used to seeing them in series, movies, games and in many other similar fictionary scenarios. For instance, a person might try to understand this imitated character's feeling

and emotions to be happy, sad or angry for the character or with the character and from her/his point of view, they can interpret their behaviours, think and empathize against what is happening to them.

A Perception-Action Model in Empathy

Empathy is described as a specific emotional experience when an individual (the subject) feels a similar emotion to another person (the object), as a result of the perception of another's condition, in accordance with a perception-action model (PAM). When the subject pays attention to the object's state of emotion, this process is triggered naturally due to the fact that the subject's emotional status representations.

First of all, the reason that this model calls as the perception-action model is that it is based on the same-named tenants of motor actions. The word perceptual activity explains the fact that there are specific expectations for the perception and generation of action in motor behaviour. Jeannerod and Frank claimed that imagined movements allow common perception and action representations (Jeannerod and Frank, 1999) because of the identification and analysis of specific instruments stimulate the imagined movements and image of the motor activity associated with the left premotor cortex. Therefore, the

Perception-Action Model: C1.3
The Russian Doll model of empathy and imitation

Increased Self-Other Distinction

Imitation | Empathy

True imitation, emulation → | ← Perspective-taking, targeted helping

Coordination, shared goals → | ← Sympathetic concern, consolation

Motor mimicry → **PAM** ← Emotional contagion
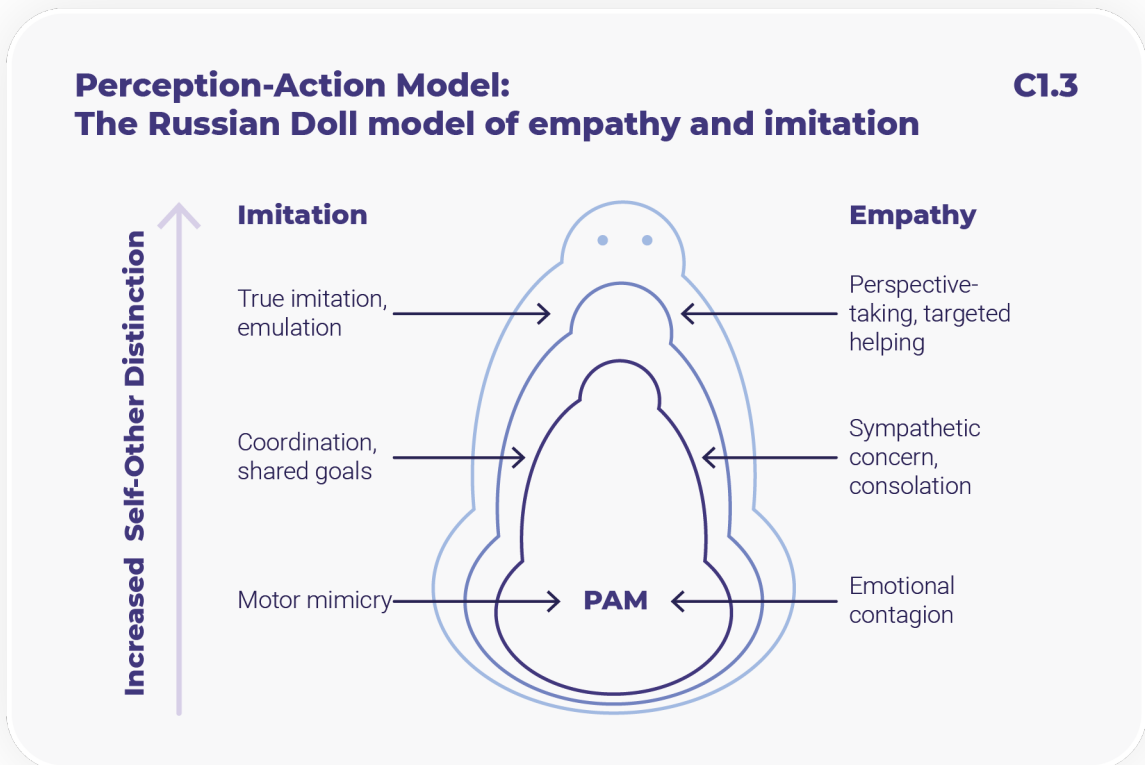
Source: Waal, 2009

experience of perception-action throughout motor activity applies to direct impressions as well as symbolism and imagination and action to transparent activities, fantasized actions and even mental affordances that are cognitively abstract (Preston, 2007).

PAM can be viewed in circumstances where the issue is clear. This model considers the object and the circumstances in which the subject imagines the object's status. The triggers for empathy may be caused by other people, animals or even an object in the manner that motor behaviours trigger empathy. Based on an original evolutionary model of Preston and de Waal (Preston and de Waal, 2002a, 2002b), the process developed into live interactions with other people so that living objects better drive the system than imaginary objects, which results in more extreme types of empathy (Preston, 2007).

According to Waal, empathy causes in the subject a similar emotional state like the object, which is locating in the centre of the process of perception-action, that produces matching statements. More scientifically, the neural model suggests that the brain areas have their cell structure and connectivity depending on the processing domains; as such, no empathy region is used and the brain areas are recruited when the appropriate domain is needed for the task (Waal, 2009).

The representation of this theory has been defined in many different contexts in psychology. One of the representation shows similarity with the neural network (McClelland and Rumelhart, 1985) in term of triggering by the same pattern. For this, a representation is a pattern of activation in the brain and body, that correlates to a common position and consistently activates the same pattern in repeated instances.

Empathy rises with past experiences and similarities and promotes the significance of similar representations in PAM. For instance, if a person has specific experience in her/his past which is related with extremely distressing experiences from childhood, this person has more empathy and compassion (Barnett and McCoy, 1989) when perceived the similar situations on someone else.

All of this considered, I found a very interesting example that it might match with the perception-action model in the storytelling field which is Russian Doll, American comedy-drama web television series (Lyonne, Headland and Poehler, 2019). The protagonist of the story stacks in a specific time and keeps going to die and come back to life at the same point and the story always follows the same memory. All the characters and objects around the protagonist are the same when she is reborn each time. In the story, through the protagonist's life and death and life disorder, she finds her alter ego, her co-sick person and also discovers the moment that is related to her mother's death and her necklace which is a gift from her mother. This situation represents a similar approach on empathy which is represented in the perception-action model. It claims that when the protagonist realized her experience from her childhood which has an extremely tragic effect on her psychology and empathized herself with the secondary character, a represented model of her alter-ego, she finally sets herself free from her repetitive psychological cycle.

Source: Netflix,2019

Understanding Empathy

In Neuroscience, empathy is categorized into three different skills for the potential for perceiving, knowing and experiencing other people's emotional states. According to Derntl and Regenbogen, these skills can be explained with the ability to understand feelings in oneself and others through various communication signals such as facial expression, tone of voice, or behaviour; a mental aspect that is also called perspective or mind theory which defines the capacity, while preserving the basics distinction between oneself and others, to adopt another person's viewpoints; and a compassionate dimension which is the ability to experience emotions similar to others thanks to emotional interactions (Derntl and Regenbogen, 2014).

Moreover, Saarikivi talks about these three skills and mentions that they are assisted by different brain functions. She explains these skills as, thoughts, feelings and actions which also mentioned above in a detailed way. Thoughts shapes with a person who tries to understand of thinkings that belongs to another person or putting themselves in other person's shoes. Our brains have a part which is called a mentalizing network and this part of the brain is active when a person thinks about other people's thoughts, people's own

memories and their future. Feelings are the way that allows perceiving other's emotions as they were their own. Humans have brain structures that are highly contagious for emotions (Saarakivi, 2016). For instance, capturing facial emotions is an automatic response that someone can understand emotional statements like happiness from a smile. Also, pain can be contagious through the way to see the individuals themselves while they are cutting their finger and to see others while they are cutting their finger. This action creates the same effect in the brain and our brains do not distinguish between the person herself/himself and the others (Lamm, Decety and Singer, 2011). Lastly, actions are described as a way to act with the information that is collected while people have the ability to put themselves to another person's place and try to understand what they can do in this situation or help to others (Saarakivi, 2016). An example from scientific research to explain the power of helping to others and sharing is related that a part of our brains which is responsible for pleasure and reward, it is more engaged if our friend is rewarding too (Fareri et al., 2012).

In addition to this, Saarakivi mentions transcranial magnetic stimulation which stimulates the brain and contributes to brain activity for increasing empathy and cleaning the obstacles that they are causing to lack of empathy. She questions about finding new ways to create synergy with other people to increase our emotional connections and interactions, for example, reading to learn and know different realities to decrease the fear of diversity and difference between us or music to turn the empathy mechanism in our brains with a rhythm (Saarakivi, 2016).

Listening with Empathy

Communications experts estimate that the words people use constitute just 10% of their interaction. The sounds constitute another 30%, and the body language accounts for 60%. People listen in empathetic listening with their ears, but more importantly, they listen with their eyes and heart. They listen for feeling and meaning to track behaviour they are using both the left and the right side like you think, you intuit, you know, you hear. Empathic listening is important because it helps to interact with accurate data. With empathy, people truly reflect the reality of dealing with someone's emotions going deep inside their head and heart instead of showing their own feelings, imagining emotions, motivations and perceptions. Empathic listening is deeply therapeutic and curative, as well as allowing one to invest in one's own because it supplies the person psychological air. Covey explains this definition more clearly with an example. If we imagine a person that she/he learns suddenly that the air inside the room will be finished soon, they will only think about surviving from the room and this thought will be the only incentive for them at that moment. However, since we know that there is air inside the room, this situation does not motivate us and this is one of the most important insights in the area of human motivation. The answer to what motivates us is the only thing that the to reach unfulfilled needs. Thus, we might say that apart from physical survival since we do not have any great worries about it in our lives, to be recognized, supported, affirmed and valued by others and this becomes the main

need of human being (Covey, 2004). When we listened to someone with empathy, this will give them psychological air. Finally, completing this vital need, supplying the psychological air, will create an impact on our communications, interactions between each other and also it will courage to move forward in our emotional relations with being more aware of ourselves and others with effective and empathic listening.

Is There the Dark Side of Empathy?

Empathy contributes to positive human experiences and interactions with helping to improve connections between people and groups, also, it creates socially deeper cultural understandings. Although, empathy is a broad and complex emotional subject (Segal et al., 2017). Empathy is a lifelong process that it might change when a person meets with new people, or it might depend on situations and socio-cultural effects. Also, it should not be forgotten to prevent being confused when experiencing someone's emotions, a person should consider other people's emotions without interpreting and merging them with their own emotions and feelings. Empathy can be complex but it does not mean that it has a dark side. It is a skill that people can feel other's emotions but they do not consider themselves in their situation and imagine a way to handle the situation. Calling wrong definitions as empathy can create misunderstandings and try to define the dark side of empathy. For instance, if a person is understanding other people's thought and after that use this situation like their weaknesses against them, it does not mean that it is empathy. This situation just leads to someone to read another person's emotional statement to bullying with them. It is meaning that bullying can read and understand other people's feelings without participating in their emotions (van Noorden et al., 2015).

Cognitive and Emotional Empathy

Hoffman divided empathy to two different sides which they are categorized as cognitive empathy and emotional (affective) empathy (Hoffman, 1977). Cognitive empathy focuses on understanding other person's thoughts, feelings, emotions, etc. with imagining ours owns on the other peoples' positions or experiences. Psychology describes empathy that considers empathy is a high-level cognitive ability which needs language is often emphasized on this aspect and is found only in human beings. On the other side, this consideration in psychology does not explain the evolution of empathy on human beings. Animals also have empathy between each other that it show itself in a different way to express their feelings, moods and emotional states to other animals. This way of expressing and transferring the emotions locate in the second side which calls as emotional (affective) empathy. According to Waal, the emotional side is the heart of all empathy and empathy is first and foremost psychological interaction between body and emotion. If a person has

a lack of emotion or prefers to stay away emotionally from another person, it is just a way to understand others' perspective instead of having empathy (Waal, 2009). Understanding other people's emotions can form the motivational foundation for moral development and acceptable behaviour (Hoffman, 1990).

In addition, these two sides of empathy have been identified in psychological literature and have influenced many recent research studies in neuroscience. Cognitive and emotional empathy match with type 1, which is defined as being pre-reflective, stimuli focused, and uncompromising, and type 2, which is defined as demanding, slow, attentive yet versatile, processes in a classic dichotomy of psychology. At first glance, emotional and mental empathy appears to be the same in the field of differentiation in neuroscience as in psychology. However, analysis of this literature shows that cognitive and emotional empathy tend to be related to widely isolated neural systems. Briefly, these two types are likely more clearly reflected in the concept of continuous experiences between an upside, while emotional empathy is more or less consistent, and a downward processing flow, which is almost in line with cognitive empathy (Iacoboni, 2015).

Experience of Narrative Empathy

Edward Bradford Titchener, an English experimental psychologist, explores empathy by explaining learning experiences in his book and mentions that "We have a natural tendency to feel ourselves into what we perceive or imagine. As we read about the forest, we may, as it were, become the explorer; we feel for ourselves the gloom, the silence, the humidity, the oppression, the sense of lurking danger; everything is strange, but it is to us that strange experience has come" (Titchener, 1915, p.198).

With the consideration of emphasizing the emotions with other people or the fictional characters and share experiences, Lee argues that empathy includes imagination, compassion, as well as the assumption that has influenced all our conceptions of an outer world and given them to sporadic and heterogeneous experiences from outside the scope of our constant and highly coherent internal experience, namely our own activities and aims (Lee, 1913).

Different experiences in narratives might create empathy between a person and the fictional characters. Empathy with the fictional character tends not to be particularly complex or rational, requiring only minor components of personality, place and emotion (Keen, 2006). A person might feel the emotional states of the character or empathise with them while they are watching a series, reading a book or playing a game. Natural compassion towards the feelings of a fictional character can sometimes pave the way for the identification of a character. Not all character emotional states elicit empathy;

in addition, empathetic responses with fictional characters and situations can more easily be addressed in the event of negative emotions, whether or not a match occurs in-depth in the experience (Keen, 2006). Also, it must be remembered that empathy and understandings under the different situations and actions vary from person to person. Every people have their own imagination, expression and identification that matches with the fictional characters. Also, personality, culture, environment or perceiving the emotions might create differentiation on emotional behaviours or affect the intensity of empathy. Thus, we can say that while one person can create an emotional bond and empathetic relationship with the character, another person may not feel empathy and connected emotionally to the character.

Narrator-theorists and specialists in the interpretation of discourses conduct empirical research into literary reading correlated a range of storytelling methods with empathy. Some theoreticians and researchers regard the formal structures themselves as empathic in nature. Character identification is one of the most widely recognized features in the narrative empathy. The possibilities for characterisation and thus for empathy could be expected to lead to particular characteristic aspects such as classification, definition, indirect inference of characteristics, reliance on styles, relative flatness or openness, representation of behaviour, the positions of plot trajectories, the performance of attributed expression and the method of consciousness presentation. In addition, fiction characters tend to have independent agencies as commented by fiction authors according to to the character's personalities, a conversation between the character and the audience, argument on their actions and consensus on feelings.

In view of the research of Bortolussi and Dixon, character behaviour helps to determine features by the people who they are reading, watching or playing with the character, whereas they stated that there were no self-assessments made by the narrator (Bortolussi and Dixon, 2003). Keith Oatley claims that the personal experience of emotional response patterns by readers or audiences builds empathy with the characters (Oatley, 1995). On the other hand, even if this is not genuine empathy, people who related themselves to the character in the story through their personal experiences are more likely to report improvements in self-perception (Louwerse and Kuiken, 2004).

Perceiving Empathy in Artificial Agents

Social interactions and physical embodiment of emotions can supply information and enable to communicate with the environment. To square measure, computational model construction for emotional development as well as verification with virtual agents and giving new suggests understanding the data or new meanings to raise the comprehension of the human development process (Asada, 2015). These approaches and information represent the virtual agents as reliable companions with highly empathetic skills in psychological experiments.

Minoru defines the relationship between the development of self-other cognition and empathy is in three different stages which they are emotional contagion, emotional and cognitive empathy and sympathy and compassion.

▶ **Emotional Contagion:** having someone's emotions and reflecting them through the conscious or unconscious way with initiating the emotional and behavioural sentiments. Emotional contagion is important because it is a simultaneity of individual relationships. It is closely related to motor mimicry and it creates automatic attitudes which come from another person's movements.

▶ **Emotional and Cognitive Empathy:** A broad construct that refers to the personal cognitive (psychological) feature to discover experiences of another and emotional reactions which consists contagion (motor mimicry) and development of self-awareness and perspective-taking, a range of status square measure evoked by the estimated perspective of someone's mental state.

▶ **Sympathy and Compassion:** Instead of emotional and cognitive empathy, virtual agents can understand someone's emotional statement and reflect her/his emotions according to the interpretation of these feelings. These feelings are different than the other person's one and they simulate emotional states of sympathy and compassion. For instance, when the artificial agent synchronizes the other's state and then feels totally desynchronized like pity or sorrow.

The relational map which states in chart C1.4 shows the summary of self-development and differentiation. It describes the evaluation and the intersection of imitation and empathy through self discrimination. (Asada, 2015).

Relational map of self-development and differentiation   C1.4

Increased Self/Other Differentiation

Emotional/Mental

Unconsciousness

Consciousness + Self-Other Distinction

Envy Schadenfreude

Sympathy Compassion

Cognitive Empathy

Emotional Empathy

Emotional Contagion

Percerived/Felt Emotion

Imitation
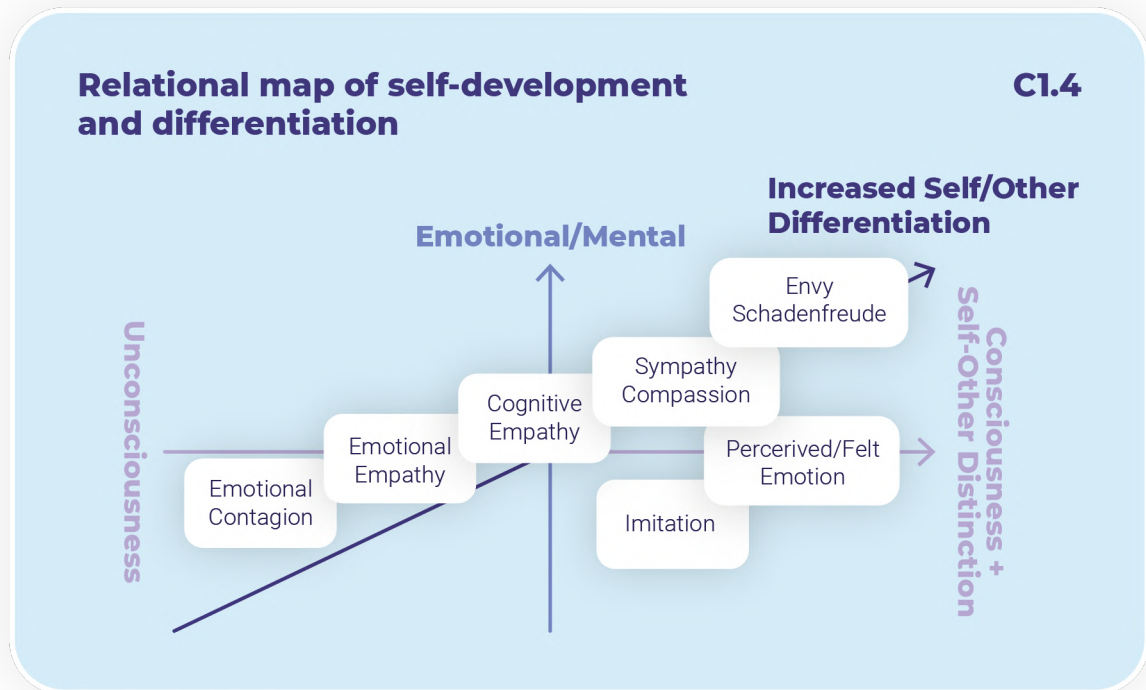
Source: Asada, 2015

According to the scientific researches in the field of neuroscience have enhanced two theories to explain better empathy. The first one calls as Simulation Theory which is a way of reflecting the same emotions and feelings that they belong to another person when someone experiencing these emotions. So, the person can understand the other person's emotional situation straight from the person which shows her/his emotions. Some other researches support Theory of Mind which is the opposite idea of the simulation theory. Theory of mind is the ability to understand the other person's thoughts and feelings and actions with considering these feelings and deciding how to act and show emotions to another person. This theory advice to people to use cognitive thought to describe another person's emotional situations and to predict or justify other's actions by regarding human behaviour (Lesley.edu, 2019).

Take-Aways

This chapter explained thoroughly how empathy affected emotional responses and the representation of emotional states. It started with knowing and explaining the other people emotional states and then it moved to understand the created effects on individuals from human to human interactions. After all, the perspective is changed by focusing on internal experiences on individuals to explain how people were creating empathetic relationships with their personal experiences.

I brought these selected theories to describe the formation of emotions, from the birth of humanity to the formation of social order and the definition of cultures and also to underline the effect of direct experience of emotions to create awareness on individuals.

In the next chapter, all these emotional theories and definitions will be connected to the computing of emotions to explain emotional intelligence.

2

Affective Computing

Emotional Intelligence

Introduction

The general definition of empathy is solely the power to make associate in nursing embodied illustration of another's emotion whereas at the same time being responsive to the causative mechanism that elicited that emotion (Gonzalez-Liencresa et al., 2013).

The interaction range between human and computer looks district in terms of to find different contexts to interact (Riek and Robinson, 2009) but the important thing is to design and create more genuine shapes of artificial empathy (Asada, 2015).

Emotional Intelligence

Emotional intelligence (EI) is an ability to structure feelings and emotions which includes someone's own emotions and also emotions between individuals and then use this information to create actions and thinking ways that belong to a person. Yale psychology professor John Meyer, says that 'emotional intelligence is the ability to accurately perceive your own and others' emotions; to understand the signals that emotions send about relationships; and to manage your own and others' emotions' (Harvard Business Review, 2004). Researches show that in the close future emotional intelligence quotient (EQ) will be more effective than the intelligence quotient (IQ) for building strong relationships with people, other life forms and machines.

In addition, several theories have been founded in time about emotional intelligence. For the research of empathetic companions, mainly I focused on three theories for the evaluation of convenient companionship which they explain emotional intelligence with performance (Goleman's Model of EI), competencies (Bar-On's Model of EI) and abilities (Mayer, Saloyev and Caruso's Model of EI).

Theories of Emotional Intelligence

1. Goleman's Model of EI Performance

Goleman describes emotional intelligence quotient in five core emotional traits. These traits are related to humans success and level of abilities (Riopel, 2019 and Executive Partnerships, 2017).

- ▶ Know and understand someone's own emotions and reactions

- ▶ Manage, control and adapt someone's own emotions, reactions and responses

- ▶ Motivate someone's own emotions and themselves to achieve their goals and take appropriate actions and feedbacks

- ▶ Understand and recognize someone else's emotions and make understandings more valuable and build more empathy

- ▶ Manage relationships with others and build social skills in social situations to negotiate conflict and become self-motivated

Domains of Emotional Intelligence   **C2.1**

	Recognition	Regulation
Personal Competence	**Self-Awareness** √ Self-confidence √ Awareness of your emotional state √ Recognizing how your behavior impacts others √ Paying attention to how others influence your emotional state	**Self-Management** √ Getting along well with others √ Handling conflict effectively √ Clearly expressing ideas and information √ Using sensitivity to another person's feelings (empathy) to manage interactions successfully
Social Competence	**Social-Awareness** √ Picking up on the mood in the room √ Caring what others are going through √ Hearing what the other person is "really" saying	**Relationship Management** √ Getting along well with others √ Handling conflict effectively √ Clearly expressing ideas and information √ Using sensitivity to another person's feelings (empathy) to manage interactions successfully

Source: Riopel, 2019

Although Goleman explained emotional quotient in his book into five sections, there is still disagreement on his model of EQ but ongoing researches show that there is a possibility to improve and develop emotional intelligence in terms of personal and social competence.

Personal competence involves self-awareness and self-management. Self-awareness helps a person to regulate their emotional reactions, understand the impact of their behaviours on other person's. Besides, self-management helps a person to keep under control these emotions and improve expressing skills to deliver their ideas and thoughts to another person. To make it more effectively a person needs to take consideration of other person's level of sensitivity while they are perceiving these actions. It also helps to overcome stressful situations and learn how to solve the problems. Thus, people will be aware of being adaptable and learning the way to control their emotional responses (Executive Partnerships, 2017). When a person will be able to keep in the balance of understanding their own feelings and being aware of how to manage them, social interactions and communications of people will be improved. The most important point is to keep the connection between being aware and managing the feelings in order to better understanding the individual emotional states and also the effects of these emotions on other people.

Causal Loop of Self-Awareness   C2.2

Pattern recognition
Self-awareness
Trainer effectiveness
2.
Observations by self
Feedback
Learner action
Desire for growth
3.
Observations by others
1.
Success

Source: Ramsey and Leberman, 2015

Social competence includes social awareness and relationship management and regulation. Being socially aware means is getting into other people's moods, attaching importance to what others do, and carefully listening to what someone else says. Moreover, relationship management is to keep a relationship going with explaining the ideas clearly while communicating with another person and managing other's feelings sensitively. So, people will be able to find new ways of communication and interaction to unlock different abilities.

Gill, Ramsey and Leberman used self-awareness competency based on Goleman's model of emotional intelligence to explore the relationship between different steps of learning and the way of thinking. The diagram (fig. C2.2) shows the self-awareness growth model to convey a wide perspective of instruction on emotional intelligence (Ramsey and Leberman, 2015).

Another model to explain emotional intelligence for leadership is developed by Freedman and Fariselli. This model provides a set of unique measures that they can help someone to develop their own emotional intelligence. Freedman divided the model into three main research prospect;

- ▶ Awareness of emotions and reactions: to know yourself better

- ▶ Responsiveness with intentions: to choose yourself

- ▶ Purposefulness in progressing: to give back to yourself

However, taking these emotional intelligence models as core values, we can try to understand the position of companions in personal and social competence. When they create a trust and have a position in someone's life, they can courage a person to grow with transforming the technology into the emotional intelligent models to build more empathic relationships.

2. Bar-On's Model of EI Competencies

Bar-On suggests that emotional intelligence is connected with behaviour system which comes from emotional and social skills. This model explains the emotional-social intelligence as an inter-relationship between dealing with someone's daily requirements and their emotional abilities as well as social skills, competences and facilitators in order to determine the efficiency of someone's own understandings and expressions and their relationship with other people who they relate with them. Most importantly, this model is merging with personal abilities like self-understanding and awareness of one's personal weaknesses and strengths. Moreover, in line with this model, a person needs to effectively understand herself/himself, communicate efficiently and deal with difficulties and pressures to ensure requirements of social and emotional intelligence.

Besides, self-awareness and understandings, to be emotionally and socially intelligent empathy shows itself in order to comprehend other people's' feelings, emotions and requirements. Thus, the person will be able to manage personal, social and environmental changes efficiently and also solve problems and take decisions in a realistic and flexible way. In order to achieve this, people must handle their feelings and be hopeful, stay motivated and optimistic. All in all, these variables are the components of emotional intelligence and they influence human behaviours and interactions (Bar-On, 2006).

3. Mayer, Salovey and Caruso's Theory of EI Ability

This emotional intelligent model is used to encourage people thoughts, lead the decision-making processes and reflect their decisions thanks to indicated data which comes from perceived emotional understandings and management of emotions.

Four-branch ability theory advanced by Mayer, Salovey and Caruso which focuses from identifying, expressing and perceiving emotions to effectively managing and engaging emotions. They updated this method in 2016 and divided these abilities and skills into main four branches for problem-solving fields which are needed for emotional reasoning (Mayer, Caruso and Salovey, 2016). With these four divisions, arranged from emotional awareness to management, are in line how the capacity fits in the general character of an individual. (Mayer et al., 2004).

► First of them is an emotional perception which states on understanding and identifying other persons' emotions and feelings with the expressions of facial or postural. These expressions are connected with the non-verbal communication that allows people empathize and perceive the emotions from other's faces or a ton of voices (Mayer et al., 2004).

► The second ability defines simplification of thoughts that they are cognitively integrated and incorporated with the complicated areas thanks to the ability to use emotions.

► The third branch is the ability to comprehend the emotions and in addition, to evaluate feelings and consciousness of the emotional development along with the results of feelings are appreciated (Mayer, Caruso and Salovey, 2016).

► The last one focuses on managing one's feelings and others which it can call as sell-management. This ability includes a personality with objectives, self-confidence and social consciousness that shape the management of emotions.

'Hot' Intelligence

Later on, Mayer, Roberts and Barsade extended their knowledge on this method and brought new value to the abilities which call as 'hot' intelligence. This intelligence contains emotional, personal and social intelligence. It will be a useful way to think about the relationship between personal and social intelligence in order to better understand emotional intelligence by reason of sharing the common concern for internal knowledge and exterior interactions in the human universe.

Personal intelligence is a new member of this intelligence because to talk about self-satisfaction, courage and awareness, is needed to show the personal reflections. This is the primary internal pleasure and pain source that describes someone's positive

A Comparison of Emotional, Personal, and Social Intelligences. C2.3

Characterization of intelligence	Type of hot intelligence		
	Emotional	**Personal**	**Social**
Brief definition	The ability to reason validly with emotions and with emotion-related information, and to use emotions to enhance thought.	The ability to reason about personality—both our own and the personalities of others—including about motives and emotions, thoughts and knowledge, plans and styles of action, and awareness and self-control.	The ability to understand social rules, customs, and expectations, social situations and the social environment, and to recognize the exercise of influence and power in social hierarchies. It also includes an understanding of intra- and intergroup relations.
Areas of problem-solving	Understand the meaning of emotions and their implications for behavior.	Guide personal choices with inner awareness, including discovering personal interests and making personality-relevant decisions.	Identify social dominance and other power dynamics among groups.

Source: Mayer, Caruso and Salovey, 2016

and negative sides. Moreover, 'Hot' intelligence encourages people to compare emotional intelligence with the individual and social intelligence and claim that emotional intelligence can be placed between these other 'hot' intelligence.

Involving the problem-solving area in this model, we can describe these three intelligence in a different way. The aim to involve the problem-solving areas inside this model is not simply to focus on solving the problems and creating solutions indeed, the proof shows that simpler models could describe emotional and personal intelligence as mental skills (Legree et al., 2014). Like emotional intelligence that is described in four branches, personal intelligence can be analyzed in four steps in terms of the identification of personal information, personality models creation, guidance for the personal preferences and systematization of life aims and plans (Mayer, 2009).

Verbal and Non-Verbal Intelligence

Every people is different than each other in terms of their feelings, emotions, the way of thinking or acting so, the emotional intelligence appears differently in every individual (Mayer and Salovey, 1993). Scarr pointed out that keeping the relationship good with other people comprise outwardness, social perception and low anxiety. They are not being intelligent, just associating with intelligence. For instance, intelligence creates behaviour but personality traits affect behaviour (Scarr, 1989). Also, personal traits might be related to social skills that they can be shaped by environmental effects like the place someone grows, relationships between individuals and family, and other actors. Gardner's argument clearly states personal intelligence "The core capacity at work here is access to one's own feeling life one's range of effects or emotions: the capacity instantly to effect discriminations among these feelings and, eventually, to label them, to enmesh them in symbolic codes, to draw upon them as a means of understanding and guiding one's behaviour. In its most primitive form, the intrapersonal intelligence amounts to little more than the capacity to distinguish a feeling of pleasure from one of pain . . . At its most advanced level, intrapersonal knowledge allows one to detect and to symbolize complex and highly differentiated sets of feelings" (Gardner, 1983).

Emotional intelligence includes also verbal and non-verbal intelligence, expression and regulation of emotions both in individuals and other people. Non-verbal intelligence is the way to analyze and understand the information then regulate the outcomes by using visuals instead of communicating or describing the things with using words. Nonverbal tasks may include skills like the understanding meaning of visual information and remembering the sequences of visuals and relationships between each of them. A person with high non-verbal intelligent skills can be more powerful to deal with non-verbal messages, which they are able to reduce needs for previous personal interactions (Penney, Miedema and Mazmanian, 2015).

Emotional Disorders

The English naturalist, geologist, and biologist, Darwin asserts a claim that adaptive emotional regulation has crucial importance for survival and reproduction (Darwin, 1872). With his consideration, many scientists worked on the light of this idea and extended it with another claim. One of the theories that they claimed is related to emotional disorders which are created by maladaptive behaviour (Gilbert, 1998). As stated in this claim, to experience the right feeling and emotion like happiness, worries, sadness, distrustfulness, etc. will improve the organism's congruity if the actions are happening in the correct moment and condition. Penney, Miedema and Mazmanian clearly explain the emotional disorders with an example in their article. According to their example, they claim that emotions might be evolved with intelligence (Penney, Miedema and Mazmanian, 2015). In view of the fact that emotions can be adaptable based on the person's abilities to foresee dangerous situations or planning the actions in these situations.

The person can decide wrongly to their actions as a consequence of these situations. These factors can create pressure and affect a person's choices and the ability to make a decision. For example, a person easily can take the wrong decision under stress or if the level of anxiety is high. She/he can not predict the actions that are happening at that moment or will happen in the next step because of their feeling of pressure, stress and worry. Moreover, anxiety will show itself again in the next similar situations and according to the evolutionary standpoint, people will be anticipated to these situations because of the worry of threatening and also they will stay out of controlling their feelings and emotions against to the actions. With this consideration, personal companions should be designed and developed carefully to avoid these threats. Also, they should be transparent and trustful enough to courage users to discover their abilities on decision making, planning and controlling their emotions.

Take-Aways

This chapter explained thoroughly how emotions are used to shape interactions between human and machines to design and create more natural shapes to define artificial empathy. It started with an ability to structure feelings and emotions and then it moved to explain the different shapes of these feelings, emotions and the way of thinking and acting on individuals. After all, emotional intelligence is examined in terms of verbal and non-verbal intelligence to describe the way of communications through human understandings and skills to shape the relationships.

I brought these selected theories to describe the self-awareness to regulate an individual's emotional reactions and the impact of their behaviours on others and also, to encourage people thoughts to improve their emotional understandings and management of emotions.

In the next chapter, all these emotional intelligent theories and definitions will be connected to the relationships between human to human, machine and other life forms with defining the shared consequences between each of them.

3

Shared
Consequences

Relationship Between Humans

Big Five Model

Myers-Briggs Personality Theory

Jungian Archetypes

Building Trust

Relationship Between Human and Machine

Perceiving Mind and Creating Empathy

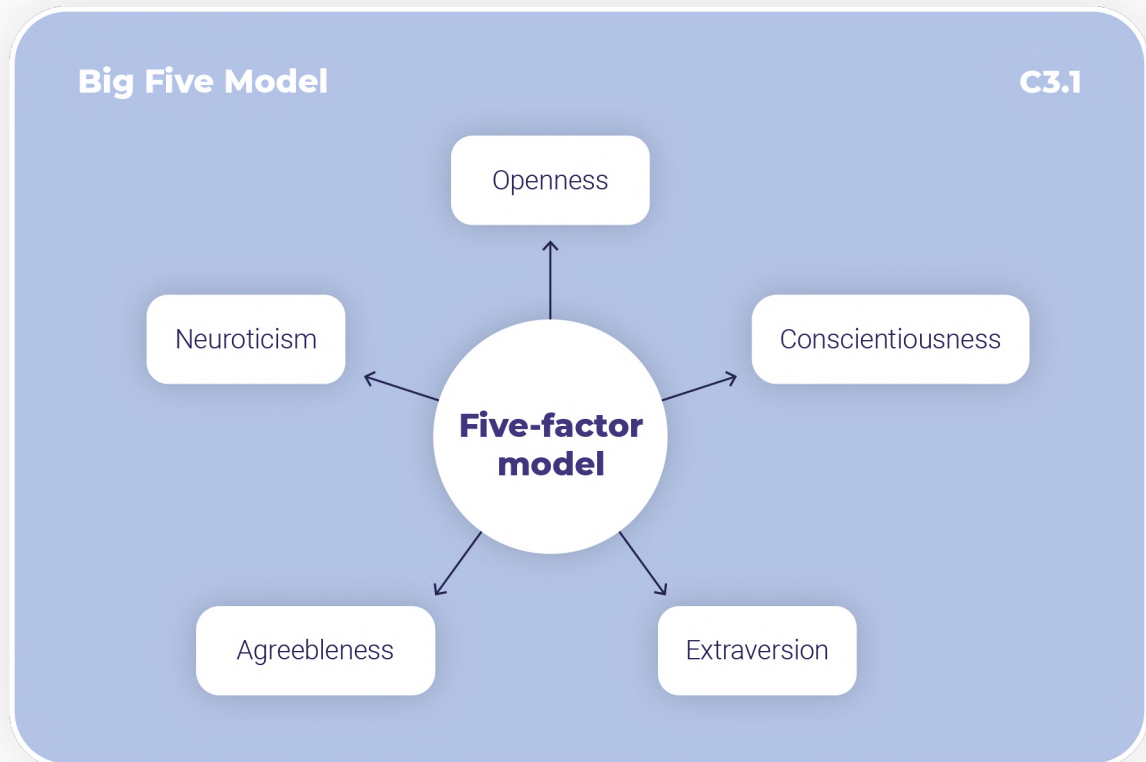## Relationship Between Human and Other Life Forms

Relationship Between Humans

Human is proved as an emotional and complicated creature in their social and personal relationships. To understand each other, empathy showed itself to create a bridge between these emotional situations and interactions to understand better the complex socio-emotional behaviours.

According to the theory which is developed by Salovey and Mayer, the new variations of emotional and social abilities can be discovered. These abilities and newly enhanced skills can be improved in terms of understanding, using, comprehending and regulating emotions (Lopes, Salovey and Straus, 2003). In order to understand a person's relationships with another person, they used a testing method which is Mayer, Salovey and Caruso Emotional Intelligence Test (MSCEIT). According to this testing, they supported that emotional intelligence and personality affect social and personal relationships. Results were showing mostly positive relations in personal and parental relationships and few negative interactions with close friends. The result of the MSCEIT test was showing the emotional intelligence relation with Big Five, verbal intelligence, personality and perceived interpersonal relationship quality. (Lopes, Salovey et al. 2003). Briefly, verbal intelligence is the capacity to use language-based reasoning to evaluate data and solve issues. Reasoning based on language can require reading or listening to words, talking, writing, or even thinking. Big Five model also is known as Ocean model is a taxonomy for characteristics which describes personal traits with openness to experience, conscientiousness, extraversion, agreeableness and neuroticism (Erder and Pureur, 2016).

Big Five Model

- ▶ Openness to experience: In this characteristic, people with a powerful inclination are regarded as imaginative and creative. They are prepared for new experiences and open to discovering new ideas thanks to their curiosity.

- ▶ Conscientiousness: In this characteristic, people with a powerful inclination are regarded as goal-focused, well-organized, and have self-discipline and take responsibilities. Also, they are willing to follow laws and planning their activities.

- ▶ Extraversion: Persons with powerful tendencies are regarded as outgoing, vigorous and person-oriented in this regard. They get their energy from other people's business and they are described as confident and passionate people like leaders with high visibility.

- ▶ Agreeableness: People with a powerful inclination to be caring, kind and trustworthy are regarded to be. They value and are tolerant to get along with others.

- ▶ Neuroticism: People of a strong tendency to be anxious, self-aware, impulsive and pessimistic about this feature. You feel relatively easily negative emotions.

Big Five Model   C3.1

Openness

Neuroticism

Conscientiousness

Five-factor model

Agreebleness

Extraversion

Source: Erder and Pureur, 2016

All of these states considered, personality for an adult did not certainly shape from the birth. On the other hand, emotional and verbal intelligence have a chance to create an impact on someone's life. Personality can be reshaped with the improvement of interaction with the environment and supporting personal learning and new experiences. (Caspi, 2000).

Myers-Briggs Personality Theory

The theory of Myers-Briggs is an update to Carl Gustav Jung theory of psychological styles which is based on sixteen styles of personalities Jung found stereotypes (Jung, 1976). Also, this theory nowadays mentioned as one of the most popular instruments in the world for psychology (Cherry, 2019).

The aim of this personality type indicator is to understand and define the personalities which suit better with a person. Myers and Briggs personality theory is a self-reporting inventory to classify the type, weaknesses and interests of an individual. The theory built on four different scales which are; extraversion and introversion, sensing and understanding, thinking and feeling, and judgement and perception.

- Extraversion around people and events, defined with "E" and Introversion between ideas and knowledge, defined with "I",

- Sensing in terms of facts and truth, defined with "S" and Intuition for understanding motivations and possibilities, defined with "N",

- Thinking with facts and logic, defined with "T" and Feeling for defining values and interactions, defined with "F",

- Judgement as a well-organized and planned lifestyle, defined with "J" and Perception as a flow-related lifestyle, defined with "P".

The Myers Briggs Type Indicator P3.1
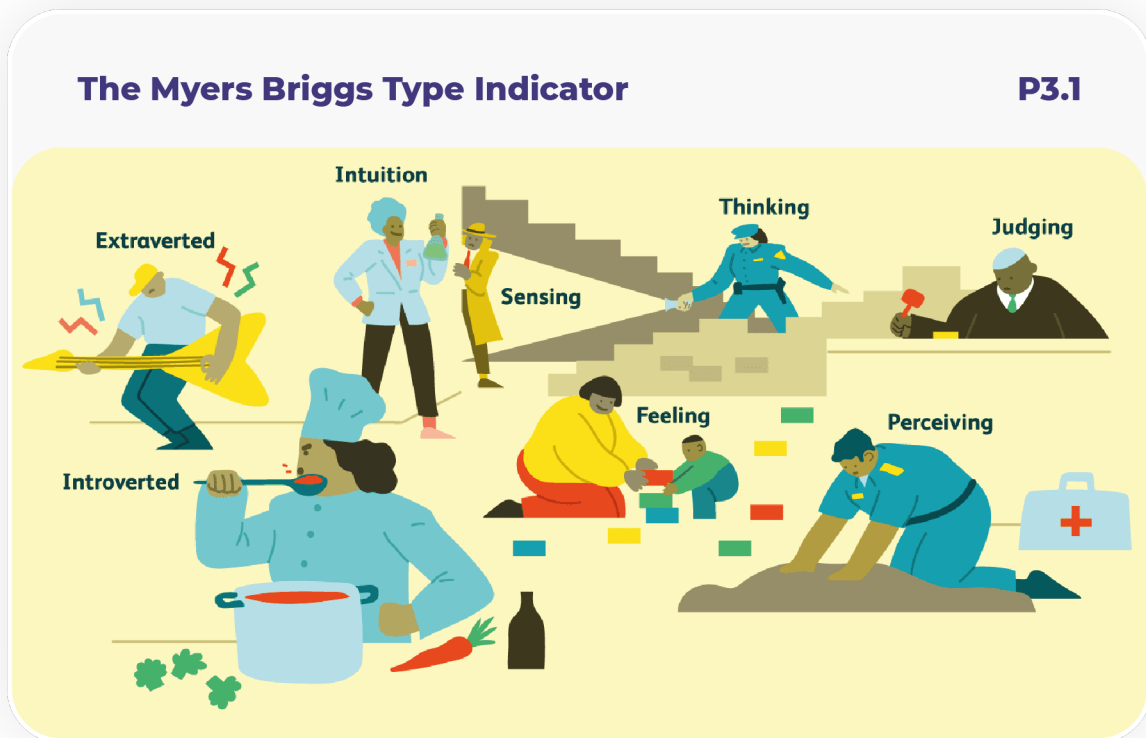
Source: Cherry, 2019

All the letters that defined above with personalities are used to identify the type of personality of a person with identifying one personality from each scales. After matching, the result shows four matched identities to shape sixteen peoples' characteristics based on the Myers-Briggs Theory. For instance, the variation of INTP defined as "the thinker" with introversion from the first section, understanding from the second section, thinking from the third section and perception from the last section. In addition to this, each variation has its own personality. It is important to remember, according to the Myers and Briggs

Foundation, each type has importance and all the types are equal. Also, while each form approaches problems differently, and the approach of another person might not be what you choose, each method can be effective (Myersbriggs.org, n.d.).

Myers and Briggs's theory is not defined as a test and there are no right or wrong answers and all the types are equal to each other so, one type is not better than another one. These types of personalities do not offer improvement of a person's skills and personality traits and also the aim of the theory is not compared to expectations as opposed to many other kinds of psychological evaluations. The instrument seeks to simply offer more data about your own individuality instead of looking at your performance relative to the results of others (Myers and Myers, 1980).

Recently, the Myers-Briggs theory is inspired by Adobe to identify peoples' creative types in terms of simple and related yet robust, science-informed evaluation of creative personality. Adobe aimed with this test to identify eight different creative types, which are artist, thinker, adventurer, maker, producer, dreamer, innovator and visionary, to match with personalities based on peoples' choices (Creative Types by Adobe Create, 2019). Also, the test not only interpreted from this theory but also designed in a more engageable way with exciting visual designs, animations and fictional characters that are designed for different personality types to unlock someone's full creative potentials and be aware of their personalities.

Creative types　　　　　　　　　　　　　　　**P3.2**

The Adventurer
So much inspiration, so little time.

Creative Strengths

High levels of creative energy, spirit of curiosity and play

Source: Adobe, 2019

Jungian Archetypes

According to Carl Jung's Archetypical theory archetypes are recognized as generic patterns, pictorial patterns and collective unconscious templates and emotional equivalents (Feist and Feist, 2008). Based on this theory, they have inherited potentials that are actualized by entering into consciousness as images or by conduct on the outside world interactions (Wang and Salmon, 2006). Jung identified through these 12 primary archetypes, and the associated motivations, the four cardinal orientations represent a model to our understanding that has a set of values, significances and individual characteristics. These four cardinals are identified as;

- The ego which has an effect on the world and leaves a mark,

- The order which is providing a global framework,

- The social that creates a link to the others and

- The freedom that sets someone's mind on being independent and wishing to reach the best.

The model is structured according to a fundamental driving force in three overall categories. They are defined as:

- **The Ego Types**

  - The Innocent
  - The Orphan/Regular Guy or Gal
  - The Hero
  - The Caregiver

- **The Soul Types**

  - The Explorer
  - The Rebel
  - The Lover
  - The Creator

- **The Self Types**

  - The Jester
  - The Sage
  - The Magician
  - The Ruler

Understanding Personality:
The 12 Jungian Archetypes

Artist — Innocent — Sage — Explorer — Outlaw — Magician — Hero — Lover — Jester — Everyman — Caregiver — Ruler

Innovation — Safety — Knowledge — Freedom — Liberation — Power — Mastery — Intimacy — Pleasure — Belonging — Service — Control

Provide structure | **Espiritual journey**
Connect to others | **Leave a mark**
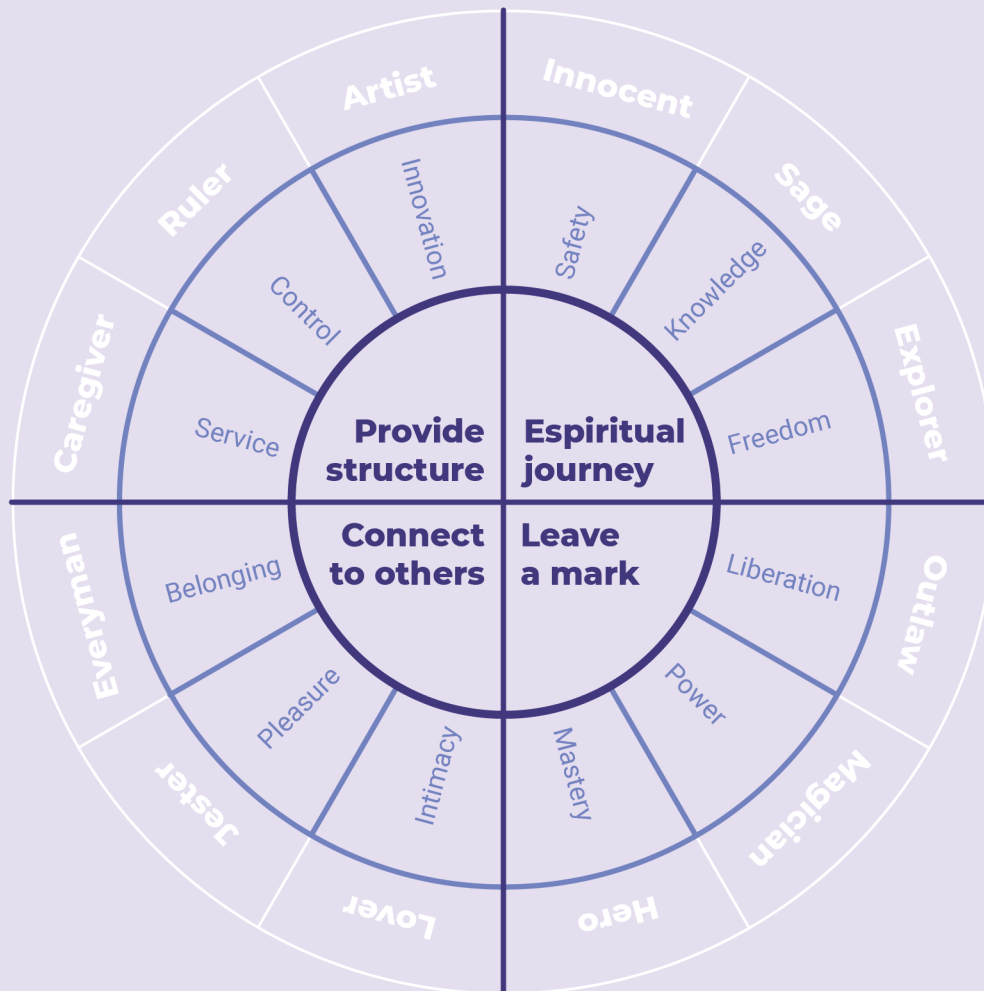
Source: Neill, 2018

Building Trust

The author and research professor at the University of Houston Brené Brown says in her interview with Devine "The courage to be vulnerable is not about winning or losing, it is about the courage to show up when you can not predict or control the outcome" (Devine, 2019). According to Brown people turned their back to each other and in time they found themselves more lonely and scared. One of the reasons that created this situation was fear of vulnerability and getting hurt which in the end brought a lack of

communication between people and caused to lose strong connections and relationships between humans. Moreover, fear brings other negative emotional states like criticism, failure, conflict, invisibility, disconnection, shame and many others like them. Most of the people select to protect themselves against to fear and move away from humanity, cut their connections with other individuals or decreased the interactions between each of them when they deny the vulnerability and the existence of fear (Brown, 2019).

All of these considered, when people take back the feeling of self-actualisation, they will be able to create connections between each other without having any fear. They are going to learn to listen, share the feelings not only decent feelings but also the uneasy and sad ones. At that point, when a person finds a way to connect with herself/himself, they will be able to take back their courage and accept the criticism. This connection will help to break the disconnection with other people and they will be able to build relationships thanks to their self-courage and self-actualisation. We as humans need to take time to remember because forgetting the things are easy about what we have done till today and what we learned from our past actions. To avoid emotional disorders (as mentioned before in the emotional intelligence part) people need to perceive the actions that they have learned in their past and use their knowledge because everything is not inherent (Brown, 2019) and think about how to shape their thoughts. When a person achieves to this point or has success, this should be celebrated and awarded by themselves to make these moments memorable for the next possible actions.

With this consideration, these states arrive in one of the main questions that this research focuses that how we can design the personal companions to improve self engagement and actualisation, vulnerability with empathy and to find a way of creating a better individual's communications.

Relationship Between Human and Machine

Presentation of the emotional empathy between human and machine is difficult enough if we consider even human to human communications are not definitely accurate. To understand the emotional states of a person is complex because everyone shows and interprets emotions in a different way. In under some conditions to understand someone's real emotional situation can be difficult according to the different personalities. For instance, some people smile while they are frustrated, can cry while they are happy instead of being sad or can look like indifferent instead of being mad about the situation. As reported by Bill Mark, president of Information and Computing Services at SRI International, machine can recognize emotions without having any problem with analyzing a lot of data and learn

how to recognize patterns in time, from voice inflection and word usage in speech, body language, gestures, facial expressions and many others, that they define the particular emotions with machine learning systems (InformationWeek, 2019).

According to Hoffman, empathy is in the centre of social interactions (Hoffman, 2000). Empathetic virtual agents as companions have a promised position in terms of improving social interactions and the important role of evaluation of human-machine interactions. Today, the society has a good position to start understanding effective reasoning for social interactions (McQuiggan and Lester, 2007) and communicating with embodied more organic companions.

Companions can simplify the social interactions and help to someone to increase their self-awareness for improving their emotional states. At the same time, with enhancing the self-awareness, people can define their position in the society easily and without having a fear of judgement which comes from someone else. In society, every humankind has many roles in interpersonal social interactions. A person needs to know different personal boundaries and ethics to show respect for each other and also to protect himself/herself from moral judgements that can come from another person. With this consideration, this person will be careful about self-disclosing information to stand out of moral judgments. The person can avoid communicating with another person in this situations but they can trust to a machine like an artificially intelligent agent which is not judging them (Mou & Xu, 2017, p. 432-440). So, their concern about being judged would disappear. With this openness, not only their visibility in the civil society will increase but also their self-closure will be improved. In addition to that, as stated in the CAPS model (cognitive-affective processing system), the self-closure and interaction between human-human and human-machine are different than each other (Mischel & Shoda, 1995).

There are much ongoing research to understand the human and the machine interactions and boundaries between each of them. For instance, McDowell & Gunkel are questioning about the reshaping or the shaping the communicative relationships with machines which are already surrounded by technology or still open to exploring. Also, what can be the boundaries between human and machine? (McDowel & Gunkel, 2016, p. 1-5).

The question can be open to search how the relationship between machine and human can take a shape with a consideration of different personalities. Can the machine be able to become a companion with considering the personal boundaries, different characteristics, needs, expectations, etc. with reducing the complexity of interaction? In this way can they lead to more trust and have a position in society with creating these empathic relationships? According to Ozge & Steve's research on empathy for interactive agents, results were showing that empathy in artificial agents and interactive systems can have an important role to create empathic emotions with the user which they are interacting. Besides, these agents can be able to interact empathically with their interaction partners (Yalcin and DiPaola, 2018).

Perceiving Mind and Creating Empathy

Moral behaviour crates the way to act through someone's beliefs and intentions without having a great deal of thought. Morality is the definition of differentiation people's actions, intentions, thoughts for that matter cultural and religious believes do not have a role when the person takes the decision to act, no matter that is a right thing to do or not. So, moralities are a set of behaviours that sustain and biologically drive human cooperation in this sense.

Morality shares a mutual connection with the perception of the mind which means being the victim or the recipient of a moral action enhances the perception of the experiential mind and only those that have an experiential mind may benefit from moral action (Gray and Wegner, 2009). Ward, Olsen and Wagner give an example which explains the relationship between experiential mind and a person's perception. When a person sees a robot which is stabbed, this situation increases our conviction to think that the robot is capable of feeling pain and thus our sense of robot's experiential mind (Ward, Olsen and Wegner, 2013).

People's perceptions of individuals and non-humans, including their mental perception, are partly determined by the manner they appear and communicate with their surroundings. There are four different scenarios that artificial intelligence may create perception; by controlling human actions, developing new capacities and adaptations, having a physical appearance or an aspect of anthropomorphic design and the last one is increasing the mind perception (Shank et al., 2019).

One of them defines that AI is interacting with the environment by controlling. For instance, in our daily life, AI can appear in many fields like controlling the access of bank accounts, creating a conversation between the person and a call centre and answering questions (Shank et al., 2019) or different from this actions AI can make suggestions like a book, series like Netflix that offers the new series based on person's interest or might be interesting to change genre, creating music playlists as Spotify based on person's analytics daily, weekly and monthly and many others. If these recommendations highly match with a person's interest, they will be extremely useful in terms of removing the steps of thinking and reduce the complexity of selections.

Another way AI interacts with the environment is through the development of new capacity, adaptation, new connections or various information processing. These are, as the mistakes and errors of AI, inherently unpredictable and the surprise nature of the new capabilities should also lead to a greater understanding of the agentic mind (Waytz et al., 2010). There are two states that describe the agentic mind. The first one is an agentic state which is a condition of mind that allows other people to lead their behaviours and give responsibilities of consequences to the other person that s/he is responsible. Another state is the autonomous state which a person is responsible and in charge of their actions,

behaviours and accept the consequences of their responsibilities. As same as some theorists believe, people take intentionality to attribute mind to nonhumans (Miyahara, 2011). Emotional AI can be a suitable strategy to take into account if it allows us to explain these effects and confidently predict new ones with creating a better understanding of actions and interactions by a human.

The third way is the physical appearance of AI which affects also mind perception. Most of the robots and virtual agents have a physical shape or humanized imitations like eyes, mouth, voice or gaze to make the machine more sympathetic and understandable to create a bridge with perception and the reality. The aim is to make the machine more related, either as one that imitates human beings or simply as one that can convey the verbal and nonverbal signals associated with human communication (Gong, 2008). In this way, emotional AI might be highly related to experiential mind and provide possible ways to create interaction and communication between human and machines.

The last scenario is to boost the perception of mind when individuals have a doubt AI for individuals, even if they have an anthropomorphic design or not (Shank et al., 2019). Until today, AI had limited interactions like voice or text-based or only in a virtual environment and it led to creating misunderstandings or could not offer fully understandable relationships. In addition to this, Nowotny mentioned that the underlying continuing theme of many of the new technology and innovation-related fears and anxieties is needed for loss. It's articulated as fear of losing a portion of one's identity, the feeling of being human as reflected in the many respects we've become used to seeing the universe and interacting with others. Thus, in time artificial intelligence supported its position as in Sci-fi movies which they gave the perception of losing our humanity, occupying and surrounding by the power of AI and they stayed under the dystopic mode expressions (Nowotny, 2016).

All these considered, as it is mentioned in chapter 6, empathetic companions will have a chance to overcome these fears and misunderstandings to create strong social interactions and increase someone's self-awareness with new empathic relationship and the new way of personal interactions. Also, they will increase their acceptance by society.

Relationship Between Human and Other Life Forms

Domestic pets have an emotional position in people life which is highly reliable (Brickel, 1986) and trustful than human-human relations. Considering pets sacred acknowledges the deeper involvement of homeowners with their pets in so far as pets transferred from the standing of an economic object to an area of high personal connectedness within the owners' lives. In time, they gain more trust and become a real reliable companion and have emotional attachments (Brockmen, B., K., Taylor and Brockmen, C., M.,2006). Pets are loyal friends and serve confidantes with the feeling of trust and no chance to betray to their owners. In addition to that animals are not only giving the feeling of trust also they are able to show empathy with sharing someone's feelings and emotions through representing them to that person (Minoru, 2015) These connections between the animals and people becomes a mutual relationship in time (Bradshaw, 1995). Fox categories this relationship in four different definitions as object-oriented which dog's role is being a possession, utilitarian/exploitative which dogs consist many benefits for human, actualizing which dog has a significant position in between others, and need-dependency that dogs become a companion or a friend. With the last definition, he shows in his report that dogs have emotions like fear, pain, jealousy, anxiety, guilt, joy, depression, and anger which they are meaning to be a human (Fox, 1981). Besides, being an owner of domestic animal have many opportunities for people. For instance, they bring the opportunity to have companionship, caring, comfort, and/or calmness and to be childlike and playful (Dotson and Hyatt, 2007). In addition to that pet owners report that having dogs create strong relationships and connections to their families and friends (Apapets.org, 2019)

Also, similar to previous consumer-behaviour studies, differing types of emotional attachment (e.g., pet as a disciple, pet as a family) were known and appear to correspond to the extent and chance of the following treatment. The thought of the opposite major themes (e.g., monetary sacrifice, recovery expectations) within the call conjointly relied on the consumer's attachment to the animal, that ranged from the animal being perceived as a cherished alternative to the animal being perceived as a possession (Brockmen, B., K., Taylor and Brockmen, C., M.,2006).

Take-Aways

This chapter explained thoroughly how relationships are shaped between humans, machines and other life forms to define a way of creating more trustful relationships with technology.

It brought the idea that technology needs to be aware of a person's mood and encourage people to do things better, more enjoyable with acting and offering personalized recommendations at the right moment.

I brought these selected theories to describe how different personalities affect user experiences and reshape them with establishing more personalized interactions.

In the next chapter, all the personality models will be explained to understand human needs, expectations and desires to be able to shape the user experiences in more personalized ways.

4

Theories: Need a Relationship with Objects

Activity Theory
Postcognitivist Theory
Actor-Network Theory
Theory of User Interfaces

Gulf of Evaluation and Execution

Aaker's Brand Personality
Hook Model

Introduction

Objects or tools are constructed elements that human is needed. With technology, these unstable tools started to become emotional objects and link to each other to create more powerful connections, values, meanings and emotions with people.

A post-cognitivist approach that includes the nature of the true exercise, broadening assessment to include a process of assessment and design that affects individuals and artefacts. Complexity in design is changing with the number of actors and objects and this is affecting the human experiences. Recently, the focus on the interaction with an object is improving and extending the usability and to make it more pleasurable (Norman, 2004), interactive and using the technology to create new possibilities for experiences.

The expanding scope of interaction design C4.1

Understanding   Informing

Human being   **Artifact**

Worker   **Tool**

User   **UI**

Evaluating   Designing
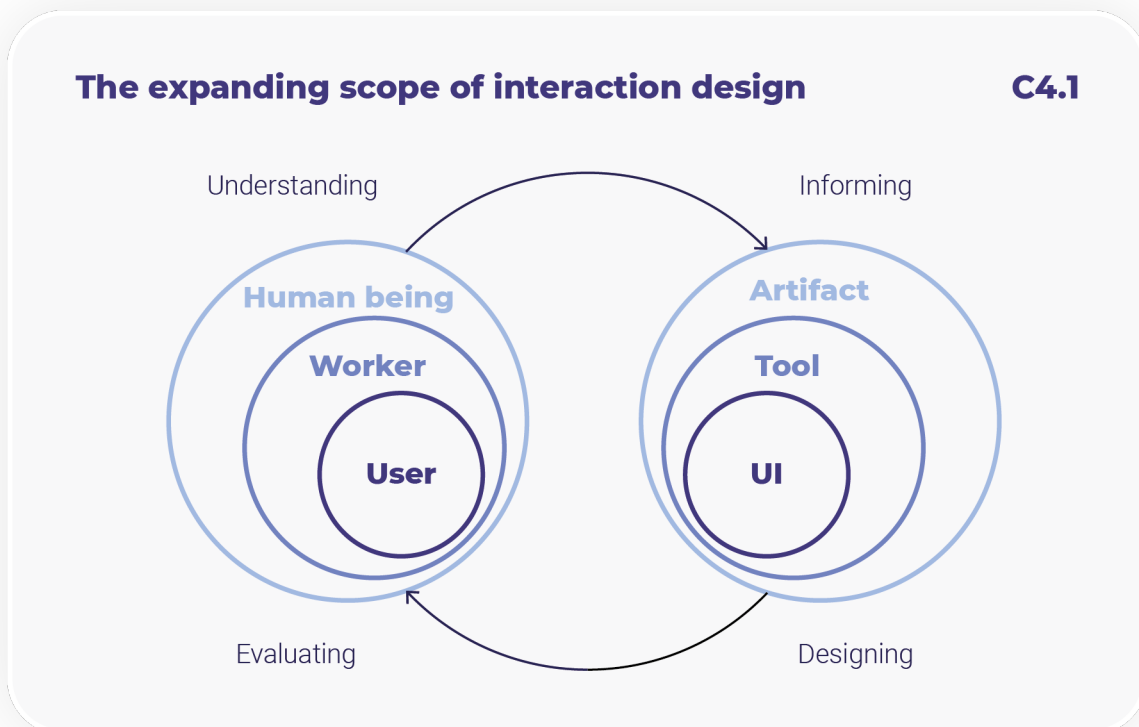
Source: Kaptelinin and Nardi, 2006

1. Activity Theory

Human needs and motives are still developing and changing the shape day by day. To give an absolute shape or definition to these needs and motives will create the wrong circumstances. This is the brief explanation of why a taxonomy of potentially effective needs and discrimination of motives are not proposed by activity theory. Activity theory just creates a bridge between motivations and actions (Kaptelinin and Nardi, 2006).

According to the relationship between activity and actions, with the consideration of interaction design in the cognitive approaches, emotions are the missing points to drive activities. Interacting with an object or a tool with missing emotions lower the actions. A person should ask herself/himself why they need to have a long relationship with an object/tool or how they keep this relationship long. In this point, if we consider human to human interactions and communications, one of the main reason of creating long relationships or being able to keep these relations lifelong is the emotions. As Engeström observed: From the viewpoint of activity theory, cognitivist and situated approaches share a common weakness, as the focus of analysis is restricted to actions, whether couched in terms of "tasks" or "situations." Neither approach is able to account for what makes people act and form goals in the first place, what creates the horizon of possible actions, what makes people strive for something beyond the immediately obvious goal or situation. What is excluded is objects and thus motives of activity, the long-term "why?" of actions. Without this level, theories of situated cognition run the risk of becoming merely technical theories of "how?", more elaborate and flexible than mentalist and rationalist models, but equally sterile when faced with societal change and institutional contradictions that pervade everyday actions. (Engeström, 1995).

2. Postcognitivist Theory

Postcognitivist theories help to people to understand the position of technology in the centre of human experiences. These theories share common points to show the involvement of humans with our own technological inventions. These theories are the phase for exploring the worlds in which the technical artefacts that are intended embody human life with their characteristics.

Communication between human beings and instruments of post-cognitivist concepts are attracted by phenomenology in terms of attention to the unification of mind and the universe. These post-cognitivist concepts concentrate on the physical and social distribution of events like agency and cognition, traditionally regarded to be part of the distinct truth of the human mind. In the fields of biology, neuroscience, and the

main philosophical and psychological regions, where technology is nearly invisible, post-cognition theories provide a significant solution to cognitive science (Kaptelinin and Nardi, 2006).

Maslow's hierarchy of needs shows us the five-tier of human needs which is represented with levels on the pyramid. This pyramid shows us the needs from bottom to up. Individuals need to be satisfied before moving to one level up. These needs which they are stated from the bottom of the hierarchy to upward are physiological, safety, belongingness and love, esteem, self-actualization (Mcleod, 2019).

Maslow's Hierarchy Pyramid   C4.2

Self actualization
Achieving one's full potential, including creative activities

Esteem needs
Prestige and feeling of accomplishment

Belongingness and love needs
Intimate relationships, friends

Safety needs
Security, safety

Physiological needs
Food, water, warmth, rest

Self-fulfillment

Psychological

Basic needs
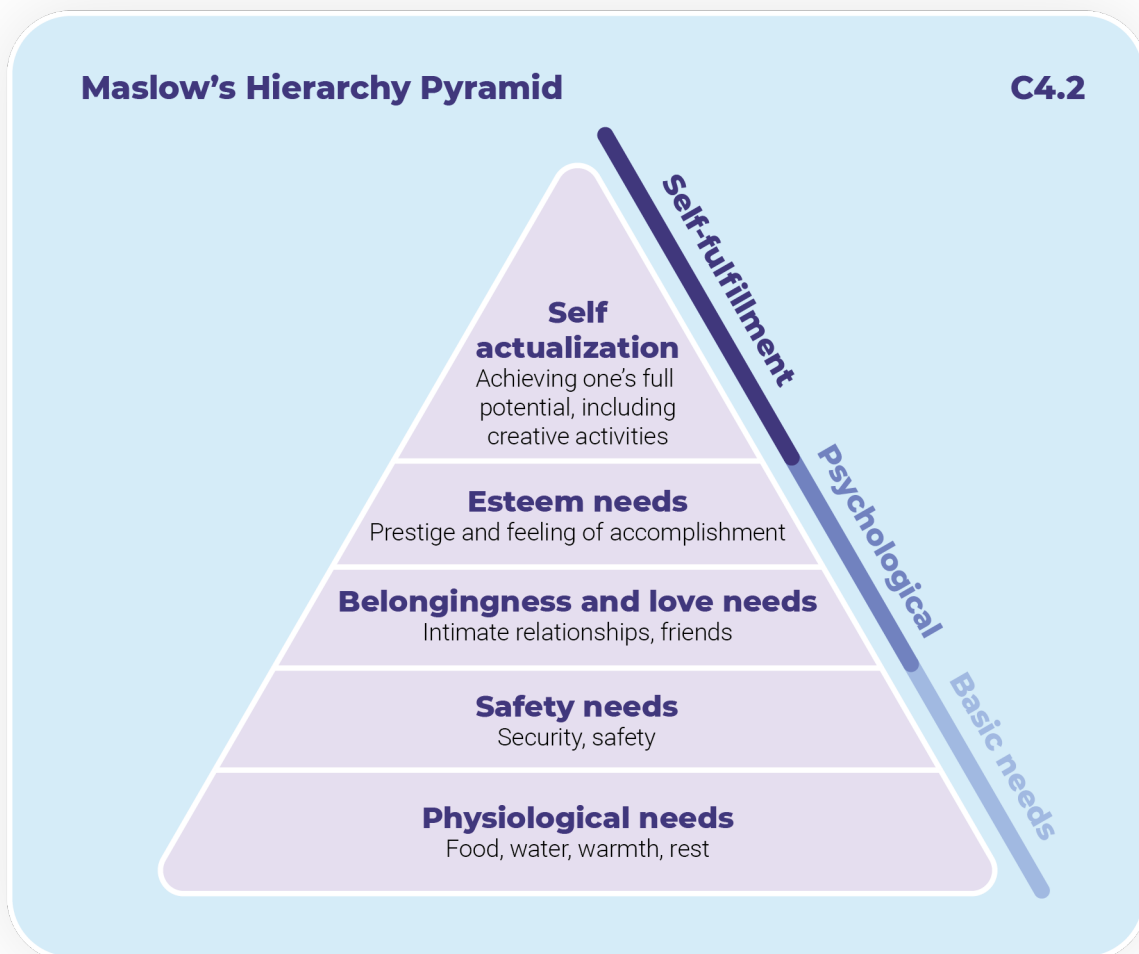
Source: Kaptelinin and Nardi, 2006

According to Kaptelinin and Nardi, the design and the development of technology is an essential step for humanity which involves the mobilisation of large cultural resources that are not reduced to universal psychological or biological procedures. They explain this with an example from Köhler and Goodall which they give an example with non-human primates like chimpanzees to understand the usage of simple tools. In time,

human enhanced language skills and started to talk about the usage of the tools instead of just showing and presenting them. This helped to increase sociality and the way of communication and made rapid progress in the creation of unique pieces of immense value for human life (Kaptelinin and Nardi, 2006).

However, one of the problems that human beings do not create computation and understand it. Thus, instead of understanding the complexity, people just adapt to situations. These situations which they are directly integrated to our computational systems, are creating many questions in human's mind like to understand the diversity of benefits by computers, reducing these understandings and increasing our alienation to technology and each other (Foltz-Smith, 2019). In addition, this statement can be a useful context to understand not only articulated problems which come from the integration of artificial Intelligence with user interfaces but also the people reactions and perceptions on these integrations.

3. Actor-Network Theory

The theory of actor-network (ANT) first established as a modern approach to social theory by science and technology scholars Michael Callon and Bruno Latour and the sociologist John Law. Actor-network theory is a method between a human and non-human entity in which symmetrical nodes and are handled equally. According to this theory, an actor is the one that affects the production of scientific theories and improvements. On the other hand, the actor creates an effect on methodologies, methods and social rules (Detel, 2002).

The expression of this theory incorporates two terms which are generally regarded as opposites to each other; one of them come from an actor and the other one from a network. This reminds people of the traditional old contradictions between agency and structure or micro and macro analysis that lies in the core of social sciences. One of the key premises of the theory of an actor-network is that what social sciences sometimes refer to as the "society" represents a continuing success (Callon, 2001). The main reasoning is the fact that scientific knowledge is an effect of existing connections between scientific processes, animals and humans.

This theory supports that no one is alone in their actions or acts independently so, it takes into account all the variables and stresses that they can trigger these actions. We might say that people actions are shaped and affected by their past experiences, tools that they have used, their friends, cultural factors, environment and so many other variables. Not only scientific theories, but also, back growths, methodologies, methods, social rules and structures, procedures, tests, measurements, suitable instruments, scientific texts

and, last but not least, external objects are influenced by an actor in any casual way besides the effect on the development of scientific statements and hypothesis. According to this statement, there can be numerous kinds of relations and interactions between actors; some actors, in particular, can change other actors (Callon, 2001). Also, these effects are not only related to only human and also they are affected by non-human actors like artefacts, institutional structures. Human and non-human in the same theoretical context and equivalent numbers of agencies must be allocated to the agency with regard to the rule of universal symmetry that actor-network theory involved. This gives a detailed explanation of the specific mechanisms at work that keeps the network together and allows the actors to be treated impartially.

After all, the role of a network is defined as a group of actors in which there are stable relationships and translations of actors, which decide the position and functions of actors in the network. When the network is created and defined which entails a kind of closure preventing the entry of other actors or relationships into the network, opening up the possibility of accumulating scientific knowledge as a consequence of translations through a network.

To sum up, the fundamental concept of the actor-network theory is that behaviour happens in the relationship between network actors when actors have reciprocal control and struggle for power. In addition, the social interaction between individuals also happens in this way but it should not be forgotten that the actor-network theory differs from traditional social theory by suggesting that participants are not the only individual but also other components (Jessen and Jessen, 2014).

4. Theory of User Interfaces

User interfaces create connections between the activities of human and the computer and then map these activities as a collection of functions from computer program, sensory, cognitive and social human world. People try to understand their actions on the environment and give meaning to each of these actions. So, they build models between other living things and themselves to define the meaning of their action, reaction and cognition. These meanings which they are created by humans during the interacting with each other, reshape the motions, senses, actions, cognition and many other reactions. Moreover, according to this model builds an adaptation and helps people to understand their relationship with the environment and the changes caused by their human abilities

The user interface is a collection from inputs, algorithms of actions and outcomes. Computers collect all arithmetic operation and combine them with data sets to control the actions by analyzing them, dividing and multiplying them. In principle, all computer

programs are a collection of human actions that people can initiate computing the information.

Interaction between human and the environment start from the infancy. An individual can make mental models of those depictions that enable them to feel, act and reach their objectives in the natural globe. Human start to interact with the environment by trying to understand her/his actions and perceiving the natural interactions which are natural interfaces produced by the environment. Besides, computer interfaces are not different than the natural interfaces in terms of shaping and enriching the human senses (Ko, n.d.).

Gulf of Evaluation and Execution

Norman and Draper talk about the gulf of evaluation and gulf of execution in his book of "User-Centred System Design" to describe effective design element to help the user to get rid of from boundaries and obstacles which they can be a problem while users are trying to reach their goals (Norman, 2013). With this definition, we can say that these gulfs create a knowledge gap between the user and the aimed goal while the user is interacting with the interface. User needs to understand interfaces and give an effort to understand the system. Mostly, people think about their past actions and interactions to decrease the effort to understand the new systems, interfaces and interactions. At this point, the theory of interfaces meets with a mental model which is a theory that describes how a system works, the meaning of signals and the outcomes which will be shaped by different users' actions. So, these mental models would be created if people rely on their past actions while they are interacting with the new systems (Whitenton, 2018).

The Two UX Gulfs C4.3

The User

Gulf of Evaluation
What's the current system state?

Gulf of Execution
How do I use this system?

The World
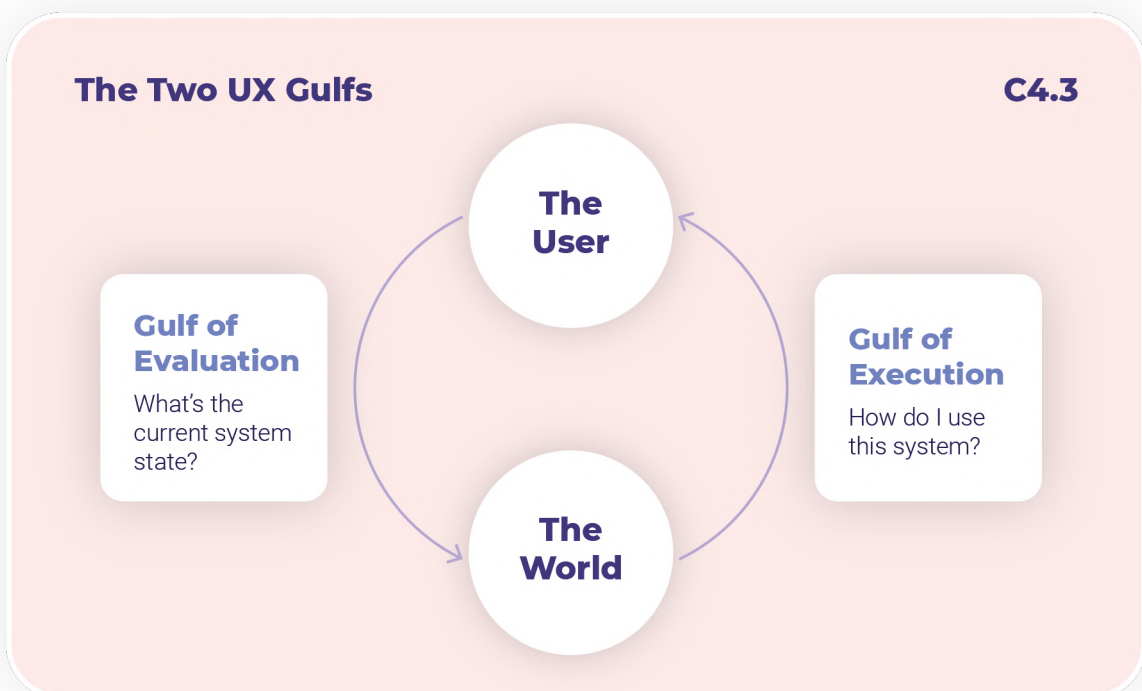
Source: Nielsen Norman Group, 2018

This theory might be helpful while a designer is trying to design human-computer interfaces, especially with artificial intelligence. Perceiving the action that comes from AI would create gaps between the user and the final aim because as mentioned above in detail, people want to use the familiar interactions when they meet with an interface which provides interaction with artificial intelligence. Also, these gaps might support the uncanny valley and create more fear against the interfaces, cause misunderstandings and lack of interactions. To avoid this, according to the article "The Two UX Gulfs: Evaluation and Execution" as Whitenton supported the idea of designers can improve natural tendency to help users to develop effective mental models like (Whitenton, 2018);

- ▶ Designing with a familiar approach which user already has

- ▶ Creating a similar visual design between the new and familiar design elements

- ▶ Creating similar functionality between the new and familiar design elements

Andrew J. Ko gives a nice example in his book of "User Interface Software and Technology" to make understandable the gulf of execution. According to his example, at the moment when the user met with the conversational agents with a voice-over user interface like smart assistants on their phones as Siri or embedded ones like Alexa or Google Home, the user discovers the gulf of execution. People did not know to communicate with the interface at the beginning and they tried to understand what to ask to achieve their goal and take an answer from the system. They did not have any idea to interact with the voice-over interfaces like a command space or syntax for each command. Also, people have not an idea to perceive possible actions. Something or someone was needed to "bridge" that gulf, to show a user some feasible activities and how these activities were organized into user's objectives (Ko, n.d.).

A theory of User Interfaces   C4.4

Person   UI   Program
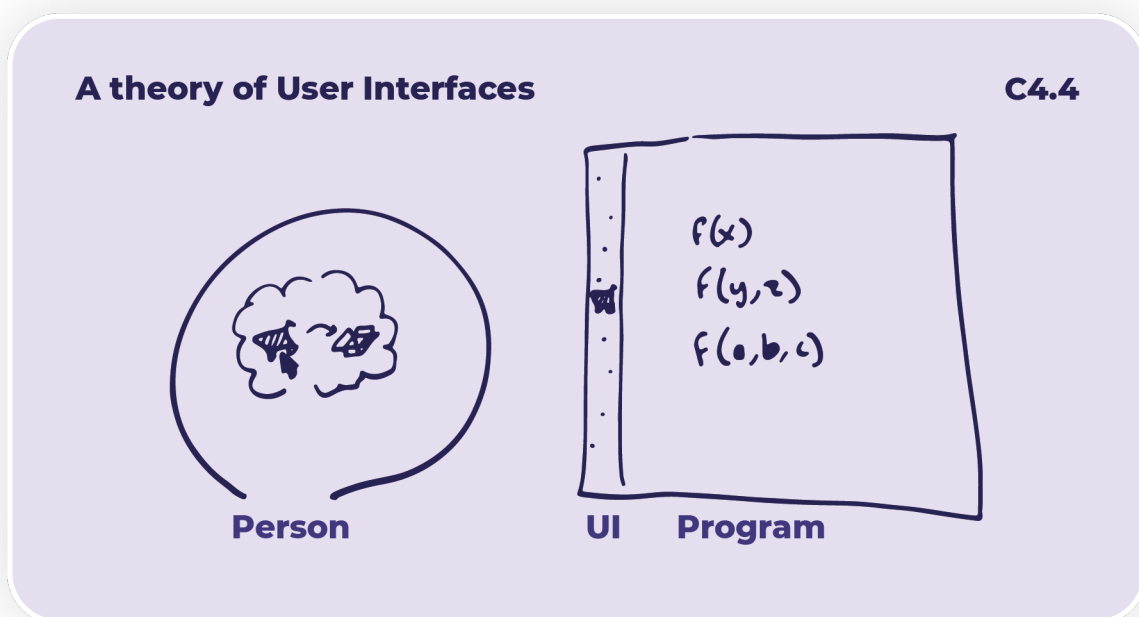
Source: Andrew J.Ko

5. Aaker's Brand Personality

The brand personality is characterized as human traits associated with brands by product personality. Taken into consideration the latter assumption, the social psychologist Jennifer Aaker has been creating a model which is based on human characteristics, such as trustworthy, technological, efficient, joyful, intelligent etc. to be a product. This can be regarded as one of the large brand personality constructs that can be extended into several product categories (Aaker, 1997).

For marketing and branding analysis, Aaker's template is described now as one of the most well-established brand personality evaluation methodologies (Schlesinger and Cervera, 2009). The advantage of using Aaker's model is that it is multi-dimensional which helps some brands to score high on all five. It also allows professionals to consider the views, behaviours of their brands and people's appreciation of their products. This allows them to distinguish themselves and provide an advantage that they may be pursued by others. The chart (fig. C4.5) shows these five personalities which they have divided also into the subcategories to help products for identifying their ton of voices, building trust and transmitting the messages that come from the brand identity.

Aaker's Brand Personality Dimension   **C4.5**

Brand Personality

Sincerity	**Excitement**	**Competence**	**Sophistication**	**Ruggedness**
Down to earth	Daring	Reliable	Upper Class	Outdoorsy
Honest	Spirited	Intelligent	Charming	Tough
Wholesome	Imaginative	Successful		
Cheerful	Up-to-date			
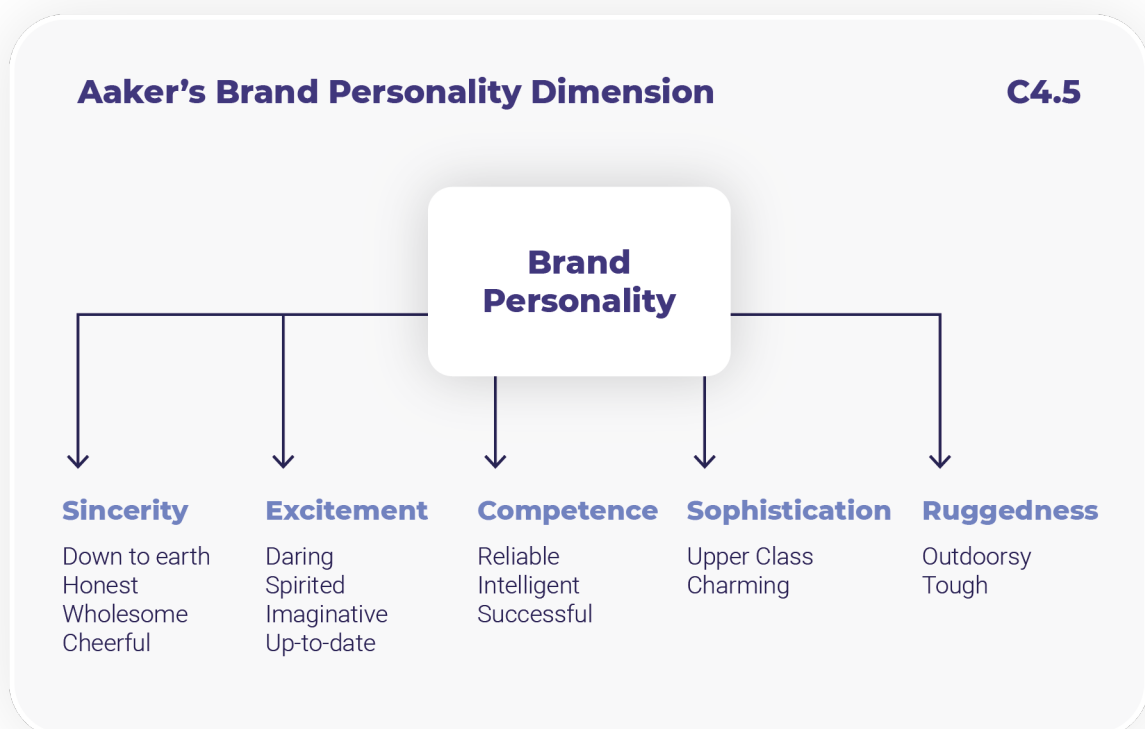
Source: Superskill, 2018

With the consideration of the Aaker's brand identity theory, one of the telecom company which calls as Telefonica has started to build their own artificial intelligent voice-over assistant, Aura, that is active now in six different countries like Chile, Argentina, Brazil, UK, Germany and Spain. As many other technology players in literature have already seen, Telefonica decided to bring new values to the assistants with personalities. Therefore not only concentrate on technological capabilities but also on developing a personality that is incorporated and capable of delivering the desired user experience (Garcia, Lopez and Donis, 2018).

Furthermore, Garcia, Lopez and Donis implemented this into their research methodology to express voice-activated virtual assistants' (VAVA) both emotional and personalized qualities in a clear, realistic way when embedded within a conceptual frame that needs to be tailored to the users of interactions (Garcia, Lopez and Donis, 2018). Besides, after the identification of VAVA personalities, they identified the desired personalities and expected behaviours for voice-over assistants by users (Li et al., 2016). Their research is primarily intended to investigate the personalities that users assign to these four major voice-over virtual agents which are Siri, Google, Cortana, Alexa and to define the VAVA personality that user wants to see in future. This would give a competitor's benchmark and potential feedback on what field the personalities of the new voice-over assistants can compete in and how they could differentiate themselves from others (Garcia, Lopez and Donis, 2018).

6. Hook Model

Nir Eyal has codified his work on how to develop behaviours into his Hook template based on years of researching effective companies and products all able to fundamentally change their users' everyday life. Eyal explored how leading-edge companies were able to build consumer habits, in another word, conduct with little or no conscious thinking, and developed a framework that is actionable.

Eyal defines the enhanced of user habits into the four-phase cycle which they are described as a trigger, action, variable reward and investment stages.

▶ Triggers are the starting point for the actions and they stimulate human behaviours for starting to these actions. The two types of triggers are defined as internal and external. A product that is able to create habits on users start with an external trigger. For instance, a notification from an application or a preview of a message on the phone screen is external triggers to take users into the actions for turning them to habits in time. If users begin to indicate their next action automatically, the

new habits become a part of their daily routine (Eyal and Hoover, 2014). Instead of the external triggers, internal triggers mostly comes through with users' memories. The internal stimuli could be correlated with the places which users have been, the individuals that users have communicated, the habits that they have been adopted, different circumstances and especially emotional feelings (Toxboe, 2019).

▶ Actions define as the second phase of habit formation or conduct in anticipation of a reward. To make this phase happens, the user needs to take into consideration of triggers. In order to engage with the user in specific behaviours, according to the Hook model, we must concentrate on easy behaviours to get users to anticipate a reward. In addition, negative feelings such as being alone, unsound, weak, sad, boring and lower can all suggest internal triggering. The actions are as dependable as the internal stimulus in response to all these items (Toxboe, 2019). Besides, motivations might be the energy for actions to understand how much user desires to take the action (Deci and Ryan, 2008). These motivations might drive our interests and attentions toward. If we would like to explain it with examples, we can take into
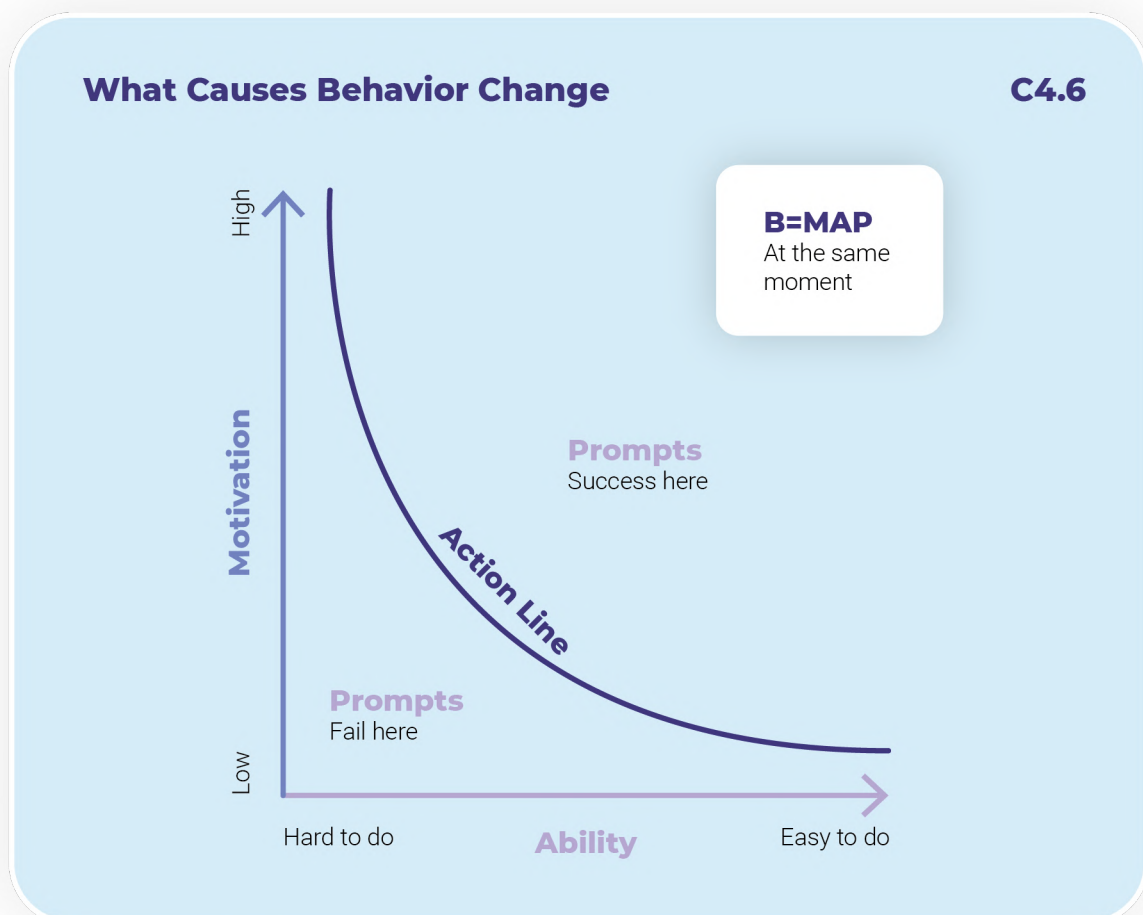
Source: Fogg, 2019

consideration of Fogg's, a founder and director of the Stanford University Behaviour Design Lab, three motivation examples, which he explains in his behaviour model (fig. C4.6), that they are effective for the actions. For example, being anticipatory that includes being hopeful and avoiding fear, being emotional that is helpful for minimizing pain and looking for fun, and being social that seeks out for being accepted in a social environment (Fogg, 2019).

Behaviour Model   **C4.7**

$$B = MAT$$

Behaviour   **Motivation** x **Ability** x **Trigger**

Must converge at the same time
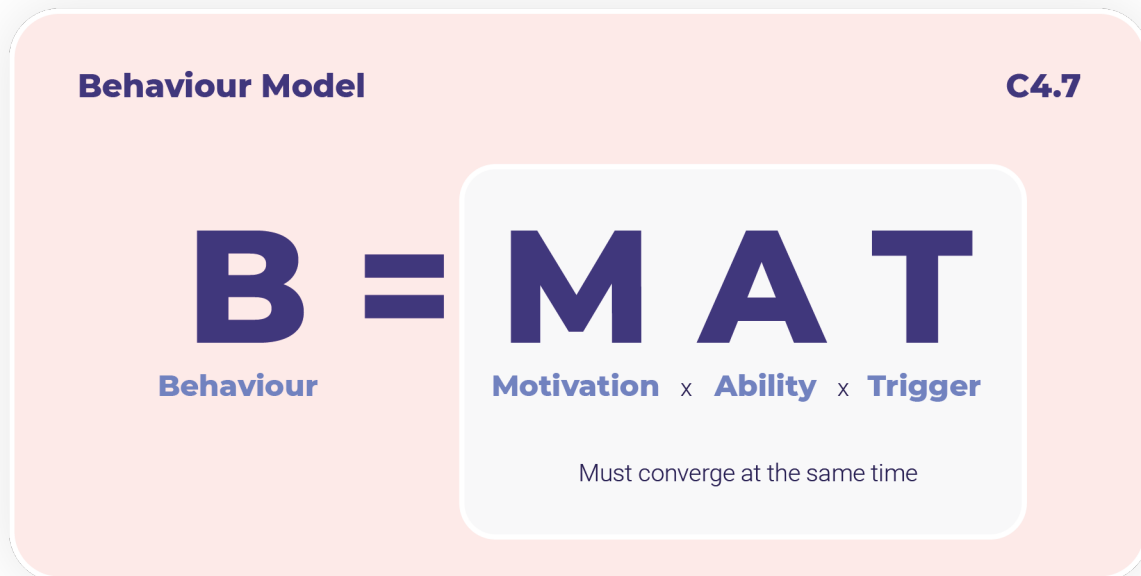
Source: Fogg, 2019

▶ Variable rewards are the section that the user reaches after their actions. Eyal pointed in his book, users expect to be a part of the future award rather than receiving the award after their actions (Eyal and Hoover, 2014). Research shows that dopamine levels arise when the brain expects an award. Variability enhances the effect, producing a frenzied hunting environment, triggering the components associated with desire and wish (Marketingjournal.org, 2016). Three types of reward are identified by Eyal: tribe rewards also know as social rewards that differ in nature and feel comfortable when a person receives them from other people and this makes them feel good, hunting defined also as winning situations and self rewards that are the benefits of self-performances as inherent incentives such as competence, ability, coherence, performance and control (Toxboe, 2019).

▶ Investment is defined as the last step of the Hook model and this phase increases the probability that in future the user will continue to their actions in the hook cycle. The investment takes place when the user inserts something into the service or product like time, data, effort, social etc. This section should be clearly defined in terms of the meaning of investment because it can create a wrong statement. Here,

investment does not come with money, rather the expenditure means an action that will maximize the next round of operation (Eyal and Hoover, 2014). Investments load the next Hook cycle and bring back users to the loop. For instance, when a person sends a message to a mate, waiting for the response from them will be a future reward to bring back the person into the Hook cycle again (Toxboe, 2019).

The Hook model four-phase cycle · C4.8

Trigger — What gets the user to the product?

Action — What is the simplest behavior in anticipation of reward?

External

Internal — What does the user really want?

What is the "bit of work" done to increase the likelihood of returning?

Is the reward fulfilling, yet leaves the user wanting more?

Investment

Variable Reward
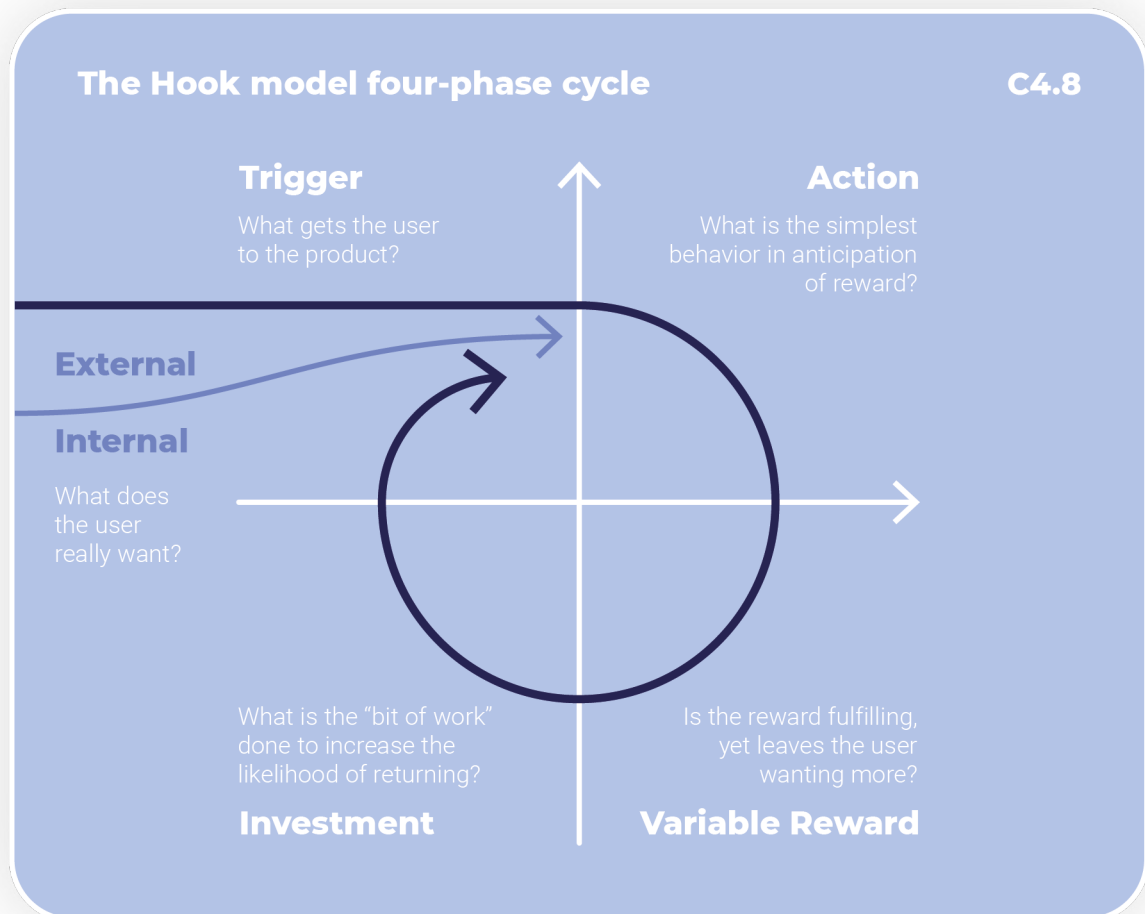
Source: Toxboe,2019

To sum up, the Hook model is an effective method because it helps the person to continue her/his actions and increases the usability of the product and the interaction with the user. Also, if the Hook model is used correctly, it can be useful in transforming user actions into habits and creating an emotional connection between the user and the product. The aim of the thesis shows similarity with this model in terms of building relationships between users and personal companions to ensure the continuity of usage of the product and interaction with loading next Hook cycles and keep continue to communicate with companions.

Take-Aways

This chapter explained thoroughly how the personality models are implemented into the digital experiences or products to define the relationship between actors and networks. Then, the focus moved on the interaction with an object to improve usability and make user experiences more pleasurable, interactive and personalized in order to create new possibilities for user experiences.

I brought these selected theories to describe how personalities evolved from individuals to products and how personality characteristics assigned to these objects change the mood and behaviour of users.

In the next chapter, the role of design in making artificial intelligence understandable and its role in shaping digital experiences will be discussed.

5

Design Involves in Artificial Intelligence

**Human is Design,
Design is Emotions**

**Designing Products
with Emotional Intelligence**

Reshaping User Experiences

Human is Design, Design is Emotions

Emotions are complicated to resolve and implement them into design processes. As mentioned in previous chapters, with affective computing and creating relationships between human to a computer or the other life forms, it might improve human to human communications and interactions too. Based on this statement, designers started to involve emotions in the design. Besides evolving design processes with empathy, also the way of the interaction with technology started to be more empathic through the design and the experiences with the physical, digital and phigital products. Pavliscak, the founder of Change Sciences, describes human as a technology's Lacanian mirror stage where they will remember themselves in the future. People have this dream, and it's logical. The technology is disappearing into the background and helping us to be successful and productive and creating a convenient, reliable and effective vision. However, there's one problem related to this vision that human beings are not entirely rational. As humans, we have emotional connections to technology. We anthropomorphize everything with giving them human characteristics and features like with a mouth, erratic movements, gestures and even with a history behind (Pavliscak, 2017). As an example, applications started to embedded human gestures into the interfaces when a user put a wrong password. The

Emotional Loop   **C5.1**

Trigger
What gets the user
to the product?

**Emotional
Trigger**

Action
What is the simplest
behavior in anticipation
of reward?

What is the "bit of work"
done to increase the
likelihood of returning?

Is the reward fulfilling,
yet leaves the user
wanting more?

Investment   **Variable Reward**
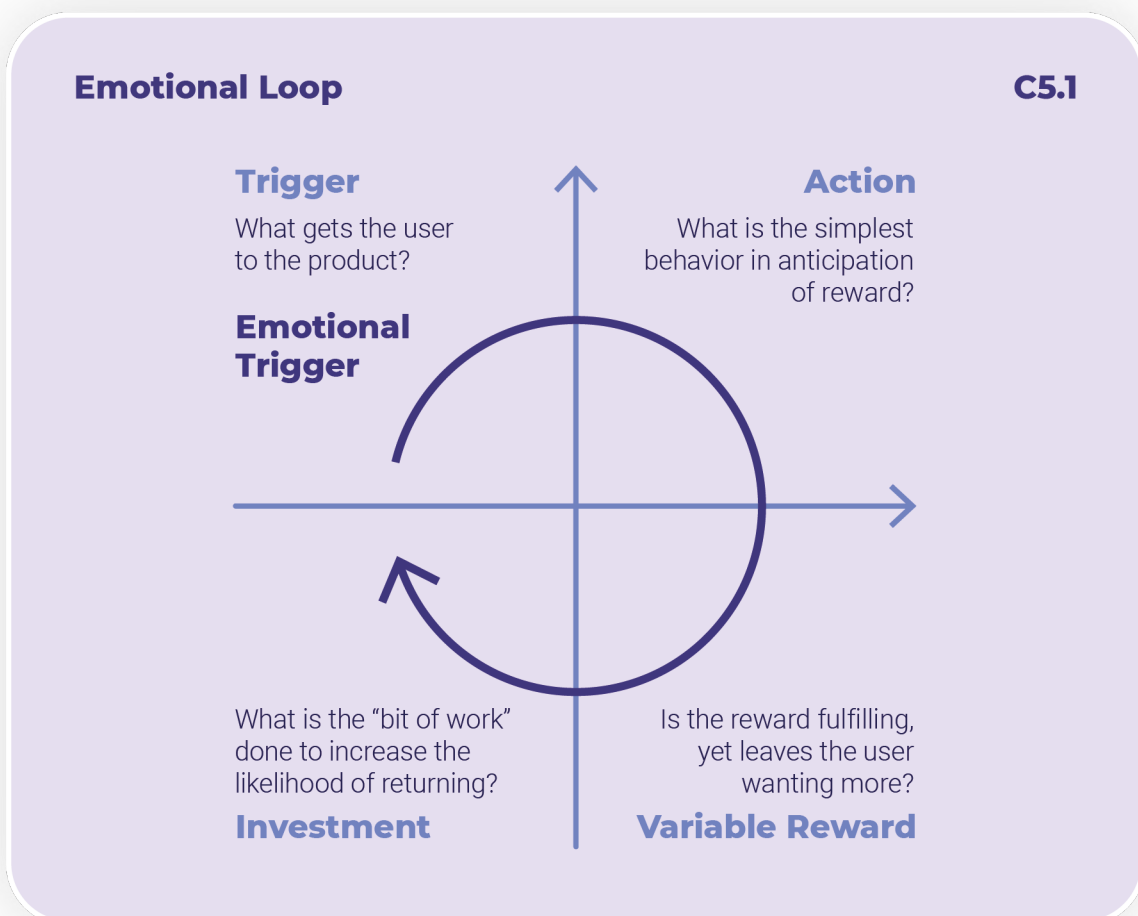
Source: Pavliscak, 2017

system understands the action is wrong and the character shakes the head, which is a human gesture to describe there is something wrong, to give an insight to the user for easily recognizing that the inserted passcode was incorrect. These interactions might be useful to define the problem and perceive them easily thanks to creating emotional connections and embedded human gestures. We should consider also these situations while embedding these human gestures with characters or shapes to represent the actions. The important point is must be taken into consideration is to take decisions carefully while designing these characters and adopting them into personalities. In the beginning, these personalities might look good representatives but after interacting many times with them, human minds perceive these situations boring, not engageable and even defines them as inappropriate behaviours or lack of empathy. And if we consider these interactions are always repetitive in the same way, human needs different emotional triggers to lead them into the actions. (Fig. C5.1).

In addition, with involving the design into technologies, designers started to create more meaningful experiences, relationships and interactions with understanding both side, humans and machines. Now, these feelings are not creating from only one side. Not only people are feeling the emotions and have empathy for machines and other life forms, but also now, machines started to understand human feelings, changes in their emotional
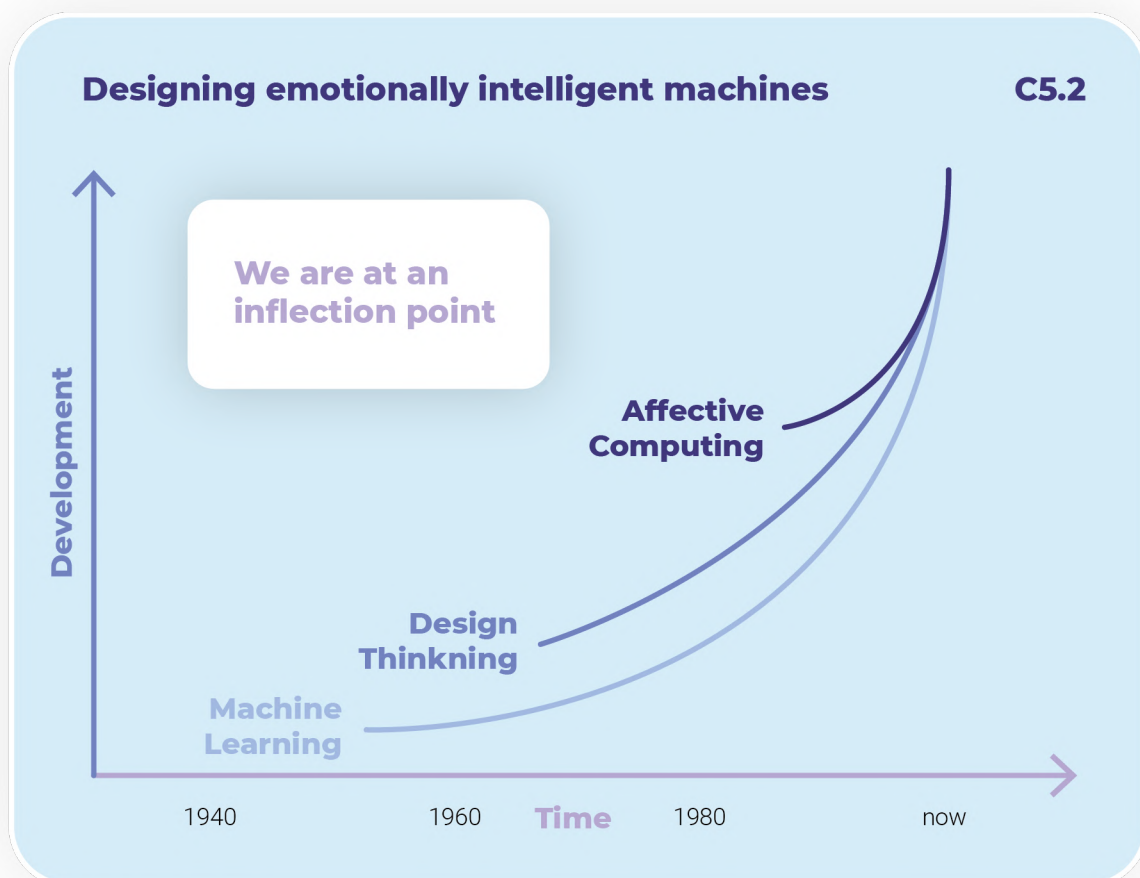
Source: Veer, 2017

states and creating empathetic connections. Since human feelings and emotions are complicated, we did not build this relationship only because of the anthropomorphize the technology with design. We are building these relationships and connections with trying to give a shape to our emotions with design in our minds and changing the perception of our emotions. This is a loop that comes from both side, human and the machine, with empathy. Reducing the complexity of technology and creating new connections with designing new experiences for human minds, we might create a loop between people and the technology itself which come to alive with design. Having thoughts, emotions and feelings that come from human understandings and matching them with the new emotional experiences that come from technology, it can be a machine, product, or even another life forms like pets, plants, etc that might have an impact on human lives, might help to design more personal, emotional and empathetic experiences. Also, these mutual loops between human and the design might have an impact to help individuals for their self-growth, awareness and courage. (Veer, 2017)

Designing Products with Emotional Intelligence

The manner in which people interact with technological products, especially mobile phones, changes dramatically. People started to speak with the digital assistants rather than interacting with the products through the graphical user interfaces. For instance, instead of searching something on the web through mobile phones screens and interacting with clicking to buttons or scrolling up and down to complete desired actions, people started to go with the conversational interactions. For the statement of Fast Company, as users, we are expecting to be understood instead of being entertained from the experiences. In addition to this, when this switched moment happened from screens to voice-over interactions smoothly, we also started to identify products we use on behalf rather than the brand. With this turn, we expect more and more not only utility and accomplishment but also we want to feel the moment of trust and emotions that comes from the product (Pakhchyan, 2019). So, we can say that this fundamental behavioural change requires to reconsider the possibilities of designs for each product. These transitions have the main driver which is artificial intelligence (AI) and in particular, we can say that machine learning has an important effect thanks to natural language processing (NLP) and understanding (NLU). NLP and NLU make the interaction between human and the machine simpler and more natural than before. However, in the meantime, machine learning assists during offering deep insight and advice on our behaviour (Pakhchyan, 2019). I would like to explain it clearly with an example. For instance, the application which calls as Woebot created from work under the supervision of a psychologist Dr Alison Darcy, from Behavioural Sciences at Stanford School of Medicine, and has clinically shown its effectiveness through a

published randomized controlled trial. WoeBot is a digital therapist which is designed with artificial intelligence in order to create a companion (Darcy, Robinson and Ng, 2019). Thanks to AI, WoeBot not only gives tools that help people for a better understanding of their thinking patterns but also provides a safe harbour. All in all, it has delicately conducted the conversation with a person, seeking permission to ask more questions or to consult with the user in the future. So, this behaviour can help to avoid being annoyed constantly unlike other applications. Also, it asks permission for communication instead of sending informative notifications directly. This example shows the importance of reconsideration of user experiences, redesigning the processes and retaking design decisions which they help to make the digital experiences more emotionally intelligent.

WoeBot Digital Therapist — P5.1

Hi, I'm Woebot

Everybody could use someone like me

Quick conversations to feel better

Daily lessons and check-ins
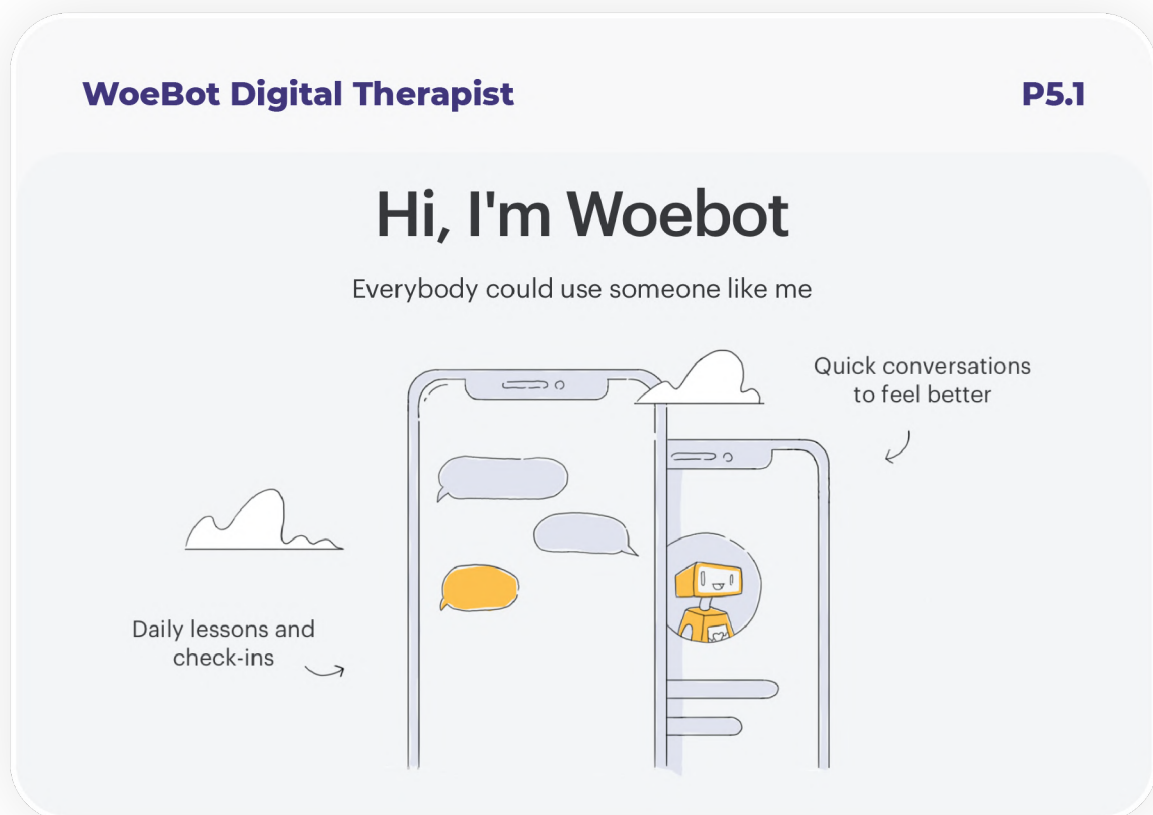
Source: Woebot, 2019

After the fundamental behavioural changes, another topic that needs to be explained in this part is the affective reasoning. In the cognitive studies of social interaction, active thinking plays an increasingly important role. People continually analyze one another's social context, adjust their own affective state and then respond with empathy to these outcomes (McQuiggan and Lester, 2007). Today, in the social interaction sense, the

community is now well placed to examine affective reasoning and also it should be noted that empathy is an important part of social interaction. If all these views are evaluated by considering the interaction between human and machines, they might have a similar effect on the user experiences and lead to reshaping these experiences if empathy involves in the design processes.

In addition to this statement, using two complementary forms of assessment the empathic reliability of an empathy model can be determined as predictive accuracy and perceived accuracy. In this section explaining the perceived accuracy will be useful before moving to the new role of user experiences. A study of perceived accuracy examines the empathy of a model with a controlled focus group experiment. The alternative model of empathy is embedded into numerous fellow agents, individuals observe fellow agents in a range of social environments, and participants evaluate the role adequacy of the empathic behaviour. An accuracy test may show the extent to which the empathy model makes decisions about evaluation and perception which people feel are situationally acceptable (McQuiggan and Lester, 2007).

Reshaping User Experiences

There is an opportunity to shape user experiences with artificial intelligence. With more understanding of users expectation, needs, effect on their emotional states and collecting all the feedbacks are bringing user experiences one step further. If we consider that the variety of products, which are physical, digital and phidital, and users, these experiences are shaping differently based on these variables. Also, it should be stated that the personality which is developed for the products are affecting the user feelings and emotional states about the products. In this point, the first meeting with products, onboardings, has a great impact on users to create good insights and to ensure the continuity of the experience.

Involving AI into design processes, user experiences can take better shape in the close future. AI can understand the appreciate parts and frustrated points of the journey with learning from individuals to tailor better experiences. It can even go further by creating more personalized experiences. Moreover, having empathetic features will be able to create emotional connections with users and it will have an effect on user experiences.

I would like to make clear this statement with an example from Netflix. Recently, they designed a personalized recommendation system which means they implemented machine learning systems into their design to create a suggestion list for their users for more personalized experiences. It can be very private and dependent on a particular taste on how people find artworks. There is so much variety in taste and interest that it would be a better idea for Netflix to find the best artwork for each of their subscribers to highlight the elements of a title directly important to them (Bodegraven and Marques, 2019).

Bodegraven explains the principles of AI design in the awwwards books artificial intelligence-driven design series. He takes into consideration four principles to explain the user experiences which are minimizing the inputs and maximizing the outcomes, designing for forgiveness, creating humanized experiences and designing to establish trust (Bodegraven, 2019).

Minimizing the inputs and Maximizing the outcomes

We live in a world that is popular with phenomena such as decision fatigue. We have been flooded with updates, rewards and demands that we all have to deal and navigate. AI can overcome these situations by considering certain activities that can quickly be outsourced. For instance, the smart thermostat Nest is setting the temperature right, Google AI is providing automatic responses, etc. If we consider these actions are taking shapes by users responses, asking the right questions can be learned in time with AI and used to be reshaped user experiences. So, minimizing the inputs and aiming the maximum amount of outcomes can shape the user experiences and solve user problems.

Designing for Forgiveness

AI is still in an infant phase so, it continues the learning stage with the contribution of the events and users around. Therefore it is very easy and highly probable to make mistakes on actions and decisions. Forgiveness has a great contribution to AI's development and understanding the system better to build a good relationship for the future. This forgiveness can come from user feedbacks to support AI and help it to take the right actions for the next steps. For instance, Netflix offers users to dislike the selections from the bucket lists and this means that the next choice will be improved based on the input received. So, having an opportunity for forgiveness and receiving feedback from users can be helpful to design more personalized experiences. Also, giving an option to the user for improving their experiences and seeing the improvements on the next interaction, it can create good insights and trust on users with being aware that the information that they gave will re-arrange and turn back.

Creating Humanized Experiences

The importance of personality becomes more prevalent in our daily interactions with machines while they are rapidly changing. When people have a story with a product, they can create more strong connections and in time they start to define personalities that match in their mind with these products. Also, having a personality can create more humanized experiences with perceiving the reactions of machines with a more humanistic approach. Identifying the machine with different personalities will have different effects on

user experiences. The recent finding of Google shows that people are willing to create more humanistic interactions with defining personalities to the products. For example, users started to talk with Google Home by saying sorry or thank you as a consequence of their actions.

Designing to Establish Trust

Today, one of the main topics about data is building trustful relationships with products. In recent years, data related cases started to led people to be more conscious about protecting their data and cause d to be more aware before accepting the terms of privacy and policy.

In this topic, building confidence by creating a trustful environment in which the cornerstones are transparency and integrity. So, it is a crucial point that AI build confidence by being transparent about what it knows about the user and how it will use their data. With this statement, users should be able to monitor and modify their data if necessary. Giving the authorization to the user should create a feeling of being in charge and control their inputs. Besides, being understandable and informative, knowing how the system will use their data and will give back to the user, should build more trust between AI and people.

Take-Aways

This chapter explained thoroughly how emotions met with the design to build trustful relationships with digital products. Also, the importance of creating emotional connections with the products and the role of AI is explained to shape the user experiences in order to make them more personalized.

In the next chapter, the importance and necessities of artificial intelligence for establishing empathetic companionships are explained and supported with related case studies.

6

Empathetic Companions

Artificial Intelligence is not a Tool, It is a Design Material

Missing Emotional Connections and Empathy

Exclusion in Artificial Intelligence

Making Memories

Case Studies

Social Interface "Microsoft Bob"

Jibo

Olly, Emotech

Riot AI

A Space For Being by Google

Maslo

Introduction

Artificial Intelligence (AI) is increasing their usage and becoming more prominent in our lives. People are mostly preferring to use virtual agents to reduce the complexity of their daily needs. Smart, artificial assistants have the potential to make someone's life easier. According to TechCrunch (Perez, 2018), 41% of U.S. consumers now own a smart speaker. eMarketer, via a report by SuperAwesome, conveyed that 91% of kids ages 4 to 11 have access to a smart speaker, like Amazon Alexa, or digital assistant, such as Apple's Siri (Collins, 2018). Why, then, but a significant number of people are still using Alexa as just a kitchen timer, and why these smart virtual assistants still are not managed to become our real digital personal assistant? Does it lack the skills for complex tasks?

It is true that personal assistants are still not powerful enough to help us in a smart way and one of the reasons could also be that we are still not ready to embrace the AI, to invite AI for joining our daily lives. We do not know yet how to build a relationship with our personal assistant, it is still blurry but promising field. At the same time, our relationship with technological devices is getting deeper and deeper and usage of hours per day is raising and our social interactions are changing because of this. We are losing moments of touch with ourselves and our self-awareness is getting damaged day by day. Consequently, our empathetic and emotional capabilities are affecting because of these interactions. Moreover, it seems clear that the trend is going to be with more interconnected emotional devices. That is why we need true personal assistants with implemented emotions that now can be applied through AI to make them empathetic companions.

Researches are focussing on emotional intelligence and empathy in personal assistants to make these agents more like companions with trying to define a more transparent communication way. According to Sony Design, machines grow both intellectually and emotionally through ongoing interaction with humans. With knowing this symbiotic relationship, we can imagine a future in which robots look more alive (Affinity in Autonomy, 2019) and with empathetic feelings, they might have an effect of building trust between people and machines. So, they might have a chance to be perceived as a real companion in the same way that our minds are creating human-human relationships with including empathy and emotions.

Artificial Intelligence is not a Tool, It is a Design Material

In the etymology, technology combined with two words that come from the Greek language which are techne and logos. Techne signifies art, craft, skill, workmanship, or the manner in which an item has been acquired. Logos means language, a word, or a phrase, through which the internal thought is articulated. However, technology has recently come to mean something else and we are defining it as a collection of means produced by technical processes (tools, instruments, systems, methods, procedures) and by science. With this meaning, our minds are perceiving the artificial intelligence is a technological tool that we can build with using programming languages to construct algorithms. This is a really cold explanation and enough to create a bias to establish a relationship between humans and machines. If we take into consideration the etymology meaning of technology and combine with artificial intelligence, we can create a new perspective to understand machines.

If we consider AI as a design material with all transparency rather than a technical tool, can we use it to shape for creating more reliable and empathic relationships? This question defined the thesis aim which is to reshape the relationship between human and the companion with including empathy into the design. This aim is supported by understanding the effect of empathy, which is implemented with different personalities to the companions, to create trustful companionship and define the effective interactions. After then this, this hypothesis implemented into methodologies to be tested.

How AI works   **C6.1**

Needs   Created by

Data   **Computer Scientists & Engineers**   defined by

Using programming languages to construct algorithms

Artificial Intelligence   resemble   **Human Intelligence**

Human can not interact or understand

AI as a technology

Artificial Intelligence → is an → **Invisible Technology**

C6.2

Sometimes is a Black Box

AI as a tool

Artificial Intelligence → is a → **Tool to use**

C6.3

"AI can be implemented to many fields. It is already done like Voice over intelligent assistants, navigation apps…"

AI as a Design Material

Artificial Intelligence → is → **Design material to shape**

C6.4

"It is still in infancy. With technology and design can take a shape and grow. Also, in time it can have it's own personality like a baby or a pet."

According to Antonelli, senior curator of Architecture & Design and founding director of Research & Development at the Museum of Modern Art (MoMA) in New York, science, engineering and arts and culture are all part of a Renaissance approach. Engineering is what makes any built object come into being and without technology, nothing happens to bring them alive. The understanding of thinking, which defined as cognitive science,

makes the product accessible for people. This recognizes interfaces which are familiar to people. If the design provides a person with an object that they do not even know how to pick or how to use, it means that this is not a good design. In addition to this, design meets with needs, whether they exist or going to exist. She defines it with an example of Tamagotchi which is perceived and defined as a useless object but this object showed that people obviously needed pain and a need to relieve the distress in their lives, and the Tamagotchis responded to these needs. It looks like an unreasonable design or a need but those are the insights and they can be combined to create something that people does not know they want or not and these are the most fascinating designs which are new and appropriate to build the new needs on the world (Antonelli, 2018).

The machine uses signals for encoding its own truth version over time. The evolving trends encapsulate our current state at the times combined with our knowledge. It is our reflections throughout the process of the system itself. It means that it is us, but it suggests a different version of us. A version of us that is a synthesis of our own direct signal by the enormous possibilities that come out of the signal. It is exactly the way that another living being experiences in terms of data flow. To define this explanation as a need or even to understand them easily, we need to build a relationship as in human relations. It is important to develop machines more empathically and emotionally in order to achieve this trust for creating a relationship between people and machines. This process needs time to ground and initiate human relationships for building this strong trustful companionship.

Missing Emotional Connections and Empathy

Every human has different personalities and emotions. In daily life, even if each person has different characteristics than each other, sometimes emotions can change according to different situations. This unexpected changes can affect people's moods and personalities in a short or a long period. While emotions show the variety, a person can expect different behaviours from another person while they are communicating. So, if personal assistants have their own personalities, how can they adapt to these behavioural changes and create a trustful companionship with people?

Emotions have an important and powerful role in a person's lives. Almost in every situation, people think with their emotions, for instance, under stressful conditions, in emotional moments, while they are making decisions and many others. All of these considered, emotions have a great impact on people's life which affects also social communications and interactions. In addition to that, they have a role to influence creating behaviours in social relationships (Gratch and Marsella, 2004).

Knowing the different characteristics regulate someone's emotions. Every human has different communication skills, social abilities, and thoughts while they are following social norms. Human creates successful social communications not only with understanding and conceding of these differences but also with having empathy.

Emotionally intelligent agents provide improvements on social interactions and increase their efficiency on acceptance, success and trust (Fan et al., 2017). Besides, for the agents to understand the complex feelings and emotions, analysing inputs and outputs is one of the main action to describe the emotions. When the emotional intelligent companion performs rational processes, it means that they can reflect human behaviours (Pudane, Lavendelis and Radin, 2016). Thus, they have an impact to affect outputs and final actions.

I had an opportunity to discuss why machines need empathy and we need to focus on establishing a trust to create an empathetic relationship with Ross Ingram who is one of the co-founders of maslo empathetic digital companion and ex-googler. I had an interview with Ross about virtual assistants, empathetic digital companions, the shape of AI, self-awareness and growth and also maslo's life story. The full interview report can be found in the end of this chapter.

Understanding emotions and building a relationship with AI can question these topics:

▸ How does AI interpret emotions

▸ What kind of features of AI, what activities, which moments trigger the intimacy building trustful relationships

▸ How can AI create affinity

Exclusion in Artificial Intelligence

The internet is now offering a degree of concrete information that was unimaginable over a decade ago regarding users ' behaviours, likes and dislikes, hobbies and personal preferences. Forbes stated that there are 2,5 bytes of data that are generated each day at our current pace (Marr, 2018). According to the 2018 report of data never sleeps by Domo, there are stunning numbers, but they do not slow down. It is estimated that 1,7 MB of data will be created for each person on earth every second by 2020 (Domo, 2018). Also, they stated that these numbers increased 9% since January 2018.

The Big Data Pool is complemented by social media accounts and online profiles, social activities, product reviews, tagged preferences, liked and shared contents, loyalty services and programs and customer relationship management systems and from many other sources.

THE WEATHER CHANNEL RECEIVES 18,055,555 FORECAST REQUESTS

GIPHY SERVES UP 1,388,889 GIFS

NETFLIX USERS STREAM 97,222 HRS OF VIDEO

SNAPCHAT USERS SHARE 2,083,333 SNAPS

LINKEDIN GAINS 120+ NEW PROFESSIONALS

AMAZON SHIPS 1,111 PACKAGES

YOUTUBE USERS WATCH 4,333,560 VIDEOS

TUMBLR USERS PUBLISH 79,740 POSTS

TWITTER USERS SEND 473,400 TWEETS

REDDIT RECEIVES 1,944 NEW COMMENTS

12,986,111 TEXTS SENT

1.25 NEW BITCOIN ARE CREATED

SKYPE USERS MAKE 176,220 CALLS

2018 every MINUTE of the DAY PRESENTED BY DOMO

GOOGLE CONDUCTS 3,877,140 SEARCHES

INSTAGRAM USERS POST 49,380 PHOTOS

TINDER USERS MATCH 6,940 TIMES

VENMO PROCESSES $68,493 PEER-TO-PEER TRANSACTIONS

UBER USERS TAKE 1,389 RIDES

SPOTIFY STREAMS OVER 750,000 SONGS

AMERICANS USE 3,138,420 GB OF INTERNET DATA

Source: Domo, 2019

Internet: Data production;

▶ The internet is used by over 3.7 billion people in a day (7.5% increase compared to 2016).

▶ Google currently conducts 3.877.140 searches in every minute

▶ Worldwide, with other search engines, there are 5 billion searches a day.

Social Media: Data sharing in every minute;

- ► Users post 49,380 images on Instagram

- ► 2.083.333 snaps post by Snapchat's users

- ► Users stream 97.222 hours of video on Netflix

- ► Users watch 4.333.560 videos on Youtube

- ► Spotify streams over 750.000 songs

Global Internet Population Growth, 2012-2017   C6.5

Billions of users

2.5   **3.0**   **3.4**   **3.8**

2012   2013   2014   2015   2016   **Time**   2017
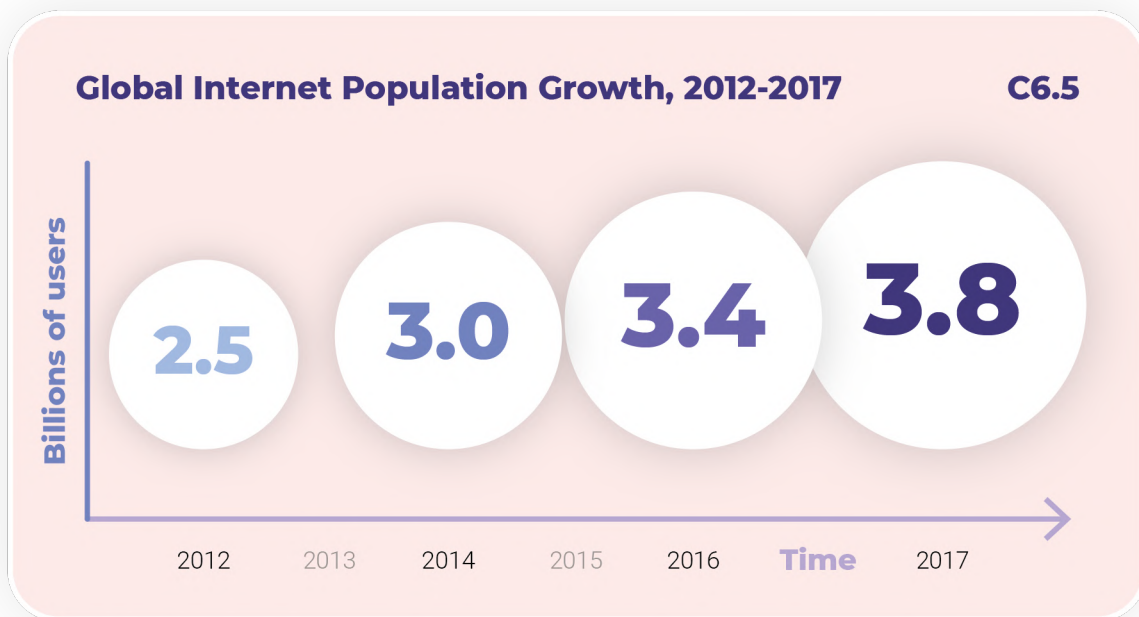
Source: Domo, 2018

If we imagine all these amounts of data produced by humans in every minute and using by artificial intelligence, how we can avoid using this big data without causing a bias on users?

It is almost impossible to avoid bias when we are meeting with a new product which is designed with AI and used these labelled and collected data from the internet. This is only identifying the AI as machines without having any personal points that people can tailor experiences or products for themselves. AI needs empathy to overcome this perception and create more personal emotional and empathetic relationships with users to avoid bias.

As Microsoft Design mentioned the more trust people have, the more they interact with the processes and the more data use by the system to deliver better performance to give back to the user. Nevertheless, trust takes a long time to develop and prejudices can tear down it immediately, harming large communities. To fulfil its pledge, AI's systems have to be trusted (Chou, Murillo and Ibars, 2017). We need to consider how and where Bias is affecting the system. By addressing these five biases first, we can create more inclusive products.
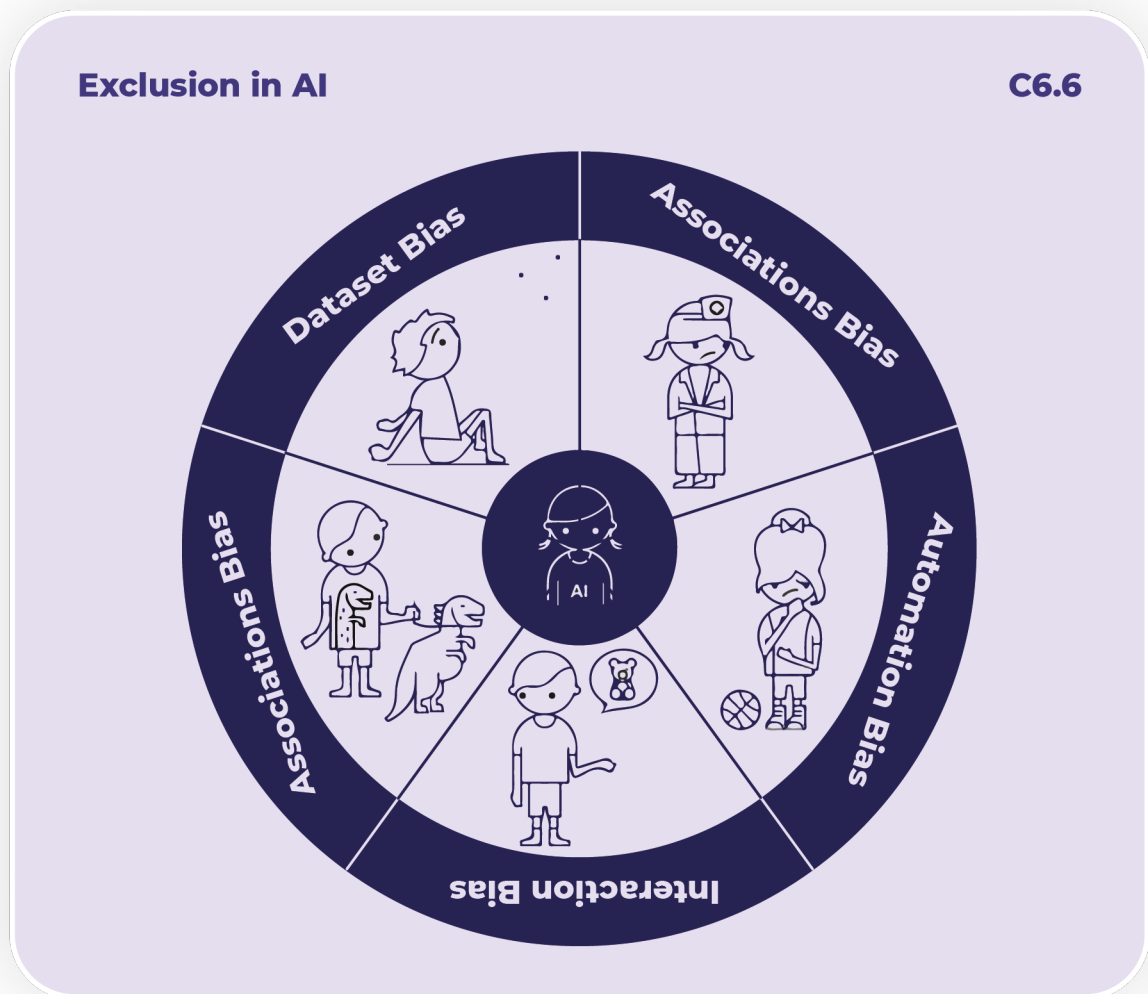
Source: Chou, Murillo and Ibars, 2017

Also, Microsoft design explains this bias in five different stages and tries to define this bias with the perspective of childhood and describes the bias from a child's eye. It starts with a definition of dataset bias and continues by explaining bias of association, automation, interaction and confirmation.

Dataset Bias

▶ Perception of AI: The child learns that most of the universe lies beyond the little knowledge in its field of view and it looks really big and complicated from their eyes.

▶ How it is: If we think on the AI side, large-scale datasets create the basis of artificial intelligence and they are not defined differently for individuals. They are the clusters and ready to implement into the machine learning systems.

▶ How might be?: So, if these learning processes are tailored for individuals, how they can affect the machines learning processes to become more intuitive.

Association Bias

▶ Perception of AI: Imagine kids are playing all together with a doctor game. So think of a couple of boys who like to be playing a doctor role and presume the girls are going to take the nurse role. Why girls cannot be in a doctor role?

▶ How it is: If we think on the AI side when data used for the creation of a model reinforce a cultural bias and multiply it. Human preference will contribute to machine learning during the training of AI algorithms. The continuity of these biases can lead to unfair customer experiences in future interactions.

▶ How might be?: So, if the machine is not only learning with the label data-set but also growing with learning from people how they can interact with people without creating gender discrimination and enabling more personal experiences.

Automation Bias

▶ Perception of AI: Imagine labelled thoughts as boys like playing football and girls like spending time on beauty. What if a girl likes sports, enjoys natural-looking and hates being artificial, so is it true to categorise every human in under some structured clusters?

▶ How it is: If automated selection transcends social and cultural factors, predictive algorithms may automate objectives that clash with human diversity. The algorithms are not human responsible but make humanly impactful decisions.

▶ How might be?: So, if the machines are responsible for human actions and can take a shape with human decisions, AI must take into account the interests of the affected individuals in their programs in the design and development processes.

Interaction Bias

► Perception of AI: Imagine a game of whispering to one next to each other a word to carry it to the last person. It is interesting to see how the data actually shifts through so many hand-offs. While this word is transmitting to the last kid, if one of them is changing this word while telling the other one, it can create funny moment or also it can be irritative.

► How it is: If we think about the artificial assistants, they have a sense of humour. This behaviour causes to perceive them as a human but many efforts to humanize artificial intelligence are involuntarily dishonoured and affected software programs by human bias.

► How might be?: So, if the interaction between humans and machines take shapes real-time, how machines can shape their learnings with establishing empathetic connections with users and can they be able to interact with a user without creating unintended behaviours and negative user experiences.

Confirmation Bias

► Perception of AI: Imagine a kid as receiving a gift with a specific character on it. Thereafter, other people will perceive this situation that the kid likes the character. This situation will keep going when they give up the idea that the kid is an admirer of the character.

► How it is: If we think that AI algorithms support what previously have chosen by other people and it excludes people making less popular choices. So, confirmation bias interprets the data to validate the preconceived information and it creates a perception of acceptance of the general situation.

► How might be?: So, if the AI learns dynamically and changes in time without only following the implemented data into the system how the AI system can help users to have a more diverse and inclusive view.

Making Memories

Artificial intelligence is using the data that is produced until today as mentioned above. This labelled data is clustering all the information and combining them with the new data so, the machine is learning and increasing its knowledge and also abilities in time. Now, if we consider using AI real-time and also learning while interacting with the user they might be able to create memories on these interactions. If this process continues with learning in every interaction with a user, they can create more natural relationships with people. Imagine person to person relationships, the communications are shaping in time and at the beginning, people do not know exactly how to behave to the other person. However, in time these communications are taking a shape with learning from each other

and all of these interactions and communications are storing as memories in our brains. These relationships that shaped with human to human interactions are identified as learned behaviours. They are helping people to build trust in each other and adding more values to their true companions to create more strong and reliable connections.

On the other hand, to identify the relationships with machines and avoid building interactions without a bias, machines need to change their learning processes with processing the signals in different ways like creating memories and using this learned actions to gain more insights on different behaviours to interpret the data for the next interactions. As Foltz-Smith states, the co-creator of maslo and AI biologist, memories of the empathic companion are just signals that are stored in whatever state when they were stored. Various layers of record at a variety of frequencies and fidelity levels with energy sensing, understandings of changes, disruptions, sounds, patterns, etc. According to him, the first steps towards general AI must be an end to the overly distorted conditioning of stimuli, which calls as bias, through flawed ideas in high levels of human concepts, such as linguistics and mathematics and free will. Also, he points to obtain general AI systems, the whole bandwidth of nature needs to be opened (Foltz-Smith, 2019).

Thus, these interactions can be reshaped by real-time learnings to be able to use signals to create memories and use this information and learned behaviours to be more empathetic and to give back instantly to the users.

Case Studies

I searched for case studies in terms of clarifying the emotional interactions with products and tried to understand in which points they have a lack of communication and failed or a potential to improve to be successful. And also, with a couple of examples, I pointed out the importance of personalized experiences creates more engagement on users. These are the examples that I will describe with the reasons: Microsoft Bob, Jibo, Maslo, Olly, Sony Aibo, Riot AI, Headspace, a space for being by Google.

Social Interface "Microsoft Bob"

Social Interface

Social Interface Microsoft Bob   **P6.2**

Source: Microsoft Bob, 2019

In the evolution process of the virtual agents, Microsoft released a task-oriented software whose name is Bob as an early experiment in metaphor in design. Bob is created to become a "social interface" for creating a relationship between the computer and the user. We can say that Bob's aim was to create human-computer interactions. They were claiming that Bob was necessary and meaningful not only for the user and also for the computer to make the life easier.

This task-oriented software was the first step to understand and improve the user experiences in the digital era which today we can see this approach as a user-focused design. The interface allowed the user for Personalization of the room inside the software, friends with different unique personalities that everyone can find a suitable friend for themselves. The aim was to create social environments with these different personalities and approaches but in the end, the experience was unresponsive and it failed. Leading and dictating user behaviour with commands. Later, we started to see these interfaces' evolutions as live chatbots and customer services for customer experiences (Nicholas, 2017).

Jibo

A Social Robot

Jibo - A Social Robot — **P6.3**

Source: Camp, 2019

The history of Jibo traces back to the MIT laboratory. Cynthia Breazeal, a university associate professor, who created and directed the Personal Robots Group of MIT, started with the goal of researching robots, meeting with AI, and how people interact with them. Jibo is one of her work and it launched in 2014.

Jibo called as a first social robot for the home. In fact, it was planned to become a friend rather than being an assistant. Moreover, the aim of Jibo was different than the other smart speakers like initiating conversations and asking the user about how was their day. We can say that Jibo was intended for being empathetic with users (Carman, 2019).

It is made from plastic, with a head curiously tilting around itself. It is not embodied like humans and does not have arms and legs; it looks like a Pixar character. The head of Jibo is designed with a display to show its emotional reactions and looks like a black mask with an emotive white eye. If Jibo wants to praise to the user, this display takes a shape as heart or pizza. Also, it had a camera and sensors on the display to understand the user's closeness and shape the reactions (Camp, 2019)

In terms of interaction with a user and understanding the closeness of users could create more emotional relationships and interactions to bring new values to the user experiences with AI. Being dynamic and reacting to the user actions not only with body movements like turning and tilting but also reflecting a pizza or a heart on the display is showing that the product tried to humanized the artificial intelligence. Jibo had its own characteristic and sense of humour and its personality did not annoy any of its users.

One of the main reason for Jibo's failure is the timing for the launch because right after the released of Jibo, other tech companies occupied the home smart speaker market with lower prices.

Olly, Emotech

Robot with Personality

Emotech Olly   **P6.4**

Source: Olly Emotech, 2017

Olly is still in the prototyping phase. It is the first robot with a personality that it can adapt to each individual. It understands the user's emotions by facial expressions, vocal intonations and verbal patterns. Also, with this understandings, Olly interacts with users in an unprecedented way (Heyolly, 2018). Olly is designed with the advanced machine learning system that allows helping to remember users routines, rather than just responding to instructions. Besides, it provides a fully personalized experience, which helps Olly to understand and adjust feelings to the world (Indiegogo, 2017).

Olly interacts with users through a custom-built circular LED screen with an equally unique visual language, but comprehensible because of its common core patterns.

In terms of interaction, having different personalities and building them in time with learning from users habits and needs can help to create emotional and strong relationships with Olly.

Thanks to the different characteristics of the product will be able to create more personalized user experiences. There is still a good opportunity to discover more about the personalities and user experiences with being more empathic with the user.

So far one of the problems can be related to trust. Olly has a display and face recognition system so, the trust needs to be defined clearly in terms of user's data usage and storage. It needs to be clearly explained to the user how they can reach their data or deactivate it. Another problem can be the same as the other virtual assistants like Alexa and Google Home which is the usage of the device. If the product is in off mode, data will still be connected or the device will be completely shut down and will not record any conversation.

Riot AI

Interactive Digital Experience, Sensory Storytelling

RIOT AI - Sensory Storytelling   **P6.5**

Source: Riot, 2017

This is a different case study than the other examples because it is an immersive and emotionally responsive experience that use face recognition and artificial intelligence during the experience. Riot reacts in real-time to the participants' emotional state to engage and change the journey through video memory. During the experience, camera and sensors understand the user's emotional states and these changes affect the outcome of the interactions and as a result the user journeys. To create possible different user journeys, the team designed various scenarios to change the experience based on the user's emotional states and reactions.

The Riot virtual interface allows the players to explore their self-awareness through technology and storytelling in a groundbreaking multi-sensory experiment. The user interface is built into an immersive digital media environment and is both technologically and scientifically advanced. Moreover, it should be stated that it is based on a combination of neuroscience and artificial intelligence (Palmer, 2017).

The measured emotions are described as calmness, fear, anger and focus. For Riot, machine learning is the main emotion-sensing application technology. AI techniques can be implemented from the data set of the audience in order to learn about the data and create a computer model that can be integrated into an interactive movie environment and identify emotions in real-time (The Guardian, 2017).

The project aimed at making people see the advantages of AI and designing intelligent dwellings, buildings and communities. Riot and its technology could bring a new empathy to the storytelling and gaming that encourages the viewer or player to bring a change to the experience, whether in the narrative or in themselves.

If we consider this experimental design that creates an opportunity to be implemented for the virtual agents and understand the user's emotional states with having an empathy how could it change the user experiences for these devices. This case study gave a lot of inspiration to my thesis for implementing AI and computational models to change user experiences based on user's emotional states and defining a way to test the hypothesis in a small scale experience.

A Space For Being by Google

Multiroom Experience to Feel More

A Space for Being   **P6.6**

Source: Flanagan, 2019

Google Design studio and arts and mind lab of Johns Hopkins University designed a multiroom experience for Milan Design Week in 2019 and the installation is based on the principles of neuroaesthetics. The field of research that explores how different aesthetic experiences have the potential to impact our biology and well-being.

The installation includes three different rooms that designed with following the neuroaesthetic principles to let visitors interact with each room. Rooms also included different kind of objects with various colours and textures, books with different topics fro each room, soft music from Google Home with allowing to user to change the music, etc (Scarano, 2019).

During the journey, they gave bracelets to the visitors, with a skin conductance sensor that is already mixed with AI, to measure their emotional reactions, responses and understand how space is affecting individuals well-being and physiology. After the measurements, data collection from the visitors, they returned this data with an aesthetic visualization that is unique for each user because of the variety of emotional states. The team stated that they worked hard about the visualization of the data to avoid creating a feeling of being scared about technology (Hitti, 2019).

This case study led me to understand the importance of returning the data to the user with a more understandable way with being transparent and engage with users being open about the data collection. If the design could be more transparent and informative, people can build more trustful connections with technology.

Maslo

Empathetic Companion

Maslo - Empathetic Companion   **P6.7**

hey i'm maslo

Empathetic computing is not only feasible but the organizing principle
to transform technology into products that help us grow.
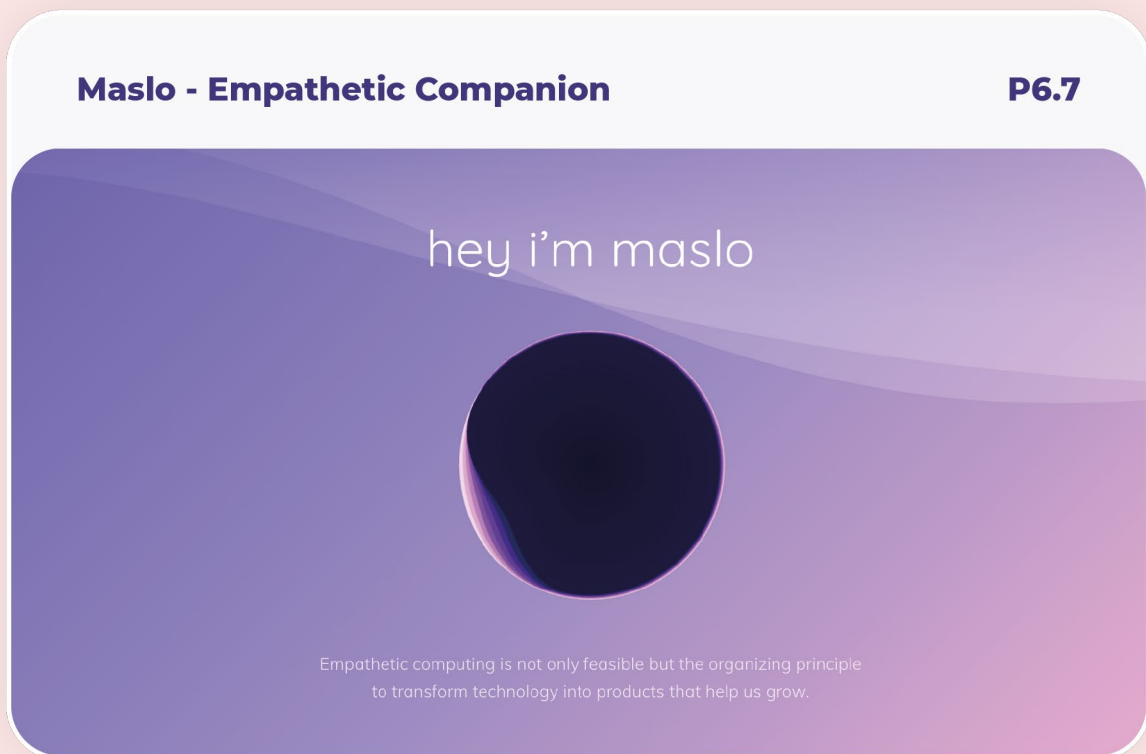
Source: Dreamjournal maslo ai, 2019

Maslo, which has been created by ex-Googlers will help users to focus on important things in their life and for improving their self-awareness with an interactive, emotionally intelligent AI. Maslo has a personality and articulate voice journal and it is designed to help users navigate the uncanny valley of technology and establish a healthier relationship with the ubiquitous digital assistant who lives in our pockets.

Right now it is an inquisitive child, it learns by asking questions from the user, helping itself eventually to become an adult and a mate of every user. The user will develop and realize his or her own knowledge. Maslo has an excited and curious personality and open for discovery and expanding its knowledge (Dreamjournal.maslo, 2019).

Ingram, the co-founder of Maslo, says about AI "I am always inspired by playful things in life. The same goes for empathetic artificial intelligence... if we are to truly deliver on the promise of artificial intelligence, what would that look like? Would it be cold and sterile like a robot? Or would it be something a bit more humanized and Pixar-like?" (Discovering Maslo, 2019).

Maslo has an organic shape and it is not embodied like other products. It is a digital companion and represents itself thanks to an organic shape with a distinctive, identifiable and yet versatile instrument that can express emotions in a natural, polymorphic, and communicative way. It is created with 8 maslo circles which include 256 triangles and this helps to Maslo to breathe in a relaxed state while Maslo is idling. The aim of Maslo's visual style, like an art ex-Machina, is to create an evolving form of art from AI. Also, this will help not only to understand emotions but also it will try to find a way to convey them in more humanistically.

In addition to that, Maslo has great potential to bring more empathy with AI and help to individuals for improving their self-awareness and to take a step further with their self-growth.

I would like to state that this case study became one of the main foundations of this research and help to gain strength for the thesis topic.

Interview Report

Interviewee:
Ross Ingram
Date:
28 August 2019

Ross Ingram

How did you start working with personal companions?

I started to work with designing interactive toys at Sphero and we designed BB8 App-Enabled Droid. This is an entertaining, interactive toy for kids who is a fan of the Star Wars movie. The toy is interactive and controlled by voice, it is perfect for little kids who can't use remote control. After this experience, I started to ask myself what if they have their own personalities and become more personal devices. With bringing this feature, can we create a relationship to help people to grow? So, these questions lead me to start my Adventure with Maslo.

Why your focus is on companions instead of virtual assistants like Alexa, and Google home?

I believe that in the close future assistants like Alexa and Google home will not be in our lives because they are not creating a strong belief in people. They are just tools that can answer the user's questions. Besides, personal companions are going to give questions to ask ourselves and have possibilities to reflect their path to help people grow. So, if we are able to use technology, first we need to use it for growing personally.

In addition to that, the main missing point is empathy. Virtual assistants have only capabilities to interpret the data but they are not empathetic. They are not able to share awareness, consequences and outcomes instead they are just taking the inputs from the user and giving them an answer as an outcome. Think about a domestic pet like dog, how they are able to create empathy, shaking their tiles to state their emotional condition, even having eye contact. What I am trying to say, we need to trust, to have trust we need to have empathy. So, this is a sort of an example of co-creation between the user and the companion.

What do you think about the role of Artificial Intelligence? What is the meaning of AI for you?

My thoughts about this question are the answer to why I am not working at Google anymore. People do not know how AI is working. We have been experienced to work with it but people do not. AI has to be accessible and open all the doors to people to let them learn. Again, I am coming to the same point. To let people learn from them, we need to develop relationships between people and the machine with empathy, giving more personality to devices. Today, machines are not only an avatar or programmed software. It does not mean anything to me to define a machine by asking questions and taking answers like "How are you? Fine and you? I am fine too". This does not mean anything, there is nothing personal and understandable. They need to be related to us, more empathic like a friend or a pet.

Also, I want to add something about AI. We are saying that Artificial Intelligence but we cannot call it as Artificial anymore because it is evolving to our lives more and more than before. It is real, not an artificial anymore. If you think about virtual assistants, they have already embodied…

Are they going to be enough accurate to communicate with the user?

Of course, they will not be 100% accurate like now. Even people relationships, reactions, emotional statements are not accurate too. Imagine that someone is crying in front of you and you will think about all the possibilities why s/he is crying, what should I do?… Then you will decide that probably I need to talk with her/him because s/he needs because of their emotional reactions.

Do we need a shape for AI?

I can answer this one by asking another question to you. Do you think that the reflection of AI is a human or like a dog is enough to trust them? Is it giving you any real feeling or do you already know that they are fake? How are you feeling when you talked with a human shape Chatbots? Is it creating fear or causing to you feel uncomfortable or opposite? I want to mention a sentence from Uncanny Valley, "Fear is about something clear and defined. It is a strong physical and psychological reaction to the experience of an immediate threat which can be real or imagined. Anxiety is fear out of control, out of context. It is about something vaguely unknown or unpredictable which may overwhelm us or not. Fear denies uncertainty, as one is absolutely convinced that the threat will materialise unless one reacts by flight or fight" (Nowotny, 2016). Maybe you will ask me what is the connection with my question, I would like to say to you just imagine the first creepy feeling of fear and then the possible psychological effects on human. This is an uncertain point so, maybe we should try a completely different way. As a conclusion, humans are not chatbots, humans are fluid, and Maslo should be that too.

So, how did you decide the shape of Maslo, I mean how it will look like?

We designed maslo as digital with using 8 Maslo Circles. The circles are formed by 256 triangle fans whose perimetric vertices use a 2d Perlin noise to modify their distance to the centre. This gives Maslo the relaxed breathing state you see when Maslo is idle. Using a slightly offset Gaussian curve to modify the intensity of the Perlin noise we obtained the 'Maslo curves' which are the ones that actually confer Maslo as an identity and make him recognizable as a brand element. So, there is an animation, movements that Maslo can reflect her/his emotions. For this, you don't need to give a face to something to describe emotions or simple reactions. If you want to know more, you can visit my blog post.

What will you improve and upgrade for Maslo?

Maslo is still on the beta version. So, we are still working on it to improve and at the same time, there are many ongoing research about it. If something is not working, we are changing our approach, or vice-versa if something is perfectly matching, we are going more deep with research. Also, we will join a research team at Columbia University because we want to make maslo more powerful and use this technology for us while the world is becoming more complex day by day.

With Maslo, we want to capture data from any source as possible and look of signals any data to measure to process these signals. For the next step, I can say that we will try to measure personal energy. What do I mean with energy? Maslo can measure the inputs which they are coming from someone's voice like frequency, volume and so on. Then, interpret the data to understand someone's emotional level. Also, maslo will be able to understand the environment where people are mostly talking with maslo or in which environment they are talking in a sad or happy way and many other examples like this.

Last question, how can we make someone to trust digital companions or the power of this technology? While I was searching for this topic, many people answered me that it is so creepy even without listening to what I am talking about? Can we cross this boundary?

I want to say just yes! We need to change the way to interact with people because they do not know the back and front job. They do not how even how is it working. So, they are simply not trusting and this creating the creepy fear about it. If you are asking me the way, I can say that with playing we can cross these boundaries. As Eames is saying that the play is a serious idea and with playing we are growing. It is actually true because most of the adults have fixed minds and they have to overcome it. Imagine playing basketball for the first time. You will throw the ball in any way into the hoop. What is it? It is a curiosity when you meet with something like the first time. So, we should push this curiosity always. For me, the key is "Playing". Then, it will create a committed relationship like a circle and trust will follow it without realising it.

Take-Aways

This chapter explained thoroughly how virtual assistants can become more like personal companions to increase an individual's self-awareness and growth with implementing emotional intelligence and empathy by defining more transparent communications. Also, the importance of building trustful relationships with machines are stated to be away from creating biases on this communications.

In the next chapter, the methodology and the experimental phases of research are explained.

7

Methodology

Pre-Experimental Phase of Research

Survey Structure

Survey Questions

Survey Outcomes Structure

True-Experimental Phase of Research

The Framework of Personality

A profound understanding of the users and their needs

An Effective Model of Personality

The Role of Empathy to Create Relationship with AI

Iteration-1 Design Process
Iteration-2 Design Process
Iteration-3 Design Process

Questionnaire

Prototyping

Introduction

The methodology for this research consists of a detailed outline of the empathetic companion's relationship with people in terms of;

- ▶ building more emotional connections with digital products,

- ▶ understanding the critical changes on episodic dispositions,

- ▶ increasing self-awareness of individuals.

With the understanding of the relationship with an empathetic companion, implementing this relationship and personality traits into the digital experiences to

- ▶ build more empathetic companion's onboarding designs,

- ▶ describe and analyze the personal experiments,

- ▶ understand the effect of these experiences with different personalities on the user's emotional states,

- ▶ test the hypothesis with implemented theories.

Also, in the last step explanation of how data was collected and which theories to implement to test the hypothesis.

The combination of the implementation of a user's personal trait, the meaning of companionship, building trust with an empathetic personal companion and the experiment will be used to answer the research questions. The research will be divided into two different sections as pre-experimental without a controlled group and true-experimental with a controlled group.

Pre-Experimental Phase of Research

Pre-experiment, without a controlled group, will be used to answer the research questions with running a survey in different countries to collect all different personalities, the meaning of the personal companions for individual and the usage of the digital virtual assistants like Siri, Cortana, Alexa, Google Assistant, to understand the desired personalities, the way of communication and interaction between people and digital products.

Research questions for the survey shaped as in two categories as the main question and sub-questions to create an opportunity to answer these questions and having data to be used for designing onboarding experiences with different personalities, communication ways and interactions.

First Research Question:

▶ What are the episodic dispositions to guide the design process of an empathetic companion's onboarding experiences?

Sub-Questions:

▶ Can a moment of self-awareness and emotional states be used to design the personalized experiences for onboarding processes?

▶ Which personalities, moments and media must be considered to build a trustful relationship with a companion?

▶ Which components need to be in place for personal experiences to meet user personalities, needs and desires?

Survey Structure

A quantitative study was conducted with an online survey to examine the moment of self-awareness on individuals, the meaning of companionship and narrative empathy with desired personalities and interactions from a digital companion that they are defined by participants. The online survey designed on Google forms to spread easily in between different countries and it consisted of 173 users in twelve different countries which are Holland, China, England, Turkey, Estonia, Germany, Italy, Japan, Netherlands, Norway, Russia, the United States. The main two countries pointed at the end of the survey as Italy (87 participants), Turkey (65 participants) and Germany (8 participants). The target of this survey is structured by Millenials and Generation Z without requiring distinctive expectations.

The simple but rigorous and scientifically validated evaluation of personality is structured based on popular personality tests such as the Aaker's and Carl Jung's Brand Personality Model, Myers-Briggs Personality Theory and Goleman's Model of Self-awareness and the Enneagram Model. The survey aimed to define different personalities in a different way than the regular personality tests that are available in different forms as online to define specific personalities. It should be stated that every people's personality includes all the personality types but some of them have a majority and dominant than the other ones. So, one the problem of these personality tests were not engageable enough with a lot of questions. Rather than defining the user's personalities, the aim of this survey is having insights about user's actions, decisions, emotions and the way of communications to have data for designing digital empathic onboarding experiences in different personalities.

The first part focuses on the moment of self-awareness for individuals. The aim of this part is to understand how much people know themselves and aware of their decisions and actions that happen every day in their lives with implementing personality trait theories into the questions and defining effects and triggers on episodic emotional changes. It consists of short questions with two different answer options that allow to participant select only one answer quickly which comes to their minds for the first time.

The second part focuses on the meaning of companionship for individuals in terms of the way of communication, interaction and different media to describe emotions on digital platforms. It comprises of quick short questions and also questions with multiple answers. Multiple selections are implemented because of data collection to shape onboarding experiences for the true-experimental phase to help to analyze and understand the behavioural changes and emotional states. The aim of this part is to understand the usage of mood aware media, matching these media with a character and creating a moment of trust with a real companion. The collection of data from this section helped to shape and design onboarding experiences with two different personalities with different communication ways like the tone of voice, media and changes of emotional reactions.

The third and the last part of the survey focuses on the narrative empathy with desired personalities that comes out as a combination of a real and a digital companion. One of the aims of this last part is to collect answers from users that they at least used one of the personal virtual assistants like Siri, Cortana, Google Assistant, Alexa and Maslo to understand the way of communication with these assistants. Another aim is to identify the desired personalities from reliable digital companions in terms of being Sincere (honest, well-mannered, cheerful, friendly, kind and family-oriented), Accomplished (logical, reliable, intelligent, confident and secure) and Excited (independent, imaginative, fun, exciting, cool and trendy) to use all these outcomes to define the two personalities for onboarding experiences.

Part 1

Based on a literature review, two personality trait models are implemented to the first part of the survey: Goleman's Model of Self-awareness and Myers-Briggs Personality Theory.

First of all, the explanation for the reason of selecting the Myers-Briggs Theory to implement into this part is to be an update on the psychological style theory of Carl Gustav Jung that is based on sixteen types of Jung's stereotypes and also, Myers-Briggs theory has also been mentioned today as one of the world's most popular cognitive method. In addition to this, the aim of this theory is to understand and define the personalities that are most appropriate for individuals. The theory of personality of Myers and Briggs is an inventory of the type, weak points and interests of an individual in self-reporting form. This theory was constructed on four scales (mentioned in Chapter 3) and for this part of the survey, only two scales are selected to analyze the answers based on being more extroverted (E) or introverted (I) and thinker (T) or feeler (F) to shape the empathetic onboardings. With these two scales, questions are constructed around people and events, ideas and knowledge to find the outcomes are on more on extraversion or introversion side and also, facts and logic, defining values and interactions to identify the outcomes are more on the zone of feeling or thinking. From this part, I collected the outcomes to create personality metrics at the end of the survey. These outcomes crossed with the results of the second part of the survey to design two onboardings with different personalities which these personalities came up as a result of crossing these outcomes.

Secondly, personal skills require self-awareness and autonomy. Self-consciousness helps a person to control their emotional reactions and comprehend the impact on others of their behaviour. For this, Goleman's Model of Self-awareness, which he describes in his theory of emotional intelligence with five core emotional traits, is implemented in the first part of the survey. From these five core traits, knowing and understanding the thoughts of someone's own and also managing and regulating someone's own emotions are considered as the main two-approach and implemented in the questions to make the survey more creative and thoughtful even if the questions are based on the quick responses. Users needed to consider their actions and ask themselves to be aware of themselves and select the most dominant one which comes in their mind as a first response.

Feeling (F) / Thinking (T)

Feelers   Agreeableness (Kind and trustworthy)
                    Decisions with heart
                    Their effects on people are important

Thinkers   Conscientiousness (Goal-focused, well-organized)
                    Decisions with mind
                    Finding the most logical, reasonable choices

Extroversion (E) / Introversion (I)

Extroversion   Openness to Experience
                        Being with people
                        Busy, always active, expressive, outspoken

Introversion   Closeness to Experience
                        Being more reserved, thoughtful
                        Prefer to be alone or in a small group

Part 2

Based on a literature review, the second part of the survey is structured according to Carl Jung's Archetypical theory and Aaker's Personality trait. As it is explained deeply in chapter 3, Archetypes are classified as universal patterns, pictorial patterns, and collective unconscious models. Jung identified through these 12 primary archetypes, and the associated motivations, the four cardinal orientations represent a model to our understanding that has a set of values, significances and individual characteristics. With the consideration of these four categories to define the sincere and accomplished characters, one archetype is selected from each category which they defined as the lover, the creator, the sage and the magician. The lover and the creator archetypes are used for creating more sincere/friendly personality besides, the sage and the magician archetypes are used for designing more accomplished/logical personality for the digital onboarding experience. In addition to this, the survey questions are structured based on archetypes' core desires, goals, greatest fears, strategies and fears to understand what are the people's reactions, the way of thinking and making decisions and variables that affect people's mood and communication.

The Lover

- ▶ Core desire: Confidentiality and experience
- ▶ Goal: To be in a relationship with the people and surround with peoples' love
- ▶ Greatest fear: Being alone, undesired and far away from being in love
- ▶ Strategy: To become more and more attractive both physically and emotionally
- ▶ Talent: Strong emotions, thankfulness, appreciation, and loyalty
- ▶ Known as: the partner, friend, intimate and sensualist

The Creator/Artist

- ▶ Core desire: Creating things with lasting values
- ▶ Goal: A dream to achieve
- ▶ Greatest fear: Having common dreams and results
- ▶ Strategy: Developing the ability and artistic control
- ▶ Talent: Imagination and creativeness
- ▶ Known as: The artist, innovator, and dreamer

The Sage

- ▶ Core desire: Finding the truth
- ▶ Goal: To understand the world by using intelligence and analysis
- ▶ Biggest fear: Be deceived, cheated and unawareness
- ▶ Strategy: Searching for information and knowledge and also thinking processes of self-reflection and understanding
- ▶ Talent: Intelligence and wisdom
- ▶ Known as: The expert, advisor, thinker, planner and mentor

The Magician

- ▶ Core desire: Knowing the fundamental laws of the universe
- ▶ Goal: Making the dreams come true
- ▶ Greatest fear: Unintentional negative effects
- ▶ Strategy: Create a dream and live through it
- ▶ Talent: Finding solutions with positive outcomes
- ▶ Known as: The visionary, inventor and leader

In addition to Carl Jung's Archetypical theory also Aaker's Personality trait is implemented to the second part of the survey to understand the meaning of a real companion. Moreover, the multiple answer questions are implemented for defining expected personalities and behaviours from the perception of a companion. In addition to that, one of the aims of shaping the questions on this theory was to understand;

- ▶ which characteristic features create an effect on people for feeling more comfortable while they are sharing them with other people or with their inner character,

- ▶ in which situations people want to share their feelings,

- ▶ the willingness to share their emotions or thinking about them,

- ▶ in which way they want to increase their self-awareness like changing the situations that they have an effect on their mood, keeping them on the track with helping them to reach their goals and listening to them without suggesting any solution or giving advice etc.

Aaker's model focuses to define brand personality. The reason for using this model was to implementing the expected or desired personalities into the onboarding characteristics. For instance, a digital companion characteristic might be defined as being more reliable, sincere, logical, helpful, funny, self-confident, imaginative, thoughtful etc. So, it helped to define the two personalities and implement people expectations on the digital brand's onboarding processes to meet with these products for the first time. The benefit of using Aaker's model that it enables brands to identify their tone of voices, create trust and convey messages from the brand identity. The main objective of the model was to investigate the characteristics that users assign in their lives to their real companions.

Part 3

Before starting to structure of part three, a critical challenge has taken into account to express both affective and personalized attributes by means of consistent interactions in the computational context. Furthermore, it must be tailored to the different communication types of users.

The aim of the last part of the survey is mainly to understand which virtual assistants were used by people and what type of personalities and the way of communications desired to be implemented in virtual assistants to make them more empathetic and emotional. Also, another aim was to find out the interactions that people wanted to use personal companions like increasing their self-awareness, keeping them on the way to reach their goals or expecting to be understood without telling the same things every time and etc.

Finally, the last two questions are shaped with people's imagination with thinking if the virtual assistants are becoming more empathic and reliable companions to understand that people were willing to give a name to them or how they would like to call and interact with them. With this question, the aim was to make people thinking about the relationship if machines could have a chance to be their companions like their friends, families, pets that they are emotionally connected. There was a possibility of unintentional reluctant answers, but all the answers showed that it was considered and showed their willingness to give a name to their possible companions.

The collected answers from this part helped to the design phase for designing different onboardings with various communication skills to define a tone of voice, visual style, content of each step, structure of sentences like long or short sentences and different personality features like acting as a friend, more serious or logical etc. And also, these variable outcomes are used to shape personal digital companion's emotional states and reactions.

Survey Questions

Survey questions can be seen in the Chapter 8
with the survey results, represented in diagrams.
Also, it is accessible with the QR code.

Survey Outcomes Structure

The extensive investigation influenced the findings in three established personality patterns. The questionnaire is translated into three parts of binary choices to test the three patterns. With this aim as I stated on the survey structure, the first part of the survey focused on to define two different personalities that the users are more on thinking or feeling side or they are more extraverts or introverts characters. The second part focused on identifying people's approaches that they are on the more emotional, logical side or in the middle of both sides.

Then, to reach the result and select two different personalities in three outcomes to define the digital companion personality, the Enneagram model is implemented on the personality evaluation methodology. With the Enneagram model, personality metrics are created to define the potential personality types to be used for the creation of the two different digital companions. Each onboarding is informed by intimate decisions and individual ways of thinking, and the aim of this onboarding experiences was to make them feel like empathic and reliable personal companions for research purposes.

Personality Metrics

- ▶ Extrovert (E) / Introvert (I)

- ▶ Feeler (F) / Thinker (T)

- ▶ Emotional (Em) / Logical (Lo)

Possible Outcomes

- ▶ EmFE   (Emotional Feeler and Extrovert)

- ▶ EmFI   (Emotional Feeler and Introvert)

- ▶ EmTE   (Emotional Thinker and Extrovert)

- ▶ EmTI   (Emotional Thinker and Introvert)

- ▶ LoFE   (Logical Feeler and Extrovert)

- ▶ LoFI   (Logical Feeler and Introvert)

- ▶ LoTE (Logical Thinker and Extrovert)

- ▶ LoTI (Logical Thinker and Introvert)

The focus was to identify the Emotional and Logical users which they include also at least one characteristic from the first part of the survey which is extrovert-introvert and feeler-thinker. These metrics have given an opportunity to users for finding common points and features which they match with their characteristics. Thus, it was aimed for the users not to feel unfamiliar with the application. And to imagine themselves in a natural conversation.

True-Experimental Phase of Research

True-experimental phase, with a controlled group, structured to understand user's behaviours, changes on their emotional states through on the episodic dispositions. The second question of the research is answered in the experiment later in this chapter. This experiment will assess the onboarding prototype against another version of the onboarding which behaves less empathic and emotional with using a different tone of voice and visual style for the communication and interaction with the user. The experiment includes three iterations and developments based on the results from each iteration sessions. All the experiments will be used to collect qualitative data to understand whether the digital companion personality improves the user experience, create an effect on their emotional states and have a feeling of trust between people and the companion to create a first positive impression between each of them. In addition to that, this experience will be analyzed to be helpful to motivate people for fulfiling their own desires and ambitions and to take appropriate action and suggestions.

This phase of the methodology will first define the research question and then explain how the personality framework and design process was implemented which comes from the survey results, the setup of the experiment, hypothesis and the collection of data will be established deeply.

Second Research Question:

▶ Will empathetic onboarding experiences with a defined personality encourage the user-companion interactions to create trustful relationships?

The Framework of Personality

In order to construct the personality model, four components are identified for the digital companion personality that is based on:

▶ The aim of designing empathetic onboardings

▶ A profound understanding of the users and their needs

▶ An effective model of personality

▶ The role of empathy to create a relationship with artificial intelligence (AI)

The first element is required to make sure the character and actions of the digital companions adhere to the aim of designing empathetic companions and the goals and a tone of voice of the digital product that it represents and support the individual's expectations, needs and desires. The second aspect must be fulfilled in order to ensure that the personality supports the users' interests and to decide which personality traits are appropriate for individuals. In addition to this, each iteration for the design testing must be explained through the users' expectations and desires after interacting with prototypes. The third component, an effective model of personality, is important for organizing and mapping personality traits into a suitable framework which will be shown on the personality diagram after the analyzing of quantitative data when the third iteration of the experiment is completed. Also, this part explains the implementation of a personality framework to construct the digital companion personality which will be tested to understand how different personalities have an effect on user experiences. The last component is needed to describe the importance of implementing artificial intelligence and machine learning into design processes to create more personalized empathetic experiences. Moreover, it explains the importance of having different personalities for digital companions to meet users' needs and shape the flow of the communication based on users' actions to create positive first impressions and a feeling of trust.

Design Process

The design process used a users-centred design approach in order to gain insights into the needs of users and to inform the digital onboarding prototype requirements. The design process focuses on the design-thinking model in five phases proposed at Stanford's Hasso-Plattner Institute of Design (Hasso Plattner Institute of Design at Stanford, 2010). The model of five-stage is constructed by a non-linear process which is defined as:

▶ Empathising: To understand user needs and desires

▶ Defining: To reframe and define the problems in human-centred ways

▶ Ideating: To develop several ideas in ideation sessions

▶ Prototyping: To adopt defined personalities in prototyping

▶ Testing: To collect insights for the next phase of the prototyping
  and see what is improved the user experiences

Therefore, each of the five phases follows the core user-centred design concepts, in which the empathising and the defining step will focus on the user and research analysis (the framework of personality, components 1 and 2). The ideation part focuses on the design processes and definition of the empathic companions' personalities (the framework of personality, component 3). The last two of stages which are prototyping and testing focus on assessing the final prototyping after the three iterations of the digital onboarding to

determine the nature of the user's interpretation, its effects on the user experiences and the changes on emotional states of users (the framework of personality, component 4). The research will concentrate on testing the final digital prototyping to evaluate the digital companion characteristics in terms of peoples' interpretation and companions' personality impact on user experiences.
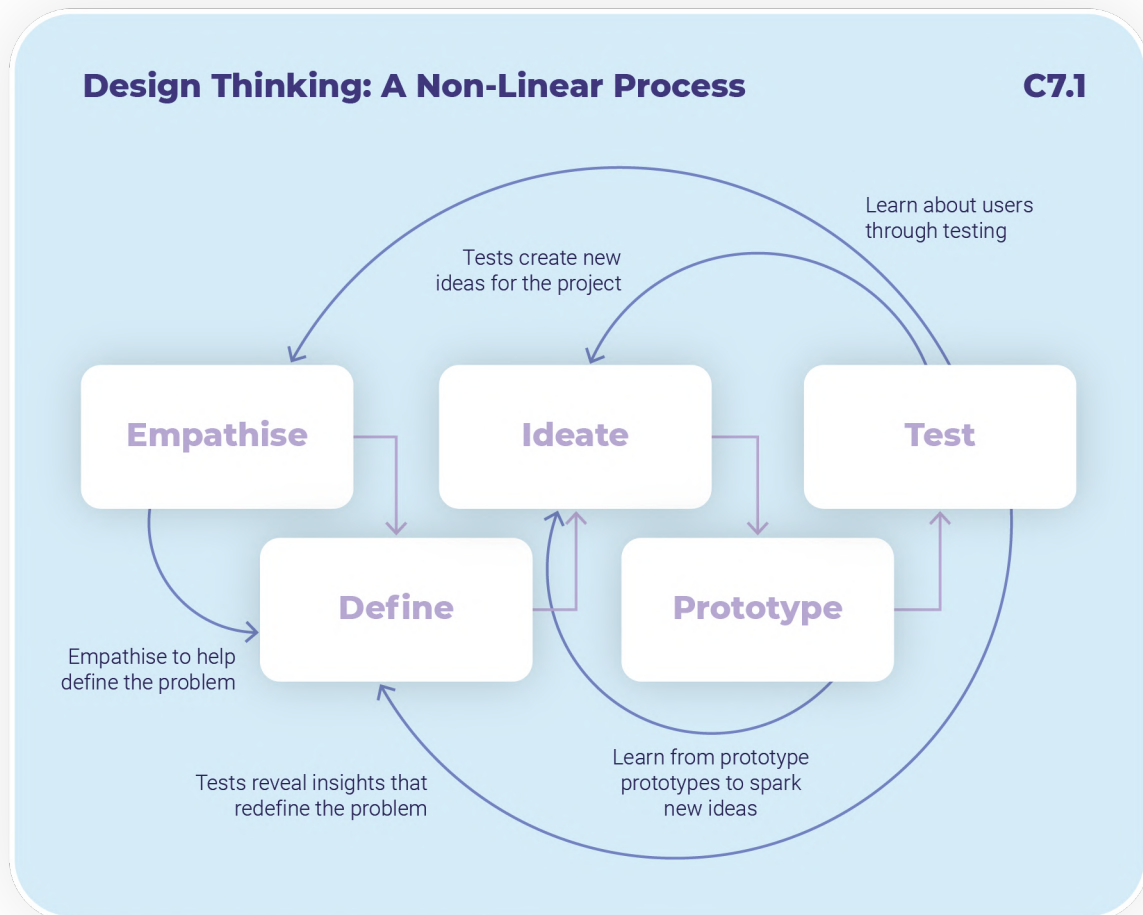
Source: Interaction Design Foundation, 2019

An innovative approach to inventing new ideas is user-centred conception (UCD), which starts with individuals and ends with answers that are customized to their individual needs.

This method combines analyzes, interviews, generative strategies and instruments and UCD focuses on designing, testing and collecting all the feedback to improve the product then test it again. And this loop continues with many iterations. User-centred design is needed to understand users' needs and desires by incorporating users at all stages of the design and testing processes. Therefore, it relies on feedbacks, insights, wishes and suggestions which they come fro users and thanks to iterations, it ensures the design processes responsive. In the final assessment, qualitative information will be gathered to address the second research question and hypotheses.

The aim of designing Empathetic Onboardings

The design of empathetic onboarding experiences is combined with two phases in terms of identifying the companions' personalities from the survey results and taking into consideration of the real brand to develop the prototyping. The brand and domain were selected with a reason for being different than the other products on the market in terms of being empathetic and more personal rather than the virtual assistants. The purpose and the aim of the product which calls as Maslo used as an example in the context and testing with redesigning the onboarding of the application and changing the personality of the companion. In brief, Maslo used with the aim of analyzing the meaning of empathetic companion. The onboarding experiences will be used to support the brand's goal to increase individuals' self-awareness and to create trustworthy relationships with digital empathic companions.

The empathetic companion domain is based on a real digital empathetic companion to create the prototyping, check the personality frame and adopt a user-centred design approach. The collaboration is stated for the research part of the thesis for the definition of digital companions characteristics through testing onboarding experiences as the first meeting with a companion, positioning the perception of digital companions' personality and sense of trust to build reliable relationships between users and digital companions. Using a real-life example was important for the prototype to demonstrate how the personality of the virtual empathetic companion reflects the tone of voice, aims and values of the brand. Also, as I stated before, using only the real brand was not enough to build prototyping for defining the personalities of a digital companion for testing with different users that they have different personalities than each other. So, the survey results are merged with this real brand and designed two different personalities with considering the different tone of voices, media that implemented into the design, visual styles, contents of the conversation and the way of interaction not only physically but also emotionally. Thanks to this unification, the prototype will be able to collect variant feedbacks from the users to meet with the aim of the empathetic companions.

Analysis of Tone of Voice

The tone of voice is interpreted from the brand's actual tone of voice and personality. The tone of voice is defined mainly by the content, call to actions and supported by the visual elements. The first onboarding designed with more logical personality and the tone of voice described to be more informative, intelligent and thinker rather than having an emotional conversation. It is identified as being a logical thinker to lead user for reaching their goals, keeping them on their way to make their dream come true and helping them to reveal their inner hero with growing their self-awareness. The tone of voice to ask questions to users is described as being more straight to the point without explaining all the reasons or informing users with all the details and the tone of voice for reactions after users shared their information is structured with logical and stable answers and reactions.

On the other hand, the second onboarding experience designed with more sincere personality and the tone of voice described being more emotional and empathetic, excited, imaginative and as a feeler rather than having a structured logical conversation. It shaped with more natural reactions based on a human to human communications. Also, it is identified to help people to increase their self-awareness with imagination and to build a feeling that they can make it together and take this path to share this experience with learning and discovering together. The tone of voice for asking questions to users is described as being more curious about the information's that users are giving and the tone of voice for reacting after receiving the information from the users is defined with a more friendly approach like in real natural conversations between friends.

To create the whole content and keep it coherent with the flow, the tone of voice is described as a product personality which is communicated both by writing and visual communication. For visual communication, the first onboarding with a logical personality designed with more static visuals and used geometrical shapes with blue and white colours. The background visuals designed and kept in the same position. Texts are located in the same positions to be single-oriented to understand how users attentions were changing if they are only following the same visual strategy without having any movement to change their point of view. At the beginning of the experience, the character with abstract geometrical shapes takes a position and keeps its position during the journey. It just changes the dimension of circles based on users answers about how are they feeling. Even these small changes locate always in the same position and try to understand users attention level during the experiences.

In terms of visual communication, the second onboarding with a sincere personality designed with more curve shapes to make the visual design dynamic and fluent. Also, the background visual design includes a sort of abstract character which moves in each scene and reflects emotions with basic shapes not only to describe emotions to state users' emotional states but also to show companion's emotions. When this abstract character takes a flat shape, it represents calmness. Besides, when the shapes become together and create more dynamic shapes, they create an effect on users and help to perceive the character's emotions. For instance, when the character wants an action to start a journey, it becomes more visible and points the start call to action so, it aims to be more couraged and ready to meet with a user. Moreover, when a user starts the experience, at the beginning of the onboarding the character stays in flat and not shows itself to give time to user focus on more content and understand the aim of the companion and the product.

Human personality characteristics are perceived on the basis of the behaviour, the physics, attitudes and beliefs of an individual and its demographic properties (Park, 1986). While personality traits of humans and brands may have similar conceptualization (Epstein, 1977), they differ in how they are formed. Using the Aaker's brand personality model, it ensures constant messages in all the interactions through the tone of voices that constantly refers to the brand personality. In deciding the number and existence

of dimensions of brand personality, Aaker established a structure for developing the conceptual framework for the brand's personality construction (Aaker, 1997). According to her model, the tone of voice is determined for this experimental design as sincerity, excitement and competence in between five dimensions which are sincerity, excitement, competence, sophistication and ruggedness.

The first onboarding, logical personality, reflected the competence personality with a tone of voice in terms of being intelligent, reliable, secure and confident. The second onboarding, sincere personality, reflected the sincerity personality with a tone of voice in terms of being cheerful, friendly, kind, excited, imaginative and reliable.

Lastly, it should be stated that both of the companion's tone of voices are determined very carefully, in keeping core values of being respectful, trustful and empathetic.

First Onboarding Experience   **C7.2**

Funny	———————————●———	Serious
Friendly	——————————————●—	Formal
Untrustworthy	——————————————●—	Reliable
Imaginative	—————————————●——	Intelligent

Accomplished / Logical Personality

Second Onboarding Experience   **C7.3**

Funny	———●———————————	Serious
Friendly	—●—————————————	Formal
Untrustworthy	——————————●————	Reliable
Imaginative	—●—————————————	Intelligent

Sincere Personality
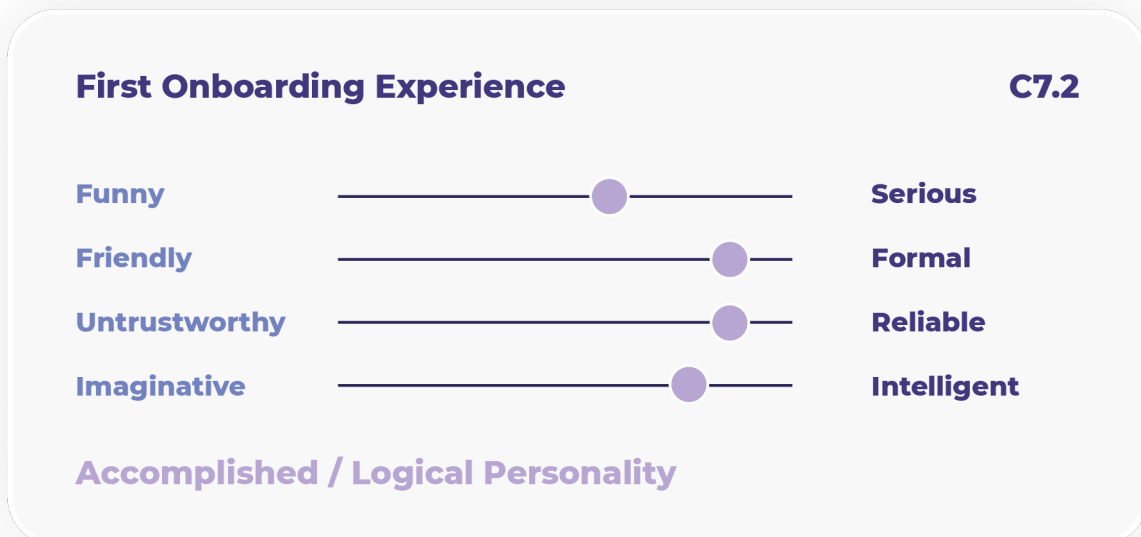
A profound understanding of the users and their needs

To achieve the second aspect, both preliminary research, pre-experimental phase without a focused group, and secondary research, true-experimental phase with a focused group, was collected to understand both the variables of establishing trustworthy relationships between users and digital products in order to gain a deep understanding of users' needs and requirements.

Iterative Design

To understand the users' needs and requirement to build more trustful relationships and meaningful interactions between users and products, iterative design methodology used for testing the onboarding designs. The functionality dimensions and the 5 related attributes are taken into account into the iterative model which are defined as:

- ▶ Easy to learn
- ▶ Efficient to use
- ▶ Easy to remember
- ▶ Few errors / Easy to adapt
- ▶ Pleasant to use

These variables are not only considered in terms of usability of the prototype but also it had an important effect to convert the users' insights into the next experimental design and understand how their effects are changing during the testing. At the end of the true-experimental phase, it is expected that the results will be open to discover more and going deep with the research and also they will be able to show the different personalities effects on people behaviours, perceptions of emotions and episodic dispositions.

Interviews

With the iterative design methodology, the onboarding designs are tested by users in three sessions. Users have selected with different nationalities to test the prototype and see the different social and cultural effects on user experiences.

The first iteration conducted with five users from an MSc. Digital and Interaction Design course at Politecnico di Milano with semi-structured interviews and observations. The students are selected between 20 and 22 years old because users of this age range are positioned between millennials and generation Z and they perceived as early adopters for the digital products. Users completed the first iteration of the experimental design

by testing the first version of the digital onboarding prototypes. Based on their feedback and suggestions about the prototype, the onboardings are redefined with the users' understandings and insights.

The second study explored the usability of the basic structure of the prototype more fully, evaluating issues such as information architecture, task flow and the user needs. This iteration conducted with ten users with different educational and professional backgrounds. Mainly they were the last year students at Politecnico di Milano in different master programs and working as a professional in several companions as an interaction designer. For this testing, they are qualified as expert users in terms of understanding of interactions and testing the usability of the digital empathetic onboarding designs. Seven of them are both working as professionals in different fields as a digital product designer and service designer also, they are last year MSc. student at Politecnico di Milano in different courses. Other three of them are only working as digital product designers and an architect. The users' age range is in between 23 and 28 and positioned as Millenials. Users completed the second iteration of the experimental design by testing the second version of the digital onboarding prototypes. Based on their feedback and suggestions about the prototype, the onboardings are redefined with the users' understandings and insights.

Thus, at the end of the second iteration, onboarding prototypes have been tested with fifteen users with following the basics of usability testing methods. As it is stated by Nielsen, the prototype needs to be tested with at least 15 users to identify all usability problems in the design (Nielsen, 2000). In addition to that, to point out creating trustful relationships between users and digital companion, diversity became one of the important variables to see the different cultural and social effects. This iteration collected all the insights and feedback from users to redesign the flow of the onboarding experiences to understand in the next iteration the importance of creating trust with selected and implemented design into onboardings.

The third iteration is conducted with usability testing with questionary that is composed of structured questions and has been done by online. The last designed version of the prototype sent to the users with a link which includes a digital mockup to test the prototype and also the questionnaire at the end of the experience. Users are selected both from the second iteration, seven users, and online survey from the pre-experimental phase of the testing. Users were more comfortable and free to act at this stage of the test. In addition, the questions were prepared in a simple and effective way with quick response answers.

An Effective Model of Personality

The model chosen to design the personality of onboarding experiences was Jung's Archetypical theory and Aaker's Personality traits, also it is stated in Chapter 6, to describe the survey structure in part 2.

First of all, to describe the personality of the "Logical" companion, first onboarding experience, built from the sage and the magician archetypes and the "Sincere" companion, second onboarding experience, built from the lover and the creator archetypes according to the model of Jung's archetypes. On the other hand, for the first onboarding, more competence and logical, intelligent and explanatory traits and also, for the second onboarding, more sincere, cheerful, explorer and imaginative are implemented according to the model of Aaker's brand personality. In addition to this, these two onboardings shared the same common traits and they defined as being reliable, kind, honest and thoughtful.

Secondly, personality models not only implemented to the onboardings but also they applied to the question while the companion was asking a user about their personality. Options are divided into 4 categories, both onboardings have the same question and options, as:

- ▶ Excitement

- ▶ Imagination

- ▶ Intelligence

- ▶ Achievement

This part aimed to give a feeling to users for personalized experiences and to show them that the journey will be tailored with their responses and also, to understand with supplying more or less information effect on users' decision making processes and changes on their level of excitement, engagement and curiosity. Moreover, again Jungian archetypes are used to define users' personalities and the explanations are interpreted from archetypes definitions. To create the content texts, Adobe Creative Types' definitions are interpreted to use in the prototype to communicate with the user in psychological terms and to convey the correct message because Adobe's test contents are created by Carolyn Gregoire, a Huffington Post senior writer, writes on psychology, mental illness and neuroscience (Anyways, 2019).

The Role of Empathy to Create Relationship with AI

As human beings, we continue to develop a society and economic ecosystem that invest in the development and use of tools such as computers that conflict with what we learn about nature and learn from what we value as a species. The reason is simple, we need them to simplify our daily basis and reduce our cognitive load. Today, the machines are becoming more intelligent and learning faster than before and also they are already able to memorize our actions. However, now the situation is describing how we started to define the machines with the latest news like collecting users' data even the machines are inactive mode, selling users data to the third parties, keeping their information related with the daily life basis, locations that they have been or they will be, even bank account information for online shopping automatically, and like many other examples. Since the situation is like this, people are still using these machines even if they do not like, appreciate or even can not understand.

So, we can say that people are becoming more aware of their actions and decisions but still, transparency and trust is missing to create relationships between people and machines. There is a key point to have a chance to establish these trustful relationships is to create empathetic companionships. Just as people create empathic relationships between each other over time, and these relationships are defined as the steps and stages of friendship and loyalty, relationships between people and machines can also be built with empathy over time, using this model as an example. For this, people and machines need to be involved in the same co-learning and co-creating experiences together and the meaning also the aim of AI should be explained in this transparent mutualist processes. Therefore, people and machines need to spend more time like in daydreaming or discovering issues creatively and should stop seeing machines as tools with creating more empathetic aspects and being more open for discovery to have trustful companionships. Thus, AI can involve in our lives with more trust and openness.

Iteration-1 Design Process

Since it is pointed out the importance of onboarding experiences, to develop the first prototype, I decided to start from the architecture with researching which are the main steps of meeting with new people. Also, I focused on which variables are considered to be represented through experiences. With this way, I came up with a series of questions and actions that reflect the born of a new relationship between human beings. Namely, exchanging names, asking how is life going, sharing in between people what are they doing in their life, start wondering about approaches to life and lastly building the first sense of trust. In this way, I tried to translate these moments of human interactions into steps of the onboarding experiences to redesign onboarding of Maslo.

From the survey, I was able to identify two main personalities. I decided to develop 2 main onboardings based on the answers which are previously stated with questions. In this way, I was able to test how people behave in front of two different personalities in order to prove that different personalities even in a digital interface can build different empathy with the user.

Talking about UI, I have opted to differentiate the two personalities based on colours, shapes, layouts, fonts and character reactions.

For the logical companion (On-boarding-1)

Colours: Blue and tones, also, bluish-purple colours are used to create more logical and intelligent oriented perception. The aim was to keep distance with the user for the first meeting and to show the character as more achievement and goal-oriented.

Shapes: Geometrical shapes, mainly rectangles and circles are used in a definitive position, which is located on the top part of the screen, in order to stay in calm and have an edge with users. Also, geometrical shapes gave countenance to the intelligent and wisdom personalities of the character.

Layouts: Flat background to give a stable and structured feeling to reflect the companion's personality. For asking questions, UI designed with rectangle buttons in grids with considering the simplicity of the design. Also, for moving to the next page, an arrow with low opacity is placed at the bottom of the page to lead the user to take the action before continuing.

Fonts: For the main title DIN Pro because of the geometrical shapes of the font to support design elements and also it's unadorned appearance. For the body, Roboto light is used as the Sincere onboarding to support the readability of texts and to avoid complexity.

Character Reactions: The stable position of the design protected and character's reactions defined by the only tone of voice and small size changes on the geometrical shapes.

For the Sincere Companion (On-boarding-2)

Colours: Soft purple and light pink colours used to create to support users' imagination personality and also thoughtfulness. The aim was to create a more friendly and trustful feeling thanks to the warm and soft colours.

Shapes: Rounded and curvy shapes supported the design in order to have a more friendly approach and perceive them more organic and natural. Besides, this onboarding supported with other visual elements like emojis to help to increase the readability of texts and also, emotional iconic shapes to make the character more alive.

Layouts: Dynamic background to give movement to the design and to keep the users' attention high. Curve shapes moved up and down and based on the questions and users' answers. Also, a simple arrow placed at the right bottom of the screen after the action has been taken by users in order to give a room to users for discovery and thinking.

Fonts: For the main titles Montserrat bold because of the font dynamism and the geometric simplicity of letters. For the body, Roboto light is selected like in Logical onboarding because it is simple but also sophisticated. Also, the font allows users to read easily and fluently the texts.

Character Reactions: Based on the users' actions and selections, the abstract character's eyes are reflecting the users' emotional states after the emojis are selected by users to answer the question of 'How are you?'. Moreover, after the personal questions, the character moved up and down to become more visible or hidden to reflect that it is shy, curious, thoughtful, excited or sad.

5 Steps of First Meeting with Companion

The architecture of the onboarding experience mainly shaped with starting from human to human interactions and with shifting the point of view to human to machine interactions. As stated above, 5 steps are defined for the first time meeting with a companion with inspiring from a real meeting of two-person.

1. The first step defined as an introduction between user and companion.

Logical Onboarding: Maslo starts with an introduction about itself and asking the user's name as "Hi, I am maslo, a digital companion. I'd like to focus on important things in your life. What about you, what is your name?".

Sincere Onboarding: Maslo starts with an introduction about itself friendlier and emotional and then asks the user's name "Hey, hiii.. I am maslo. I am here to do my best to be your companion and expand my knowledge to increase your self-awareness. What's your name?".

2. The second step is a soft question before starting to conversation and introductions.

Logical Onboarding: Maslo asks after user placed their name "Thanks! Nice to meet you. By the way, how are you?" and offers to users 4 option which is text-based to pick up one of them by the user (visible in the first on-boarding flow, in the next pages). Options are defined with simple answers:

- ▶ a. I am good and you;
- ▶ (this is the only option to give an opportunity to ask back maslo and to understand users are willing to ask back or not)
- ▶ b. I am good;
- ▶ c. Not so good;
- ▶ d. I don't know;

Sincere Onboarding: Maslo asks after user placed their name "Thank you to share. I am glad to meet with you. First things first, how are you doing?" and offers to users 4 option which is presented with emojis to pick up one of them by the user. Options are defined:

- ▶ a. Grinning Face with Star Eyes Unicode Emoji (represented 'great')
- ▶ b. Smiling Face Apple Emoji (represented 'good')
- ▶ c. Sad Pensive Apple Emoji (represented 'a bit sad')
- ▶ d. Overheated Face Unicode Emoji (represented 'I don't know')

3. The Third step is defined with the deep question to understand users personality.

Logical Onboarding: Maslo gives information about itself and then asks users about their personality as "I use my intelligence to solve things and I am a logical thinker. Which one are you?" and offered 4 options which they are built with the personality theories. (check "an effective model of personality") Options are defined as:

- ▶ a. Excitement

- ▶ b. Imagination

- ▶ c. Intelligence

- ▶ d.Achievement

Sincere Onboarding: Maslo gives information about itself and then asks users about their personality with more organic buttons with aiming to share information to avoid creating a stressful moment for the selection and without thinking that the answer will be wrong because for Sincere companion openness is an important value. Maslo says "So, well.. I would like to discover which one is you more? So, I can use my imagination to help you." and offered 4 options which they are built with the personality theories. (check "an effective model of personality") Options are defined in the same way of logical onboarding.

4. The fourth step is an exchange point between the companion and the user to create trust in each other.

Logical Onboarding: Maslo says "Great! It is clear to me. I am sure together we will take a path to grow our potentials! Can you trust me?" and offers 2 option to select:

- ▶ a.Yes, for now (Here, the aim of saying 'for now' is to make users thoughtful about data protection, privacy, policy and create a question on their mind which is "can I delete it later, what are the options if I do not trust later or if I trust more what can happen...".)

- ▶ b.No, not yet (Here, the companion gives an opportunity to start and try to build relationship and trust in time.)

Sincere Onboarding: Maslo says "I trust you Friends support each other. I can trust you. Can you do it as well for me? There is nothing to hide." and 2 option to select as in the same way of logical onboarding.

5. The fifth and the last step is the beginning of a journey, with meeting maslo and entering the application. This screen shows the real screen from the maslo app as same as for both onboardings.

First Iteration
On-boarding-1

Insert your name

Name inserted

Go back

How are you

Hi I am maslo
A digital companion

I'd like to help you to focus on
important things in your life.

What about you, what is your
name?

Insert your name

Hi I am maslo
A digital companion

I'd like to help you to focus on
important things in your life.

What about you, what is your
name?

Great name

→

Thanks!

Nice to meet you. By the way,
how are you?

| I am good and you? | I am good |
| Not so good | I don't know |

→

Insert your name

Next page

maslo's reactions

maslo's reactions

Good to hear!

Thanks, I am good too

I am new here and actively learning about the world.

I want to help you to grow your potentials and reveal your inner hero.

→

Good to hear!

It's a positive start

I am new here and actively learning about the world.

I want to help you to grow your potentials and reveal your inner hero.

→

Go back

Next page | after asked back to companion
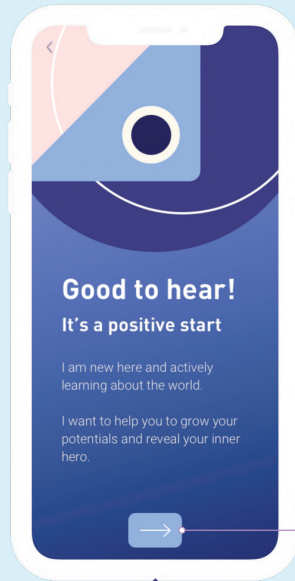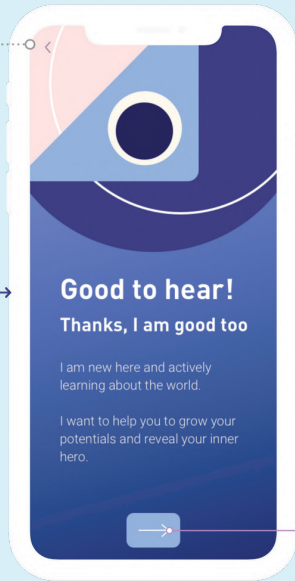
Next page | after stated "I am good"

Next page | select your personality

maslo's reactions

maslo's reactions

That's okay!

Thanks to be honest

Let's find a way to change it!

I am here to improve my knowledge with helping you to grow your potentials and reveal your inner hero.

→

That's okay!

I can understand

Let's find what's going on!

I am here to improve my knowledge with helping you to grow your potentials and reveal your inner hero.

→
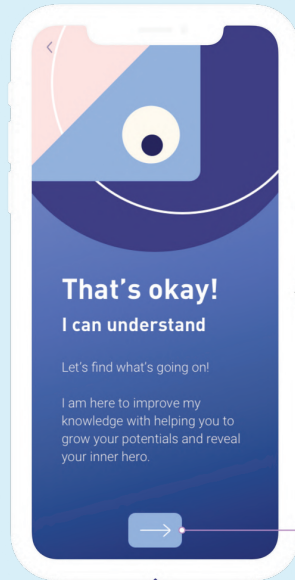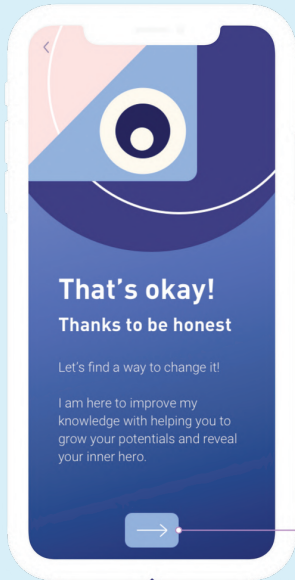
Next page | after stated "Not so good"

Next page | after stated "I don't know"

Policy privacy

Maslo Inc. Privacy Policy Last Updated: May 17, 2018

Information You Give Us.

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When registering to use the App and creating an account ("Maslo Account"), we may also ask you to provide certain information about yourself, such as your name, email address, social media username and profiles, and user name and password ("Contact Information"). Your Contact Information, together with any other information we gather through the App that may be used to identify, contact, or locate you individually, is collectively referred to as your "Personal Information."

Go back

Go back

Personality selection

All good!

I use my intelligence to solve things and I am a logical thinker. Which one is you?

| Excitement | Imagination |
| Intelligence | Achievement |

→

View data policy

Do you trust me

Great!

It is clear to me. I am sure together we will take a path to grow our potentials!

Can you trust me?

View our data policy ›

| Yes, for now | No, not yet |

→

After user selected personality

I trust you

Insert your email

Let's start

Great!

It is clear to me. I am sure together we will take a path to grow our potentials!

Can you trust me?

View our data policy >

Yes, for now | No, not yet

→

Cheers!

Take me with you. Together we will increase our potantials and reveal your inner hero.

Insert your email to start

email

Cheers!

Take me with you. Together we will increase our potantials and reveal your inner hero.

Insert your email to start

hoppidi@gmail.com

Let's start

Yes, I trust

I don't trust you

Give me a chance

Insert your email

Great!

It is clear to me. I am sure together we will take a path to grow our potentials!

Can you trust me?

View our data policy >

Yes, for now | No, not yet

→

No problem!

I am sure that I will gain your trust in time and we will take a path to grow.

Give me a chance

Cheers!

Take me with you. Together we will increase our potantials and reveal your inner hero.

Insert your email to start

email

No, I don't trust

maslo app homepage

Start using the app

Let's start

Glad you're here
Tap above to start

Insert email

Cheers!

Take me with you. Together we
will take a path to grow.

Insert your email to start

hoppidi@gmail.com

Let's start

Start using the app

**First Iteration
On-boarding-2**

Hi I am maslo

Insert your name

How are you

Hey, hiii.. 😊
I am maslo

I am here to do my best to be
your companion and expand my
knowledge to increase your self-
awareness.

What's your name?

Your name please

Hey, hiii.. 😊
I am maslo

I am here to do my best to be
your companion and expand my
knowledge to increase your self-
awareness.

What's your name?

Lovely name

→

Thank you
to share 😇

I am glad to meet with you.
First things first,
how are you doing?

🤩 😊 😔 🥺

Insert your name

Next page

Emotional moods

Emotional moods

Emotional moods

Thank you to share 😇

I am glad to meet with you. First things first, how are you doing?

Great

Thank you to share 😇

I am glad to meet with you. First things first, how are you doing?

Good

Thank you to share 😇

I am glad to meet with you. First things first, how are you doing?

A bit sad

→

→

→

Select your emotional mood

Next page

Next page

Next page

maslo's reactions

maslo's reactions

maslo's reactions

Awesome!
I am great as well 🤩

I am new here to share your experience as much as you'd like.

I am so curious to discover and I want to learn how you do the things 😮

That's great!
I am good as well 😊

I am new here to share your experience as much as you'd like.

I am so curious to discover and want to learn how you do the things 😮

Oooh..
Sorry to hear that!

Come on! I am here to share your experience and listen to you as much as you'd like.

I am so curious to discover more and want to learn about you 😮

→

→

→

Next page | Personality selection

Thank you to share 😇

I am glad to meet with you.
First things first,
how are you doing?

🤩 😊 😔 🥹
I don't know

→

Hımm..
A soup situation 🤔

We will find together what's going on! I am here to share your experience and listen to you till the end.

I am so curious to discover more and want to learn about you 🥺

→

So, well.. 🤔

I would like to discover which one is you more?

So, I can use my imagination to help you.

| Excitement | Imagination |
| Intelligence | Achievement |

Wouu! 😲

It seems cool! You made me more curious.

Let's dream big together. Can't wait to know you more and grow together 😎

→

Privacy policy

I trust you

**Maslo Inc. Privacy Policy
Last Updated: May 17, 2018**

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I trust you 😌

Friends support each other. I can trust you. Can you do it as well for me?

There is nothing to hide

Check our data policy »

Yes, for now

No, not now

Do you trus me?

I trust you 😌

Friends support each other. I can trust you. Can you do it as well for me?

There is nothing to hide

Check our data policy »

Yes, for now

No, not now

I don't trust you

I trust you 😌

Friends support each other. I can trust you. Can you do it as well for me?

There is nothing to hide

Check our data policy »

Yes, for now

No, not now

Let's start

Insert your email

Email inserted

Yeeey! 🤭

Thank you!
It means a lot to me 🙂

Let's start

Welcome!
Take me with you 🤗

I am glad that you are here.
Now, also you can start to
discover me more 😌

Insert your email to start

email

skip for now

Welcome!
Take me with you 🤗

I am glad that you are here.
Now, also you can start to
discover me more 😌

Insert your email to start

hoppidi@gmail.com

→

Give me a chance

Insert your email

Email inserted

No worries 🙂

It's totally fine, I can understand
but I believe in myself to be your
reliable companion.

Give me a chance

Welcome!
Take me with you 🤗

I am glad that you are here.
Now, also you can start to
discover me more 😌

Insert your email to start

email

skip for now

Welcome!
Take me with you 🤗

I am glad that you are here.
Now, also you can start to
discover me more 😌

Insert your email to start

hoppidi@gmail.com

→

Welcome

Welcome!

I am glad that you are here. Now, also you can start to discover me more 😌

Let's start to this journey.

→

maslo app homepage

Glad you're here
Tap above to start

Start usign the app

Welcome

Welcome!

I am glad that you are here. Now, also you can start to discover me more 😌

Let's start to this journey.

→

Iteration-2 Design Process

The first iteration results created an opportunity to evolve and reshape the second onboarding design processes with the user needs, aspects and feedbacks. The second iteration designed to be tested with structured interviews besides the usability testing of the onboarding prototypes. The test is conducted in a more explorative way since the aim of the experiment was not to measure efficiency instead the aim was to let the user browsing the application to understand the curiosity and discovery path of users. To implement this purpose, the design of onboardings is simplified in terms of content and the duration of the flow. Also, to be able to understand the users' actions on variables, the focus of the first iteration is changed, from testing the effectiveness of the app to understanding users' interactions with different represented contents like being more descriptive or exploratory, tone of voices like being more goal-oriented or friendly and helpful and visual communication effect on the user decisions. Considering all these variables, mainly the user interface design kept like before and the flow of the experience and the characteristics of both companions redefined with being more descriptive and stick to the point. Keeping these variables same for both onboardings affected the result to see the effect on users on which personality created more empathy and excitement on them. Just the UI of privacy policy section is changed since one of the most discussed topics was privacy and policy design style in the first iteration. The interface changed through categorizing texts by topics and representing the content by supporting visuals to make this section more effective and understandable.
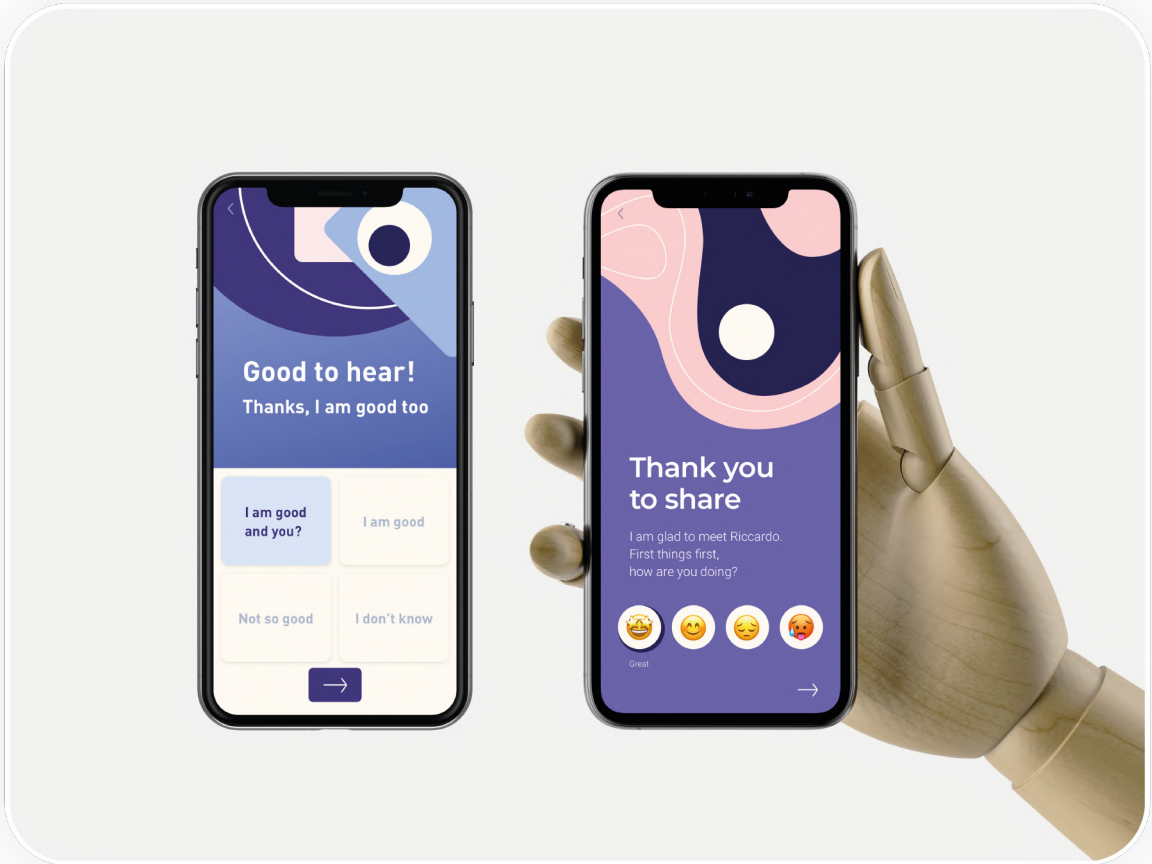
In addition to all these variables, to make onboardings more personalized, the names of users added to prototypes for making it tailored for each person. At this point, when the companion met with the user and learned their name, it started to call them by their name to understand effects on users' emotional states and the value of trust.

At the end of the two onboarding experiences, I decided also let users try the actual onboarding of maslo to give them the opportunity to compare it with the designed ones.

In this way, users perceived a clear difference in the experience. Especially related to the fact that the logical and the sincere onboarding were tailored to the mission of the application. Namely, to establish a personal connection for self-awareness.

To sum up, since this step is conducted by structured interviews, this process aimed to collect all the user feedback on their emotional and behavioural changes, attention levels, visual communication elements' effects on both cognitive and emotional changes that can reshape the user experiences in different ways.

Yagmur Serin

Riccardo Agosto

Sandra Tonts

Paola Zani

Second Iteration
On-boarding-1

Go back

Insert name

Name inserted

How are you

Hi, I am maslo
A digital companion

I'd like to help you to focus on important things in your life.

What is your name?

Insert your name

Hi, I am maslo
A digital companion

I'd like to help you to focus on important things in your life.

Riccardo

Great name!

→

Thanks!

Nice to meet you Riccardo. By the way, how are you?

I am good and you?

I am good

Not so good

I don't know

→

Insert your name

Next page

How are you - Emotional states

How are you - Emotional states

How are you - Emotional states

Good to hear!
Thanks, I am good too

I am good
and you?

I am good

Not so good

I don't know

→

Good to hear!
It's a positive start

I am good
and you?

I am good

Not so good

I don't know

→

That's okay!
Thanks to be honest

Let's find a way to change it!

I am good
and you?

I am good

Not so good

I don't know

→

After asked back
to companion

After stated "I am good"

After stated "Not so good"

Next page

Next page

Next page

maslo's reaction

maslo's reaction

maslo's reaction

I am new here!

Actively learning about the world.

I want to help you to grow your
potentials and reveal your inner
hero.

→

I am new here!

Actively learning about the world.

I want to help you to grow your
potentials and reveal your inner
hero.

→

I am new here!

I want to improve my knowledge
with helping you to grow your
potentials and reveal your inner
hero.

→
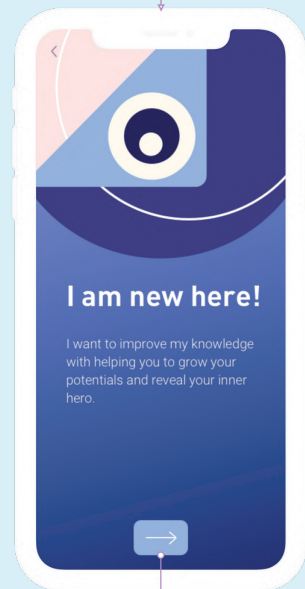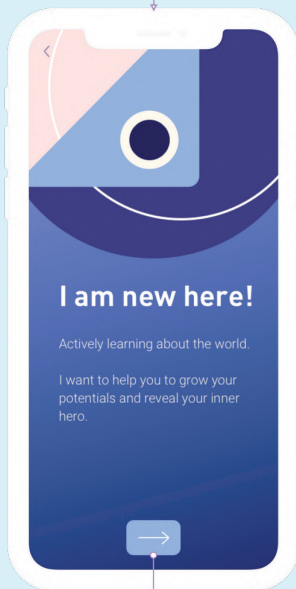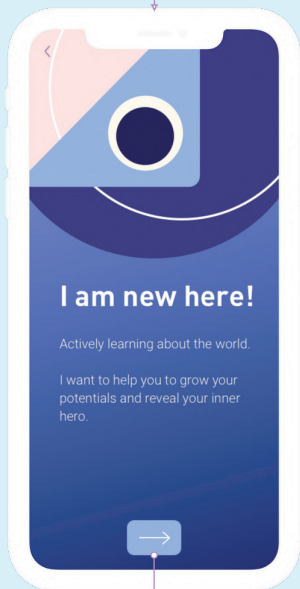
maslo describes itself

How are you - Emotional states

That's okay!
I can understand
Let's find what's going on!

I am good
and you?

I am good

Not so good

I don't know

→
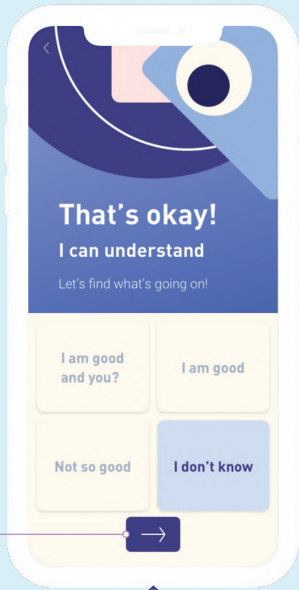
After stated "I don't know"

Next page

maslo's reaction

I am new here!!

I want to improve my knowledge
with helping you to grow your
potentials and reveal your inner
hero.

→

Excitement

Personality selection

All good!
I use my intelligence to solve
things and I am a logical thinker.
Which one is you?

Excitement

Imagination

Intelligence

Achievement

→

Excitement explanation

Excitement
Fueled by high energy levels and
boundless enthusiasm.

Excitement

Imagination

Intelligence

Achievement

→

Imagination

Achievement

Intelligence

Select your personality

Imagination explanation

Intelligence explanation

Achiement explanation

Imagination

Life is limited only by the boundaries of your own beliefs.

| Excitement | Imagination |
| Intelligence | Achievement |

→

Intelligence

Intellectual and creative powers to solve problems and improved ways of doing things.

| Excitement | Imagination |
| Intelligence | Achievement |

→

Achievement

Derive great pride and satisfaction from your ability to implement ideas.

| Excitement | Imagination |
| Intelligence | Achievement |

→

Next page | Trust

Do you trust me

Great!

It is clear to me. I am sure together we have a path to grow our potentials!

Can you trust me?

View our data policy >

Yes, for now | No, not yet

→

Data Policy 3

Maslo Inc. Privacy Policy

Information we collect >

Uses of Information >

How we protect your data >

California Privacy Law >

Changes on our policy >

Data Policy 2

Information we collect

Information You Give Us

The primary purpose of the App is to allow you to journal your life in a new, fun, and interactive way. We are utilizing machine learning algorithms to allow you to use your device in a new way that you may never have thought possible. At any point in the day, you can record a 60 second audio clip through the App. We plan to aggregate those 60 second recordings to analyze your emotional and mood indicators by using speech recognition, facial recognition, sentiment, translation, background

⌄

Information Obtained From

Data Policy 1

Information we collect

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When registering to use the App and creating an account ("Maslo Account"), we may also ask you to provide certain information about yourself, such as

Insert email

Let's start

maslo app homepage

Yes, I trust

Cheers!

I will be only active while you are
using the app.

Insert your email to start

email

Cheers!

I will be only active while you are
using the app.

hoppidi@gmail.com

Let's start

Glad you're here
Tap above to start

Insert email

Try the app

Give me a chance

Try the app

**No, I don't
trust**

No problem!

I am sure that I will gain your
trust in time. I am encrypted, I
will keep your data in safe.

Give me a chance

Second Iteration
On-boarding-2

Insert name

Name inserted

How are you

Hello 😊
I am maslo

I am here to do my best to be your companion and expand my knowledge to increase your self-awareness.

What's your name?

Your name please

Hello 😊
I am maslo

I am here to do my best to be your companion and expand my knowledge to increase your self-awareness.

Riccardo

Lovely name!

Thank you to share

I am glad to meet Riccardo. First things first, how are you doing?
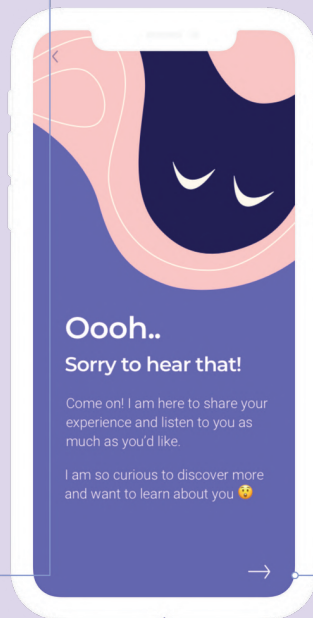
Insert your name

Next page

I don't know

A bit sad

Great

Awesome

maslo's reaction

maslo's reaction

maslo's reaction

Awesome!
I am great as well

I am new here to share your experience as much as you'd like.

I am so curious to discover and I want to learn how you do the things 🤭

→

That's great!
I am good as well

I am new here to share your experience as much as you'd like.

I am so curious to discover and want to learn how you do the things 🤭

→

Oooh..
Sorry to hear that!

Come on! I am here to share your experience and listen to you as much as you'd like.

I am so curious to discover more and want to learn about you 🤭

→

Excitement

Fueled by high energy levels and boundless enthusiasm.

Excitement

Imagination

Intelligence

Achievement

→

maslo's reaction

Personality selection

Excitement

Intelligence

Imagination

Achievement

maslo's reaction

Hımm..
A soup situation

We will find together what's going on! I am here to share your experience and listen to you till the end.

I am so curious to discover more and want to learn about you 😧

→

So, well.. 🤔

I would like to discover which one is you more?

So, I can use my imagination to help you.

Excitement

Imagination

Intelligence

Achievement

maslo's reaction to excitement

Wouu! 😲

You made me more curious.

Let's find more things to grow with your excitement.
Can't wait to know you more.

→

Next page | Trust

Personality - Imagination

Personality - Intelligence

Personality - Echievement
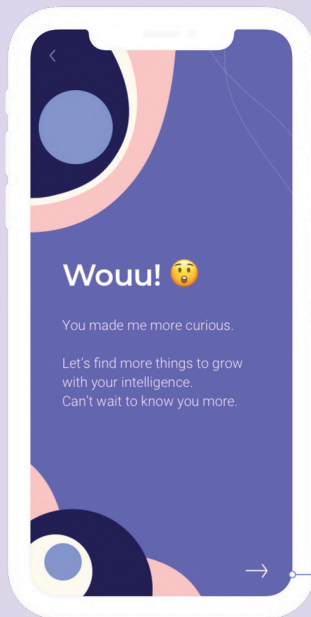
Imagination

Life is limited only by the boundaries of your own beliefs.

Excitement

Imagination

Intelligence

Achievement

Intelligence

Intellectual and creative powers to solve problems and improved ways of doing things.

Excitement

Imagination

Intelligence

Achievement

Achievement

Derive great pride and satisfaction from your ability to implement ideas.

Excitement

Imagination

Intelligence

Achievement

maslo's reaction

maslo's reaction

maslo's reaction

maslo's reaction to imagination

maslo's reaction to intelligence

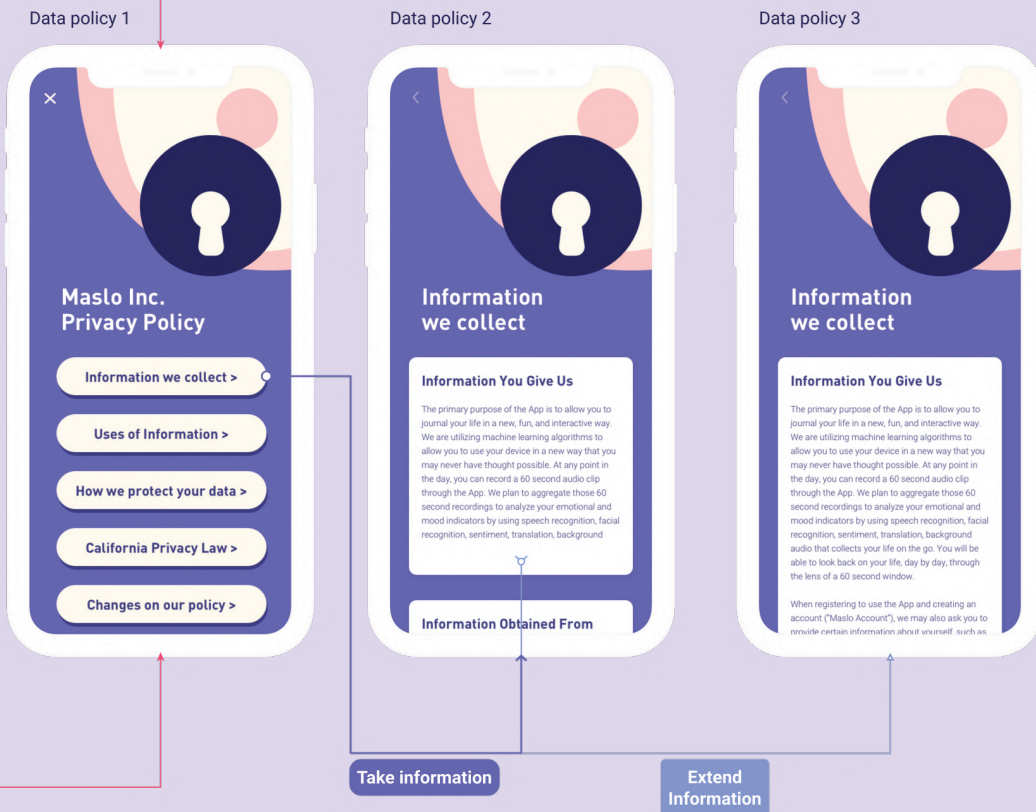maslo's reaction to achievement

Wouu! 😲

You made me more curious.

Let's find more things to grow with your imagination. Can't wait to know you more.

Wouu! 😲

You made me more curious.

Let's find more things to grow with your intelligence. Can't wait to know you more.

Wouu! 😲

You made me more curious.

Let's find more things to grow with your achievement. Can't wait to know you more.

Next page

I trust you

Let's start

I trust you 🙂

I will be only active while you are using the app. Can you trust me, as well?

There is nothing to hide.

Yes, for now   No, not now

Thank you 😊

It means a lot to me. Friends support each other.

Let's start

Yes, I trust

Trust

I trust you 🙂

I will be only active while you are using the app. Can you trust me, as well?

There is nothing to hide.

Data policy >

Yes, for now   No, not now

View Data policy

Next page

No, I don't trust

I don't trust you

Give me a chance

I trust you 🙂

I will be only active while you are using the app. Can you trust me, as well?

There is nothing to hide.

Data policy >

Yes, for now   No, not now

No worries

It's totally fine, I can understand. I believe in myself to be your reliable companion.

Give me a chance

Next page

View data policy

email inserted

Start using the app

13_inserted email

Email skipped

maslo app homepage

Welcome!
Take me with you

hoppidi@gmail.com

Welcome!
Now, also you can start to discover me more 😊

Let's start to this journey.

Glad you're here
Tap above to start

Give me a chance | starting journey directly

Data policy 1

Data policy 2

Data policy 3

Maslo Inc.
Privacy Policy

Information we collect >

Uses of Information >

How we protect your data >

California Privacy Law >

Changes on our policy >

Information we collect

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Information we collect

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Take information

Extend Information

Iteration-3 Design Process

With outcomes of the second iteration, user feedbacks are implemented to be tested with the third iteration of the usability testing. This process is designed for testing the usability and effectiveness of the prototype but this time instead of interviews, online usability testing and questionnaire prepared with short and multiple selection options. For iteration 3, the selected method aimed to give a chance to users for being themselves and let them think with their own mind, be independent and understand their actions. Users are selected in between who joined in the pre-experimental phase of testing. These selected people are or graduated with a certain level of education with a master degree in different fields of design, engineering and neuroscience or they are still students in different master programs in the field of design. They have all a certain age which in the category of Millenials and live in western countries. This iteration started after onboardings redesigned with outcomes of the second iteration and the link of the prototype sent to users.

The aim of the third iteration shaped through understanding the way of communications between people and machines, the effect of different personalities that implemented into onboarding designs. Also, users perceptions of onboardings' personalities, which are collected thanks to the questionnaire will be shown on the personality diagram with the third iteration results.

First of all, all the common feedbacks, that collected through the structured interviews after usability testing, are implemented to onboarding designs to be tested with the third iteration. The other, mainly personal comments, that came out after the second iteration, are stated on the results of the second iteration section person by person to show the diversity of user experiences to be discussed on the discussion part of the thesis.

Secondly, the third and the last iteration of the testing included changes on UI in the trust part of the experience and content for both onboardings, the flow and the visual communication style of the second onboarding experience.

Supportive Visual Elements

Emojis are removed from the entire flow of the second onboarding and they just used for welcoming the user and asking to define their emotional states because according to users emojis were not matching with the expected meaning in their mind but they made the conversation more friendly, familiar and natural. With this, the effect of non-verbal communications' tried to be tested in between the first and the second onboarding. Also, one of the aspect to define users' emotions with emojis was trying to make the user think about the emotions of their imagination to foster self-awareness in the user.

Differently from the second iteration, after users selected emojis to define how they are, another screen is placed to give a chance for users to state that emojis were matching with their imagination or the meaning were different than the presented one. Thus, the right to make changes in the flow and the ability to define their own emotional states were given to people. Also, it was shown that artificial intelligence would take these variables into consideration and keep them in mind to make these experiences more personal with the users' actions.

The Flow of the Experience

To make the experience more personal, the flow of the second experience is changed by adding new supportive screens based on user feedback. For instance, when the companion asked users to define their personalities, the companion started to interact with the user based on their selections. When the user picked up one of option in between four, the companion reactions changed based on user personality and this reaction is represented with text-based communication.

Another topic under this section that tried to be defined is inserting personal information. The first onboarding started by asking user name and the email before starting the experience which means before meeting with the companion. The second onboarding started to the conversation by asking the user name just like a first meeting, then asking the email information after the trust question. If the user select to trust, the companion asked to insert the email by explaining the reason why it is needed. Besides, also it gave a chance to the user to skip inserting the email even if the reason is clearly explained. So, with these changes, on the flow between two onboardings, tried to understand how these changes have an impact on the user.

The Personality of On-Boarding Experiences

For the second onboarding, the personality of the companion became more explanatory than the second iteration in terms of creating a more transparent trustful starting point before moving to the real journey. The companion explained how is the journey and how is going to use the user's data, what are the opportunities that defined for the user to convince them for giving a chance to the companion like deleting their data option or ten days of trial for an app and then deleting the data automatically. So, the onboarding took a more promised position and explained clearly all the steps to let the user give a chance for their relationship and keep the user in the journey.

The User Interfaces

Additionally to the last user interface design, leaving the app option added in the trust part of the experience. Since the companion is asking the user "give a chance to try", users felt they had to continue to the experience and the lack of this option makes users think they have no other choice and affected user experiences. In the beginning, I thought that users would close the application and end this experience but in the testing phase, I understood that user wants to have an option because they perceived the experience as a real conversation. And this situation did not create an idea on users to have a chance to leave the conversation with the companion. So, that's because this micro change is implemented to the user interface to give a room for a user to select freely to shape the next phase of the conversation.

Questionnaire for the Iteration-3

Questions (reported in chapter 8 under 'results of Iteration-3') are shaped to understand:

▸ In which experience users felt more in line with their personalities

▸ Which experience created a more trustful effect on users

▸ Which experience made the user more thoughtful about their decisions

▸ The effect of the changes on the flow

▸ How user experiences changed with asking personal information at the beginning or at the end

▸ The presented emojis matched with user's imagination or not

▸ How the users defined the usage of emojis in digital experiences for communication

Prototyping

The personality frameworks are implemented into the design processes as stated before and have been explained in the methodology section to allow implementing other archetypes into the onboarding experiences. Prototypes have designed with Sketch software then they transferred to the Marvel application for testing. Marvel allowed testing the prototypes in an interactive way. First two iteration, Marvel application used on mobile to give users the impression that the application is realistic and the interaction is more familiar and natural to create real insights. The third iteration since it was conducted as online usability testing, the sharable link created via Marvel App and the link of survey placed in the last screen of the prototype to take users directly to fill the questionnaire.

The interactive prototype is open to explore with this link: **marvelapp.com/d6f8dj1** Or visit my Vimeo profile to watch the prototypes videos: **vimeo.com/cansuhizli**

Third Iteration
On-boarding-1

Go back

After asked back to maslo

01_ Hi I am Maslo Copy 2

01_ Hi I am Maslo Copy 7

03_How are you

Hi, I am maslo
A digital companion

I'd like to help you to focus on important things in your life.

What is your name and email?

Insert your name

Insert your e-mail

Hi, I am maslo
A digital companion

Great name

hoppidi@gmail.com

q	w	e	r	t	y	u	i	o	p
a	s	d	f	g	h	j	k	l	

z x c v b n m

123   space   enter

Thanks!

Nice to meet you!
By the way, how are you?

I am good and you?

I am good

Not so good

I don't know

→

Insert your personal informations

Next page

04_1_How are you selection

Good to hear!
I am good too
Thanks to ask back.

| I am good and you? | I am good |
| Not so good | I don't know |

→

04_2_How are you selection

Good to hear!
It's a positive start

| I am good and you? | I am good |
| Not so good | I don't know |

→

04_3_How are you selection

That's okay!
Thanks to be honest
Let's find a way to change it!

| I am good and you? | I am good |
| Not so good | I don't know |

→

After selected "I am good"

After selected "Not so good"

Next page

Next page

Next page

05_1_Answer from Maslo Copy

I am new here!

Actively learning about the world.

I want to help you to grow your potentials and reveal your inner hero to be aware about yourself.

→

05_2_Answer from Maslo

I am new here!

Actively learning about the world.

I want to help you to grow your potentials and reveal your inner hero to be aware about yourself.

→

05_3_Answer from Maslo

I am new here!

Actively learning about the world.

I want to help you to grow your potentials and reveal your inner hero to be aware about yourself.

→

maslo describes itself

04_4_How are you selection

That's okay!
I can understand
Let's find what's going on!

I am good and you?

I am good

Not so good

I don't know

Personality selected |
Excitement

06_which one is you

All good!
I use my intelligence to solve things and I am a logical thinker. Which one is you?

Excitement   Imagination

Intelligence   Achievement

Personality selected |
Imagination
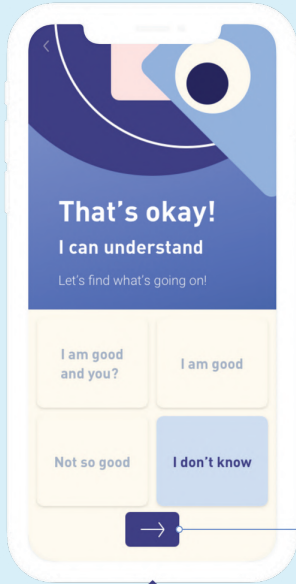
After selected "I don't know"

Next page

05_4_Answer from Maslo

I am new here!!
Actively learning about the world.
I want to help you to grow your potentials and reveal your inner hero to be aware about yourself.

Personality selected |
Intelligence

Personality selected |
Achievement

Select your personality

Excitement

Fueled by high energy levels and boundless enthusiasm.

Excitement	Imagination
Intelligence	Achievement

→

Imagination

Where others see facts, you catch hidden meanings and let your mind roam free.

Excitement	Imagination
Intelligence	Achievement

→

Next page | Trust

Intelligence

You're here on this planet to light the way into the future with intellectual and creative power.

Excitement	Imagination
Intelligence	Achievement

→

Achievement

Derive great pride and satisfaction from your ability to implement ideas.

Excitement	Imagination
Intelligence	Achievement

→

07_trust

Great!

It is clear to me. I am sure
together we have a path to grow
our potentials!

Can you trust me?

View our data policy >

Yes, for now   No, not yet

Policy, privacy

**Go back to
trust section**

07_001_data policy copy 6

✕

**Maslo Inc.
Privacy Policy**

Information we collect >

Uses of Information >

How we protect your data >

California Privacy Law >

Changes on our policy >

07_001_data policy copy 7

‹

**Information
we collect**

Information You Give Us

The primary purpose of the App is to **allow you to
journal your life in a new, fun, and interactive
way.** We are utilizing machine learning algorithms
to allow you to use your device in a new way that
you may never have thought possible. At any point
in the day, you can **record a 60 second audio clip**
through the App. We plan to aggregate those 60
second recordings **to analyze your emotional and
mood indicators** by using speech recognition,
facial recognition, sentiment, translation,

ⱽ

Information Obtained From

07_001_data policy copy 8

‹

**Information
we collect**

Information You Give Us

The primary purpose of the App is to allow you to
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We are utilizing machine learning algorithms to
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the day, you can record a 60 second audio clip
through the App. We plan to aggregate those 60
second recordings to analyze your emotional and
mood indicators by using speech recognition, facial
recognition, sentiment, translation, background
audio that collects your life on the go. You will be
able to look back on your life, day by day, through
the lens of a 60 second window.

When registering to use the App and creating an
account ("Maslo Account"), we may also ask you to
provide certain information about yourself, such as

Take informations

**Extend
text**

08_1_cheers

Cheers!

I will be only active while you are
using the app.

Let's start

10_maslo

Glad you're here
Tap above to start

Start using maslo

Yes, I trust

Start using maslo

No, not yet

08_2_no problem

No problem!

I am sure that I will gain your
trust in time. I will be in the same
adventure with you.

Give me a chance

08_2_no problem copy

You are leaving
the app,
are you sure?

Yes   No

Give a chance

Do you want to leave the app

Third Iteration
On-boarding-2

hi I am maslo

Insert your name

How are you

Great

Hello 😊
I am maslo

I am here to do my best to be your companion.
I'll try to help you to increase your self-awareness.

What's your name?

Your name please

Hello 😊
I am maslo

Lovely name

q	w	e	r	t	y	u	i	o	p
a	s	d	f	g	h	j	k	l	

z x c v b n m

123   space   enter

Thank you
to share

I am glad to meet with you.
First things first,
how are you doing?

🤩 😊 😌 🥴

Insert your name

Next page
emotional mood

Good

How are you

Great!

That means feeling great to me.
Is the meaning same for you too?

Yes, same   No, different

Great

maslo's reaction 1

Awesome!

I am happier than before

Woow, I was thinking same as
you.

I am so curious to learn how you
imagine for the other things.

→

maslo's reaction 2

Oo.. I surprised

This is interesting

I've already discovered something
new and I'll keep it in my mind.

I am excited to learn how you
imagine for the other things.

→

next | personality
selection

No, the emoji meaning is different

Yes, the emoji meaning is same

A bit sad

How are you

Good!

That means feeling good to me.
Is the meaning same for you too?

Yes, same   No, different

Good

maslo's reaction 1

That's great!

I am good as well

Woow, I was thinking same as
you.

I am so curious to learn how you
imagine for the other things.

→

maslo's reaction 2

It's a good
feedback

Happy to know

I've already discovered something
new and I'll keep it in my mind.

I am excited to learn how you
imagine for the other things.

→

next | personality
selection

No, the emoji meaning is different

Yes, the emoji meaning is same

I don't know

How are you

maslo's reaction 1

maslo's reaction 2

A bit sad!

That means feeling sad to me.
Is the meaning same for you too?

Yes, same   No, different

A bit sad

Oooh..

Sorry to hear that!

I see, I was feeling the same.

I am here to share your journey
and listen to you as much as
you'd like.

→

It means a lot to me

Thanks to tell

I've already discovered something
new and I'll keep it in my mind.

I want to know how you imagine
for the other things to help you
better.

→

No, the emoji meaning is different

Yes, the emoji meaning is same

next | personality selection

How are you

maslo's reaction 1

maslo's reaction 2

I don't know!

That means emotional confusion
to me. Is the meaning same for
you too?

Yes, same   No, different

I don't know

It's open to discovery

Thanks to share

I've already discovered something
new and I'll keep it in my mind.

I want to know how you imagine
for the other things to help you
better.

→

Himm..

A soup situation

Seems that I felt same as you.

I am here to listen to you as much
as you'd like and sure that you will
find what's going on.

→

No, the emoji meaning is different

Yes, the emoji meaning is same

next | personality selection

Excitement

Imagination

Personality | Excitement

Personality selection

Excitement

Your abundant enthusiasm fuels you in the pursuit of many interests.

Excitement   Imagination

Intelligence   Achievement

Imagination

Life is limited only by the boundaries of your own beliefs.

Excitement   Imagination

Intelligence   Achievement

So, well..

I would like to discover which one is you more?

So, I can use my imagination to help you.

Excitement   Imagination

Intelligence   Achievement

*click for information

Personality | Imagination

Personality | Intelligence

Personality | Achievement

Next | maslo's reaction

Next | maslo's reaction

maslo's reaction 3

maslo's reaction 3

Woouw!

It's just a beginning

I am thinking that **excited** people are natural storytellers that inspire many people with their excitement.

I am curious that you are like this or different.

Woouw!

It's just a beginning

I am thinking that for **imaginative** people, the inner world is always where you've felt most at home.

I am curious that you are like this or different.

next | personality selection

Intelligence

Achievement

Intelligence

Intellectual and creative powers to solve problems and improved ways of doing things.

Excitement

Imagination

Intelligence

Achievement

Achievement

Connect deeply with intuition and emotions to come up with authentic and original work.

Excitement

Imagination

Intelligence

Achievement

Trust

I trust you

I will be only active while you are using the app. Can you trust me, as well?

There is nothing to hide.

Data policy >

Yes, for now

No, not yet

Yes, I trust

View Policy

Next page | maslo's reaction

Next page | maslo's reaction

maslo's reaction 3

maslo's reaction 3

Woouw!

It's just a beginning

I am thinking that **intelligent** people has inquisitive mind to experiment and play with ideas.

I am curious that you are like this or different.

Woouw!

It's just a beginning

I am thinking that **achievement** is connected with dedication that can lead to achieving mastery.

I am curious that you are like this or different.

next | personality selection

Let's start

Thank you

It means a lot to me. Friends support each other.

Let's start

Insert email

Welcome
Take me with you

I need your email to personalize your user experience.

email

skip for now

Email inserted

Welcome
Take me with you

hoppidi@gmail.com

skip for now

q w e r t y u i o p
a s d f g h j k l
z x c v b n m
123 space enter
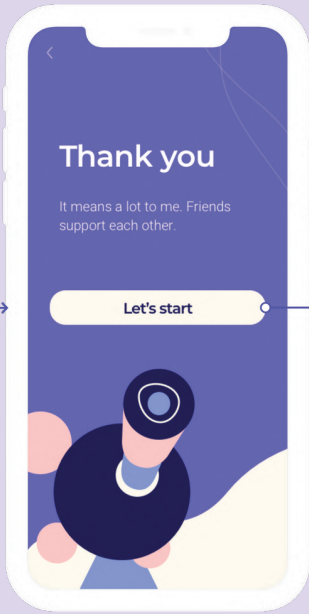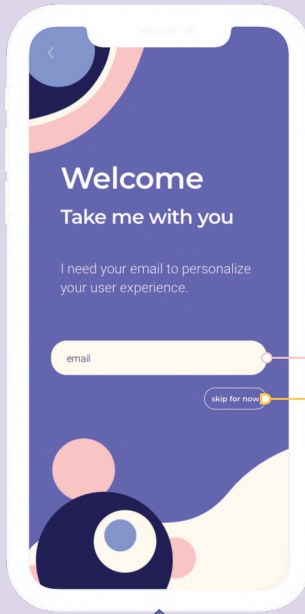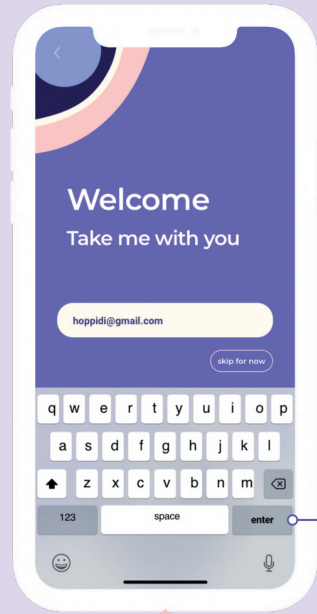
Welcome

Insert email

Go back

Policy Privacy

×

Maslo Inc.
Privacy Policy

Information we collect >

Uses of Information >

How we protect your data >

California Privacy Law >

Changes on our policy >

Policy Privacy 2

Information
we collect

Information You Give Us

The primary purpose of the App is to **allow you to journal your life in a new, fun, and interactive way.** We are utilizing machine learning algorithms to allow you to use your device in a new way that you may never have thought possible. At any point in the day, you can **record a 60 second audio clip** through the App. We plan to aggregate those 60 second recordings **to analyze your emotional and mood indicators** by using speech recognition, facial recognition, sentiment, translation,

Information Obtained From

Policy Privacy 3

Information
we collect

Information You Give Us

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When registering to use the App and creating an account ("Maslo Account"), we may also ask you to provide certain information about yourself, such as

Take more information

Extend the text

Email skipped

maslo app

Let's start to this journey

Now, you can start to discover me more.

→

Start the journey, try the product

Glad you're here
Tap above to start

Let' s start

No, not yet

Start the journey, try the product

No worries

Give me a chance

Do you want to leave

No worries

It's totally fine, I can understand. Just to clarify, the transparency is the key value in this journey.

Let me tell you a little bit how the things are working.

→

Your Journey

I'll keep your data on your phone during the journey to support your personal growth.

You can delete your data whenever you want from the settings, it's up to you.

I believe in myself, for 10 days:

Give me a chance

✕

You are leaving the journey, are you sure?

Yes   **No**

Next page | Give me a chance

Do you want to leave the app

Take-Aways

This chapter explained thoroughly how the selected methods are implemented to test the experimental phase of the research. Deeply, the frameworks of personalities are defined and explained how they are implemented into design processes for reshaping the onboarding experiences.

In the next chapter, the results of the experimental phase of research will be presented with the detailed outcomes from the survey, usability testing and questionnaire.

8

Experimental Testing Results

Pre-Experimental Results

Survey Results

True-Experimental Testing Results

Results of Iteration-1

Ideation of First Outcomes and Next Design

Implementation

Results of Iteration-2

Ideation of Second Outcomes and Next Design

Implementation

Results of Iteration-3

Pre-Experimental Results

Results are structured based on the collected answers from the online survey. Collected outcomes helped to structure the two different onboardings' personality, tone of voices and the visual style. These outcomes defined the way of communications that users are interacting with their companions. Besides, with the results, the way of desired interaction and communication with a digital empathetic companion tried to be pointed out.

Survey Results

The survey includes 3 main sections as stated before in Chapter 7, a moment of self-awareness (first part), the meaning of companionship (second part) and the narrative empathy with desired personalities (third part). The results of the survey are shown below this section according to the parts that were effective in designing the onboarding experiences.

The first part showed how much people know about themselves and are conscious of their everyday decisions and actions. The questions were simple but also encouraging people to think about their awareness. Most answered options showed that people interact directly with digital platforms like Spotify, NetFlix, youtube, etc. when they are alone, willing to solve their problems sharing with others and also to be a part of events to share the same consequences with others. In addition to that, half of the answers stated that people want to share their feelings rather and staying in the silent mode and also half of them stated the opposite of this situation. Even these results were half and half, they stated that prefer to talk a friend rather than talking with themselves. So, they are willing to share when they became self-aware about the situations.

The second part showed not only the way of communication, interaction and different media to describe emotions on digital platforms but also the meaning of companionship. In this section, questions were again simple but designed more thoughtful than the first section. Most answered options showed that people were preferring to think for solving the problems or imagining all possible scenarios if something bad is happening. For the opposite, if something good is happening they were preferring to stay in calm and imagine about it or couraging themselves to make dreams come true. This two opposite scenario showed that people want to act with their imagination or thinking about the facts before

acting. Mainly, these insights helped to shape two onboarding personalities. Moreover, answers showed the variables that have an effect on peoples mood with different media. Lastly, most answers showed that people want a companion with reliable, sincere, logical, helpful and objective characteristics to share their emotions easily.

The third and the last part of the survey showed all the results as a combination of a real and a digital companion. It was understood that people first chose written communication and wanted to complete it by means of visual communication. Another main result that comes out from this section is the most desired personalities for the digital companion. Results showed that people want to identify more Accomplished (logical, reliable, intelligent, confident, secure) and Sincere (honest, well-mannered, cheerful, friendly, kind, family-oriented) personalities for their digital companions.

Considering all these results, the most preferred results by the users helped to design the moment of the first meeting with the companion and define the personality traits of the digital companions. Besides, these results were used as the first important elements for designing the next experimental test.

Part 1

You are on the train
173 responses

Call a friend — 33 (19%)
Open Spotify/Netflix/Youtube — 140 (78%)
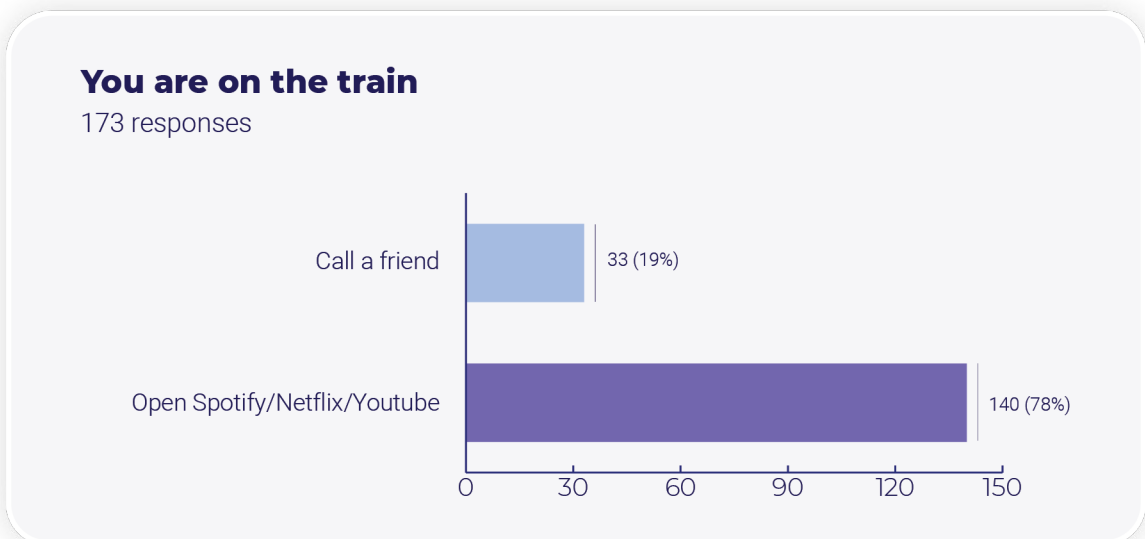
Someone knocked on the door
173 responses

I was not expecting someone	149 (86%)
Ohh! Someone made a surprise	24 (14%)

(Bar chart, x-axis: 0, 30, 60, 90, 120, 150)

I prefer
173 responses

To stay in silent mode	87 (50.3%)
To share with the world	86 (49.7%)

(Bar chart, x-axis: 0, 20, 40, 60, 80, 100)
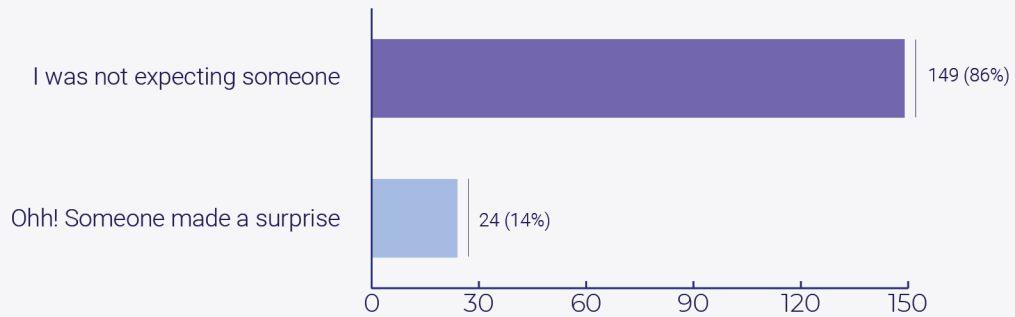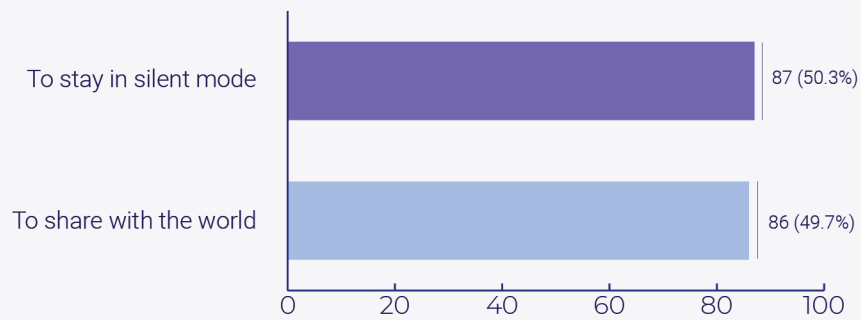
I usually talk with
173 responses

Myself	53 (30.6%)
A friend	120 (53.4%)

(Bar chart, x-axis: 0, 20, 40, 60, 80, 100, 120)
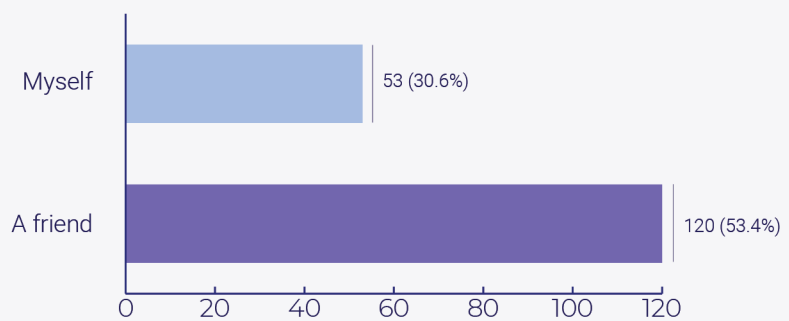
I solve problems by

173 responses

Category	Value
Applying my way	72 (41.6%)
Sharing with others	101 (58.4%)

(x-axis: 0, 20, 40, 60, 80, 100, 120)
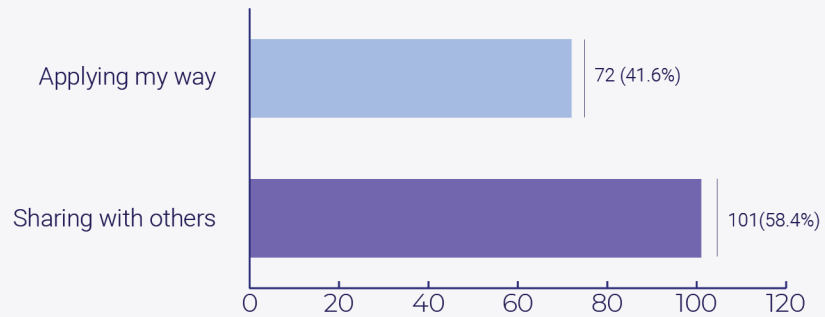
In a group, I am the

173 responses

Category	Value
Motivator	75 (43.4%)
Realist	98 (56.6%)

(x-axis: 0, 20, 40, 60, 80, 100)
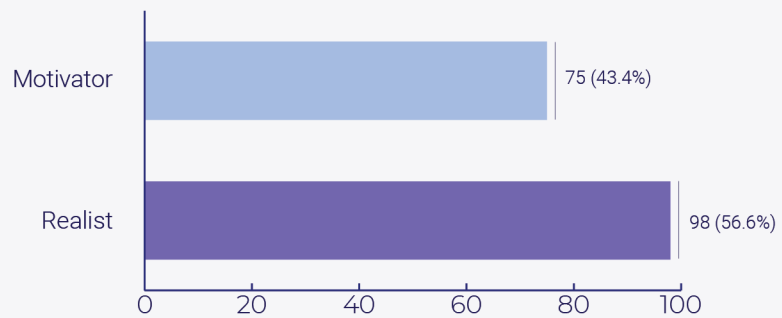
Suddenly something good happened and your friends call you to celebrate

173 responses

Category	Value
Count me in, things can wait	128 (74%)
I need to finish couple of things before	45 (26%)

(x-axis: 0, 30, 60, 90, 120, 150)
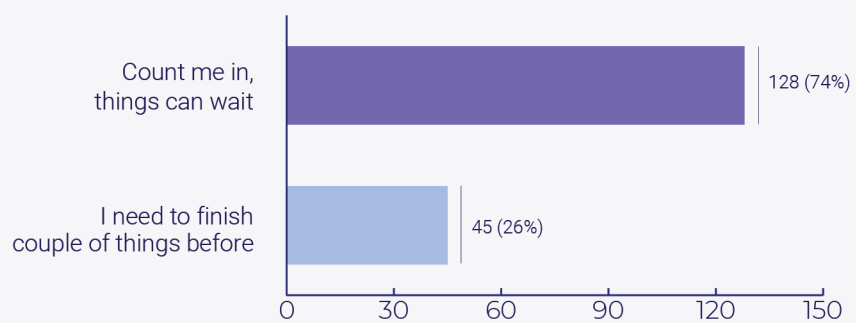
I'd rather be

173 responses

Yoda	120 (69.4%)
BB8	53 (30.6%)
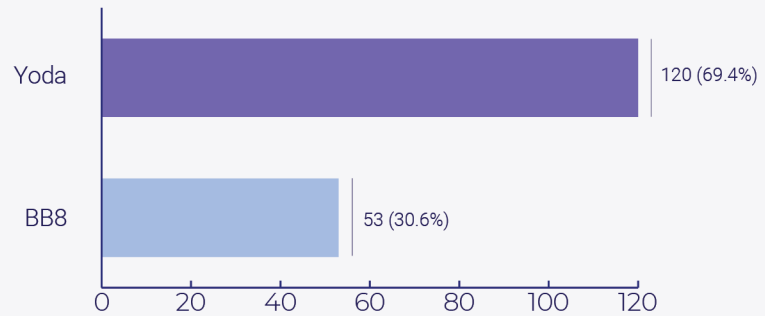
You live your life

173 responses

One day at the time	54 (31.2%)
Chapter by chapter	119 (68.8%)
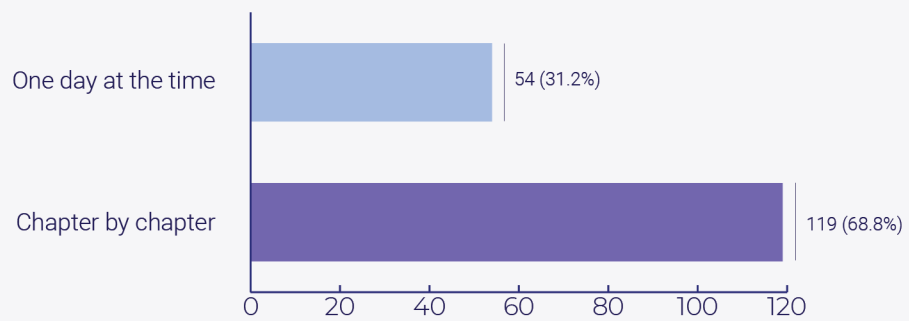
At the cafe with friends

173 responses

I go with one of my favourites	101 (58.4%)
Ask a suggestion	72 (41.6%)
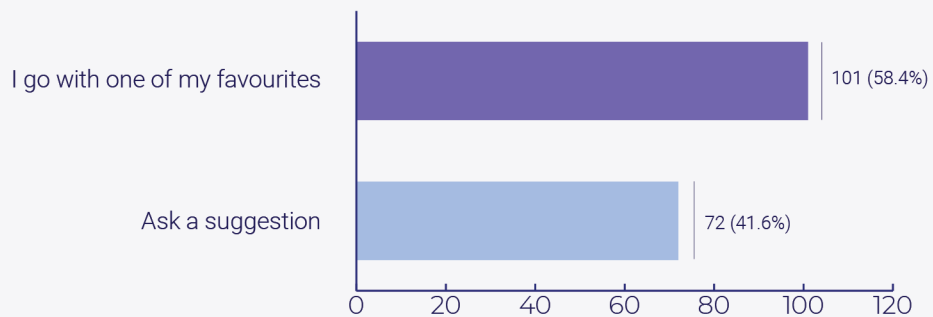
Part 2

I am in the zone of
173 responses

Madness	79 (45.7%)
Calmness	94 (54.3%)

0   20   40   60   80   100
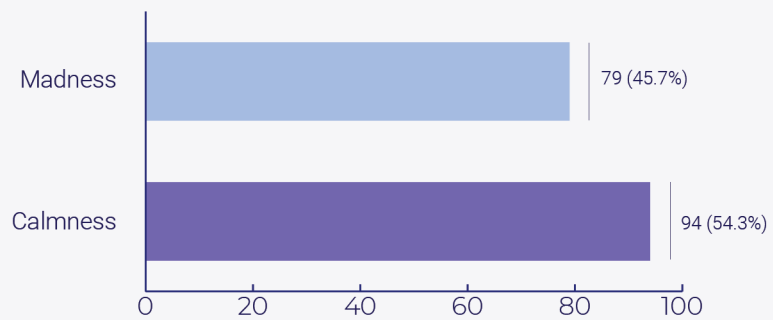
Something bad is happening
173 responses

Start to worry about it and share with my besties	33 (19.1%)
Think a way to solve the problem	52 (30.1%)
Try to understand the reason	35 (20.2%)
Imagine all possible scenarios	53 (30.6%)

0   10   20   30   40   50   60

I prefer
173 responses

Salty	87 (50.3%)
Sweet	86 (49.7%)
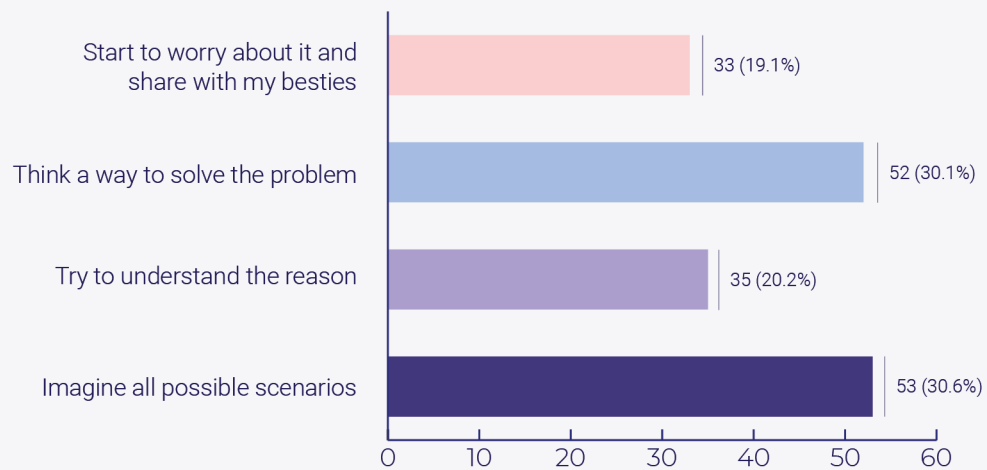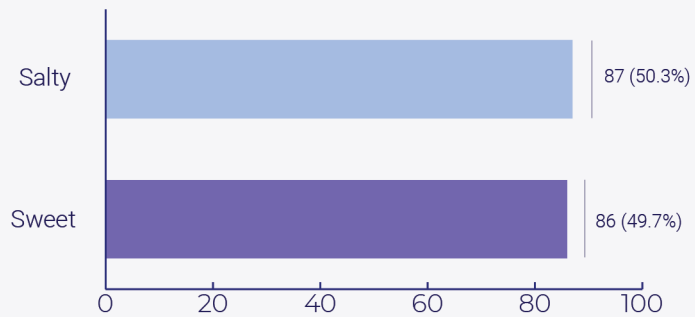
There is something good on the horizon
173 responses

It is happening. I need to talk about it with someone!	46 (26.6%)
Let's be calm and imagine about it!	60 (34.7%)
No doubt about it, it is gonna happen!	16 (9.2%)
I will make it happen, the dream comes true!	51 (29.5%)
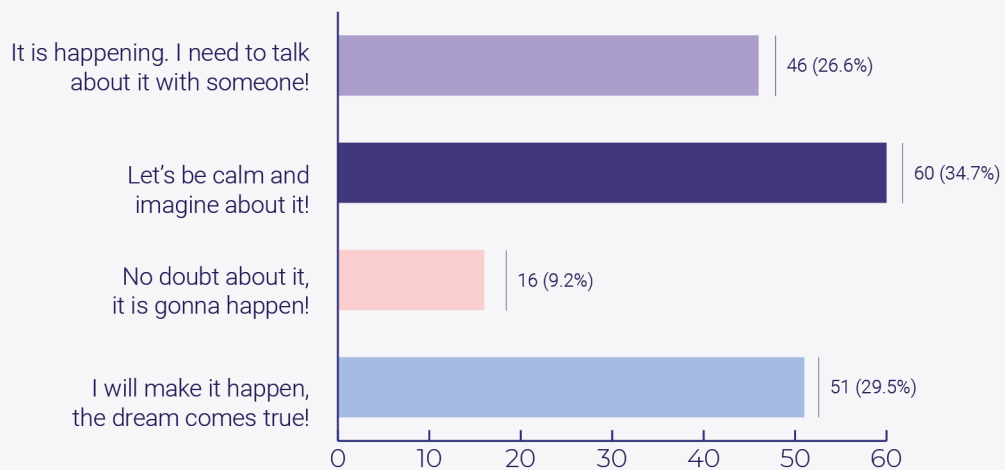
I belong to my
173 responses

Heart	44 (25.4%)
Spirit	48 (27.7%)
Mind	81 (48.8%)
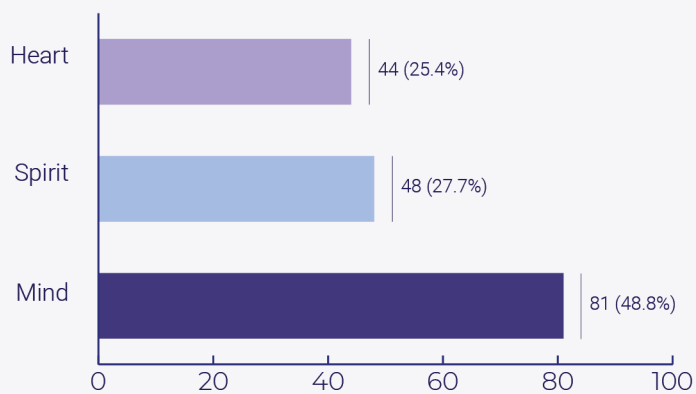
What affects your mood more
391 answers

1. **71** Listening to music, give me my headphones!
2. **33** Feeling the vibes of memories, I have extra storage for it!
3. **43** Having a walk or staying at home, my mind will bring me away!
4. **44** Going through discovery, I am hungry for new experiences!
5. **6** Just a word from an Idol / Coach, keep me up!
6. **44** Watching movies / series, look I am exactly like her/him!
7. **53** Reading, learning, don't stop thinking!
8. **85** Hanging with friends, they are mood boosters!
9. **12** Playing a game, I set the rules here!

You need to share your emotions to get advised. Your companion needs to be...
509 answers   (with max 3 answers)

1. **79** Reliable
2. **64** Logical
3. **47** Funny
4. **59** Helpful
5. **25** Self-confident
6. **40** Imaginative
7. **42** Thoughtful
8. **76** Sincere
9. **29** Cheerful
10. **46** Objective
11. **2** Rugged 1 + Good Listener 1

I want to share with someone who is able to

509 answers   (with max 2 answers)

1. **55**   Change my mood
2. **60**   Listen to me till the end of the world
3. **69**   Give me an advice
4. **38**   Be with me without asking what happened
5. **12**   Tell me that 'don't be a fool!'
6. **81**   Push me to reach my goals
7. **14**   Control me to keep on the track
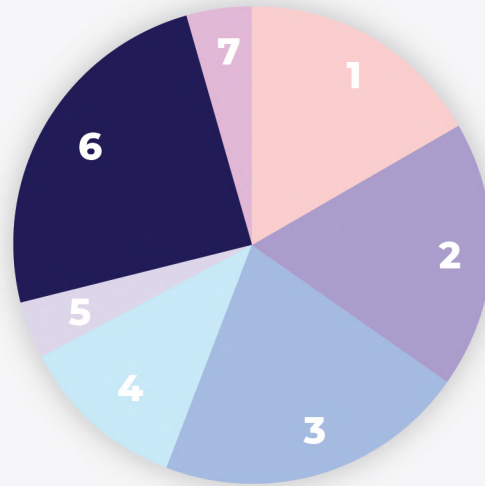
Who do you consider as your emotional companion

(emotional means that a character that you can share all your emotions and they can have an effect on your emotional state

329 answers

1. **40**   My friends
2. **5**   My dad
3. **24**   My mom
4. **31**   My best friend
5. **5**   My pet
6. **16**   My imagination
7. **12**   My girlfriend
8. **25**   My boyfriend
9. **15**   Others

Part 3

Which suits with you more
173 responses

Option	Value
Voice	53 (30.6%)
Text	67 (38.7%)
Video	53 (30.6%)

0 10 20 30 40 50 60 70 80
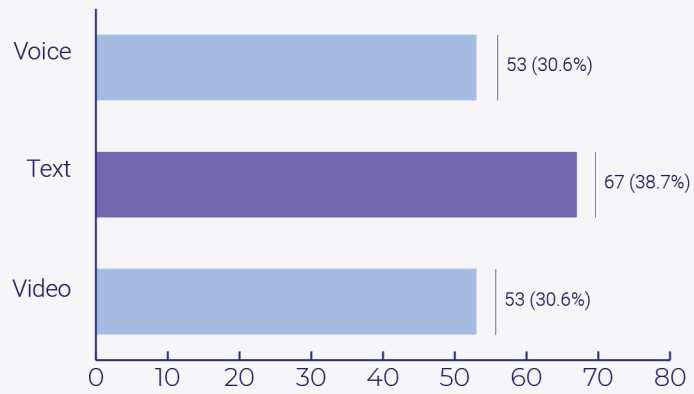
I can share my mood better with (More expressive for me)
173 responses

Option	Value
Visuals	107 (61.8%)
Sounds	66 (38.2%)

0 20 40 60 80 100 120
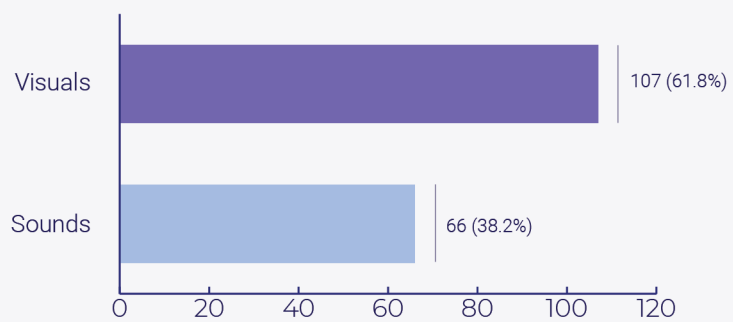
Express emotions on digital platforms with

173 responses

emojis/stickers	74 (42.8%)
gifs	31 (17.9%)
musics	27 (15.6%)
video	15 (8.7%)
text	26 (15%)

0 10 20 30 40 50 60 70 80
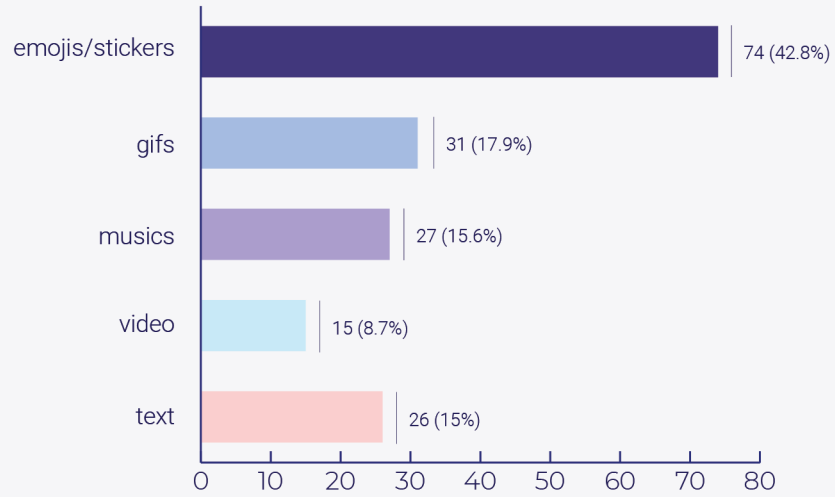
I used or at least tried to interact with one of these virtual assistants (the most used one)

173 responses

1. **89** Siri
2. **57** Google Assistant
3. **4** Cortana
4. **12** Alexa
5. **1** Maslo
6. **8** None

   * 1 user used all of them
   1 user used S Voice
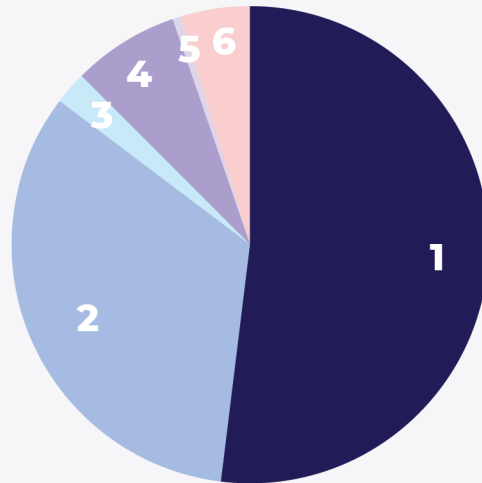
I want my personal assistant to be more

173 responses

Category	Value
Sincere (Honest, Well-mannered, Cheerful, Friendly, Kind, Family-oriented)	50 (28.9%)
Accomplished (Logical, Reliable, Intelligent, Confident, Secure)	80 (46.2%)
Excited (Independent, Imaginative, Fun, Exciting, Cool, Trendy)	38 (22%)
Others (Ironic, Intrinsic, Supportive and positive/optimist, more capable to continue the deep conversations)	5 (3%)
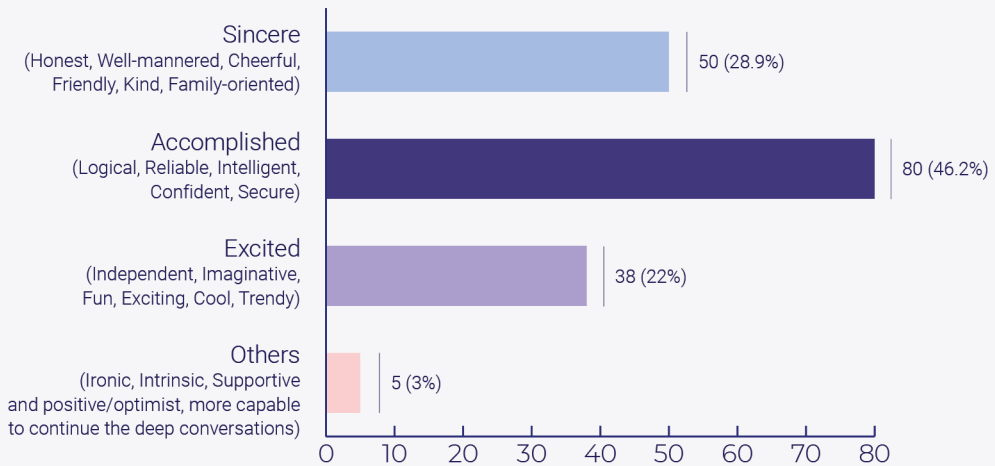
How do you want to interact with it?

444 answers   (with max 3 answers)

1. **81** Keep me on the track to reach my goals
2. **61** To increase my self-awareness
3. **52** Share my day and analyze it, joke about it, have advice for it etc.
4. **32** More empathic, like my friend
5. **36** Like my life coach
6. **62** Understand me without telling the same things every time
7. **36** Communicate in different ways, for example, this time I can play music for you
8. **45** Help for daily basis
9. **37** Help to change my mood
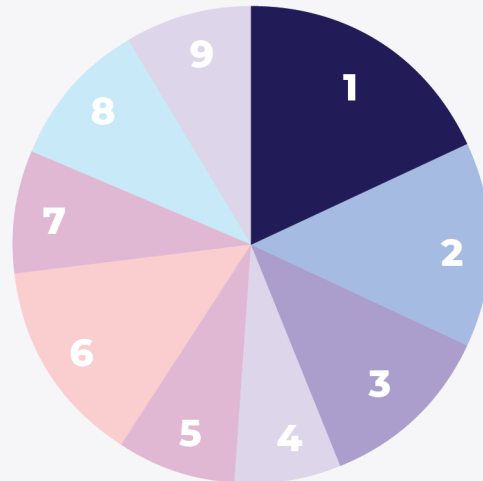
* 1 user "More emotionally, like a friend"
  1 user "I don't like to interact with machines"

How old are you?
173 responses

Age	%
16 - 22 yo	14%
23 - 26 yo	57%
27 - 30 yo	20%
31 - 42 yo	9%
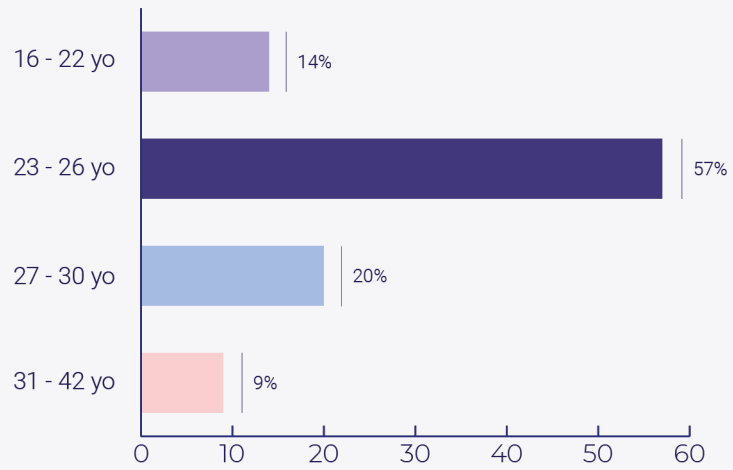
What is your gender?
173 responses

Gender	Count
Female	93 (53.8%)
Male	74 (42.8%)
I do not want to state	6 (3.5%)
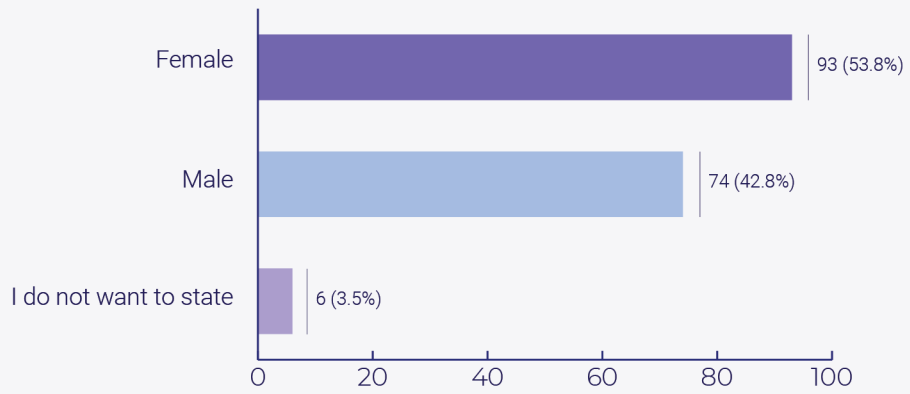
Where are you living now?

173 responses

Italy — 87

Turkey — 65

Germany — 8

Others — 13

* Others: Holland, China, UK, Estonia, Japan, Netherlands, Norway, Russia, US.

(x-axis: 0, 20, 40, 60, 80, 100)
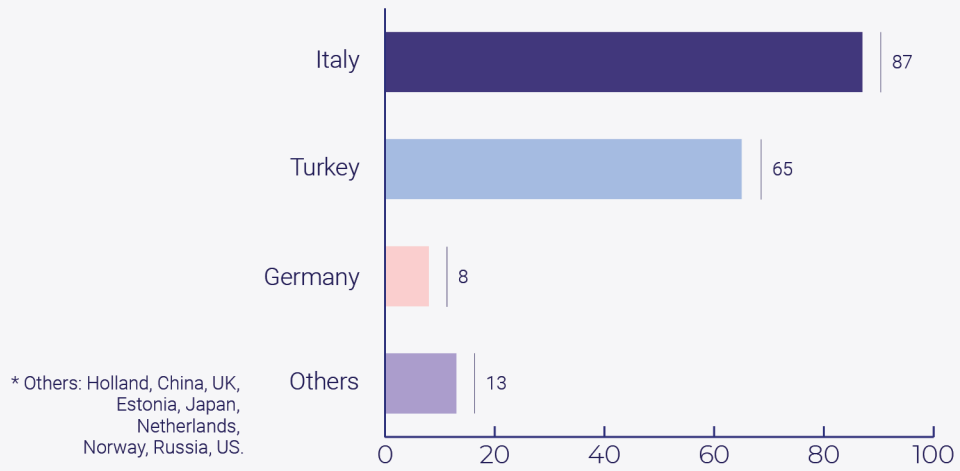
True-Experimental Testing Results

Results will be divided based on the 3 iteration phase and explain with all the outcomes that have been discovered. Also, feedbacks, wishes, likes and suggestions from the users will be stated related to each iteration and 2 Onboarding experiences with different personalities.

Results of Iteration-1

The first iteration is tested by 5 students from the first year of MSc. Digital and Interaction course with the consideration of the usability testing methods and it is conducted as a semi-structured interview as stated before. Usability testing is shaped to understand what users like more, dislike about the experience and also the wishes and suggestions about the digital companion personality and the onboarding experience. After all these points are stated, the results analyzed to understand what is the main variables to create doubt on the experience and how to build opportunities with the ideation of these doubts and wishes.

Before moving to the deep analysis of users to describe specific parts of the experience, I would like to state the general outcome that came out from the first iteration. The first meeting with the companion, when they saw the first scene of the onboarding experience, they shared that starting to the conversation with learning the companion's name and sharing their name helped them to perceive this experience like a real conversation between two friends.

The results are divided into different sections based on the users' insights to explain clearly in term of the flow of the experience, visual style, content, tone of voice of the companion, call to actions, perceived personalities and trust. All the insight that collected from users are shared under these categories and helped to reshape the onboarding experiences for the second iteration.

1. Visual Communication

1.1. Emojis
The usability testing results showed that emojis were useful communication materials to catch the users attention more.

What Worked better and User Liked

▶ 3 to 5 users stated that when they switched to the second experience, to see a reflection of a real human emotion was engageable and more clearly understandable to understand the feeling of the companion.

▶ 1 user stated that she felt that emojis reduced the complexity of cognitive thinking and she directly created a connection between emojis and emotional states.

What did not Work and User Disliked

▶ 2 to 5 user found out the emojis a little bit too much for the overall design.

▶ 2 to 5 users stated that emojis are not a communication way for them to express their feelings in their daily life and it was not creating excitement on the experience.

▶ 1 user described that emojis are disruptive for him and he prefers to describe his emotions with words rather than visuals.

▶ 1 user stated that he prefers to use his imagination to perceive the emotions with the tone of voice of the text and the content.

▶ 1 user said that to have only 4 emoji option to describe the emotional states was not enough.

User Wishes and Suggestions

▶ 2 to 5 users said that to describe emotions with emojis they would prefer to see extreme emojis rather than the usual ones to create more curiosity on the next phase of the experience.

▶ 3 to 5 users wished to reduce the amount of emojis even if they like them.

▶ 1 of the user stated that he was expecting to see a wide range of emojis.

1.2. Visual Design

The testing results showed that visual design was consistent with the topic and the flow of the experience.

What Worked better and User Liked

▶ All the users stated that the colours were reflecting the content.

▶ 3 to 5 users liked the second onboarding visual style because of the curve shapes allowed them to feel more comfortable, trustful and friendly.

▶ 2 to 5 users liked the first onboarding's visual style because of the geometrical shapes were more goal-oriented and stable.

▶ Both onboarding's visual style was remarkable by only 1 user and she matched the visual styles with characters in her mind. It was a good touch for her to humanize the companion to create a connection.

▶ The visuals for the second onboarding are defined as organic and friendlier by 1 user.

What did not Work and User Disliked

▶ Movements are not perceived by 4 users. Only one user was able to understand the movements.

▶ In the first onboarding small reactions with the geometrical shapes, becoming bigger or smaller perceived by none of the users.

▶ In the second onboarding the reflection of users' emotions, having the same facial expression with the emoji, are not realized by 3 users.

User Wishes and Suggestions

▶ They suggested making the second experience more active and fluid by adding more movements.

▶ They would like to read less text and wish to realize the visuals to be able to spend more time during the experience.

1.3. The Tone of Voice and Content

What Worked better and User Liked

▶ For 2 users, information related to companion explained clearly in the content for both experiences to learn and discover more about its personality and the reason why they need to build this empathic relationship.

▶ 2 to 5 users stated that the first onboarding was reflecting its knowledge and capability to learn. It is explained in the content clearly.

- 1 user perceived the second experience tangible in somehow and she stated that the content was reflecting the personality of the companion. Also, this made her think about the reality of communication and she felt that the conversation is real and is going in a personal way.

- From the first onboarding 1 user understood from the tone of voice that it was a personal experience.

- The tone of voice of the companion for the second experience was friendly for 3 to 5 users.

- 2 users liked the first onboarding's tone of voice because of its logical approach.

What did not Work and User Disliked

- The intensity of content. 3 to 5 users stated that after four screens it started to be boring and less engageable.

- 2 to 5 users wanted to start the journey directly because reading a lot of texts decreased their attention on the product.

- The personality selection, which they are intelligence, achievement, excitement, imagination, was not clear to select easily for 4 users.

User Wishes and Suggestions

- They wished to have less text and explanations.

- 1 user stated that she would like to have information about the interaction with the companion like when is active and when is off.

- For the personality question, 3 users suggested placing brief information to understand what they are defining. Also, 1 user wanted to be able to select two of them instead of only one.

- 2 user wanted the companion to call them by their name.

2. Companionship

The overall results are proved to give an option to users for trusting to the companion or not was unexpected and engageable more than the usual onboarding experiences. This option led to users to create more trust with the digital companion and also made them curious for the real journey. Also, the feeling of being in the conversation even before starting using the application was natural.

2.1. Trust and Data Protection

What Wrked better and User Liked

- 5 to 5 users stated that having an option for trust was interesting and it took the journey far away from being demanding. For both onboardings, trust part of the journey was describing a chance to create a more trustful relationship. Also, the intention of the companion was positive to create a trust for each other in the future. They found the second onboarding more trustful thanks to the tone of voice and the content of the experience, for example saying "there is nothing to hide" created a direct connection with trust.

- 4 to 5 people stated that this option made them more curious to see the result when they selected to trust or not to trust. Their first answer was to trust companion but for curiosity, at the end of the experience, they asked to go back and check what could happen if they have answered not to trust.

- 2 of the user said that they felt that they are communicating with a real friend and this experience can lead to make them more reliable companions and they would like to share their emotions easily.

- 2 user said that when companion said "there is nothing to hide", they directly had a feeling of trust and courage to go further.

- 2 to 5 users checked the data policy because of their curiosity. They said that to have an option to check is better than not having an option. To know that there is an opportunity to check it directly was a good insight.

- The call to action of the data privacy was more visible in the second experience and the companion was more couraging to check it. Also, it was like a button and they felt familiar to click on it.

- 2 user stated that after they selected to trust for both experiences, having an option to skip inserting the email, created more trust. They thought that they did not give any personal data and there is no reason not to trust. Also, one of the users said that this option created an opportunity to start a journey with the companion without being under pressure or thinking on what kind of data she gave and how this companion will use it.

What did not Work and User Disliked

▸ For the first onboarding, companion with more logical personality, users said that it created a feeling that the companion is self-couraged and structured with the tone of voice.

▸ 2 user stated that they trusted but they did not like the communication with stating as "we". They say that it was a bit scary because we do not know each other yet.

▸ 2 user said that having an option to check data policy was nice but they were including a lot of texts and they felt lost where to find the important information related the data that they gave.

▸ 4 to 5 users did not realize the call to action for the data privacy on the first experience. When they checked it again they stated that the position of the call to action and the size of the text was not proper to understand for the first time.

▸ 2 users stated that for both experiences, call to actions for the data policy was cold and was not couraging to check.

▸ 1 user stated that link to trust to privacy and policy is created confusion in her mind and she could not understand clearly that trust is related to companionship or data protection.

User Wishes and Suggestions

▸ 4 to 5 users suggested making the flow shorter if they have selected not to trust. Also, they would prefer after asking to give me a chance, directly starting to the experience, stick to the point, rather than having more information.

▸ To make more incentive the call to actions for the data policy could create a chance to check their data and be aware of how this data is using by the companion.

▸ To categorize the data policy to find information easily what they are looking for could create more trust to see the system is descriptive and understandable. Also, another option could be making it more interactive and supporting with visuals rather than just placing the texts.

▸ 1 user suggested clarifying the relationship with the companion in terms of trust with using more clear explanations.

▸ 1 user expected to have information to discover more about her personality after she made a decision and be surprised about the information.

2.2. The Personality of the Companion

What Worked better and User Liked 2 to 5 users prefered the first onboarding's personality because they found good matches with their personalities. Also, they perceived it as more focused and quick to reach the end of the experience.

- ▶ 3 to 5 users prefered the second onboarding's personality because of a more friendly approach.

- ▶ 1 user felt like they are already friends and the companion will not do something wrong against her like stealing her data or telling her secrets to someone else.

- ▶ 1 user perceived the behaviour of the second companion more organic more than being friendly. It was ingenuous.

- ▶ 1 user stated to have a personality with more humanized behaviours brought her closer to the companion.

What did not Work and User Disliked

- ▶ 1 user found the personality of the second companion more humanized and he would not interact with something that reminds him human.

- ▶ 2 user stated that they do not like the feeling of closeness before knowing each of them in a better way. For instance, when the companion started to talk as "we" rather than "I".

User Wishes and Suggestions

- ▶ Having an edge between the user and the companion at the beginning of the experience.

- ▶ Carefully humanizing the AI to avoid creating an uncanny valley effect.

- ▶ 1 user wished to see more personal information from the companion rather than formal explanations.

Ideation of Outcomes and Next Design Implementation

After clustering of the data of outcomes from the first iteration, the most desired and suggested implementations and changes are selected to re-design the onboarding to test through the second iteration (take as a reference Chapter 7 for detailed information about the design process). The selected outcomes are:

The flow of 2 onboarding experience

▸ The next screen of the trust page to ask users a chance to try. After "Give me a chance" call to action, if users are willing to give a chance rather than leaving the application, the flow changed to move directly into the application and start the journey.

▸ For the Logical onboarding (first experience), all the additional information and conversations with the companion are removed and the flow became shorter than the Sincere one (second experience).

Trust

▸ To create more trust about data security of users and protection, the content is changed for the Sincere onboarding and it defined to underline when the app is using their data as "I will be only active while you are using the app. Can you trust me, as well?".

▸ The data policy call to actions became more visible and distinguishable in both designs. Also, with the content tried to courage users to check policy and data protection.

Visual Communication and Content

▸ Personality definition screen redesigned with adding information to explain and distinguish the characteristics.

▸ Reduced the amount of text and tried to make the visual style more visible than before.

▸ The Logical character kept more stable without having any movement. The more movements are defined for the Sincere character to let users understand the dynamism and excitement of the companion.

▸ The complexity and amount of emojis are reduced to let users focus on more tone of voice of the content.

▸ The way of addressing it has been changed from "we" to "I".

▸ The data policy and privacy screen redesigned again with categorizing the information to make easily accessible what users are searching for and also the visual style tried to match with the onboardings to make the design more coherent for both onboardings.

Results of Iteration-2

The second iteration is conducted by usability testing and a structured interview with 10 users in between students and professionals. As clearly stated before, onboardings have been tested with more expert users, that includes interaction designers, digital product designers, service designers and also architects.

Widely, usability testing is shaped to understand these topics:

- ▶ The effect of changes that are implemented after the first iteration.

- ▶ The flow of logical and sincere onboardings in terms of effectiveness

- ▶ The tone of voice importance for building trustful relationships

- ▶ The feeling of empathy with content, tone of voice and visual style

- ▶ The coherence of content and visual style to shape conversations between the user and the companion in the frame of "trust"

- ▶ The variables to create trustful companionship and start the journey

- ▶ Dual Conversational perception effect on user experiences

- ▶ The motivations that cause changes to users' emotional states and behaviours

- ▶ Secondary visual elements' effects like emojis or visual representation of the companion's reactions

- ▶ The privacy, policy and data protection effect on trust

- ▶ The effective way of communication for users

- ▶ The companion's personality definitions for both onboardings at the end of experiences

First of all, the most important and considered topics will be explained in this section with quantitative data. The schedule will be 1 to 10 people to share the common insights, worries and suggestions with numbers.

Secondly, the perceived personalities from the experiences will be defined by person to person with the reasons. Besides, the most important variable for creating trustful relationships will be stated with quotations, directly collected from users during the interviews.

Last but not least, other important topics, that is discussed during the interviews, will be stated to consider these insights for future developments. Also, the importance of

different personalities' effects will be emphasized on reshaping user experiences. Lastly, the outcomes will be analyzed to be used for the third iteration.

Testing maslo's onboarding

In the end, I tested the real onboarding of maslo with the same users that they joined to the second iteration of usability testing. First of all, they defined maslo as a natural name and it did not create any perception about gender and it was a good starting to define a personality for maslo by themselves. All the users are stated that it was natural and friendly starting for learning about maslo. On the other hand, with the usability and effectiveness of maslo's onboarding users' feedbacks identified the onboarding process of maslo as a standard for mobile applications that do not lead to more engagement or creation of a mutual connection with the service. Instead, they found the onboarding similar to a simple collection of data required for using the app. However, they appreciate the difference in the tone of voice even if the redundancies in the use of encouraging expressions lead to a sense of detachment. This due to the fact that users did not feel in a relationship with the application that actually was pushing them with advice about their self-confidence. People perceived that the interaction was designed beforehand. The collected feedback from users will be presented at the end of this section.

What is matter most?

The important variables will be explained into three main categories in terms of content, visual style and trust. The graphics will describe the value 1 to 10 based on how many people were stating the same topic to clearly sum up the outcomes. 10 will be the maximum amount and 1 will be the minimum amount representation.

Content

Information about personality (10 to 10 agree)
Users stated that personality information was descriptive but they would like to see more personal information to perceive the experience as a real conversation.

Text-based communication (10 to 10 agree)
Users have stated in terms of the content and the tone of voice, the communication was reflecting the personalities of companions and they were easy to understand.

Duration and Effectiveness of Onboardings (10 to 10 agree)
Users have stated that the information used for descriptions and questions were enough to understand the content and to keep their attention high on the experience.

Dual Conversation (8 to 10)

Users stated in terms of creating a conversation with a companion the content was interesting to communicate. They liked to have an option to ask back to the companion like "I am good and you" was engageable and made the conversation more real than before. Also, it was not a usual interaction that they faced before and it created excitement, curiosity and feeling of trust.

The Personality of the Companion (9 to 10 user)

Most of the users stated that the personality of the second companion was understandable with a tone of voice, content and also with the visual style. These users also stated that they mainly prefer the second onboarding experience because they found common points between each of them and built more empathy. The results show that the perception of the second companion's personality was mainly focused around a friendly approach and sincere. It can be found better at the perceived personalities section which is defined by each user during the experience.

The first onboarding's personality understood as well but users stated that they did not find it engageable like the second one. Its behaviour was colder than the second one and could not create a friendly and emotional approach to users.

Visual Style

Visual Elements (9 to 10 users defined it as coherent with the companion's personality)

Most of the users stated that the visual coherency with the content and the personality of the companion was coherent. Also, the visual elements are one of the main element to represent the interfaces with strong and understandable content. Users said that the visual style for both of the onboardings was compatible with what is character saying and what are they imagining. Besides, the visuals were simple and helped to reduce the intensity of the texts.
For the first onboarding, the abstract character is realized just 4 users and even if they realized, they could not understand clearly what it was representing.

For the second experience, most of the users stated that the movements of the abstract character gave a dynamic to the experience and made it more organic, familiar and friendly. Also, the emotional reactions of the abstract character increased the empathetic relationship and changed the users' emotional states and episodic dispositions.

Secondary Visual Elements (7 to 10 users liked emojis)

Secondary visual elements appeared as emojis in the second experience. More than half of the users stated in terms of creating closeness, emojis were useful to move the experience one step further and made it more friendly and familiar. They perceived

communication as they are talking with their friends because of the regular usage of emotions in our daily lives while texting.

Emojis meaning (7 to 10 users didn't match the meaning)
On the other hand, on their imagination, emojis were matching with specific emotional states and they stated the perception of the emoji's emotional states were different than it is stated. So, at the same time, they found emojis complicated and hard to understand.

Trust

Having an option to Trust (6 to 10 users)
More than half of the users stated having an option to select to trust an application or not was really interesting. Especially the second onboarding created directly trust on people thanks to the empathetic tone of voice and the way of representing this fragile and sentimental topic.

Skip inserting the email (8 to 10 users)
Most of the users stated having a chance to skip inserting email helped to increase their trustfulness and curiosity before starting to the journey. It was a good starting point to feel that the companion is reliable and will not share their data.

Sharing personal informations (6 to 10 users)
On the other hand, more than half of the users became thoughtful about why they are sharing their emails. They stated that most of the times, it is an automatic action and they are just inserting the emails without knowing the reason. For this experience, they would like to have an idea why the companion needs their email like for keeping their data safe, sending information or interesting updates based on their personalities, their analysis after the journey etc.

Give me a chance (8 to 10 users)
For both experiences, most of the users wanted to face with more information to have a reason to give a chance to start a journey. They could prefer to meet with a more informative and imaginative personality to give them a reason to try. Also, the duration of the onboarding could be longer rather than starting a journey directly.

Perceived Personalities

The personalities of the companion showed variability to each user and they are defined in different personalities by users. These outcomes showed that every people have a different imagination and perception. Even if all the variables are the same in terms of the way of communication and interaction and also the visual representation, users perceived

the companion's personalities in different ways. Also, they described these personalities with finding common points from their imagination to personalize them. Even the specific characteristics are presented with these 2 onboarding experiences, users embodied their personalities in different ways.

In addition to that, at this point, the name of the companion gain importance and half of the users stated that it was a natural name and helped to define their own gender. Also, almost all users stated that at the beginning of the experience they would like to know more about maslo because the represented personality created curiosity.

1. Samuele
- ▶ Onboarding 1: Introvert, Rational and Cold
- ▶ Onboarding 2: Lover and Sincere

2. Paola
- ▶ Onboarding 1: Logical and Rational
- ▶ Onboarding 2: Funny and Sincere

3. Yagmur
- ▶ Onboarding 1: Logical and Kind
- ▶ Onboarding 2: Excited and Imaginative

4. Sandra
- ▶ Onboarding 1: Logical and Helpful
- ▶ Onboarding 2: Cheerful, Calm and Sincere

5. Alessandra
- ▶ Onboarding 1: Helpful and Caregiver
- ▶ Onboarding 2: Lover, Imaginative and Explorer

6. Gamze
- ▶ Onboarding 1: Skeptical and Rational
- ▶ Onboarding 2: Sincere and Imaginative

7. Xiaofeng

▶ Onboarding 1: Rational and Original

▶ Onboarding 2: Self-confident

8. Elena

▶ Onboarding 1: Thoughtful and Informed

▶ Onboarding 2: Lover and Sincere

9. Caterina

▶ Onboarding 1: Explanatory and Rational

▶ Onboarding 2: Cheerful, Natural and Justified

10. Riccardo

▶ Onboarding 1: Helpful and Explorer

▶ Onboarding 2: Lover, Sincere and Self-confident

What is matter most for individuals?

Every human has different approaches against events that affect people in a good or bad way, increase or decrease courageous, self-awareness or growth, shape their ideas in different ways and make different decisions and many other variables. Every user is different than each other while they are building a relationship or meeting with a person. These actions are giving shapes to their interactions and the way of communications and change events in order of their importance.

Here, the result of the second usability testing with 10 different users showed and emphasized the importance of different personalities effects on user experiences. Because of the different personality traits of users, the user experiences have changed and evolved in different ways. And this iteration showed that making artificial intelligence more empathetic and transparent helped to gain trust and helped to increase users' attractions on digital products. Moreover, it caused sudden changes in users' emotions and dispositions with making them sometimes more sceptical or curious to go deep on the topic or to avoid talking about it.

Below, the results of the most important topics for each user will be shared and stated in terms of content, visual style and trust with their quotes.

Samuele | Italian lives in Italy

25 yo | Service Designer at Intesa
MSc. Product Service System Design

> "I trusted from friendship point of view thanks to the tone of voice"

Content

- It is not giving me a human perception, this is **friendly!**
- Content should change based on my personality selection
- I would like to see more information to give me a **reason to trust**
- I felt **trustful** and able to have **friendship**

Communication

- Characters are matching with reflected personalities
- Emojis are interesting but the amount should be reduced
- The tone of voice explains everything and enough to **feel personality**
- 2nd onboarding colors and **visuals** are more **friendly**

Trust

- Convinced me to try
- If I trust, I would not prefer to check privacy, policy. It can create artificial trust
- 2nd onboarding's **personality created trust** on me
- I have two types trust, here I **trusted** to companion **emotionally**

*2nd onboarding was more in line with my personality

Paola | Italian lives in Italy

24 yo | MSc. Product Service System Design

> "I felt close to the companion thanks to visual communication"

Communication

- Characters, colours, shapes perfectly **reflecting companion's personality**
- **Reactions** of 2nd character was really nice
- **Emojis are funny**, made me laugh but for me their meanings are different
- 2nd onboarding visuals **made me excited** and I felt **closeness**

Content

- Having an option to **ask back** was nice
- **Basic answers**, suitable for the first meeting
- Clear, **brief explanations** about personalities
- **Easy to understand** text communications and the tone of voice

Trust

- Asking "do you trust me" increased my **self-awareness**
- Policy, privacy is more visible on the 2nd onboarding and it is **trustful!**
- I did not realize email skip button
- Human traits and **personalities** made conversation **active**

*2nd onboarding was more in line with my personality

Yagmur | Turkish
lives in Italy
27 yo | MSc. Digital & Interaction Design

"I felt trustful and perceived it as a real conversation with the flow and tone of voice"

Content

- I felt like a **real conversation**
- Having an option to ask back, it is **empathetic**
- Before selecting the personality explanations were **clear** and **understandable**
- Flow could be more personalized
- I felt **couraged**

*2nd onboarding was more in line with my personality

Communication

- Characters and colors are matching with reflected personalities
- 2nd onboarding is **dynamic**. I like the movements of character
- I found 2nd onboarding more organic and excited
- I felt **trustful** with the **flow** and **tone of voice**

Trust

- Privacy, policy part is understandable. Categorized informations **guided me** to find right informations
- I would like to see how companion will gain my trust if I select not to trust
- I would like to see how companion will gain my trust if I select not to trust

---

Sandra | Estonian
lives in Italy
25 yo | MSc. Digital & Interaction Design

"Companion is still learning, I felt empathic and relax"

Content

- I would like to have more information about companion
- Having an option to **ask back** was nice
- 2nd onboarding made me thoughtful about my decisions
- It is still learning, I felt **empathetic** and **relax**
- Personality contents are not clear to select

Communication

- Characters and colors are matching with reflected personalities
- 2nd onboarding's character reactions **made me** more **connected**
- Emojis could have more information, it was not clearly defined
- 2nd onboarding is **organic** and **soft**

Trust

- Privacy, policy part should design with more visuals and interactions
- I would like to see why I should trust to companion. The flow can be longer and informative
- I would like to see how companion will gain my trust if I select not to trust

*2nd onboarding was more in line with my personality

Alessandra | Italian
lives in Italy
28 yo | UI/UX Designer at illimity

"Conversation was fluid and it thinks exactly like me and talking a way that I prefer"

Content

- I prefer more empathic and friendly answers

- Personality contents need more information

- I felt the journey was **tailored for me**

- Tone of voice is perfect to perceive personality and both onboarding has **friendly approach**

- **Tell me more**! I expected, experience will continue

*Both companion was in line in a way with my personality

Communication

- Emojis are not matching in my imagination. The amount should be reduced

- 2nd onboarding character reactions created more **trustful interaction**, I felt relax

- I felt more **humanized AI** with warm colors. It was not scary.

- Tone of voice matched with the design

Trust

- Privacy, policy part is understandable with categorized informations

- Companion should tell me more about itself to make me more trustful rather than asking to trust

---

Gamze | Turkish
lives in Turkey
27 yo | Architect, Visual Designer

"Interface was nice, questions were tailored. I felt that is a real digital meeting"

Content

- Having an option to **ask back** was nice

- I felt like a real **digital meeting**

- Personality contents are not clear to select

- It perceived both experience was like **personalized**

- Contents are shaped with friendly approach, I felt **comfortable**

*1st onboarding was more in line with my personality

Communication

- Tone of voice was friendly

- Emojis made design more **interactive** and **dynamic**. It was familiar

- 2nd onboarding's visual elements were rich. Colors were soft and **touchable**

Trust

- Informations could not convince me about data usage. I would like to have more empathic information rather than reading privacy

- I felt more **worried** with companion's explanations to trust

- Before asking personal informations, having an idea about companion was comfortable

Xiaofeng | Chinese
lives in China
26 yo | UI/UX Designer at Mercedes
MSc. Digital and Interaction Design

"Policy, privacy part had an important role to create trust on me"

Content

- Having an option to **ask back** was nice

- I felt like a **basic setup** before the journey

- I would like to have more information about companion

- 1st onboarding, **easy to understand**, clear and **fast**

- 1st onboarding had simple and clear flow

Communication

- I prefer **logical** tone of voice, friendly is not my type

- Emojis were not matching with my imagination

- I prefer text-based communication rather than visuals

Trust

- To have an option to trust was a **transparent interaction** and made me trustful

- Personal informations were at the end and it was **meaningful**

- Policy, policy have an important role for me and here was completely **understandable**

*1st onboarding was more in line with my personality

Elena | Italian
lives in Italy
25 yo | MSc. Digital & Interaction Design

"I am the user, I want to have a chance to try before sharing my personal data"

Content

- I would like to have more information in the final step before starting journey

- Having an option to ask back, I found **skeptical**

- Good to know it is new and will grow with me

- To know that is only active while I am using the app gave me good insight to trust

Communication

- I found emojis disruptive

- Movements added some dynamism, could be nice to see motions and animations

- 2nd onboarding's curvy shapes **reduced the distance** with companion

- With the 2nd onboarding's reactions, I felt more friendly

Trust

- Privacy, policy part clearly stated and I felt that it is **not hiding anything**. It gave me trust

- **Small but effective interaction**, to skip inserting personal information gave me trust

- With giving a chance to the companion, I'd like to have an option to delete my data when I want

*2nd onboarding was more in line with my personality

Caterina
Italian | lives in **UK**

25 yo | Product Designer at Facebook

> "Words and visuals are very important elements to be in the conversation. It is natural and justified"

Content

- I felt that it is from a **different culture** and curious about it to discover
- I prefer more personalized answers
- I understood that it **will help** me in a way
- Words are **effective**
- Content is very positive and welcoming.

Communication

- The tone of voice **natural** and **justified**. Even can be more friendly
- Emojis are a **natural step** for communication and good **guidance**. Can be a balance with defining my own emojis
- **Visual style** is so important for me to perceive that **companion is talking** with me

*2nd onboarding was more in line with my personality

Trust

- Data protected, **encrypted** informations are directly reminding machine
- It needs to be more friendly with the tone of voice to support trust
- I'd like to see more information after "give me a chance"
- I am not sure to talk about trust. If I trust, **I will trust with content and visuals**

Riccardo
Italian | lives in **Italy**

25 yo | Visual Designer at PlugandPlay

MSc. Product Service System Design

> "Someone is there for me with its knowledge, it gave me trust, this guy knows something!"

Content

- Have an option to ask back made me **curious**
- More personalized reactions so it can be more alive
- It **will help** me in a way
- "Inner hero" sounds like a Professional
- Personality informations are understandable and for me "**first moment for a discovery**"

Communication

- Emojis are fine, natural communication elements
- Design, colors gave me **sense of friendship**
- Reactions of character made design more **alive**
- Tone of voice was **empathic**

*Both companion was in line in a way with my personality

Trust

- 1st onboarding CTA was too cold for policy part
- I'd like to have an information about policy if I do not trust for now. It should convince me with being more transparent
- To know the second character **is there for me**, gave me more trust
- To **be called with my name** gave me trust

Ideation of Outcomes
and Next Design Implementation

After clustering of the data of outcomes from the second iteration, the most desired and suggested implementations and changes are selected to re-design the onboarding to test through the third iteration (take as a reference Chapter 7 for detailed information about the design process). The selected outcomes are:

Emojis

- ▶ Emojis have been excluded from the whole flow of the second onboarding and have only used to welcome users and to describe their emotions.

- ▶ Another screen is inserted in the stream so that users can tell that the emojis correlate or have a different meaning than the one shown.

Email

- ▶ Users prompted for the first onboarding by asking for an email before beginning the experience and instead of this, the email asked at the end of the second onboarding session.

- ▶ Also, the additional information related to why the email is needed for the journey is described in the second onboarding.

Defining the Personality

- ▶ In the first experience, the section related to the selection of users' personality did not change. This, in order to keep the experience as short and direct possible.

- ▶ Instead, the second experience is upgraded with an extra page after the selection of the personality. It gives a description from the point of view of the personal companion.

Trust

- ▶ The exit button is added to leave the app to let users select between trusting the app or leaving the app

- ▶ The second onboarding became more explanatory to keep the user inside the journey and showed them a glimpse of what they can find inside the app.

Results of Iteration-3

The third iteration is conducted online by usability testing and questionnaire. As it is stated before in the previous chapter, for iteration 3, the selected method aimed to give a chance to users for being themselves and let them think with their own mind, be independent and understand their actions. 18 people joined online usability testing and answered questions. These 18 people include 7 users from the previous testing, iteration 2, and 11 users from the pre-experimental phases of the research who joined the online survey. These seven users are selected from those who participated in the previous test phase because these users have mastered the application. It is thought that they can provide an opportunity to understand what is created effective and meaningful insights with the applied changes into onboardings. Other 11 users have joined the online usability testing as well as new users to meet with the companion for the first time through onboarding experiences.

After briefly explanations of the third iteration results, the outcomes of the questionnaire will be graphically explained, the perceived personalities from two onboardings will be mapped and also testimonials and feedbacks from users that are considered to be effective in the future development phase of the project will be shared.

The Flow of the Experience

▶ The testing results showed that most of the users stated that they felt more in line with their personalities with the second onboarding experience.

▶ For the definition of the personality, slightly more than half of the users stated that the second experience made them more thoughtful about the selection of their personalities.

▶ Most of the users shared their expectation related to digital experiences being open for discovery rather than being explanatory.

▶ All of the users said both onboarding experiences were created excitement and aroused a sense of curiosity on them.

Trust

▶ The results showed that the majority of users trusted to the companion in both experiences. Only one user in between 18 users trusted neither first nor second experience.

▶ For both experiences even some users selected not to trust to the companion, they gave a chance to try the application.

Email

▸ Most of the users stated that sharing their personal data after having an idea about the journey was more meaningful and promising. The general comments to explain why users prefered shared their personal information at the end of the journey was to feel in trust with the product. According to the general comments of the reason why users prefer inserting their personal information at the end and not at the beginning of the journey is that they want to create a sense of trust and want to have information about the application.

▸ Most of the users said they had noticed the sharing of email information, and the majority of the users who noticed this said that they chose to share their email. This outcome showed that the inserted descriptive information, about why the companion needs users' email, helped to improve creating more reliable user experiences. From the results of the second iteration, users' expectation was to know the reason before sharing their personal data.

Emojis as Secondary Visual Elements

▸ Most of the users stated that the representations of the emotional states with emojis were friendly and familiar also the represented meanings were matching in their imaginations. Reducing the amount of emojis from the whole flow and giving the option to users for identifying the meaning of the represented emoji is matched or not with their expectations are found interesting and familiar.

▸ So clearly, the third iteration results showed that in comparison with the second iteration, emojis supported the visual communication and made the design more natural and friendly for users.

Personality

▸ For the first onboarding that designed with more accomplished personality, most of the users defined the personality of the companion as logical, rational, objective and explanatory.

▸ For the second onboarding that designed with more sincere personality, most of the users defined the personality of the companion as friendly, cheerful, imaginative and natural.

After the survey results and testing of the third iteration desired personalities for companion are analysed on a radar map. A comparison can be done between the pre-experimental survey and the perceived personality of the third iteration post-testing questionnaire.

Personality mapping on radar

Survey Results | Desired Personality Mapping

Reliable

Funny

Cheerful

Objective

Sincere

Helpful

30
40
50
60
70
80

Imaginative

Thoughtful

Logical

Amount of preferences: 30 to 80

1st Experience Personality Mapping

Logical
Thoughtful
Explanatory
Objective
Informed
Self-couraged
Rational
Skeptical
Helpful

2
4
6
8
10
12

Amount of preferences: 2 to 12

2nd Experience Personality Mapping

Sincere
Cheerful
Self-confident
Excited
Sentimental
Imaginative
Explorer
Friendly
Natural
Honest

2
4
6
8
10
16

Amount of preferences: 2 to 16

Questionnaire results

Which experience did you feel more in line with your personality?

18 users

1. **61.1 %**   1st Experience
2. **38.9 %**   2nd Experience
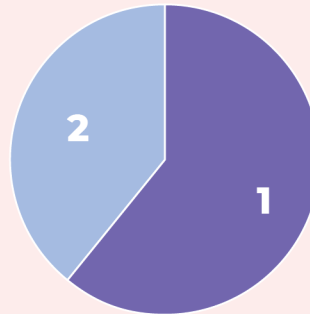
How can you describe the personality of the 1st experience?

40 responses

Personality	Count
Sincere	4
Cheerful	6
Excited	1
Imaginative	5
Friendly	16
Honest	2
Natural	4
Explorer	1
Sentimental	2
Sel-confident	1
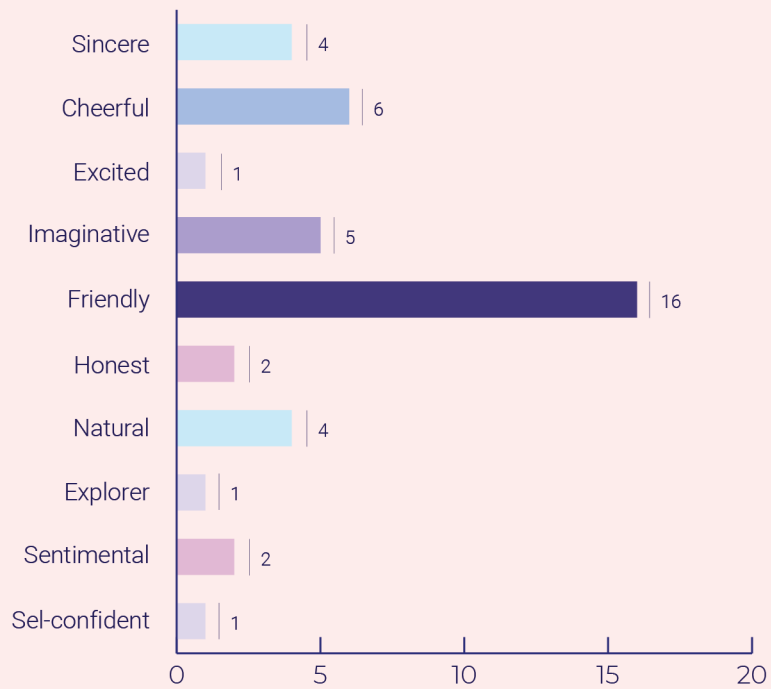
Did your emoji match with the proposed meaning?

18 users

	Value
Yes	13
No, but I've found the reactions interesting	3
No	2
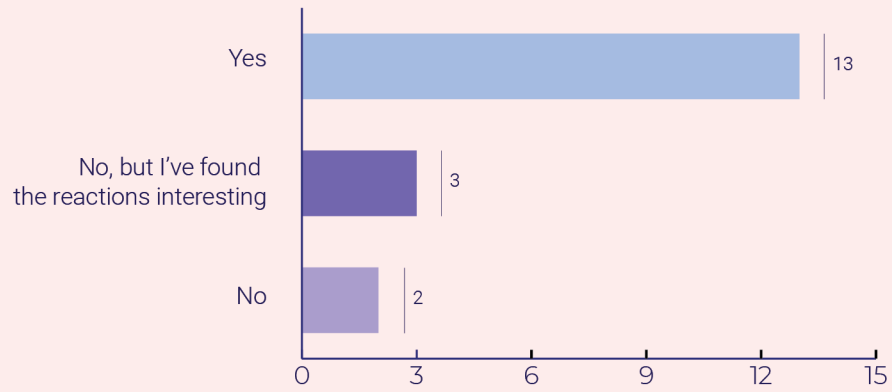
How did you feel use emojis to describe your emotions?

18 users

	Value
Sincere	10
Cheerful	4
Excited	1
Imaginative	1
Friendly	3
Honest	3
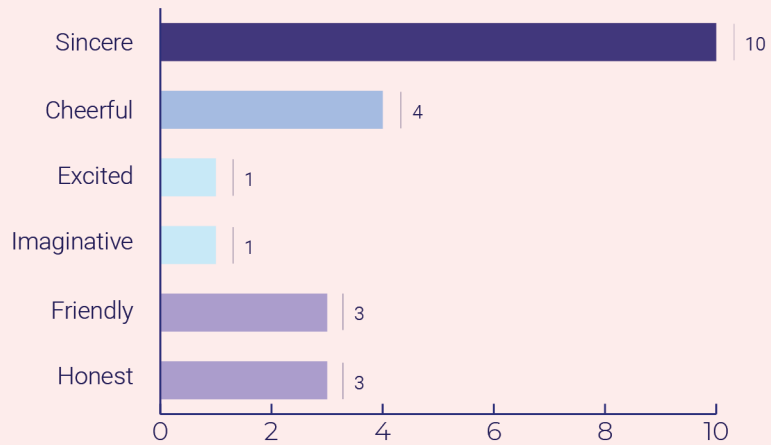
When companion asked you in the 2nd experience: "Do you trust me? What did you select:

18 users

1. **77.8 %** Yes, for now

2. **22.2 %** No, not yet
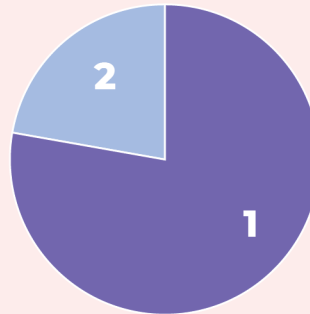
If you selected "No, not yet". Then, did you click on "give a chance"?

4 users

1. **75 %** Yes

2. **25 %** No

3. **0 %** No, and I left the app
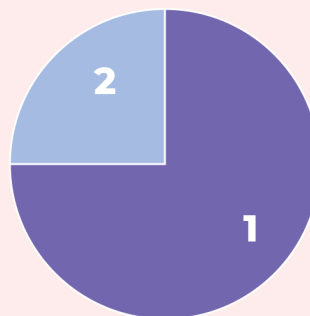
Did you skip inserting the email?

18 users

Yes	3
No, but I've found the reactions interesting	8
No	7

0 1 2 3 4 5 6 7 8
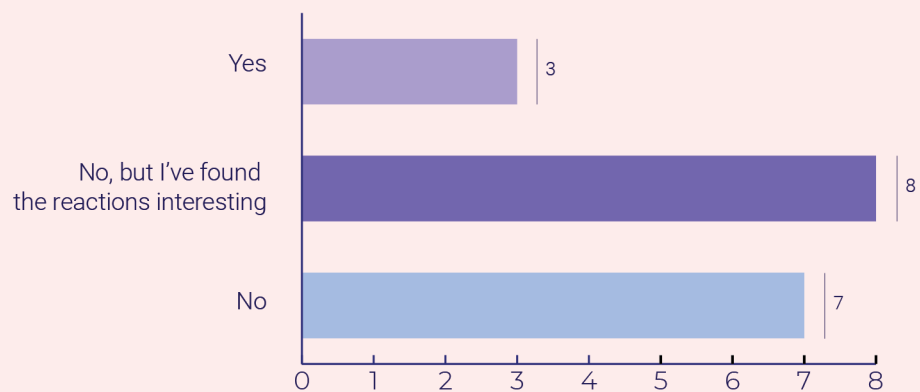
Do you prefer to share your personal information (like email)

18 users

1. **77.8 %** After meeting with the companion (2nd experience)
2. **22.2 %** Before starting to the journey (1st experience)
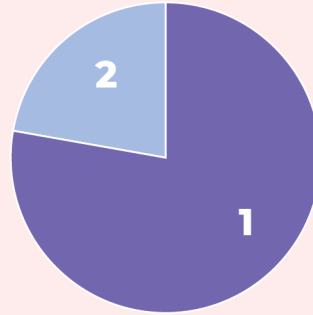
Which experience made you more thoughtful in the selection of your personality?

18 users

1. **33.3 %** 1st Experience
2. **38.9 %** 2nd Experience
3. **27.8 %** Both of them
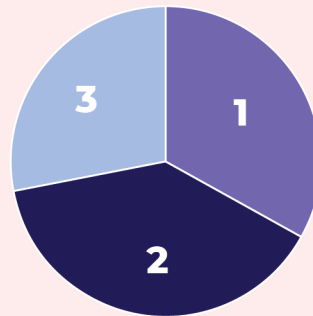
For you, it was a moment of:

18 users

1. **27.8 %** Learning, so I needed an explanation to pick up the right one
2. **72.2 %** Discovery, so I questioned myself and pick up the most promising
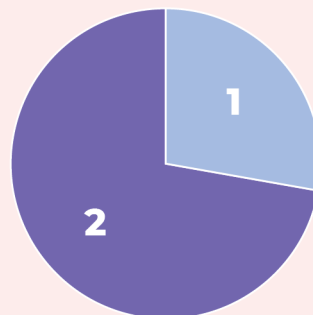
Which experience created more trust on you overall?

18 users

1. **22.2 %**   1st Experience
2. **38.9 %**   2nd Experience
3. **33.3 %**   Both of them
4. **5.6 %**   None of them
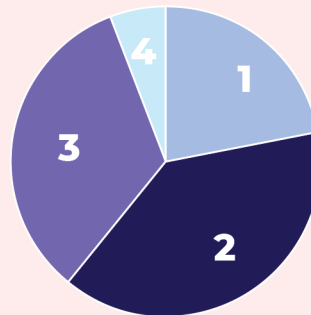
How can you describe the personality of the 1st experience?

35 responses

Personality	Count
Logical	11
Thoughtful	3
Objective	4
Rational	7
Helpful	1
Skeptical	1
Self-couraged	2
Informed	2
Explanatory	4
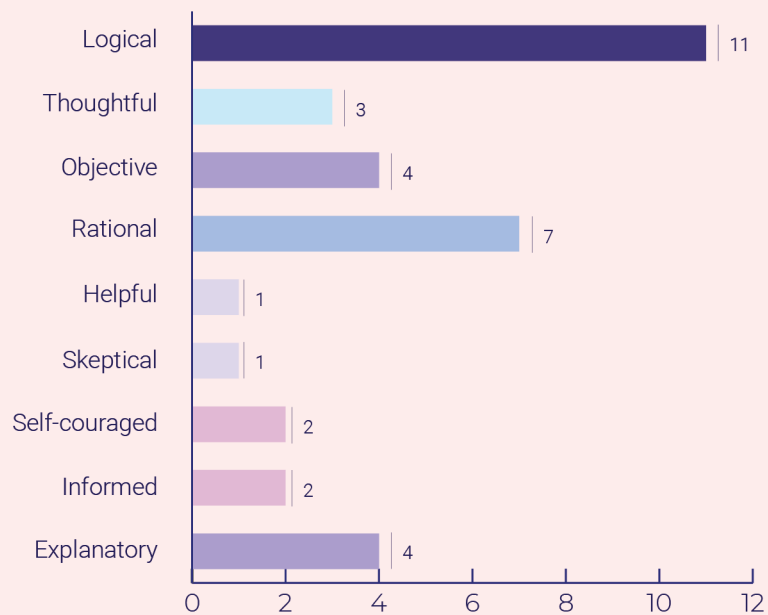
Which experience created more excitement and curiosity on you?

18 users

1. **16.7 %** 1st Experience
2. **66.7 %** 2nd Experience
3. **16.7 %** Both of them
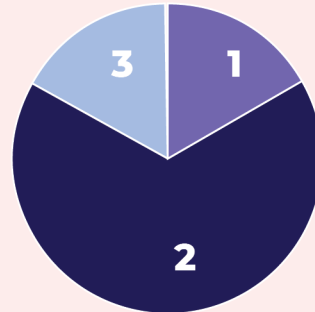
When companion asked you in the 1st experience: "Do you trust me? What did you select:

18 users

1. **72.2 %** Yes, for now
2. **27.8 %** No, not yet
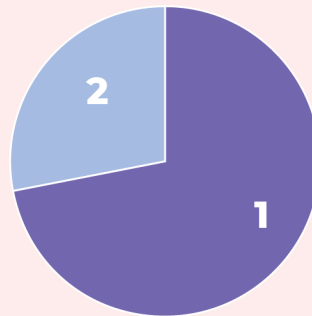
If you selected "No, not yet". Then, did you click on "give a chance"?

5 responses

1. **100 %** Yes
2. **0 %** No
3. **0 %** No and I left the app
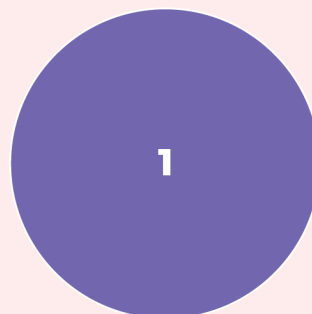
Take-Aways

This chapter explained thoroughly how findings of the usability testing performed to determine the outcomes of personality tests. And also, the results of the user experience assessment are discussed with analyzing all the design iteration processes, survey and questionnaire outcomes.

Discussion Conclusion Future Research

Discussion

The aim of the experiment was to understand the effect of implementing two different personalities into onboarding processes and assess the sense of trust built thanks to this.

Limits of the test must be considered in: the usability of the prototype itself (eg: inserting the name and email properly); the implementation of a limited spectrum of personality compare to the total archetypes of Aaker and Jung's personality models; iterations were run in a limited batch of almost homogeneous users from the target addressed by the application.

Friction nowadays is one of the main parameters that every UX/UI designers and businesses are looking to reduce in their customer journey. In the next paragraph, these usual practices of UX/UI are reported and confronted with the results at the end of the experiment.

▶ "The onboarding should be as quick as possible": both experiences were actually longer and slower to read compare to what this best practice says. Anyway, higher engagement is perceived until the point that many users started to go back and forth in the application to discover how the companion would answer if they choose a different option.

▶ "Push the user to sign-up and lead them to use the app as fast as possible": Instead, all the prototypes were built in order to create first a sense of trust and pre-experience of the application. Only in the last phase, the onboarding was moving to ask the user their personal information in order to subscribe to the service. Considering only the third iteration, almost 80% of the people were pleasant to insert their data after this first meeting with the companion. The first and second iteration reinforced this value. In the second experience, on 60% of the users that realized to have a chance of skipping the email inserting, only around 15% of the users consciously decided to skip. Even though, they were willing to try the app. Instead, the counterpart (about 45% of the total) consciously decided to sign-up based on the description of the reason behind the request.

▶ "Avoid designing clear exit points from your app": After building an initial relationship between the user and companion even in front of an evident button to lead the user close the app and leave the journey, only 1 user in 1 of the experiences used it. Probably this happened due to a sense of curiosity to discover what was happening in exiting the app. This means two onboarding created a correct sense of discovery and intrigued users to the offer of the service. This data can be misleading because of the testers did not feel correct to feel the app. On the other side, there was no reward in reaching until the end of the application.

▶ "Make sure that the user knows when he/she signs the terms and conditions": In both experiences, there was a step dedicated to asking users about trust. The aim of this step was asking to users to trust the companion in terms of relationship and at the same time in terms of policy, privacy and data usage. This in order to build the maximum sense of transparency and legitimate the initial emotional bond established before. Instead of limiting the practice to a checkbox, onboardings drove the users to explore their rights and feel aware and connected to the companion.

This strategy led to positive results showing how a better sense of trust is needed for optimal service experience. Trust is one of the pillars of creating empathic relationships that have to be in the core of the emotional design.

Self-identification

Moreover, the aim of the experiment was to test the implementation of multiple personalities.

The last iteration showed that 60% of the users identified themselves more closely to the second experience. On the other hand, 40% of the users identified themselves more closely to the first experience. After the second iteration, it was expected that the gap between the two values could be higher. Anyway, in the previous phases, users were never pushed to select or associate themselves to one of the experiences. The data of the third iteration is surprising because it shows that actually the two processes, similar only in the information architecture, were almost appreciated equally.

Building Trust

Another interesting final outcome is connected to the fact that the two different personalities were equally perceived trustworthy. Even if, they differ in features and visual communication.

This is another proof that building empathic and tailored experiences with two different personalities can be a striking feature to implement in the design industry.

At the end of three iterations and after completing the whole experiment the result clearly confirmed the hypothesis. The outcomes suggest that the implementation of these theories is crucial to develop trust in digital products for the next future of transparency and emotional connection especially considering the capabilities of artificial intelligence.

Conclusion

The aim of this thesis was to understand how artificial intelligence could shape user experiences by creating emotional and empathic relationships.

The hypothesis on this topic showed that complexity in design is changing with the number of actors and objects and this is affecting the human experiences. Also, the focus on the interaction with a digital product improving and extending the usability and make it more engageable and pleasant. Since all the focus is on designing quick and efficient products and experiences, the missing part appeared to be empathetic and emotional relationships with products. Especially with the inclusion of artificial intelligence in our lives, technology started to take shape as a tool to help individuals in their daily basis. The usage of AI increased but the sense of trust remained almost missing and it damaged human-machine interactions in building trustful and emotional connections. The general purpose of the thesis was to explore the scenario of artificial intelligence meeting with empathy and emotions and to investigate the effects of AI on trust in user experience. Besides, during the research effects of empathy were analyzed in psychological, cognitive and social constructions to explain a variety of psychological events, including motivation and personality.

With this intention, the topic narrowed down to be able to test a part of the hypothesis with designing empathetic onboarding experiences as a first meeting moment with a new digital companion (or person?). To create a trustful and empathic relationship, various communication signals are used as the tone of voice, visuals and personalities for understanding how individuals' behaviours are changing, adapting to the different point of views and experience emotions thanks to emotional interactions. These variables have been tested through empathic onboarding experiences in order to be able to adapt these changes into the user experiences for making them more personalized. So, AI will be able to create tailored personalized user journeys and build empathetic companionships with virtual assistants.

The testing phase of the thesis divided into the main part as pre and true-experimental. Pre-experimental phase collected user data and used to design onboardings' personalities and interactions. The true-experimental phase conducted with three iteration sessions and tested the usability of the onboarding prototypes. Two onboarding experiences reversed the basic UX/UI design practices to prove how a better sense of trust is needed for optimal service experiences. Even if these two onboardings designed with different personalities, a different tone of voices and visual styles, the aim was the same. It has been tested with three iterations of onboarding designs to perceive different trust effects on users to create curiosity in having a chance to build trustful interactions. Iterations' results showed that the two onboardings created almost equally trust in the testers. The second experience found more excited and increased users curiosity about the real product and the next phase of the journey. Also, it has been founded more in line with user's personalities. In terms of personality implemented traits, were easily perceived by users to identify characteristics of companions and defining a position to them for establishing relationships. Additionally, results showed that the followed reversed design effect was powerful to create a sense

of trust and they did not identify any problem related to efficiency and effectiveness of the experience.

Last but not least, the findings from the third and last iteration found that the effect on user experience was significantly improved of empathetic companions compared to virtual assistants in terms of building trustful relationships through digital experiences. Hopefully, this research will generate unusual perspectives to lead a new path in user experience and open more thoughtful scenarios to discover the potentials of artificial intelligence.

Future Research

For future research, the different archetypes and personality traits should be implemented into other onboarding experiences. Also, these onboardings should be tested through implementing personality frameworks to create variability to understand the personality effects to build trust. Thus, onboarding processes will have a chance to reshape the user experiences according to different collected outcomes with gathering the data and learning from the user processes.

Moreover, another interesting topic has been found to be discovered that redesigning the policy, privacy, terms and conditions parts. In particular, this part of the application has been found remarkable by users to draw attention to the sensitivity of the subject and to explain it more transparently. Most of the users' feedbacks were based on redesigning this part in a more interactive way and supporting it with visuals to make it more descriptive, understandable and most importantly to make it more engageable. With these considerations, the privacy, policy and data protection part of the digital products can be open for discovery.

Another research can be related to reshaping all of the onboarding experiences with combining different interactions like voice over or haptic feedback. The system can interact with users including speech recognition and background audio which can be useful to understand how and where users are interacting with the app to shape onboarding experiences more engageable way to build trust in their first meeting with the companion.

Another aspect of the research was little considered in regards to how users perceive the digital products or embedded virtual assistants in their imagination, is the visual design. Onboardings can be or tested with an avatar or a character in comparison with the abstract character that is designed for this thesis. Or besides, visual design can be more dynamic and also supported with motion design and micro-interactions to test the effects o users in terms of engagement.

Zooming out from all these deep possible research topics, I would like to highlight the potential of AI which has a chance to be improved by implementing design methodologies and with values of empathetic and emotional interactions to build more trustful life-long companionships with digital products.

Testimonials

After the third iteration, users shared their insights about the onboarding experiences. Here's a colleciton of quotes directly from their survey results, clustred based on relevant topics emerged.

Which experience was more in line with your personality?

Felipe | Colombian
lives is Italy

26 yo | Game tester at Bending Spoons
MSc. Digital and Interaction Design

"

I feel the language was more friendly, warmer and in some way empathic.

*2nd onboarding was more
in line with my personality

Dila | Turkish
lives is Turkey

26 yo | Neuroscientist

"

Because it is more confident and more socially interactive to me. Emojis helped to connect more to maslo.

*2nd onboarding was more
in line with my personality

" I liked the way Maslo asked about confirmation here (i.e. "I think this is sad, do you think it too?")

*2nd onboarding was more in line with my personality

" It was not directly aimed at collecting my personal information. The acquaintance with maslo was gradual, closer to a normal conversation.

*2nd onboarding was more in line with my personality

" It provided guidance and looked more trustworthy while still being friendly.

*1st onboarding was more in line with my personality

Which experience made you more thoughtful in the selection of personality?

Caterina | Italian
lives is **UK**

25 yo | Product Designer at Facebook

> **I prefer the way the content is framed in the second one, since it is clearer what maslo means.**

*2nd onboarding

Chiara | Italian
lives is **Italy**

25 yo | MSc. Product Service System Design

> **I see AI as logical rather than imaginative. I stopped to think "can a robot really use imagination?"... but maybe in a few years it won't feel strange anymore**

*1st onboarding

Do you prefer to share your personal information..

Paola | Italian
lives is **Italy**

24 yo | MSc. Product Service System Design

" It gives me the possibility to chose, and also sometimes people are not willing to go on with the experience if you immediately ask the email

*2nd onboarding

Martina | Italian
lives is **Italy**

" I prefer to understand what I am going to do before giving my personal information.
In many cases I quit just because they firstly ask me my email.

*2nd onboarding

Which experience created more trust on you?

Giulia | Italian
lives is Italy

25 yo | MSc. Product Service System Design

" The first onboarding experience made me feel more calm and concentrated, the second one with the tone of voice of maslo was also friendly.

Melisa | Turkish
lives is Italy

26 yo | Data Scientist at Accurat
MSc. Telecommunication Engineering

" Second experience had a language which has empathy.

*2nd onboarding

Felipe | Colombian
lives is Italy

26 yo | Game tester at Bending Spoons
MSc. Digital and Interaction Design

" The language used made me feel more comfortable. Also, in my opinion, the second option's graphics have a most 'casual' look, instead the first is kinda cold and (too) serious.

*2nd onboarding

"

"I don't want to rule or conquer anyone. I should like to help everyone if possible... We all want to help one another. Human beings are like that. We want to live by each other's happiness, not by each other's misery. We don't want to hate and despise one another. In this world, there is room for everyone."

Charlie Chaplin

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I would like to state that all the charts that represented in this thesis re-designed from the original sources. Some of the charts are arranged by simplifying the information mentioned in the thesis. To avoid being misunderstood please check the original sources of each chart if you would like to go deep with the topic. The original sources are mentioned below chapter by chapter with the name of the charts.

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