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Smart objects and human beings
A study on master-servant relationships' patterns

Prof. Paolo Peverini
SUPERVISOR

Prof. Gianluca Comin
CO-SUPERVISOR

Elena De Santis
CANDIDATE

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Introduction

The aim of this study is to delve deeper into what relationships between consumers and smart objects mean. In particular, master-servant interactions among the actors of the IoT landscape will be studied. Before facing the core problem, the of interest of the research is to describe the main parties involved in such a scenario and the characteristics of the crucial aspects composing the relevant context. It will be explained what smart objects are and the reasons why it is important the keep track of their contact with human beings.

In the first part, the IoT environment will be described. Day after day technology is increasingly changing the way in which people interact with objects, with other people and with the environment that surround them. Therefore, the nine most common settings encompassing IoT use, namely homes, offices, factories, worksites, retail environments, cities, vehicles, the outdoors and humans will be considered.

Afterwards, the most relevant definitions of smart objects and IoT will be reviewed. Hoffman and Novak's (2018) description of Internet of Things and the relative characteristics that suggest a number of propositions about smart devices will be analysed. What differentiates a smart object from a traditional product will be studied, as well as the technical definition proposed by Mani and Chouk (2017). Finally, the ways in which IoT technologies depart from Web-based environments will be explained.

In the third section, the growth potential of the sector will be evaluated, since, by 2025, the Internet of Things industry is expected to reach $3 trillion of value. The statistics, however, can only briefly synthetize the revolution that is about to invest consumers and businesses in the next few years, not only presenting new opportunities for manufacturers and companies but also changing completely the way in which consumer experience today is considered and studied.

Last but not least, the major drivers of smart devices resistance will be considered. The thesis will deal with two categories of "barriers" preventing adoption of IoT technology, with different implications for the relationship between customers and devices. Psychological barriers can be attributed to consumer characteristics such as self-efficiency, dependence's risk and privacy concerns. On the other hand, the functional barriers, mainly occurring when the consumer perceives a radical change approaching the object, are related to product characteristics, such as usefulness, novelty, price and device intrusiveness. Other points of view on the issue of consumers' resistance to the adoption of smart objects will be incorporated, from the perspective of both companies and people. The theme of trust will be reviewed as well.

The aforementioned studies will lead to a more in-depth analysis of relationships between smart objects-consumers, as well as specific master-servant interactions, analysed in the second chapter.

The second chapter will attempt to contribute to the understanding of what encompasses consumers-objects relationships.

The first theoretical framework refers to a large strand in consumer's behaviours literature and in the topic of how people become attached to objects. What are the main motives for this phenomenon? What does this attachment lead to? Which are the emotions and thoughts involved? The ideas analysed and employed in the

research are mainly from Belk (1988). Indeed, extended-self theory explains why "we regard our possessions as parts of ourselves".

Insights from the branding literature will be employed afterwards: if it is possible for human beings to feel "something" towards mere "things", it has been demonstrated that is also possible to create brand affection. In this case, studies conducting by Fournier (1998) will be incorporated.

Why are the two previously described theories possible? Literature suggests that consumers feel the natural tendency to anthropomorphized "things" to facilitate the approach to real non-human world and to build a relationship with them.

The third section will go in-depth on the relational nature of consumers-objects interactions, building on the literature reviewed in the first part of the chapter. Firstly, the passage from analogue object and smart devices will be explained. Then, to describe such a relational nature, theories on consumers-objects relationships' experiences in the Internet of Things realm will be considered. The main theories in academia regarding the subject, assemblage theory and the consequent relationship's journeys paradigm will be used, as well as Belk's (2019) research on voice-controlled smart assistants, where the authors theorized the most commonly played roles of smart devices in interactions with consumers.

Additionally, a note on the interpersonal motives that drive interpersonal behaviours will be given, with the theoretical support of norms provided by Horowitz (2006).

At the end of the chapter, a gap in theory is individuated. While it is true that Hoffman and Novak (2018) with assemblage theory and Belk (2019) in his study "Servant, friend or master? The relationships users build with voice-controlled smart devices" depicted accurately the role of master for the subject and the role of servant for the user, it is also true that an analysis of the relevant dimensions inside the master-servant paradigm has not been conducted and the connections between them have not been clarified. Moreover, a cross-device study is needed to understand how perceptions change according to the IoT support used. These questions will remain unanswered until the third chapter, where the empirical research on the relationship's styles and particularly on the master-servant model will be conducted.

The central topic of the analysis consists in the description of the master-servant relationship.

The master and servant model appears when the individual plays the role of the master of the smart object, which is his/her servant. The consumer is an authoritarian owner who gives orders to the device and expects it to fulfil its requests. The smart object is submissive and incapable of acting autonomously, it tries to obey orders in the best possible way, but it is not always capable of doing so. When it succeeds, they both feel positive emotions (e.g., happiness, satisfaction, pride) creating a lasting relationship of subordination; when it fails, they both experience negative emotions (e.g., the subject can feel anger, disappointment and the smart object can feel sense of frustration, sadness) cracking or breaking the relationship of trust previously established.

Generally, the aim of the empirical research is to investigate how master-servant relationships are structured and developed during customer-smart object experiences. Moreover, their characteristics will be studied.

Specifically, based on the previous literature review, insights on specific dimensions will emerge, within a cross-device analysis. On the object's side, attributes and behaviours assumed during the relationships will be studied. On the subject's side, behaviours displayed, effects suffered, emotions and thoughts will be taken into account.

A section will be dedicated to the qualitative methodology adopted to conduct the empirical analysis, as well as how the collection of the data through a survey has been done and how the coding process was structured. First, a description of the sample, in terms of gender, age, and education level will be provided. Then, the different relevant dimensions for the purpose of the analysis will be explained: how the object has been described by the subject (its attributes) and how it reacts to actions of the other (behaviours displayed), as well as the correspondent subjects' behaviours, the effects he or she suffered during or right after the relationship's experience, the emotions and the thoughts he or she felt. For each code, the text of the most relevant answers will be reported.

Chapter 1 – The general context

The first chapter will be used to explain Internet of Things and smart devices and what enables consumers' interactions with smart objects.

The characteristics of the Internet of Things and of smart devices will be uncovered, as well as the relevance of studying the topic.

The potential economic growth of the sector will be evaluated and the impact of the introduction of innovations will be discussed: not only for what concerns their hyper-connected togetherness but also for what regards the human intervention in such a technological community.

The drivers of consumers' resistance to smart objects will be considered, since some of the concepts reported will be discovered in the empirical research carried out in the third chapter.

The aforementioned topic will lead to a more in-depth analysis of smart objects-consumers relationships, as well as specific master-servant interactions that will be further analysed in the second chapter.

1.1 IoT environment

Day after day, technology is increasingly changing the way in which people interact with objects, with other people and with the environment that surrounds them. Companies are following and enhancing this trend with innovations that would have been unimaginable just a decade ago: home automation systems that switch on the lights when the homeowner leaves work, internet-connected cars that are able to run autonomously, t-shirts with biometric sensors that deliver data about the person wearing them.

The impact of these innovations makes it necessary to study the evolution of the Internet of Things (IoT), not only in terms of product development and diffusion, but particularly for what concerns people's shifting expectations about computer-mediated social relationships. Indeed, with the implementation of smart devices and of the IoT ecosystem, "everyday objects and a myriad of devices can be connected not only to social networks and the Internet itself, but also to other objects and devices" (Hoffman and Novak, 2015, p. 5). As Belk proposed, it is evident that "the meaning of everyday objects changes, depending on who is connecting them, what they are being connected to, and where they are being connected" (Hoffman and Novak, 2015, p. 5). As the meaning of objects change when they become "smart", in the same way consumers' experience of such objects is revolutionized.

Studies conducted from the McKinsey Global Institute (2015) estimate that the Internet of Things will have a total potential economic impact of $3.9 trillion to $11.1 trillion per year in 2025. The value of this impact - including consumer surplus - would be equivalent to about 11 percent of the world's economic output in 2025. Which will be the settings where such new technologies will deliver the most? In studying nearly 300 IoT applications, McKinsey researchers discovered that where interactions between IoT systems occur, the impact of such devices is intensified. They have identified nine settings encompassing IoT use, namely homes, offices, factories, worksites, retail environments, cities, vehicles, and the outdoors. Researchers have also included as ninth category the "human" setting for those environments that are enabled through the human body, that is to say not only systems that work with health and wellness applications for monitoring disease or exercise levels but also with productivity-enhancing applications for workers and employees. The following section studies in details the areas analysed:

- *human*: as above-mentioned, two types of IoT technology applications fall under this setting. New technologies have potential for great improvements in the field of human health. Adopting the use of connected devices to continuously monitor patients in their daily routines, the Internet of Things could measure the adherence to prescribed therapies, avoid hospitalizations and improve the quality of life for hundreds of millions of patients. On the other side, human productivity applications could help companies with devices such as goggles that display real-time information to employees, leading to an enhanced efficiency and an increased effectiveness of work routines;

- *home*: the smart-home environment is one of the most relevant to consumers, thanks to its day-after-day usage possibilities. Devices such as connected thermostats, locks and lightbulbs, smart appliances and self-guided vacuum cleaners are gaining everyday more space in modern households. Chore automation, energy management and security will be the areas that will experience the greatest impact with hours of labour saved and costs cut;

- *offices*: in this setting, the key benefits of IoT use will be detected in security and energy management. For example, by using digital security cameras with advanced image-processing capabilities, operators of office buildings can monitor access routes throughout their properties without requiring human control;

- *factories*: as McKinsey analysts have found, this setting could take a great advantage from the adoption of the Internet of Things. In such an environment, sources of value would arise from productivity improvements, including 10 to 20 percent energy savings and a 10 to 25 percent potential improvement in labour efficiency. Refinement in equipment maintenance, inventory optimization, and worker health and safety are also foreseen;

- *worksites*: numerous companies have been early adopters of IoT technologies. Sensors and self-driving vehicles help streamline operations, reduce costs and improve equipment maintenance, leading to major positive consequences for human health and safety;

- *vehicles*: relevant sources of value within vehicles' setting that involve IoT systems are the seamless monitoring of means of transport's performance and the improvement of self-driving models for cars and for public transportation;

- *cities*: innovative and experimental urban design is all about smart cities. In the opinion of McKinsey researchers, cities can benefit from the Internet of Things in four areas: transportation, public safety and health, resource management, and service delivery. While transportation could gain from including IoT-based systems to manage traffic flow and autonomous vehicles, public health could also benefit from air and water quality improvements that would reduce damages due to pollution. IoT smart meters could be employed to reduce loss of electricity in distribution and to detect water leaks;

- *outside*: the last category captures use of smart technologies outside all of the other settings: they take place outdoors between urban environments.

The revolution analysed by the McKinsey Global Institute envisions people as the central pillar of such big changes in a number of different settings. The present work will study in detail the relationship that is going to be every day more established between new IoT technologies and consumers.

1.2 Formal definition of the Internet of Things and of smart objects

Since this work studies the relationship between consumers and smart objects, the first theoretical step that is needed is to frame smart devices in the landscape of the Internet of Things. The definition here applied is the one provided by Hoffman and Novak in 2015 (p.14):

"*the collection of everyday objects and devices in the physical environment that are embedded with technology including sensors and actuators that are programmable and have the ability to communicate wirelessly with the Internet. These "smart products" interact and communicate with themselves and each other – and with humans – on an ongoing basis by sending and receiving data through the Internet that is stored and organized in a database. Through the use of interfaces, smart products have the capacity to collect active and ambient interactions from humans. They can interact on the basis of their internal state and/or the state of the environment. That means they can operate autonomously. Together, consumer IoT objects connected to each other and other humans through the Internet and databases represent a whole that is more than the sum of the parts*".

The definition is applied here because it puts a crucial stress on the core subject of the research: interactions between consumers and objects, that are no more a function of the person but rather a separate and autonomous member of the relation that contributes to the outcome of the exchange.

The IoT represents a complex and interactive environment with fundamental characteristics organized by Hoffman and Novak (2015) along four dimensions: network, components, interaction, and programmability. These characteristics suggest a number of propositions about smart devices that the authors have analysed as follows:

1. *interaction among devices is more important than the devices themselves*. A crucial point in the study of interconnected objects is the formation of smart assemblages that fully enable the capacities of the single component. It is only through interaction that assemblages can develop properties which go beyond what the devices can do by themselves;

2. *interaction among the component parts creates a whole that is greater than the sum of the parts*. The reciprocal interactions that happen within these components, as well as which particular component is involved in these interactions, cannot be pre-specified in advance, but rather, it is a process that evolve over time;

3. *consumer experience emerges from the ongoing interaction among the component parts.* Experience cannot be decomposed into the specific events lived by each component or merely into the sum of these events. It is the interactions among parties that are going to compose the consumer experience. Assemblages could therefore be decomposed, and each element could be assigned to other entities where new and different experiences emerge.

What are, specifically, the actors involved in the ecosystems of Internet of Things' ecosystems? As Hoffman and Novak (2018) synthetize, it consists of the billions of devices that are able to communicate with consumers and other systems through the Internet. The definition, however, does not elaborate on the explanation of what the devices involved are and by which nature they are composed. Moreover, in another work from 2018, the authors explain that "consumers' interactions with smart objects – those devices, services, and AI systems that have Internet connectivity and some level of intelligence – undoubtedly have a relational nature" (p. 2).

The definition of what smart objects are starts with the conceptualization of the key aspects that differentiate traditional objects from smart ones. As Hoffman and Novak in 2018 have explained, they depart in two critical ways:

1. a breakthrough innovation of smart devices is that they have a unique capacity in interacting with others, both humans and technological entities as well. More importantly, such capabilities could be exercised without the consumer being present, and so "a smart object must be understood as it participates in a broader assemblage that does not always involve direct interaction of the object with the consumer" (Hoffman and Novak, 2018, p. 3);

2. devices equipped with A.I. are not passive entities during interactions, since they are able to express their own roles and such roles are readily perceivable by consumers entering in a relationship with them.

In the present view the technical definition proposed by Hsu and Lin (2016) of smart objects is also considered as "a physical embodiment with communication functionality, possessing a unique identifier, some basic computing capabilities and a way to detect physical phenomena and to activate actions having an effect on physical reality" (Mani and Chouk, 2017, p. 79). The approach is further detailed by Mani and Chouk (2017), assessing that smart devices have: "sensors that collect data about the environment; actuators that activate an action and are controlled by some other entities; and network connectivity that can take several forms, including WiFi, Bluetooth or RFID" (p. 79).

However, as Weinberg et al. explains (2015), it can be challenging to comprehend what comprises an "object" in the IoT landscape. While it is true that technology devices use Internet to connect, receive or transmit data, it is also true that smart objects go beyond these basic characteristics, directly accessing the Internet via the Web. Other key distinctions between a Web-based environment and an IoT-based environment, as summarized by Weinberg et al., could help the research to fully explain the nature of smart devices.

- *Data*. In a Web-based environment, consumer-related data about online behaviours are formed by interactions in which the consumer purposively engages in the digital world (text, image, video, audio, clicks, page visits, or other cookie-related types of information). This data tends to be created, generated, or entered by who is browsing the Web. In an IoT-based environment, devices monitor and record data related to consumer characteristics in the natural, non-digital environments in which the person exist.

- *Data entry*. Consumers in a Web-based environment actively produces data online through digital devices. On the other side, consumers can interact with IoT devices, but in most of the instances, they do not directly enter the data. Rather, IoT devices monitor and retrieve relevant insights from people and environment.

- *Data sharing*. In IoT environments, data are primarily sent to other devices and to the provider of the related cloud. In Web-based circumstances, consumer information is used internally within the organization or externally with affiliated third parties.

- *Learning*. For IoT services, the learning process of people insights happen while actions are carried out in real world, while websites obtain information about consumers through their activities on the web, like when they surf the Internet on shopping sites or social media.

Another important definition here incorporated highlights that smart objects' technical capacities are being increasingly embedded in all manner of consumer objects commonly used in everyday life, which through connectivity are now able work together as assemblages through a process of ongoing interaction. Three main innovating aspects in such services have been identified: "*intelligence*, where the service experience becomes autonomous; *connectivity*, where devices communicate with each other; and *ubiquity*, where the consumer can access the service anytime, anywhere, and through any device" (Mani and Chouk, 2018, p. 782).

1.3 Growth and development potential

"This exciting evolution of the IoT encompasses the wide range of everyday objects and products in the real world that are able to communicate with other objects and consumers, through the internet"

(Hoffman and Novak, 2018, p. 1)

By 2025, the Internet of Things industry is expected to reach $3 trillion of value: this number could only briefly synthetize the revolution that is ready to invest consumers and businesses in the next few years, not only presenting new opportunities for manufacturers and companies but also changing completely the way in which consumer experience is considered and studied today. Indeed, the problem is socially construed, and it will interest an audience that will increasingly incorporate smart devices in their everyday life. On the other side, firms would take advantage from the analysis of this research problem to enhance their strategies and their product development processes. For this reason, the matter at hand will be studied through individual experiences' narrative and will be generalized to understand broadly how a specific kind of relationship between human and smart object can arise, develop, grow and decline.

If with physical products consumption situations would occur in private or public space, IoT environment would bring about a substantial amount of real-time quantitative data on experiences, interactions and contextual situations. This would create a dimension of visibility that had not previously existed. Methods such as experiments, surveys, and focus groups have been deployed to understand how consumers feel about their experiences and what are the emotional associations they build with products they have purchased. While insights about consumers' behaviours remain a large strand of research and investigation and consumer experience is still conceptualized as subjective, personal and engaging at different levels (rational, emotional, sensorial, physical, and spiritual) (Gentile, Spiller and Noci, 2007), a greater level of visibility from real-time information turns the physical product experience into a kind of service experience (Edvardsson, Enquist and Johnston, 2005; Hui and Bateson, 1991; Patrício, Fisk, and Constantine, 2011; Patrício, Fisk and E Cunha, 2008). This new model offers new insights into the value creation and value-in-use perspectives (Holbrook, 1999, 2003; Ng and Smith, 2012). Consequently, the relationship between the consumer and the company that deliver such devices also evolves into a service relationship where experiences become co-created, inseparable, perishable, heterogeneous and intangible (Ng and Wakenshaw): "the IoT technology could be even considered the turning point of a new industrial revolution, due to new types of products which alter the industry structure and the nature of competition, exposing companies to new competitive opportunities and threats; reshaping industry boundaries; and creating entirely new industries" (Porter and Happelmann, 2014, p. 1).

1.4 Resistance to smart devices

After having defined the landscape of consumer-object's relationships, the study of the key drivers of consumers' resistance to smart devices must be taken into account: indeed, "the success of any innovation in smart services depends on the value perceived by consumers in having it" (Mani and Chouk, 2017, p. 76). In this regard, two studies of Mani and Chouk will be considered, analysing the different tenets of consumers' resistance to IoT set of products. In broad terms, consumers may manifest resistance "either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structures" (Mani and Chouk, 2017, p. 78). In this sense, threats and barriers inherent in the smart objects' word emerge since the revolutionary strength of the IoT raises significant challenges and ethical issues. Innovation resistance could encompass three different forms, according to Mani and Chouk (2017): *passive*, if the consumer feels unwilling to adopt the innovation; *active*, if the consumer hesitates in an adoption decision because the innovation is seen to appear too risky; or *very active,* if the consumer decides to engage in actions or attacks against the acceptance of the innovation.

The idea is that resistance is motivated by various categories of factors, detected within on-field investigations. In their first conceptualization from 2017, they designed two classifications of motivations to engage in attitudes of resistance with regard to smart objects' and IoT innovations:

- functional barriers, caused by products' characteristics, such as usefulness, novelty, price and device intrusiveness;

- psychological barriers due to consumers' characteristics, namely self-efficacy, dependence and privacy concerns.
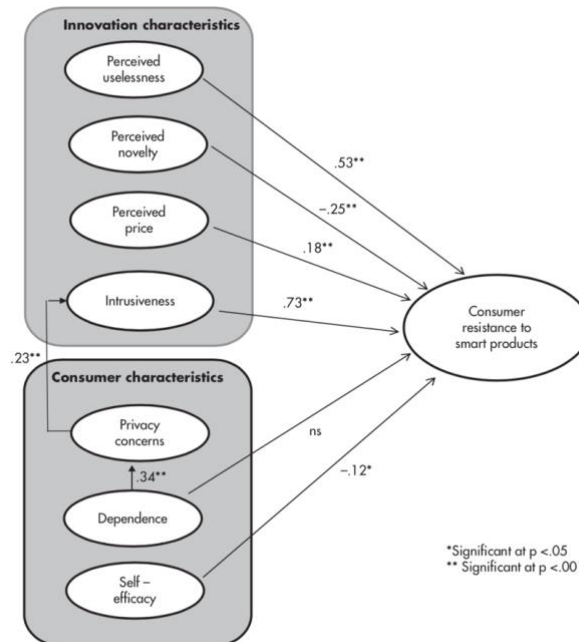
Figure 2. Structural model.

Fig. 1, Mani and Chouk (2017)

With a second study, Mani and Chouk actually broadened the scope of their study and formulated the categories as described (2018):

- functional barriers, considered as significant changes resulting from adopting innovation:
    - usage barrier (or perceived complexity);
    - value barrier (or perceived price);
    - risk barrier (divided in perceived security risk and perceived health risk);

- psychological barriers, seen as upsetting prior beliefs:
    - tradition (or need for human interaction);
    - image (self-image incongruence);
    - technological vulnerability barriers, where innovation is liable to change attitudes and beliefs; in turn, they are separated into technological dependence and technological anxiety;
    - ideological barriers, regarding smart devices as objects that stands against personal convictions and values;

- individual barriers, when there is a strong predisposition of the individual to reject change (constructed in scepticism);

- consumer demographics, according to which women are more incline to resist IoT devices than men and young consumers are less prone to resist smart objects than mature ones.

Another framework here considered is the one resulting from the ideas of Weinberg, Milne, Andonova and Hajjat (2015). In the study of the Internet of Things landscape, a substantial part of their analysis focuses on the concerns regarding smart devices. The analysis takes into account managerial problems as well as consumer problems.

An important point of the research is the amount of data generated by such objects that needs to be stored and processed by service deliverers. In managing large quantities of information, it could be difficult to correctly order and work the useful insights. Another issue of concern is ownership: who is the possessor of such a great amount of data when a multitude of parties co-creates and adds values? Moreover, questions about interoperability, communication and standard practises remain unanswered. Providers and manufacturers need to come up with and develop structures and systems to address these challenges.

From consumers' side, the most relevant concern is about privacy. As Weinberg et al. explain (p. 6), "data and data-related processes such as generation, acquisition, transmission, and interpretation are central drivers in the design and application of IoT". In this sense, for organizations, the newly enabled access to a set of real-time information about the environment in which a person behaves and exists – such as health-related insights about blood composition or dietary habits – will persuade consumers to reflect and act on the basis of trade-offs associated with the positive outcomes offered by IoT devices and the costs and losses in their privacy.

An issue related to the extent to which consumers are ready to risk their privacy in IoT environments is trust. A study conducted by Harwood and Garry in 2017 lays the foundation of the issue of trust in techno-service systems. The first step in their study is a shift in perception from human trust to trust in the IoT world: "in an IoT context there may exist no cardinal or central entity on which end users of services may focus trust decisions. Within these multi-partite environments, trust becomes a fundamental component of the value proposition itself, residing within and across a network of actors and objects. It is embedded within the data derived from interactions and behavioural responses and re-used to provide services for consumption by the provider, their personal or extended network and other beneficiaries in the wider network" (Harwood and Garry, 2017, p. 444). The point is, from the actor's perspective, that he or she will likely be completely or partly unconscious of his or her role in the assemblage or of the range and scope of activities performed within the IoT network the person is interacting with. Therefore, the traditional, dyadic, human-referred trust is not easily applied in such an environment because of information asymmetry and/or limited understanding of or familiarity with the service system, its actors and their agency. Confidence in the system as well becomes crucial as a result of limited evaluation of potential alternatives. In conclusion, the authors consider that

essence of trust may depend upon the degree of the agency of human actors and objects involved in the network.

All of the above considerations will contribute to the understanding on a deeper level of relationships established between consumers and smart objects engaging in reciprocal exchanges that will take place in the second chapter.

Chapter 2 – The master-servant relationship

The second chapter contributes to the understanding of what encompasses consumer-object relationships.

The first theoretical assumption refers to a large strand in consumer's behaviours literature and in the topic of how people become attached to objects. What are the main motives? What does this attachment lead to? Which are the emotions and thoughts involved? The ideas analysed and employed in the research are mainly from Belk (1988). Indeed, extended-self theory explains why "we regard our possessions as parts of ourselves".

Afterwards, insights from the branding literature are employed: if it is possible for human beings to feel "something" towards mere "things", it has been demonstrated that is also possible to create brand affection. In this case, studies conducted by Fournier (1998) will be incorporated.

Why are the two previously described theories possible? Literature suggests that consumers feel the natural tendency to anthropomorphized "things" to facilitate the approach to the non-human world and to build a relationship with them.

The third section will go in depth on the relational nature of consumer-object interactions that emerges from the literature review carried out in the first part of the chapter. Firstly, the passage from object to smart devices will be created. Then, to explain such a relational nature, theories on consumers-objects relationships' experiences in the Internet of Things realm will be considered. Among the most approved in academic circles, assemblage theory and the consequent relationship's journeys paradigm will be proposed, as well as Belk (2019) research on voice-controlled smart assistants, where the authors theorized the most commonly played roles of smart devices in interactions with consumers.

A note on the interpersonal motives that drive interpersonal behaviours will be given, with the theoretical support of norms provided by Horowitz (2006).

At the end of the chapter, a gap in theory is individuated. While it is true that Hoffman and Novak through assemblage theory (2017) and Belk in his study "Servant, friend or master? The relationships users build with voice-controlled smart devices" (2019) depicted accurately the role of master for the subject and the role of servant for the user, it is also true that the relevant dimensions inside the master-servant paradigm has not be totally uncovered and the connections between them are not be clarified. Moreover, a cross-device study is needed to understand how perceptions change according to the IoT support used. These questions will remain unanswered until the third chapter, where the empirical research on the master-servant model will be conducted.

2.1 Consumer-object relationships

The present section contributes to the understanding of consumers-objects relationships. The first theoretical assumption is about the topic of people becoming attached to objects and brands. Why does this happen? What are the main motives? What does this attachment lead to? Which are the emotions and thoughts involved? The ideas here analysed and employed in the research are mainly from Belk (1988) for what concerns people-objects relationships and from Fournier (1998) for people-brand affection.

2.1.1 Possessions and the extended self

After the formal definition of what smart objects are, it is crucial to describe how human beings perceive their possessions to fully understand the relationships and the experience that can grow between people and smart devices. The paradigm adopted in this research is the one formulated by Belk (1988), who studied the meaning that consumers attach to possessions. The thesis he followed is that "*we regard our possessions as parts of ourselves*": in this sense, Belk has formulated the idea of "extended self", according to which it "is seen not to be limited to external objects and personal possessions, such as our body, clothes and money, but involves also people, places, and group possessions which contribute to the building of our self" (William, 1980, p. 291). Generally, the incorporation of the above-mentioned "items" into the self requires different processes, such as contamination and habituation: "while in the former both good and bad aspects of objects are able to attach to us through physical contact or proximity; the latter is related to the maintenance of multiple levels of the self, through the habituation of viewing our family, city, and nation to be a part of who we are" (Belk, 1988, p. 140). Another important way through which people learn to regard an external thing as a part of the self is the appropriation or the control of an object for own personal purpose. This kind of mastery of the device increases the perception of the reflection of a person's identity in it. McClelland in 1951 suggested that "external objects contribute to the building of our self when we are able to exercise power or control over them, just as we might control an arm or a leg" (Belk, 1988, p. 140). Generally, "the greater the control we exercise, the more closely the object should become allied" (Belk, 1988, p. 140). Based on this assumption, McClelland hypothesized the following hierarchy of most to least closely self-allied object categories: "me and my free will; my body and my conscience; my belongings; my friends; and finally, strangers and the physical universe" (Belk, 1988, p. 140).

According to the process designed by Belk, consumers invest such items with emotions and, for this reason, they acquire a significance beyond the mere possess. It is interest for the present work to inspect how people establish a connection with such things, that is in a process of creating personal identity in a continuous sum of what is considered "me" and what is considered "mine". To formulate the concept with the words of Belk, it can be argued that "we invest psychic energy in an object to which we have directed our efforts, time, and attention. This energy and its products are regarded as a part of self because they have grown or emerged from the self" (Belk, 1988, p. 144). Indeed, contemporary study on consumption show that the strength of the perception of identity transferred in material objects can be extraordinarily high. Thus, "having possessions

can contribute to our capabilities for doing and being" (Belk, 1988, p. 145): Belk supposes that having possessions is a matter of extending identity. With this aim, four turning points of our life were identified: "first, the infant distinguishes self from environment; the infant distinguishes self from others; afterwards, possessions help adolescents and adults in managing their identities; and finally, possessions help the elders in achieving a sense of continuity and preparation for death" (Belk, 1988, p. 139).

However, with the progress of technology and the rise of a whole new category of products, Belk (2013) felt the necessity to update his work with the addition of new insights about the digital world. Applying the ideas of the extended self to a new set of smart, intelligence objects leads to an issue that is "the degree to which virtual self-construction online transfers into nonvirtual self-construction offline. (…) The old idea of a core self is an illusion. As such, the relationship between online and offline personas becomes a key to defining the self in a digital age" (Belk, 2013, p. 478). Indeed, not only smart devices do not share the same characteristics of traditional objects in extending the self, but they also bring the focus on differences and similarities of online and offline personas. Belk (2013) has tried to harness these ideas into five big categories of new insights that has emerged within the digital environment. After each of this, needed updates in respect of the extended-self conceptualization are added.

- *Dematerialization*: "*things are disappearing right before our eyes*". With this sentence, Belk (2013) is trying to explain that a lot of valuable possessions that people have stored with care in their houses for years are nowadays becoming invisible and immaterial. Photos, videos, music, calculations and messages are just a few examples of possessions that are composed of electronic streams of ones and zeroes that may be kept in cloud storage spaces. These items represent ways through which people configure themselves, get to know by others and interact.

  1. *Attachment and singularization.* With the rise of de-materialized and nonmaterial possessions, Belk (2013) queries if consumers can become as attached to such possessions as they can to material possessions and whether it is possible to gain status and enhance the sense of self through virtual objects. Moreover, it is worth asking if the loss of digital possessions could hurt people as the loss of their analogue counterpart and if this could lead to feel a diminished sense of self.

  2. *Almost, but not quite, the same* (*what virtual possessions lack*). "Digital virtual possessions appear to lack some of the characteristics that invite attachment to material possessions" (Belk, 2013, p. 481), what Belk (1988) in his first work described as contamination, such as the soft tactile characteristics of clothing and furniture.

- *Re-embodiment*: a major change with the emergence of new technologies is the possibility for consumers to literally engage in a process of disembodiment and re-embodiment as online avatars,

photos and videos. Visual online representation does not stop with the designing of physical characteristics of avatars, since users have the possibility of select, modify and accessorize this representation of the self with relative freedom: "in the present digital age, our online physical invisibility and command of the virtual re-embodiment of self-created avatars provide an easier and less risky environment for such self-experimentation" (Belk, 2013, p. 482). The point arrives at the heart of the issue that leads Belk to update his previous work: to what extent users manage to transfer virtual identities in real world ones and vice versa?

1. *Attachment to avatars.* Players, investing time in creating and modifying their online avatars, get more and more attached to these virtual representations. Re-embodiment, immersion, and telepresence experiences challenge the role that the physical body was seen to play in Belk's formulation of the extended self (Belk, 1988).

2. *Proteus effects.* The phenomenon that takes its name from the Greek god who could transform in whatever he wished occurs when slight differences between real-world bodies and virtual reality bodies affect offline behaviours.

3. *Multiplicity.* Internet is the world of alter-egos. In online realities, users can impersonate whichever personalities they feel comfortable with or want to experience, even at the same times in different areas. Which implications bring this about on real-world identities?

- *Sharing*: blogs, social media and forums have as underlying mechanism the human-related need to share things with other human beings. The idea was taken into account in Belk's previous work, where the author underlines the importance for individuals of the aggregate sense of self. The question that remains is how sharing possessions online enhances senses of self at singular and collective levels (Belk, 2013).

1. *Self-revelation.* The anonymity that virtual environment guarantees has led to disinhibition and confessional effects: so, the sharing of information about self and the ease to present the selves in ways that would have been awkward in predigital times are a major change in the realm of extended self in virtual environment.

2. *Loss of control.* The potential audience of users' sharing confidences is far broader in virtual realities, with the result that "contemporary processes of self-management are not fully under our control. Even if we restrict certain content to a designated circle of online friends, there is no guarantee that the information will not be reposted, retweeted, or quoted" (Belk, 2013, p. 486).

3. *Shared digital possessions and aggregate self.* As abovementioned, the greater amount of possibilities of digital sharing online foster feelings of community and aggregate sense of self, even with others known only by their online pseudonymous (Belk, 2013).

4. *Shared sense of (*cyber*)space.* "The sense of aggregate self can also extend to a shared sense of space online" (Belk, 2013, p. 486). Even if it is true that individual users may claim the ownership of their blogs, web sites, and social media spaces, it is also true that in most of the Internet domains shared access is sought more than ownership. The entire cyberspace environment could be considered as a significant part of the aggregate extended self, jointly experienced with other participants.

- *Co-construction of self*: the largest part of users' experience in virtual environments is social in nature as blogs invite comments and social media thrive on interactions.

  1. *Affirmation seeking.* In this sense, other users help to co-construct and reaffirm each other's sense of self though posting, tagging, and commenting reciprocally.
  2. *Building aggregate extended self.* "Affirmation of self is also often an affirmation of the aggregate self, comprised of friends or lovers" (Belk, 2013, p. 487): long sequences of messages and other virtual possessions such as photos and videos become less an expression of an individual and more a joint expression of the group that has composed them. Self-transcendent possibilities theorized from Belk in its previous work are magnified in the digital world.

- *Distributed memory*: memories are recorded and archived more easily and without costs in virtual domains: thus, these technologies allow access to an expanded set of individual and collective autobiographical memory traces. This means that "our memories benefit not only from our online actions but those of others who post images of us and "tag" us in them. Thus, just as self is co-constructed online, so is the shared portion of our memory co-constructed with others on social media" (Belk, 2013, p. 489).

  1. *Digital clutter.* Passing away, users leave behind a great amount of virtual possessions that could result in an "unfathomable surfeit of files, links, e-mails, and other digital flotsam and jetsam" (Belk, 2013, p. 489) with which survivors must come to terms.
  2. *Narratives of the self.* Given the massive amount of information that people has accumulated during their online experience, "we may be beginning to see the extended self as comprised of whatever seems apropos to the situation" (Belk, 2013, p. 489).
  3. *Digital cues to sense of past.* Distributed digital memory functions also at the level of collective memory and aggregate extended self, developing a narrative that is imbued with sense of past.

In a following theorization by Belk (2014), the author underlines the necessity to abandon the idea of a central core self with the introduction of a consideration about object ontology. As an additional support of what has been explained before, Belk says that "rather than speaking of the extended sense of self we might equally

talk about the extended sense of object" (Belk, 2014, p. 1110). To support the conceptualization, ideas from Hodder has been taken into account. In 2012, he extended these observations not just for people that are becoming more comfortable by identifying with things, but also for things that add something to humans, becoming greater by their identification with users: "that is, not only does the thing add to the person's sense of being, but the same association can also add the person to the things' sense of being" (Belk, 2014, p. 1111).

2.1.2 Branding literature

In 1998, Susan Fournier proposed that "brands could be considered as active relationship partners, and not merely passive objects of marketing transactions" (p. 344), studying the human tendency of anthropomorphizing inanimate objects. Moreover, she proposed different core conditions, which need to be satisfied in order to qualify relationships in the interpersonal domain. The most crucial one is connected to relationships involving reciprocal exchange between active and interdependent relationship partners. Indeed, "for a relationship to truly exist, interdependence between partners must be evident: that is, the partners must collectively affect, define, and redefine the relationship" (Fournier, 1998, p. 344).

As proposed by Fournier and reported by Hoffman and Novak (2018), "this anthropomorphism helps consumers see brands as making active contributions to the brand-consumer relationship. […] Consumers' interactions with brands have meaning that extends beyond purchase and immediate consumption, and are embedded in a broader, socio-material network of interactions" (Hoffman and Novak, 2018, p. 2). Indeed, in the interpersonal domain of relationships, interactions could occur as well between brands and consumers. A factor that must be taken into consideration is that this kind of relations could dramatically leverage on objects-consumers touchpoints. In this regard, the definition by Fournier on relationships and their nature is here accounted inside the perspective of a brands-people affiliation study. Indeed, the theorization that follows encompasses the view on brand relationships formulated by Fournier (1998):

1. "relationships involve reciprocal exchange between active and interdependent relationship partners" (Fournier, 1998, p. 344). In the case of brands, it means that consumers animate, humanize or somehow personalize partners. This reflects an ancient practice that displays a need to anthropomorphize objects in order to simplify interactions with nonhuman world, called animism. In connections between people and brands, the vitality of the latter is fully realized;

2. relationships are purposive, their essence could be found in the provision of meanings of persons engaging in them;

3. relationships are multiplex phenomena;

4. relationships are process phenomena: in this sense it can be said that they develop in the act of reacting to interactions and fluctuations in the contextual environment.

Following the ideas suggested by Belk (1988) on the extended self, Fournier studied different types of relationships that people build with brands and the analysis takes her to consider "how the projects, concerns, and themes that people use to define themselves can be played out in the cultivation of brand relationships and how those relationships, in turn, can affect the cultivation of one's concept of self. (…) The author was able to identify an interconnected web of brands that contributed to the enactment, exploration, or resolution of centrally held identity issues. Thus, relationships were seen to cohere at a portfolio level where brands were marshalled across category boundaries for their meaning-provision purposes" (Fournier, 1998, p. 359): parent brands could on their own affect the connection that might be established with people.

2.2 Why do people get attached to objects? Anthropomorphism as a possible answer

As seen in the previous section, the human tendency to anthropomorphize inanimate objects plays a big part in product adoption and in retention processes.

In the regard of objects consideration, two main lines of thinking has been highlighted to describe human-object interaction. On one side there is the concept of anthropomorphization, namely the attachment of human appearance to non-human subjects, transforming them into a person with life, feelings and thought (Shi, 2017). The most well-known theories in this sense are HCI (*human-computer interaction*), HRI (*human-robot interaction*) and CASA (*computers are social actors*). On the other side, theories based on object-oriented ontology support the idea of two ontologically equivalent parts in the interaction (human and non-human). Objects-oriented ontology has been developed from Hoffman and Novak (2017) in their assemblage theory, that this thesis will investigate further in the next section.

For what concerns anthropomorphism, the definition here approached encompasses "the ways in which brands are animated, humanized, or somehow personalized" (Fournier, 1998, p. 344). Fournier (1998), as previously highlighted, applies the theory of anthropomorphism in the explanation of subject-brand relationship. In this sense, the author makes reference to concepts from animism, according to which "people feel the need to anthropomorphize objects in order to facilitate interactions with the nonmaterial world" (Fournier, 1998, p. 344). The process of anthropomorphizing can be defined as well as the attribution of "humanlike properties, characteristics, or mental states to real or imagined nonhuman agents and objects" (Epley, Waytz, Cacioppo, 2007, p. 865). Moreover, animism could provide insights into the specific ways in which the existence of the brand can arouse during relationship; different processes are possible, depending on the degree to which human condition is approximated. The first mechanism is related to a brand's association in consumers' mind, involving "instances in which the brand is somehow possessed by the spirit of a past or present other" (Fournier, 1998, p. 345). This mechanism is at the core of the choice of famous testimonials in brands' advertising, but it is also viable in personal brand relation: for instance, "a particular brand of air freshener used by a grandmother could become strongly associated with the past-other and it is evoked reliably with

each use" (Fournier, 1998, p. 345). Additionally, the mechanism is also put in place for objects received as gifts, which are likely to "recall the spirit of the giver as well, contributing to animate the brand as a vital entity in consumer's mind" (Fournier, 1998, p. 345). Another system is the complete anthropomorphization of the brand products, described with human qualities of emotionality, thought, and volition. Indeed, researchers have proven that people assign human properties to a range of consumer goods (Belk, 1988), mainly to tools, food, drink, clothing, weaponry, and household technology (Fournier, 1988).

Since smart devices depart in a number of ways from traditional, analogue products, as the thesis has explained before, the nature of relationships with human beings has brought about a set of different theorizations. The Internet of Things environment creates the context for the study of how people behave with such "unconventional" things. If the idea of humanizing things remains extremely valid in theory, consumer-object relationships in IoT environments have been conceptualized through three main related paradigms: the CASA (*computers are social actors*), the HCI (*human–computer interaction*) and HRI (*human–robot interaction*). For what concerns the interest of the present research, the CASA model is focused on people, that, engaging with computers, tend to react as if they were people. In the HCI and HRI literatures, analyses are based on "cognitive science and engineering principles, with the aim to explain how the characteristics of smart objects like computers and robots are interpreted by users and influence their behaviour. The emphasis in these literatures is on design considerations that are likely to improve user experience" (Novak & Hoffman, 2018, p. 2).

The theoretical description of interaction's processes and user experience will be carried out in the next section, since they are at the heart of the instauration of consumers-objects relationships.

2.3 Consumer-smart object interactions have a relational nature

Consumers' interactions with smart objects have been proved to be characterized by a relational nature. Indeed, the dissertation has already analysed how different smart devices may be in comparison with traditional brands and products. As already underlined, smart objects are able to affect and to be affected by the assemblage they are a part of, and to interact with consumers and other entities: this is made possible thanks to their inherent characteristics, namely their properties, capacities and abilities (Novak and Hoffman, 2018). In particular, the degree to which an object is "smart" corresponds to the extent of its capability to exercise agency, autonomy, and authority.

The first theoretical contribution to be applied here to delve into the relational nature of consumers-smart objects interrelations is the description of interactions between consumers and smart assemblages developed by Hoffman and Novak in 2015 during their research on smart homes. Afterwards, a brief consideration of

what comprises experiences in IoT contexts will be given. These two dimensions will help to form the definition of the relational nature of consumers-smart objects interactions.

In studying consumers' relationships experiences with smart homes, the authors started by conceptualizing the idea of interaction within the Internet of Things. Three different dimensions were taken into account and can be summarised as follows:

- *levels of interaction*: The authors deployed insights from the assemblage theory to explain the view applied in their work: a manner in which levels of interaction could be categorized is by whether components play a material (lower level) or expressive (higher level) role during the exchange. It is not excluded, however, that parties could play a mixture of the two, by exercising different sets of capacities (DeLanda, 2006). Material roles are defined as structural, infrastructural, mechanical, operational and functional. On the other side, expressive roles are considered both linguistic/symbolic as well as non-symbolic (e.g. behaviour, facial expression, body expression), conveying meaning (e.g. words, gestures) and identity (e.g. fingerprints, architectural elements). Thus, it can be said that interactions occur at a low level (material) but also at a high level (expressive), since "the interactions that lead to consumer experience correspond to objectives that occur at a range of different levels" (Hoffman and Novak, 2015, p. 71);

- *zones of interaction*: Hoffman and Novak (2015), in their smart home assemblage study, divide the zones of interactions into direct and ambient. The conceptualization could be transposed in other IoT environments where a number of devices enter in contact and approach each other as a system. An important point here, which could be linked to the previous literature review, is the role played by trust in ambient interaction: building trust is a process that could take place where on-going successful interactions shape the relationship and the consumer experience, since "routine types of interaction that happen over time and that increase the homogeneity of an assemblage will yield a more stable identity that is more likely to be trusted" (Hoffman and Novak, 2015, p. 74). Furthermore, theory has demonstrated that repeated interactions play an important role in strengthening interpersonal confidence (Harwood and Garry, 2017);

- *time of interaction*: user experience studies are taken into account to highlight the importance of considering the perspective of the appropriate time span when analysing consumers-objects interactions. The categorization operationalized by Roto et al. (2011) in four time spans relevant to UX is here applied. Anticipated user experience is a form of indirect experience, occurring before actual usage, where future interaction is imagined through the lens of prior experiences with other products, other consumers, and marketing stimuli. Momentary user experience is the direct experience lived

through the real interaction with a product and it could be measured repeatedly over multiple time points during product usage. Episodic user experience constitutes an assessment of a specific product usage episode comprised of a series of momentary experiences. The longer time span considered is the cumulative user experience, where UX reflects a retroactive evaluation formed subsequently to a series of usage episode as well as periods of non-use. As Hoffman and Novak explains, "the choice of an appropriate time frame is necessary to clarify which aspects and scope of user experience are objectively in focus" (2015, p. 81);

Another point derived from researches of Hoffman and Novak that will be included in the present theorization is the idea that experiences emerge when a critical mass of devices is assembled (2018). It seems that the value extracted by consumers when interacting with smart objects could be impacted by the number of devices that can actually "talk" to each other: it has been proven that when consumers possess up to five or six smart devices, they start feeling a sense of togetherness with smart objects, that leads people to the question of what the objects could do if they can interact more and more between them and with human beings. It emerges that individual devices lose importance, while interactions among them become crucial. Clearly, the meaning of the resulting relationships could vary across different people, since the uniqueness that characterized each person is part of the assemblage within the single user (Hoffman and Novak, 2018).

Therefore, what is the consumer experience definition here employed? Again, the research takes its cue from the study on smart homes undertaken by Hoffman and Novak (2015): in their study, the authors describe experience as what "emerges from the consumer's part-whole interactions with the smart home, as exercised through paired capacities. The paired capacities explain how consumers and the smart home have the capacity to affect and to be affected during interactions with each other" (Hoffman and Novak, 2015, p. 86). The present view is still far from existing theories of consumer experience and in this sense, a comparison of conceptualizations of properties and capacities collected from the assemblage theory with attributes and benefits from the marketing perspective is necessary. It is possible to link attributes as the same of properties and benefits as the same of capacities. This shift in perspective is justified by the different matter at hand, namely by traditional and smart, hyperconnected products. Traditional marketing theories are no longer useful in a context where "intelligent" objects possess a level of agency that let them interact and live experiences in the same way consumers do: the value of experience in existing theories is estimated by summing up the characteristics of the number of actors involved in the consumer's episode with the product. However, smart devices play a crucial role during interaction, since they enter in contact not only with consumers, directly or ambiently, but also with other objects and with third parties.

2.3.1 From relationships with brands to relationships with smart objects

A crucial gateway that links concepts from branding literature to theorizations about consumer-smart object assemblages has been formulated in the analysis of Hoffman and Novak of smart homes published in 2015. As in the present study, the starting point is considering the view of Fournier as theorized in the previous section, where brands have been described as active relationship partners and not merely passive objects of marketing transactions: "the crux of Fournier's relationship argument was that marketing strategies (implemented by human marketing managers) could be interpreted as behaviours by the brand acting as relationship partner. Effectively, the marketing mix decisions actualize the brand's personality and justify the consumer-brand relationship" (Hoffman and Novak, 2015, p. 88). The second subsequent logical step in the passage from brand to object relationship is the addition of Belk's ideas. A step further in the transposition is made after the incorporation of the theory of the extended self, according to which objects can contribute to the construction of our identities: "through the self-extension process, consumers invest the object with emotions or feelings, so that the object takes on a significance beyond a mere possession" (Hoffman and Novak, 2015, p. 89). While the core idea of extended self is included, the following corrections that Belk has made are also recognized, whereby consumers are able to stretch their identity into digital representations and that such online personas are able to affect offline personas in the physical world, thanks to the sense of self. Another point into the process from brands to objects as pole of the interactions with consumers is the one proposed by Raimann and Aron in 2009 called self-expansion theory, a useful tool for understanding the way in which consumers develop and maintain relationships with brands: the theory explains that people are prone to establish close relationships with others because they increase the human ability of achieving goals. Self-expansion, when realized through close affect bonds including significant others in the self, contributes to the construction of the personal identity. The idea can be easily applied to smart, intelligent objects that possess a form of agency which leads to the formation of own resources, perspectives and identities.

2.3.2 Assemblage theory approach

As previously highlighted, the IoT environment is composed by elements of different assemblages, where people, devices and networks co-exist and interact. Before investigating the idea of smart assemblages, the thesis studies the assemblage itself.

The concept of assemblage derives from French philosophers Gilles Deleuze and Félix Guattari (1980), which define it as:

"*a multiplicity which is made up of many heterogeneous terms and which establishes liaisons, relations between them across ages, sexes and reigns – different natures. Thus, the assemblage's only unity is that of co-functioning: it is a symbiosis, a 'sympathy'. It is never filiations which are important but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind*" (Müller, 2015, p. 28).

Assemblages are systems of heterogeneous entities that work together for a certain time. It consists of multiple, varied parts linked together to form a whole: what results is that assemblages are relational. An innovative issue that the thesis will investigate further in a following section is that for Deleuze and Guattari (1980) there are no pre-determined hierarchies or organising principles in assemblages. All the components, objects as well as humans have the same ontological status (Müller, 2015).

Assemblages have at least five constituent features:

- *assemblages are relational.* They are systems of different elements linked together to form a new whole. For Deleuze and Guattari (1980), assemblages consist of continuous interactions of exteriorities. This implies a certain autonomy of the entities (people, objects, etc.) from the relations between them and that the characteristics of the individual component parts can never explain the links that form the whole (DeLanda, 2006);

- *assemblages are productive.* Assemblages produce new spatial organisations, new behaviours, new expressions, new actors and new realities each time they are assembled ex novo;

- *assemblages are heterogeneous.* What the elements that are related in such systems are not predetermined - humans, animal, things and ideas - nor is the hierarchy of components;

- *assemblages are caught up in a dynamic of deterritorialisation and reterritorialisation.* Assemblages establish territories as they emerge and hold together but also constantly change, transform and fracture, forming new systems in new places;

- *assemblages are desired.* What holds together continuous flows and items that are by nature fragmentary and fragmented is the desire (Deleuze and Guattari, 1983).

Ultimately, in IoT contexts, assemblage refers to objects/devices working together with humans and, thanks to their interactions, the ability to do things that none of these components could perform on their own emerges (Hoffman and Novak, 2015). By applying the distinctions between property (a defining characteristic of a component, answering the question "what it is"), capacity (the activated/exercised properties in the assemblage, "what it can do"), and tendency ("what an assemblage can become") made by De Landa (2006), Hoffman and Novak (2015) emphasize that the IoT assemblages are constantly changing and that through on-going relation of the parties, new capabilities can emerge. Indeed, IoT is a "whole" that is more than the sum of its parts, and its identity is constructed by the interactions among its multiple, varied constituents.

It evident that an assemblage approach is needed in the smart objects' environment, since, in this context, the "whole" that encompasses assemblages is for a great part formed by objects that increasingly incorporate sensors that collect data and actuators that transmit that data. In addition to network connectivity, previously

unrelated products will now work together through a process of ongoing interaction (Hoffman and Novak, 2018). Smart objects' abilities change completely the kind of relationships viable to be established between people and everyday products. Devices equipped with AI are not merely recipients of humans' actions, they possess unique properties with which they can affect and be affected by consumers' interactions. This ability permits the instauration of relationships not only with people but also with other devices and with third parties, forming an hyperconnected assemblage unimaginable just a few years ago (Hoffman and Novak, 2018). For this reason, in the assemblage theory developed by Hoffman and Novak "traditional, human-centric conceptualizations that evaluate consumer experience from only the consumer's point of view may not be sufficient to conceptualize experience in consumer IoT" (Hoffman and Novak, 2017, p. 3): indeed, they adopt a nonhuman-centric approach in the framework used here to explain the interactions between consumers and everyday smart objects. The thesis recognizes the impact of the objects' ontology on the assemblage theory approach and later in the conceptualization the issue will be deepened.

The phenomenon of interest in the theorization of the assemblage theory by Hoffman and Novak (2017), here applied in the study on the relationships likely to be established between consumer and smart devices, is the emergence of consumer experience during interactions with smart devices and, in the same manner, the consideration of the experiences of objects in such interrelations.

Although marketing stimuli are seen by current theories as impacting the most consumers' experience, it has been acknowledged by experts that people are no more passive receivers of brands' strategies and experience is not a response to brand's transactions. It has also been recognized that is a necessary interaction for consumer experience to occur (Hoffman and Novak, 2017). The assemblage theory here incorporated to explain relationships in IoT world is grounded in the definition of three levels of experience:

- *basic experience*: this is the most fundamental level of experience that a subject could live. Experiences of this degree involve not only human but also nonhuman entities and constitute the material which is at the basis of the next level of experience;

- *aware experience*: this level concerns how inputs derived from basic experience are received, recognised and ordered by brain and processing systems;

- *conscious experience*: at this layer, subjective experience is produced by the integration of awareness process of input reception, recognition and ordination.

With the description of who the main actors are, of how assemblages work and of what consumer's experiences consist in, the study of consumers-smart objects relationships could go further.

As the focus of the research is the interactions between people and smart devices, the concept of assemblage regarding how the abovementioned actors behave and the interrelations among them will be taken into account. Consumers-object assemblages (Hoffman and Novak, 2017) could be considered as an outcome from four types of interactions' models. The first two are the following:

1. *consumer-centric part-part interactions* between consumers and objects;
2. *consumer-centric part-whole interactions* between consumers and assemblages.

These specific kinds of experience assemblages, involving consumers as the central party, are outcomes of consumer-centric interactions within a consumer-object assemblage. To define the identity of such consumer experience assemblage three concepts are necessary: properties to identify what an assemblage is, capacities to identify how an assemblage interacts (particular attention is on two specific categories of capacities: the parts to enable and constrain the whole and the whole to enable and constrain its parts), and material and expressive roles that identify why the interactions have meaning (Hoffman and Novak, 2017).

Since the interest of the research is on human relationships with smart objects that are able to impact the networks they are a part of, the thesis will focus on the second type of interactions where consumers interact in part-whole relationship within consumer-object assemblages. People in this context could express a) agentic roles as when they enable or constrain the consumer-object assemblages, and b) communal roles as when the consumer-object assemblage enables or constrains the consumer (Hoffman and Novak, 2018). At this point, four consumer experience's categories result from part-whole interactions:

- self-extension experiences where the agentic transfer of the consumer's capacities into the assemblage leads to the capacity of the part to enable the whole;

- self-expansion as a communal interaction where features that characterized consumer-objects assemblage's identity are absorbed into the consumer's sense of self;

- self-restriction as consumer's agentic expressive role in part-whole interaction, that leads the consumer to constrain the assemblage;

- self-reduction experiences that involve the consumer's communal expressive role in part-whole interaction, where the assemblage has developed the ability to constrain the consumer.

NESTED AND OVERLAPPING EXPERIENCE ASSEMBLAGES
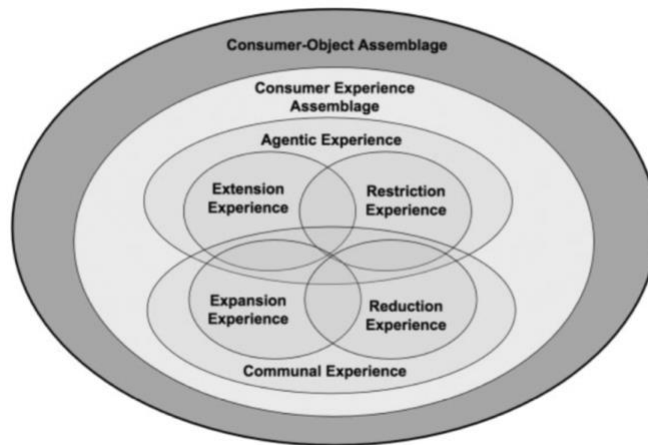CONTINGENT ON THE CONSUMER-OBJECT ASSEMBLAGE

Fig. 2, Hoffman and Novak (2017)

On the other hand, the conceptualization of consumer-object assemblages, here incorporated, highlights the crucial input of objects' experience as well. The understanding of the establishment of relationships between consumers and smart devices is greatly expanded if it is possible to consider the role of both poles of the interaction. For this matter, object-centric relations are involved as follows:

3. *nonconsumer-centric part-part interactions* between objects and other parts such objects or consumers;
4. *nonconsumer-centric part-whole interactions* between objects and assemblages.

Objects' experience, however, should be considered under the light of the different characteristics that smart devices possess in comparison with traditional product. One is *agency*: it means that objects equipped with AI are able to interact with components of assemblages, having the capacity to affect and be affected by other entities. Autonomy, as the degree to which smart devices have the ability to work independently with other parties, in pursuit of their own agenda. Finally, authority, intended as the license to control how they interact with other entities and how other entities respond to them (Hoffman and Novak, 2017).

In the same way as consumer experience assemblage functions, the capacity of smart objects to affect and to be affected in interactions allows them to create object experience situations: "object experience is defined by its emergent properties, capacities, and expressive roles. These represent the identity of the object experience assemblage derived from all the object-centric interactions" (Hoffman and Novak, 2017, p. 11). In this sense, the smart devices' capacities could be divided into two kinds: a) the capacities of the object to enable and constrain the whole, and b) the capacities of the whole to enable and constrain the object. In the same way consumers do, even objects can execute agentic or communal expressive roles during interaction with other assemblages and other objects. This leads to the creation of four specific object part-whole interactions: object-extension, object-expansion, object-restriction and object-reduction.

As the work of Belk (1988) highlighted, consumers are able to have a meaningful relationship with inanimate objects they possess, and these relationships can help with the constitution of a person's identity. Smart objects, however, are inherently different from other products because they have incorporated a form of intelligence that poses them as an active pole during interactions. Indeed, as said before, the present framework adopts an object-oriented ontology, where "smart objects express roles as they interact, just as humans do, and the roles that object express indicate the types of experiences objects are having" (Hoffman and Novak, 2018, p. 4). But in which ways consumers could understand the expressive roles of objects? As it has been pointed out, researches in the past have applied views from anthropomorphism. Are such theorizations fully capable to explain smart objects interactions and their impact in the world of the future? A step forward that can be made to acquire a more accurate comprehension of smart objects' experiences is to adopt an object-oriented anthropomorphism, that "emphasizes what it is like for the object to be an object and assumes that objects can be perceived for what they really are" (Hoffman and Novak, 2018, p.7). Stating that smart objects are passive to have an own ontology means that they could exist independently from the brands that labelled them, the firms that produce and offer them and the consumers that purchase them. In this manner, the development of a form of agency for smart devices is assessed, but it is not a completely structured form of object ontology. The concept, instead, becomes day after day more relevant, with the pervasion of the Internet of Things in daily routines, where human actors alone do not acknowledge a *"thing perspective"*. Lindley, Coulton and Cooper in 2017 published a study named "Why the Internet of Things needs Object Oriented Ontology", in which they laid the foundation of a new approach towards the design of IoT devices that will help shed a light on the very nature of smart objects and on their behaviours and experiences during interactions with consumers. In developing an object-oriented ontology, it is important to understand that "while the 'tool' may be facilitating the task of the human, it is also performing its own task, which may be quite different to the task that the human is concerned with. This situation, although not new, has been made more apparent because things are becoming networked and increasingly designed around their ability to communicate and interact with one another" (Lindley, Coulton and Cooper, 2017, p. 2848). Particularly, Lindley et al.'s object orientated ontology puts objects at the centre of being. In this view, people represent one of the number of things that exist, and all conceivable entities are "objects", "things" or "stuff". All the actors considered are deserving of equal consideration, hence OOO is termed a "flat ontology", because no object is more significant than any other. In this sense, each object is a single entity that exists in a larger landscape of "stuff". Moreover, the research incorporates Harman's (2007) idea according to which "things" are note merely defined through human use but through any use, including object to object situations: this idea is encountered in the framework here applied, since a number of activities exercised by objects are done in concert with other objects and third parties.

2.3.3 Relationship journeys in the Internet of Things

To investigate in detail the relationship of consumers with smart objects, an important contribution that the theory could give is the idea of relational journeys in the Internet of Things. Indeed, the present work takes advantage of the theoretical framework on the topic proposed by Hoffman and Novak in 2018, that sum the concepts from assemblage theory, explained before in the work, and from the circumplex model of interpersonal complementarity. Such a model elegantly captures the reciprocity typical of consumer-object relationship styles, since they are defined, as abovementioned, in terms of the two foundational behaviour's dimensions, namely agency and communion. The dimensions are based on the expressive roles played by the actors during the interaction (Hoffman and Novak, 2018).

Ideas from relational journeys configuration will help to understand relationships' styles in the context.
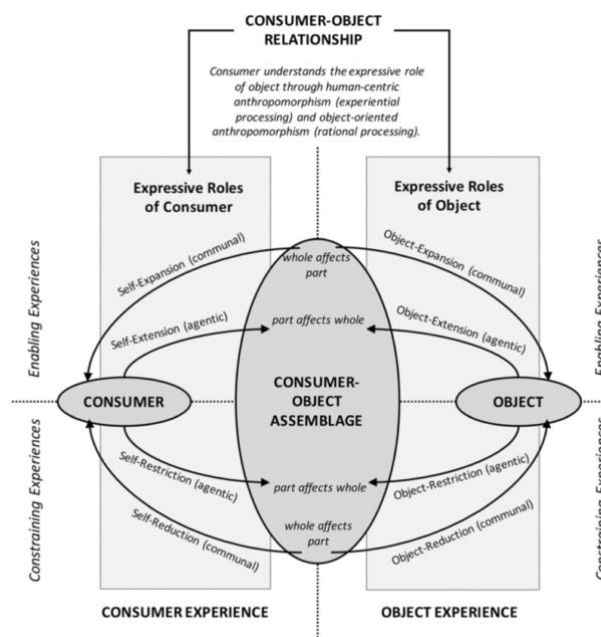

Fig. 3, Hoffman and Novak (2018)

Indeed, the framework proposed for understanding interactions between consumers and objects sustains that a relationship could grow from the joint of agentic and communal expressive roles consumers and objects perform during interactions (Hoffman and Novak, 2018). The reciprocity involved in these two concepts is well captured by the circumplex model of interpersonal complementarity, according to which individuals' behaviours could be displayed with a geometrical position on an empirically derived circumplex. The representation is done on the basis of the interactions' styles and the underlying dimensions of agency and communion. Afterwards, agency and communion could explain the patterns of the relationship: "through the circumplex, we can understand the joint interpersonal styles of two individuals, or in our case, consumers and smart objects, in the context of their interactions. […] Underlying the circumplex is a motivational theory specifying how the relationships between individuals are guided by the notion of complementarity. Complementary patterns involve reciprocity (i.e., opposite values) on agency, and correspondence (i.e., similar values) on communion" (Hoffman and Novak, 2018, p. 8). In this regard, it is argued that interactions are

positively valenced when agentic roles are reciprocal (*opposite*) and when communal roles are correspondent (*similar*).

What are the types of consumer-object relationship styles that can be displayed after the circumplex model? Four categories are detected as follows and they permit to formally connect relation models to consumer experience framework (Hoffman and Novak, 2018):

A. *master-servant relationships – complementary relationships*. Here is displayed a complementary pattern in which consumer and object express similar values on their communal expression (both high or both low), but opposite values on their agentic expression (one high and one low). Indeed, opposite values on agency (reciprocity) and similar values on communion (correspondence) identify complementary behaviours that increase stability in the relationship and lead to balance in the field-regulatory system defining the relationship.
This interactions' category results as one of the most stable and it is likely to continue: the actors involved are prone to resolve conflicts and to reinforce the relationship;

B. *master-servant relationships – non-correspondent relationships*. They represent a semimorphic acomplementary pattern because they express opposite values on agency (reciprocity), as well as opposite values on communion (non-correspondence). While it is true that opposite values on agency lead to the master-servant style, it is also true that opposite values in the communion index represent less stability in the relationship as well as diminishing possibilities of continuing the interaction;

C. *partner relationships*. They reflect an isomorphic acomplementary pattern. Partner styles express similar values on agency (non-reciprocity), as well as similar values on communion (correspondence). The similar values on agency means that partner styles are less unfluctuating than complementary master-servant styles. In this model, it is likely that the consumer will experience frictions with other actors and that, for this reason, he or she will express tendencies to shift toward a more complementary style, increasingly separating agentic roles;

D. *unstable relationships*. The last type reproduces an anti-complementary pattern. Unstable styles express similar values on agency (non-reciprocity) and opposite values on communion (non-correspondence). The actors behave in ways that are opposite to what it is expected to be raised on both dimensions.

In this framework, relationships that emerges from consumer-object interactions are dynamic.
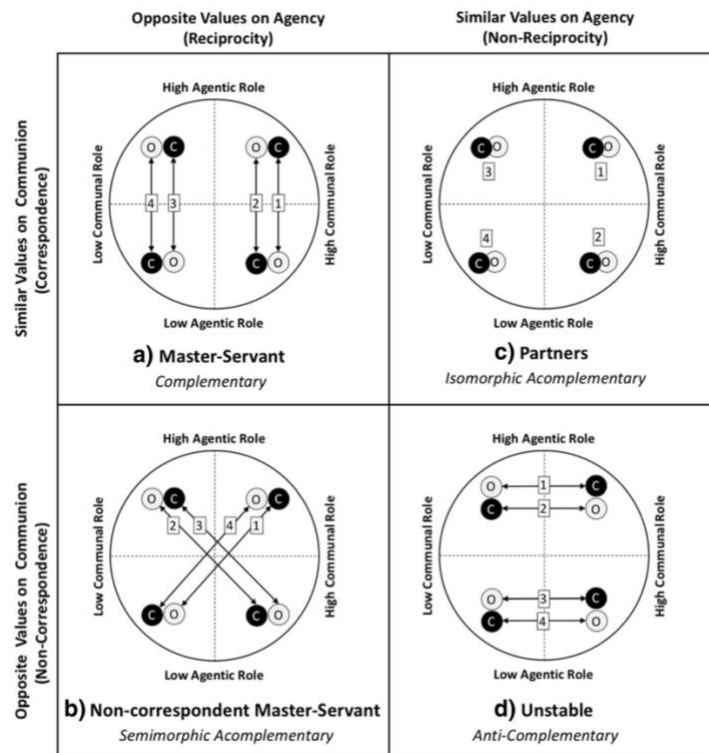
Fig. 4, Hoffman and Novak (2018)

User-service provider. The consumer-object relationships listed before fall into the framework designed by Hoffman and Novak. However, another kind of interrelation could emerge after human-object interactions. The relationship "user-service provider" is a relationship in which the individual plays the role of user and the smart object the one of the service provider. In particular, the individual (user) explicitly asks the smart object (provider) to perform the activities for which it was purchased and has confidence in its functionality. In addition to the economic value of the purchase, the user attributes value to the object in terms of quality of service. The smart object fulfils the requests of the subject in a simple and correct way according to the functions for which it was designed.

Indeed, the very nature of each relationship studied, that is to say the different motivation that leads to the starting point of interactions, could be identified in two mirror-like rules: communal and exchange. The framework here used is the one developed by Clark and Mils in 1993, that has been largely employed in the literature about the phenomenon at hand. The fundamental distinction between communal and exchange reside in the norms that regulate the giving and receiving of benefits. In particular, in exchange relationships, "benefits are given with the expectations of receiving a comparable benefit in return or as repayment for benefit received previously". While regarding communal relationships, the norm "is to give benefits in response to needs or to demonstrate a general concern for the other person. In communal relationships, the receipt of a benefit does not change the recipient's obligation to respond to the other's needs" (Clark and Mils, 1993, p. 684).

User-service provider relationships clearly appeal to the norms of exchange relationships, where the parties involved understand that one benefit is given in return for another benefit (Clark and Mils, 1993). The authors

describe this kind of associations as long-term and stable. In the context of IoT environments, user-service provider relationships claim an expectation shared from both the consumer and the smart object of the fulfilment of reciprocal obligation between the actors. The consumer relay on the object for the holding of a task and the object is able to perform the task with the quality that the person expects.

2.3.4 Belk's analysis on consumers-objects relationships

Another interesting research on relationships between smart objects and consumers is the one conducted by Belk et al. in 2019. The study focuses on relationships that users build with voice-controlled smart assistants through continued use. The empirical analysis highlights three groups of segments for what concern the type of relation built. Summarizing, "the informants described the relationship with their VCSA in three different ways. One group described it as a sort of servant–master relationship, with the VCSA being the servant (VCSA as a servant). Another group explained it the other way around (VCSA as a master), while a third group described the relationship as one between partners (VCSA as a partner)" (Belk, 2019, p. 701). Authors classified the sample's answers in a threefold structure, that organizes the results within the realm of interactions. Indeed, for each of the relationships encountered Belk studied the nature of it, the feelings and emotions that unfold during it and the consequences of it.

What emerges from the empirical investigation are three relationships dimensions that resemble the ones displayed by Hoffman and Novak (2017). Admittedly, the authors in the study use as theoretical foundation most of the conceptualizations exposed before: "a viable way of taking a closer look at the various human–object relations that experiences with anthropomorphised smart objects nurture is to blend anthropomorphism theories with the emergent theories of the digital self and the assemblage theory of the Internet of things" (Belk, 2019, p. 695).

What emerges from Belk's study (2019) is that consumers not only do not measure VCSA quality in terms of its functionality, but they also engage in relationships in which, similar to human relationships, trust in others' intentions is relevant. Furthermore, the research highlights some pursuit of mastery in interaction with the smart devices. When people do obtain the sensation of control, mastery and superiority, they feel encouraged to further investigate the VCSA system and to expand the relationship. Indeed, increased interactions are more likely when consumers feel superior to the device, leading them to experience the master-servant relationship model. This particular insight will be investigated further in a following section.

The study has the aim of linking anthropomorphism theory to self- extension theory in order to provide an explanation for the failure to build an emotional connection in the human-object relationships studied: "while the human–object relationship with the VCSA as a servant experience stimulates a sense of beneficial closeness that encourages the consumer to incorporate VCSAs into their self, those consumers who perceive VCSAs as partners or masters build non-beneficial relationships that make them reluctant to interact with the

non-cathected devices. We theorise that the reason for this reluctance is rooted in a lack of self-extension, when consumers are in the early stages of trying to build a partner relationship with VCSAs. The reluctance seems to be due to the fear of losing control over their digital self when they feel lost in a master (VCSA)–servant (user) relationship" (Belk, 2019, p. 708). Indeed, the answers confirmed that those respondents who perceive the VCSA as a servant were more prone to use the VCSA in the future than those who regarded the object as a partner or a master: "this extends prior partner/servant anthropomorphism literature by adding self-extension capabilities as an explanation for the readiness to use VCSAs when they are perceived as servants. We also show that VCSAs as partners seem attractive at first, but that users are likely to emotionally abandon them if they do not live up to their expectations emotionally. Those users who achieve a partner-like relationship with their devices are more likely to regard the device as an integral part of their extended self, as a prosthesis, and use it frequently and normally" (Belk, 2019, 708).

Another important insight derived from the research of Belk et al. is that the study encompasses not only immediate reactions to VCSAs, but also the development of relationships through experience of cumulative interactions. For what concerns adjoining interactions, the partnership with anthropomorphised VCSA could have appeared the best for human–object relationships. However, researchers discover that the long-lasting establishment of such a relationship had a negative effect on the users' future usage intentions, since people discover the actual VCSAs' lack of real emotional interaction capacities.

After having analysed the two most relevant studies on the relational nature of the relationships between consumers and smart objects, the next section will be dedicated to the in-depth understanding of the norms that conduct interpersonal behaviours.

2.4 Norms by Horowitz

The review of Belk's (2013) work, in which his conceptualization starts from considering the role of a central core of self, passing by the contraposition of real and virtual identities, for arriving at objects' sense of being, opens the discussion about interpersonal behaviours. The fundamental theory framework here applied is the one derived from Horowitz, Wilson, Turan, Zolotsev, Constantino and Henderson (2006) about interpersonal motives as clarification for the meaning of interpersonal behaviour. Interpersonal theories, which began to emerge between 1940 and 1950, have originated for explain insights associated with personality and social interaction.

The view here applied help with the theorization of what interpersonal space is made of: this is a necessary premise for the encoding of the branding literature review that will follow where relationships between consumers and brands are explained in terms of interaction's partners.

As Kielser formulated and Horowitz et al. incorporated "a person's interpersonal actions tend (with a probability significantly higher than chance) to initiate, initiate, or evoke from an interactant complementary

responses" (Horowitz, 2006, p. 67). A complementary response, as later described, is therefore defined in terms of a two-dimensional interpersonal space. In turn, interpersonal space has been described as organizing around two orthogonal dimensions that in most of the theory has been called:

- *affiliation*, that ranges from hostile to friendly behaviour and is put on the horizontal axis. A behaviour and its complement are said to be *similar* with respect to affiliation. In later theorization the concept has been translated into the label of *communion*;

- *dominance*, which encompasses from submissive to dominating behaviours and it is represented on the vertical axis. A behaviour and its complement are said to be *reciprocal* with respect to control. In later theorization the concept has been translated into the label of *agency*.

In their research, Horowitz et al. (2006) examine the organization of motivational constructs and study interpersonal motives to clarify the meaning of behaviours: the most relevant part for the proceedings of the present research is the definition they provide for the categorization of interpersonal motives. On one side they put a communal motive, theorized as "a motive for connection with one or more others; it is a motive to participate in a larger union with other people" (Horowitz, 2006, p. 69). On the other, the agentic motive "emphasises the self as a distinct unit; it focuses on the person's own individual influence, control, or mastery over the self, other people, and the environment" (Horowitz, 2006, p. 69).

The tension between these two concepts will be detected in the following sections where individual-brand relationships and consumers-objects assemblages will be investigated further.

2.5 Master-servant characteristics

The analysis of the relational nature of interactions between smart objects and consumers as well as the study of different theories that present categorizations for what concerns relationships' models end with the adoption of Horowitz's (2006) norms of interpersonal motives. The next step will focus on one specific kind of human-smart device interaction, that both in assemblage theory and in Belk's (2019) empirical research has led to significant insights: the master-servant relationship model.

Characteristics of this type of relation building process will result from Belk's practical study dated 2019 and named "Servant, friend or master? The relationship users build with voice-controlled smart devices" and from the theoretical approach to the problem given by assemblage theory.

Belk's (2019) sample has been divided in three different groups in accordance with respondents' answers to the study: voice-controlled smart assistant as servant, as partner and as master. Pursuing the theoretical approach of the preceding parts, the interest of the present research is about the subject as master and object as servant system. This arouses as a consequence of the number of theories that sustains control as a crucial

way through which people learn to regard an external thing as a part of the self. This kind of mastery of the device increase the perception of the reflection of a person's identity in it. McClelland in 1951 suggested that "external objects contribute to the building of our self when we are able to exercise power or control over them, just as we might control an arm or a leg" (Belk, 1988, p. 140). Generally, "the greater the control we exercise, the more closely the object should become allied" (Belk, 1988, p. 140). Indeed, Belk et al. point out that assuming the position of the pole that exercises control requires a certain degree of mastery: "the device will only do as it is told if it is told properly. (…) Furthermore, this master position probably requires a certain personality or set of expectations. Someone who feels a lack of control in his or her interpersonal experiences might seek the role of master with VCSA assemblages" (Belk, 2019, p. 704).

Helper. Authors summarize the approach of VCSA as a servant with the definition "the subservient helper". What emerges from the analysis of the answers is primarily that consumers describe the VCSA as a servant that helps them fulfil their tasks. This is particularly true in their perceptions of the VCSA as being in a lower hierarchical position than they are. As an example, one respondent describes it as follows: "*Siri says 'yes and amen' to everything, like an employee to her boss. In such a situation, she would also rarely disagree*" (Belk, 2019, p. 703). Consequently, the anthropomorphised perspective of the VCSA as a servant results as a nice, friendly, helpful, reliable person with a ready-to-please character, who acts professionally, as well as somewhat subserviently, and remotely: "*She is a perfectionist and very civilised, dressed like a secretary – blouse and jeans. And she is very shy, stays in the background, and obeys if talked to*" (Belk, 2019, p. 703).

Doll. A closer look on the role in which VCSA merely reacts to users' orders and in which is strongly perceived its dependence on the users' actions ("*She only answers to things she has been asked, she doesn't speak spontaneously*") (Belk, 2019, p. 703), uncover an anthropomorphic image of a doll that only responds when a button is pushed: the object is now seen as "a subordinate, completing tasks that the user, the superordinate, asks it to do, and as acting without the slightest inclination to grumble or contradict" (Belk, 2019, p. 703).
A common pattern that emerges is that the communication between the informants and the VCSA are constituted around two opposite poles: the reaction to master's commands is the VCSA merely responding, not initiating anything or working independently ("*I see the relation as one between a master and a slave. The slave follows orders. That sounds harsh, but actually I want something from this person, and she is always available, like a servant when I need something. And it needs me to actually come 'alive', because it doesn't even work if I don't provide power. I decide if and when I will switch it on and for how long*") (Belk, 2019, p. 703). Reconnecting with previous theory, it is evident that informants in this group perceived themselves as imposing agency on the VCSA.

Generally, informants in this group perceive an ease in interacting with the VCSA: "they enjoyed the tasks in the experience journey that required an information search, praised the VCSAs' refreshing usefulness and cherished them as self-enhancing and empowering helpers who facilitated their information search" (Belk,

2019, p. 703). The sample shows an interest in individualising the VCSA to better serve their needs, regarding it as empowering tool that enhance human capabilities: this behaviour reflects a feeling of self-extension and by incorporating the smart object as a part of self, "the VCSA is regarded as an extended part of the users' body that allows them more and different means of expressing themselves by moving beyond existing boundaries to reach their goals and interact with the world around them" ("*there are many situations in which the VCSA is or will increasingly be part of my life*") (Belk, 2019, p. 703).

For what concerns cumulative interactions, participants at first seems to take advantage of the VCSA, driving the relationship into one that is useful for them and extends their possibilities. Repeated successful exchanges lead consumers to feel empowered by the smart object and to use the device for a number of different tasks, arriving to consider it as part of their daily routines: "*I have the feeling that the VCSA largely extends my possibilities, I plan to use the VCSA more in the future and wish to see extensions*" (Belk, 2019, p. 703).

Dog. An important pattern unfolded is that the initially pragmatic style of interaction with the VCSA gradually has been transformed into "a more connected understanding of togetherness" (Belk, 2019, p. 703). The interdependency that emerges is pictured through the metaphor of the master-dog relationship: "*the VCSA is like a faithful companion, comparable to a dog. He is always by my side, but sometimes doesn't obey immediately*" (Belk, 2019, p. 704). Most importantly, although the VCSA is considered, as seen before, hierarchically inferior, the consumer also feels of lacking something if the device is not around: "*like a dog really; when it is not around, or does not work, I have a problem*" (Belk, 2019, p. 704). Roles here could be better labelled as master and pet rather than master and servant.

The process of repeating interaction, however, leads the informants not only to feelings of self- extension, but also to the understanding of what comprises a successful as well as an unsuccessful interaction experience. This awareness thought them that the VCSA is useful and efficient with simple tasks, but it is inaccurate when handling more complex tasks. This might be the motive for that some of the informants "describe the VCSA as dumb and annoying, for making fun of the VCSA's insufficiencies, and even for describing the VCSA in disparaging ways" (Belk, 2019, p. 704). For these informants the relationship returns to the starting point, where they valued the VCSA only as long as they feel they are personally profiting from it: "*I think this woman is stupid and naive. She simply gave me too many stupid and senseless replies for me to think of her as an intelligent creature. Some of the interactions were wrong, and, for whatever reason, Siri simply can't process certain tasks. Perhaps the technology isn't sufficiently developed as yet*" (Belk, 2019, p. 704).

Interrelations with Hoffman and Novak's assemblage theory. Linking Belk's (2019) ideas to the theorizations of Hoffman and Novak (2017) and to assemblage theory, the concept of agentic expressive role could be found when informants originally were prone at activities that accentuated self-related goals. Overtime, moving into a state in which successful interactions have changed the nature of the relationship, consumers start to express

a communal expressive role with VCSA: "this highlights the potential permeability of the agentic expressive role and the communal expressive role developed overtime due to enabling experiences" (Belk, 2019, p. 704).

The breaking point in the descriptions of the master-servant relationship's conceptualization could be identified in the meaning of self-extension in the two models. While the assemblage theory conceives self-extension to only have an agentic expressive role, Belk (2019) finds that self-extension leads consumers to consider VCSAs as empowering tools that they can incorporate into self. On the other side, Hoffman and Novak (2017) master-servant relationships are likely to be established when the smart object is regarded as a servant with low agency (defined as the power to affect and be affected) and conversely the user has high agency. As the subcategories formed in the device-as-servant class show, Belk et al. discover that "this type of anthropomorphic relationship is more about authority and subservience. That is, it is not that the device has low agency, but that its agency is responsive and in the service of the master" (Belk, 2019, p. 704). It is also true that master-pet interactions might be explained with a low autonomous power device, but those who seek a master and servant relationship expect "the VCSA to be a powerful, agentic and empowered other" (Belk, 2019, p. 704).

2.6 Research question and empirical research

The research question can now be formulated since the problem has been described in its crucial aspects. The rest of the thesis will be dedicated to the study of one key relationship between consumers and smart objects. The choice of such a relationship was dictated both by the numerous theoretical cues collected during the literature review and by the relevance of the results emerged from the empirical research that follows. The quantity of answers to a survey formulated to investigate in-real-world interactions between people and smart devices reveals a clear trend for subject as master and servant as object models.

Furthermore, a theoretical gap in the following interaction style is detected: Hoffman and Novak (2017) as well as Belk (2019) and many others attempted to give a conceptualization of the problem. The explanations sometimes lack in cross-device applicability, sometimes in excessive theoretical description and insufficient practical application.

The study at hand delve into the understanding of consumers' perceptions when they engage in experiences that they perceived as regulated by norms of mastery and enslavement. This can happen in a form that displays the consumer as master and the object as servant. The analysis will explore the different outcomes that results from this relationship's experience: object-side and subject-side investigation will be conducted as well, to understand both the point of views of the actors in the network.

The following chapter will delve into the research question in an empirical way. While the main actors of the landscape have been described in theory and the relational nature tying them up has been defined, an empirical

study about master-servant relationships is now conducted. The coding structure as well as the interpretation of the results will be explained. The survey administrated to the audience is part of a study structured with a qualitative methodology and it is about consumers-objects master-servant interactions. The technique here applied is the critical incident technique (CIT).

What are the characteristics of the relationship between the master (subject) and the object (servant)? The subsequent chapter will try to answer this question.

Chapter 3 – Empirical research

The central topic of the analysis consists in the description of the master-servant relationship model through the study of its relevant dimensions, both from the subject's and from the object's side (as described by the respondent).

The master and servant model appears when the individual plays the role of the master of the smart object, which is its servant. The consumer is an authoritarian owner who gives orders to the device and expects it to fulfil its requests. The smart object is submissive and incapable of acting autonomously, it tries to obey orders in the best possible way, but it is not always capable of doing so. When it succeeds, they both feel positive emotions (e.g., happiness, satisfaction, pride) creating a lasting relationship of subordination; when it fails, they both experience negative emotions (e.g., the subject can feel anger, disappointment and the smart object can feel sense of frustration, sadness) cracking or breaking the relationship of trust previously established.

Generally, the aim of the empirical research is to investigate how master-servant relationships are structured and developed during customer-smart object experiences. Specifically, based on the previous literature review, insights on specific dimensions will emerge, within a cross-device analysis. On the object's side, attributes and behaviours during the relationships will be studied. Thus, on the subject's side, behaviours, effects suffered, emotions and thoughts will be taken into account.

A section will be dedicated to the qualitative methodology adopted to conduct the analysis as well as how the collection of the data through a survey has been done and how the coding process was structured. First, the description of the sample, in terms of gender, age, and education level will be provided. Then, the different relevant dimensions for the purpose of the analysis will be explained: how the object has been described by the subject (its attributes) and how it reacts to actions of the other (its behaviours), as well as the subjects' behaviours, the effects he or she suffered during or right after the relationship's experience, the emotions and the thoughts he or she felt. For each code, the text of the most relevant answers will be reported.

3.1 Methodology employed in the research

3.1.1 Data collection

The purpose of the present research is to investigate the relationships regulated by norms of mastery and enslavement likely to be established between consumers and smart objects.

In line with the literature review conducted in chapters 1 and 2, the focus of the study is about the patterns of master-servant interactions. The focal point has been selected for its relevance in the narratives of the direct experiences of participants and for its significance in the theory. The purpose is to understand how the relationship impact on customers' behaviours enacted during the conversation, as well as emotions and thoughts felt and what are the effects suffered by the subject during the interaction, given some particular attributes and behaviours assumed by the smart product.

The empirical analysis consisted in a study conducted through an online survey platform called Qualtrics. The survey method is therefore electronic, administered via Internet. The language of the survey is Italian. In the section Appendix, the text of the survey is reported.

Afterwards, the answers have been coded according to the dimensions interesting for the study: objects' attributes and behaviours and subjects' behaviours, effects suffered, emotions and thoughts.

3.1.2 Technique employed: Critical Incident Technique

The methodology here applied to gather consumers' insights on their relationships with smart objects is a qualitative methodology, since the data in the study are obtained through open-ended and conversational communication.

The technique deployed in the study is the critical incident technique (CIT). CIT has been originally developed by Flanagan in 1954 and has been used in a number of disciplines such as management, human resources and education. In a marketing perspective, the technique is adapted here to identify the emotions, thoughts, effects and behaviours from the subject's side and attributes and behaviours displayed from an object's side. The categories highlighted are based on specific events' incidents and are extendable for managerial application.

As Bitner, Booms and Stanfield Tetreault defines it, "the critical incident technique consists of a set of specifically defined procedures for collecting observations of human behaviour and classifying them in such a way as to make them useful in addressing practical problems" (Bitner, Booms and Stanfield Tetreault, 1990, p. 73). CIT is considered as an inductive grouping procedure, since it determines the relevant categories in the analysis on the basis of the study of a specific set of data, and, like the other inductive grouping procedure, it is recognized as appropriate in researches where there is a little documentation of the characteristics that will result crucial for the classification scope.

The critical incident technique extracts insights from the content analysis of people's narratives: indeed, it "takes the stories that people have told and asks questions of the stories in order to classify each one within the scheme" (Bitner, Booms and Stanfield Tetreault, 1990, p. 73).

The present empirical research has the aim of studying the relationship between consumers and smart objects: the topic is analysed both on negative and positive poles. In this sense, CIT records facts that have been perceived by the sample as leading to success or failure in accomplishing a specific task. The orders dictated by the consumer-master, indeed, could be fulfilled or not: what implications have on the relationship?

By the literature, the specific description of events and behaviour is identified as a critical incident. An incident is defined as an "observable human activity that is complete enough in itself to permit inferences and predictions to be made about the person performing the act", while a critical incident is depicted as contributing or detracting "from the general aim of the activity in significant way" (Bitner, Booms and Stanfield Tetreault, 1990, p. 73).

In the master-servant study's perspective, specific interactions between consumers and smart objects has been considered: not all of the relationships' reports are analysed, but only the ones that bring insight into the fundamentally relevant dimensions. In this case, the critical incident was required to:

1. involves interaction between a consumer and at least one smart object as defined at the beginning of the research;
2. the narrative should display crucial aspects inherent to the dimensions identified;
3. represent a discrete episode (a threshold of 500 characters has been put);
4. illustrate a number of useful details.

The information results as reliable and valid and an advantage of using CIT as a technique within a qualitative methodology was that it provides accurate and consistent interpretation of people's stories about their relationship with smart objects without depriving them of power or eloquence.

3.2 Coding process

The total number of answers collected was 218. Afterwards, the survey on Qualtrics was closed and data was exported to Excel, where a cleaning operation was needed. Indeed, some columns which were not useful for the purpose of the analysis where deleted, such as "Start Date", "End Date", "IP Address", "Response Type", "Response Id" and "Recorded Date". Furthermore, not completed responses were excluded. The next step was dividing answers in different Excel's sheets, based on the kind of relationship chosen by the respondent: user-service provider, master-servant, partnership and none of the above, respectively with 10, 49, 8 and 10 valid field.

RELATIONSHIP STYLE	NUMBER OF ANSWERS
User-service provider	10
Master-servant	49
Partnership	8
None of the above	10
Total	77

Table 1 – Answers per relationship

In particular, among the total answers, the focus of the research is on respondents that identified their relationship with smart objects with one of the theoretical proposed relations, namely the master-servant. For what concerns the participants who stated that their relationship could be identified with user-service provider or partnership models or that the three models do not describe their relationship with smart devices, the study will be conducted from the point of view of the segmentation.

As mentioned before, in order to perform the analysis on the interactions' styles, specific dimensions which could fit the aim of the present research has been identified. In this sense, the distinction between the subject's side and the object's side has been operated. On the subject's part, the understanding of implications of the relationship's models on four main dimensions is pursued: firstly, on behaviours the consumer assumes in interactions; secondly, on the effects suffered by the subject during or right after the interaction; thirdly, on the emotions he or she feels in interacting with the object; and finally, on his or her thoughts about the relation. On the object's side, the analysis goes more in depth in smart devices' attributes and correspondent behaviours, both as mentioned by consumers.

According to these dimensions, a qualitative analysis on texts was performed by examining in detail all the responses.

In particular, the analysis' effort was double. On one hand, a manual analysis was carried out to capture all the shades behind a dimension described in each answer; indeed, it was usual in the responses to find both negative and positive facets of the same coin. On the other hand, for analysis purposes a standardization attempt was made in the coding of the text, assigning a limited number of dimension's categories to the answers. All the categories, emerged from the reading of the content, will be analysed more in depth in the following paragraphs.

3.2.1 Analysis of the data

In a first section, the description of the population will be provided, in terms of gender, age, and education level. In the second section, the relevant dimensions for the purpose of the analysis will be pictured in detail.

3.2.2 Description of the sample

Master-servant relationships, with 49 valid responses have been proven to be the most common interaction model in the relationship experience between consumers and their smart devices. Before going more in depth in the contents of the replays, it is crucial to describe the sample. An effort was made to direct the survey to distinct segments, in order to divide the audience via a range of demographics.

In general, the number of men surveyed was 32, while the number of women was 33. 12 people did not express their gender. The mean age of the respondents was between 39 and 40 years old, ranging from 22 to 57. For what concerns participants' occupation, 11 are employees, 1 is an independent contractor, 20 are students and 1 person selected "Other". 44 people did not answer. Levels of education detected are junior high school diploma (1), high school diploma (15), bachelor's degree (24) and master's degree (25). 12 people do not complete the field. The mean number of the smart devices owned is more than 2 per person, with 13 respondents having one, 17 having two, 16 having three, 12 having four, 2 having five and 4 having more than five. 13 consumers do not provide this detail. The types of devices uncover are voice assistants, smartphones, computers, printers, smart TVs, tablets and smartwatches.

By relationship. In order to identify the characteristics of the respondents in the sample an analysis of segments contained in master-servant relationship model has been performed. In particular, gender, age and education level will be considered. This has been done with the aim to investigate how the population of the sample is characterized.

Respondents identifying their relationship with smart objects with the master-servant model, present the following characteristics. For what concerns the gender, 22 responses belonging to women and 15 responses belonging to men were collected. 12 people do not specify the data. Regarding the age, 26 responses belong to respondents with less or 25 years old, 2 response belong to people that have between 26 and 30 years, 9 people have more than 31 years. 12 people do not specify the data. Education levels detected are high school diploma (9), bachelor's degree (13) and master's degree (15). 12 people do not specify the data.

3.3 Results

In the present section analyses of data will be carried out, according to six relevant dimensions for the purpose of the study. As mentioned above, object's side and subject's side will be taken into consideration. While for the object's part attributes' and behaviours' dimension will be examined as described by respondents, for the subject's part dimensions studied will be emotions, thoughts, behaviours and effects. Based on each dimension, the text of the responses will be coded in order to emphasize different aspects of the specific dimension.

First, on the object's side we are going to analyse the attributes of the smart object, investigating whether the respondent highlighted the interaction abilities of the smart object, its efficacy, or a humanization process. Then the behaviours displayed, whether objects serve, poke in, work diligently or take care. Secondly, the

research proceeds with the study of the subject's side dimensions behaviours assumed, effects suffered, emotions and thoughts. First, we will examine the behaviours displayed in the interaction with smart objects, investigating whether they resemble literature theorization. Then, the effects suffered during or right after the interactions will be categorized into physical and psychological improvement and physical and psychological worsening. For what concerns the subject's emotions and thoughts, the investigation research whether the respondent expressed positive or negative comments. In the first place, a general analysis on the two poles will be performed. Afterwards the relevant association trends will be examined. In particular, satisfaction and simplification of daily activities association, as well as frustration and technology's obsolescence and surprise and willing to discover more will be explained further.

3.3.1 Object side: attributes and behaviours

As said before, the mean of the smart devices possessed is more than 2 per person, with 13 respondents having one, 17 having two, 16 having three, 12 having four, 2 having five and 4 having more than five. 13 consumers do not provide this detail. The types of devices uncover are voice assistants, smartphones, computers, printers, smart TVs, tablets and smartwatches. The most owned device is the smartphone, but virtual assistants and smartwatches follow immediately after.

The dimensions emerging primarily from the texts of the answers that comprise the object's realm in the master-servant model were attributes and behaviours. Each one will be further analysed in the following paragraphs.

Attributes

Attributes	Interactions abilities
	Efficacy
	Humanization

Table 2 – Object's attributes

For what concerns smart objects attributes' dimension, in the answers of the respondents three main patterns emerged: interaction abilities (with negative and positive shades), efficacy, with negative and positive poles as well, and humanization, a trend strongly highlighted from the literature analysed previously as well.

Expectations were that the interaction abilities positively affect the relationship experience. Indeed, what emerged was that when the user fails to communicate properly with the object, the relationship's experience was described with negative words. Disparaging comments on interaction abilities were found in those cases where the smart objects did not understand slightly complex orders.

Regarding humanization processes, it appears evident that the most felt experiences arise when the object is strongly anthropomorphized by the respondent. This finding is in line with previous theory.

Master-servant. In master-servant relationships, the object is submissive, and it is not capable of work autonomously. It displays no agency. The user expects it to fulfil the requests given and the object tries its best to succeed. From the answers emerged a strong tendency of humanize the servant as well as crucial consequences when the servant fails its mission. As seen before, when the object understands orders and shows its "intelligence", the authoritarian possessor feels satisfaction and pride. On the other hand, when its interactions abilities are lacking, the master expresses anger and disappointment, leading to a negative evaluation of the experience. A positive example of an experience that represents satisfaction and pride is the one that follows, during which successful interaction abilities leads to efficacy in accomplishing goals:

"*In last months I have purchased different types of smart objects, taken by the enthusiasm of trying a new thing and given my desire to keep up with new technologies. For what concerns master-servant relationship, I can mention an episode that leads back to a final positive reaction. It happened that guests at home got their attention drawn by the smart object in plain sight. They ask more about the functionality and if, in the end, it had a big impact on my life. It all led to a practical demonstration of how the device works and what it could do: we started by turning on the light bulb, changing its colour, turning off the light bulb and then the TV we were watching, and finally playing a song from Spotify in the general amazement of those present*".

<div align="right">24 years old male student in a master-servant relationship with Amazon Echo Dot</div>

The example shows an enthusiasm in possessing such a relationship with the object: it derives from the ability of perfectly understanding task and to perform them successfully in front of an amazed audience. The servant is loyal, and it permits its master to feel happy and proud of the relationship's experience.

On the other side, negative experiences that derive from communication inefficiencies shows a humanization process in giving disparaging comments to the servant.

"*The point arises from the wise and judgmental tone, or even from the fact that it does not understand minimally complex questions. You start by making a stupid query and you end up insulting her in a meaningless escalation. I realize that it's something on the verge of madness but it's very funny and in moments of boredom it happens to do stupid things. One of the funniest things is to give it a nonsense sentence. (…) Well, let's say that it doesn't really hold it. In short, talking with Siri also stimulates a bit of sadism, although then I'm a little bit sorry when it plays the role of the smartass*".

<div align="right">52 years old female employee in a master-servant relationship with Siri</div>

The answer is full of insights that could be generalized. For what concerns humanization processes, it is clear that the respondent considers Siri as a device with human resemblances, defining it "her" in Italian, talking with it like with a real person and mostly expecting from it answers pertaining to a human being. The

participant highlights the problem of the little capacity of the smart assistant to understand complex sentences and queries. It is evident that this bring about a whole negative experience and the interaction is no more the one from a master dictating orders to a servant, but it recalled king and jester relationships where the former makes fun of the latter: however, the negative interpretation of the experience highlights far more the consideration of the object as with "humanlike properties, characteristics, or mental states to real or imagined nonhuman agents and objects" (Epley, Waytz, Cacioppo, 2007, p. 865).

The texts show a positive correlation between good interaction abilities and efficacy as well as a number of humanizing comments in respect to the object, especially when it falls to accomplish goals that the master has dictated. The servant is more than an object, especially when it fails to complete a task.
The attributes recognized are in line with previous literature' findings.

Behaviours

Behaviours	Serve
	Poke in
	Work diligently
	Take care

Table 3 – Object's behaviours

The behaviours that the devices perform, as seen by consumers, that are identified in the sample represent a specular image of what the literature definition of the smart objects explains, with some insights that are worthy to be analysed. What emerge are five pattern that range from "serve" to "take care" affectively. Now the different relationship's interacting modes will be reviewed in respect of these smart object's parts.

Master-servant. Master-servant interactions provide a number of insights about object's behaviours, ranging from positive to negative attitudes. This two-fold nature is found in the theory as well, where, as described in the survey, the individual plays the role of the master of the smart object, who is its servant. The individual (master) is an authoritarian owner, which gives orders to the smart object (servant) and expects it to fulfil its requests. The smart object is submissive and incapable of acting autonomously, it tries to obey orders in the better way, but it is not always capable of it. When he succeeds, they both feel positive emotions (e.g., happiness, satisfaction, pride, etc.), thus creating a lasting subordinate relationship; when it fails, both feel negative emotions (e.g., the subject can feel anger, disappointment... and the smart object can feel a sense of frustration, sadness, etc.) cracking or breaking, in this case, the relationship of trust previously established.
As a servant, the device tries its best to succeed in completing tasks. When it pleases the master, it has been seen as a serving parent who affectively takes care of its owner.

"At home we have a home automation system through which you can turn on and off the lights and the air conditioning and you can put the alarm. Once, coming back from a trip to the mountains during which I suffered the cold and having to stay out for several days with my parents that live with me, we wanted to turn on the heating. Indeed, the idea of entering the house and suffering from the cold again did not appeal to us much. We decided to turn on a few hours before our arrival the air conditioning, setting it to a high temperature, which would heat the house much faster than the radiator, all done with our smartphones. When we entered the house, we felt joy and satisfaction in having installed the home automation system, a very useful object."

25 years old female student in a master-servant relationship with a home automation system

On the other side, when the servant is incapable of understanding master's queries or to perform them properly, it is considered like serving the owner with a sort of limited capacity of understanding.

"I asked my smart device to turn off the light, but, maybe because of the tone of voice or of other things, the smart device did not perform the task. So, I tried and tried again but it kept answering that it had not understood. This means that you need to take a tone of voice high enough, so that it can perform the command but it is not so obvious and this creates discomfort because I prefer to turn off a light with a finger, especially in the morning when I do not want to talk and express myself and I prefer not to have relationships with anyone, let alone with a smart device!".

56 years old female employee in a master-servant relationship with a smart vocal assistant

In worst scenario, even if the object in this relationship style does not have agency, some respondents describe the device as poking in their daily life, because it activates itself absorbing words, that were not directed to it, as orders. Clearly this is a failure caused by insufficient interaction abilities in the system that leads to disappointment and frustration.

"It was a quiet evening, it must have been around 23.30, just the time to go to bed and wait for Messalina (the cat) to curl up on her towel near my feet for deciding what to watch on TV. I zap a bit and at the end I decide to put a movie that I found already half-started on SkyCinema. (…) While scrolling through the images of Facebook and Instagram on my phone, suddenly, without having asked anything, Google Home from the bedside table feels called into question and decides to talk to me in an offended tone saying: "I'm not sure I can be of help".

38 years old female employee in a master-servant relationship with Google Home

With more neutral shades, numerous narratives describe the object-servant as interpreting the role of an employee who diligently and respectfully accomplishes the task its boss assigned it. In most of the cases, the employee is not depicted with positive compliments or negative insults, it is considered as doing its duty.

"*During the last weekend I talked with the Google Assistant, an Android application in my smartphone, saying the words "Ok, Google". At the activation, I asked to listen to a song from Spotify saying, "I would like to listen to the song "Please don't stop the music" by Rihanna". After a few seconds the Google Assistant replied with the sentence "Sure, I immediately ask Spotify to play "Please don't stop the music" by Rihanna". Soon after, the Spotify application opened, and the music started to play*".

24 years old female employee in a master-servant relationship with Google Assistant

What emerges in this part of the study, that is of particular relevance, is the behaviour pattern of poking in in consumers' daily activities as never detected in previous studies: since servants are seen as entities without any degree of agency, a nosey attitude could result as misleading. In this sense, the present research uses this label to identify such cases where objects, as a consequence of a technological insufficiency, perceived words and orders as aimed at them, while those are only bits and pieces of human conversations.

3.3.2 Subject side: behaviours, effects, emotions and thoughts

The analysis proceeds with the study of subject's side dimensions: behaviours, effects, emotions and thoughts will be taken into account. First, the research will examine the behaviours respondents seems to enact during relationships with smart objects. Then, a study of what are the effects of such relationships on the subject will be proposed. For what concerns the subject's side of emotions and thoughts' dimensions, the analysis will state whether the respondent expressed positive or negative comments to describe both. At the beginning, the polarity of emotions and thoughts in the different relationship will be considered. Afterwards, only the most relevant will be identified.

The research follows once again master-servant models of interaction.

Behaviours

Behaviours	Dictate
	Manage
	Bully

Table 4 – Subject's behaviours

In the text of the answers, a reflection of the theory for what concerns the behaviours that respondents display in reacting to objects' interaction appears evident. Behaviours consumers enact are almost specular to images derived from objects' behaviours, ranging from "dictate" to "bully".

Master-servant. In master-servant relationships' answers, the uncovered trend shows that subjects are strongly persuaded of their role of master in respect to the smart object. They are conscious of their authoritarian as well as superior condition, they behave as masters and possessors and feel entirely entitled to dictate orders to the servant. The subject feels joy for the competency of the servant when it successfully completes tasks, but he/she is also ready to break the relationship in the case in which it fails to please the master. As masters, they impose agency upon the objects dictating orders. The attitude can be explained by the example that follows.

"*I use the smart device mainly for work, of course I am the master and I am satisfied with the speed with which the servant performs the commands I have assigned. The use helps me and my company to be more productive and efficient. I appreciate its use when I'm away from my usual place of work. The ability to access via smart device all the information I need to keep me up to date on the development of projects, anticipating response times, facilitates my activities by managing the time to devote in a rational way, without encounter problems of project delays or stress when I return*".

48 years old male employee in a master-servant relationship with a tablet

For what concerns a more neutral and detached mode of behaviour interpreted by consumers, a relevant pattern is unfold when people act as bosses, managing all the activities the object should perform in a detached manner, with professionalism. This categorization is a mirror for employee-object roles. An example is given:

"*I was at home, and I wanted to listen to a newly released album on a music streaming platform integrated with the device's operating system. Without having to move around, I activated the smart device's voice assistant by simply calling it up. After the command was given, the voice assistant asked for confirmation of the album and started playing music. Then I asked the voice assistant to activate Bluetooth connectivity and to connect my headset*".

23 years old male student in a master-servant relationship with a tablet

For what concerns a behaviour that to date has not be detected by the preceding literature review, insights on attitudes of bullying emerge. Respondents fiercely report their experiences of disparaging comments, insults and jokes of the smart device because of its technology insufficiencies. Bullies are conscious of victims' limitations and draw pleasure in prevaricating psychologically the objects.

"*Sometimes I tried to fight with Siri. But the thing is almost impossible: even if you repeatedly insult it, Siri will always remain totally impassive and will continue to give you the same answers. Siri never gets pissed off. The best would be to get Siri and Alexa to argue or even Cortana and Siri to fight. Sooner or later I'll try*".

52 years old female employee in a master-servant relationship with Siri

Effects

Effects suffered from subject	Physical improvement	Simplification of daily activities
		Creation of a routine
		Freedom of movement
	Psychological improvement	Less stress
		Security
	Physical worsening	Overwork
	Psychological worsening	Disregard

Table 5 – Effects on subject

Another pattern that can be observed through subjects' descriptions of interactions' experiences is the effects suffered by the participants during or as a consequence of the relationship with the smart object. It emerges that the effects suffered could be categorized into four dimensions: physical and psychological improvement as well as physical and psychological worsening, depending from the smart object. It must be underlined that, in the coding of the answers, an influence of interaction abilities on the effects suffered by the subject has been detected.

Master-servant. Master-servant answers are the collection of the most insightful effects suffered by the subject during or after the relationship's experience.

For what concerns the physical improvement category, in a number of cases the servant put a lot of effort in completing the task and delivering simplification of daily activities and to a freedom of movement. The following text identifies this trend.

"*I used a smartwatch to monitor a hike in the mountains; the device allowed me to immediately monitor my physical parameters helping me to perceive my limits and, through a summary of data expressed in the form of graphs and numerical values, provided me with a final overall assessment of the performance. In addition, the device, being equipped with a GPS sensor, allowed me to assess, with reasonable accuracy, my position in space, allowing me to control my progress on the previously chosen route. It has also recorded the starting position so that I can indicate the position of the means of transport giving me more peace of mind. Finally, thanks to the Bluetooth connection with the smartphone, my device showed me the notifications received, allowing me to stay connected to my profiles, but with extreme freedom of movement*".

24 years old male student in a master-servant relationship with a smartwatch

A series of positive interactions that leads to simplification of daily activities and to a freedom of movement leads as well to the creation of a routine pattern as highlighted in a number of different texts.

"*A few months ago, I received a Google Home. I started interacting with it for fun and one morning I said good morning to it. At that point a "good morning protocol" was established, which involved information*

about the weather, the temperature I should have expected and the main news from various newspapers, TV and radio. What started out as fun became routine and I started to "greet" the device almost every morning".

40 years old male employee in a master-servant relationship with Google Home

It is also possible that the servant, performing repeatedly and correctly master's orders, contributes to a psychological improvement experienced by the subject. This leads to the perception of a sense of increased security and less stress suffered by the master.

"I usually ask Siri to call someone or provide me with information about the weather conditions in Rome. If it executes the request correctly, I feel happy and also positively surprised. Last week I asked to call someone because I was in the car and it called the right person at the first attempt, making everything easier and safer".

22 years old female student in a master-servant relationship with Siri

Master-servant coded answers provide information on the negative effects suffered by the user consequently to or during the interaction. Physical overwork is experienced when the object not only does not understand orders, but it also force the subject to do them her- or himself, conducting the relationship to the breaking point. An example follows.

"I used to shower with music. At home I have a Google Home in the bathroom with which, via my smartphone, I can listen to my music on Spotify. I connected everything to the same Wi-Fi network, selected the playlist and got into the shower. As soon as I started getting wet, the music stopped. Wet, I got out of the shower trying to understand the problem. Suddenly and without doing anything, the music started again and got back into the shower. After 20 seconds it happened again, and I have done all the procedure again. It kept happening for two other times until I give up and disconnect everything".

24 years old male student in a master-servant relationship with Google Home

Psychologically, the subject experiences feelings of disregard when the smart object does not listen to orders and not understand what the master is trying to ask. The frustration that derives from disregard could lead to a cracking of the interactions.

"I was driving in my car and I wanted to set the route on Google Maps because I always get lost in the streets of Rome. So, I asked Siri to search for the bar on Google and then to set the address, but I had to repeat it three times because it doesn't understand for s***".

26 years old male student in a master-servant relationship with Siri

While psychological improvements and physical and psychological worsening are acknowledged by the literature, a contribution that the research has made is the unfolding of three physical enhancements caused by smart objects. Simplification of daily activities is an effect further analysed in the following sections.

Emotions and thoughts

The most relevant insights could be guessed through the coding of texts in the light of emotions and thoughts felt by the respondents. They are often expressed verbally, while sometimes they could be argued from the context.

The investigation proceeds towards negative and positive poles. Firstly, positive and negative emotions and thoughts will be analysed in their emergence during the relationship's experience. Afterwards, the most relevant ones for each dimension will be studied more in depth. In the emotions' dimension, a neutral category appears.

Master-servant. Master-servant relationship's subjects often show a mixed pattern, expressing both positive and negative emotions whether the completion of orders dictated is successful or not. Thus, master-servant respondents tend to experience conflicting emotions during their interactions with smart devices. However, in general, the positive feelings were the predominant percentage.

In the table below, the most common emotions expressed by participants are summarized. On the positive side, happiness, pride, satisfaction, surprise, trust and comfort were reported. The negative emotions encompass frustration, bother, physical labour, mistrust, disappointment and finally anger. Another noteworthy point is that in the population, little emerging of neutral emotion is verified.

Emotions	Positive	Happiness
		Pride
		Satisfaction
		Surprise
		Trust
		Comfort
	Neutral	Neutrality
	Negative	Frustration
		Bother
		Physical labour
		Mistrust
		Disappointment
		Anger

Table 6 – Subject's emotions

Subject's thoughts during the relationship's experiences are examined in terms of positive or negative valence as well.

Master-servant. As in emotions' analysis, the master/servant group was characterised by a distinct split between positive and negative thoughts; indeed, respondents have expressed a large percentage of positive opinions, well balanced with technology's intrusiveness and dependency mechanism's ideas. Another noteworthy point is that in the population, each respondent expresses a determined emotion, as to say no substantial narratives of neutral thoughts were found.

In the table below the most common thoughts mentioned by respondents are showed. Among the positive ones, opinions on satisfactory results, simplification of daily activities, gamification of daily activities, technology's enthusiasm and willingness to discover more could be encountered. The negative thoughts concerned technology's intrusiveness, technology as being obsolete and dependency.

Thoughts	Positive	Satisfactory results
		Simplification of daily activities
		Gamification of daily activities
		Technology's enthusiasm
		Willingness to discover more
	Negative	Technology's intrusiveness
		Technology is obsolete
		Dependency

Table 7 – Subject's thoughts

According to the empirical research's purpose, in the following paragraphs a qualitative analysis on relevant associations of emotions and thoughts for master-servant relationships will be performed. In particular, the investigation will go more in depth in some aspects that emerged both from the literature review and from a numerous set of answers coded.

Relevant patterns' associations that could be identified in master-servant relationships are satisfaction (emotion dimension) and simplification of daily activities (thought dimension), frustration (emotion dimension) and technology's obsolescence (thought dimension) and finally surprise (emotion dimension) and willingness to discover more (thought dimension). These variants of the two dimensions were chosen on the basis of their coupled recurring pattern inside the texts.

These associations are particularly crucial for the investigation because they represented a substantial contribution of the research in the landscape of master-servant relationship's studies.

Satisfaction and simplification of daily activities. As previously stated when reflecting about object's attributes, the two main dimension of interactions' abilities and efficacy were strictly correlated especially in the realm of master-servant relationships, where whether the completion of tasks results successful or not determines the continuing or the breaking point of the interaction. Satisfaction emerges when orders are carried out efficiently and is quite often related to the variable of simplification of daily activities according to participants' experiences. The answers collected show a trend from respondents in matching feelings of

satisfaction when one or more tasks are performed entirely from the servant, preventing them from dealing with a lot of boring day-to-day operations.

"*I was in bed, ready to fall asleep after a long day. I remembered not having set the alarm clock for the next day, but I had no desire to switch on the light and wake up to pick the phone from the bedside table. I solved the problem by saying two simple words "Hey Siri" and telling the device at what time I wanted to be woken up the next day. With a simple voice command, I was able to activate the alarm in a very short time without bothering myself. After that I went back to sleep*".

<div align="right">24 years old female student in a master-servant relationship with Siri</div>

"*The smart object that I refer to is my smartphone. The most daily master-servant relationship that comes to mind is when in the morning, as I prepare to leave home, I start to scream a nice "Ok Google". Most of the time, I get a positive answer and I can ask the second question, the most important of the day: "How is the weather today?". I know it would be enough to look out the window but at least I can find out immediately if it's going to rain*".

<div align="right">24 years old female student in a master-servant relationship with Google Assistant</div>

Different smart objects have been included in episodes linked to the positive emotion of satisfaction: smartphones, tablets, smart TVs, virtual assistants and others. Indeed, findings suggest a positive correlation between satisfaction and the efficacy attribute as well as with simplification of annoying daily tasks, especially in master-servant contexts. A useful insight could result in the correlation of the two variables in emotions and thoughts dimensions.

Frustration and technology's obsolescence. When respondents report a feeling of frustration, most of the times it is consequent to the inability of the object to understand complexity in the dictated orders. A lot of participants wish for an update in communication skills performed by smart devices, with the resulting implication of a smoother conversation scheme. Furthermore, technologies' obsolescence is not only perceived during wording phases, but also refers to inaccuracies that emerge during interactions and that lead to feeling of frustration. Particularly in the master-servant context, such technologies' shortcomings could bear consequences for the continuing of the relationship.

"The device is a smartwatch/sport watch, the episode is related to a malfunction of the GPS sensor during the first workout. Once I configured the product, I decided to test it and verify if it actually met expectations in terms of performance. During my jog everything seemed to work perfectly and I was fully satisfied with the purchase but, once the session was over, accessing the dedicated app, I realized that the clock had traced the route very roughly (not correctly recording pace, speed and distance covered)".

21 years old male student in a master-servant relationship with a smartwatch

"As I was about to leave for a car trip, I was trying to proudly demonstrate to a friend sitting next to me the artificial intelligence capabilities of my smart object, which in particular would have to show us the directions needed to reach our destination simply by answering a voice command. Unfortunately, however, despite more than one attempt, the smart object did not understand the instructions given by me, forcing us to give them to him manually".

24 years old male employee in a master-servant relationship with a smartphone

In negative scenarios, respondents underline the need for an update of the current technologies' status. This powerful insight could be deployed from a managerial perspective to invest more in communication decoding studies for objects equipped with artificial intelligent. Both the perspectives here incorporated from the answers show the emergence of a second emotion right after frustration is perceived. The respondents mistrust the objects that fails to match expectations as a consequence of insufficient technology.

Surprise and willingness to discover more. When consumers are initially suspicious, the efficiency of the smart device can make a difference in the relationship. Mainly for what concerns master-servant models, efficiency is the most desired outcome from an interaction. A lot of respondents highlight their suspicious approach to the device at the beginning. When the smart object proves its competency and pleases the master with its services, the subject feels surprise and uncovers a willingness to discover more. In the sample analysed, a set of interactions during which the servant surprises the master with efficient exchanges results in a desire of the subject to experience more the technology at hand and to use a greater number of devices together.

"Recently I've been using more and more smart devices. For example, I often connect my phone to television via Bluetooth. This allows me to watch movies downloaded from the TV on my mobile phone whenever and wherever I want. All of this is incredible because it can be done easily and the benefits and advantages that you get from this feature fully meet all the expectations and needs of a consumer in everyday life. With this feature, you can also easily access from your TV YouTube channels and watch videos that otherwise you could only see on the small screen of a mobile phone or of a computer. Experience has made me realize that we are in the era of hyper-connected technological objects that, thanks to their links, make our lives easier and allow us to do things unthinkable only 10 years ago. This experience has made me think about what our houses will

be like in 10 years when everything we have in our homes will be hyper-connected and will prevent us from doing daily operations that can often be annoying. This little experience has been a source of reflection for me about the future".

<div align="right">24 years old male student in a master-servant relationship with a smart TV and a smartphone</div>

"It's a simple episode. When I'm driving my scooter I always listen to music at low volume. Obviously, being focused on the road, I cannot use the phone and for commands related to the choice of songs or for the selection of routes, so I use a lot Siri, the iPhone vocal assistant. To give instructions, I just use the buttons of the headphones without ever having to interact with the screen. Recently, while I was driving, I asked Siri to play a song of which I remembered only a few words of the lyrics and not the title. Against all odds, Siri responded quickly to the command without distracting me from driving. In fact, not only did it recognize the song by connecting to "Apple Music", but she also played it".

<div align="right">24 years old male employee in a master-servant relationship with Siri</div>

"In the paradigm of the relationship master-servant, I can cite various episodes that results in final positive interactions. Indeed, in the last months, I have purchased different types of smart objects, taken by the enthusiasm of trying a new thing and given my desire to keep up with new technologies".

<div align="right">24 years old male student in a master-servant relationship with different smart objects</div>

The enthusiasm that results in discover more of smart devices' realm originates from a series of successful interactions where the device demonstrates its attributes properly, namely efficacy and its interaction's abilities. Surprise is a pattern emotion that is common with innovation in technology. When smart devices amaze with their characteristics, in subjects is created the desire to experiment more and more. This is another powerful managerial insight for companies working on systems of interconnected products that can be sold in bundles.

Conclusion

According to a gap analysed through the literature review, an empirical analysis has been conducted. In particular, for what concerns the master-servant relationship, literature sometimes lacks in cross-device applicability, sometimes in excessive theoretical description and insufficient practical application. Moreover, the relevance of the narratives encountered, and the number of answers provided about the model have justified the choice of this subject for the empirical research.

The objects' side and subjects' side have been studied under the categorization of different dimensions: from the texts of the answers that comprise the object's realm displayed attributes and behaviours were extracted. The analysis then proceeded with the study of dimensions from the subject's side: correspondent behaviours assumed, effects, emotions and thoughts were taken into account. Firstly, the research examined the behaviours respondents adopt during relationships with smart objects. Then, a study of what are the effects of such relationships on the subject was proposed. For what concerns the subject's side of emotions and thoughts' dimensions, the study analysed whether the respondent expressed positive or negative comments to describe both. Initially, the polarity of emotions and thoughts in the different situations was considered, as well as the appearance of a little category of "neutrality" in the emotions dimension. Relevant patterns that could be identified in master-servant relationships were satisfaction (emotion dimension) and simplification of daily activities (thought dimension), frustration (emotion dimension) and technology's obsolescence (thought dimension) and finally surprise (emotion dimension) and willingness to discover more (thought dimension). These variants of the two dimensions were chosen on the basis of their recurring coupled pattern inside the texts.

Limitations. In the collection of data, respondents were given the definition of what master-servant relationships signify in the Internet of Things landscape. In a context where an open dialogue is permitted, participants in the qualitative analysis could report more insightful evidences, leading to a larger categorization of the nuances of other relationship's experiences.

Moreover, the research should be developed on a larger scale to capture substantial insights.

Managerial insights. Two important cues for the managerial perspective emerge from the relevant pattern of emotion-thought associations in master-servant relationship's interactions' descriptions.

In scenarios where frustration is connected to technology's obsolescence, respondents underlined the need for an update of the status of the current technologies. This powerful insight could be deployed from a managerial point of view to invest more in communication decoding studies for objects equipped with artificial intelligence. Both the perspectives here incorporated from the answers show the emergence of a second emotion that is perceived right after frustration. The respondents mistrust the objects that fails to match expectations as a consequence of a lack of technology. Trust is therefore an important driver of products' adoption.

In contexts where surprise and willingness to discover more get along, another idea arises. The enthusiasm that results in discovering more of the realm of smart devices originates from a series of successful interactions where the device demonstrates its attributes properly, namely efficacy and its interaction's abilities. Surprise is a pattern emotion that is common with innovation in technology. When smart devices amaze with their characteristics, in subjects comes the desire to experiment more and more. This is another powerful managerial insight for companies working on systems of interconnected products that can be sold in bundles: the more a device is efficient, the more the master is interested in discovering more of the IoT world, leading to an increase in purchase intentions.

Appendix

Here is represented the structure of the online survey administered to the population.

The online survey starts with a contextualization of the research:

"*I'm a marketing student at LUISS Guido Carli. Thank you for participating in the present questionnaire that will be used for my thesis project. You will be asked to carefully read a definition and answer some open questions. The questionnaire has a total duration of 10 minutes. The answers will be completely anonymous*".

The second step explain the purpose of the research:

"*The questionnaire focuses on Smart Devices and the relationships that are established between them and individuals. Below you can read a brief description of these devices. Smart Devices are electronic devices, generally connected to other devices or to the network, via various wireless protocols (e.g. Bluetooth, NFC, Wi-Fi, LiFi, 3G), which can function interactively and autonomously. Smart Devices are designed to respond to basic commands and to help individuals in the management of daily activities (e.g. work, training, health monitoring, home management)*".

After being informed about the objective of the research, respondents were introduced with the type of relationship analysed: MASTER-SERVANT.

"*Smart Devices and individuals can interact by establishing different types of relationships. One type of relationship is MASTER - SERVANT. You will be provided with the definition of this relationship. The definition will be shown to you only once, read it carefully and answer the following questions*.

The relation "Master-Servant" is a relation in which the individual plays the role of the master of the smart object, who is its servant. The individual (master) is an authoritarian owner, which gives orders to the smart object (servant) and expects it to fulfil its requests. The smart object is submissive and incapable of acting autonomously, it tries to obey orders in the better way, but it is not always capable of it. When he succeeds, they both feel positive emotions (e.g., happiness, satisfaction, pride...), thus creating a lasting subordinate relationship; when it fails, both feel negative emotions (e.g., the subject can feel anger, disappointment... and the smart object can feel a sense of frustration, sadness...) cracking or breaking, in this case, the relationship of trust previously established.

Participants than have been asked if they ever experience such a relationship. When the participants identified the master-servant relation as one they have previously experienced and in which they recognize themselves, they are presented with an open question asking them to describe their most recent interaction with a smart object displaying such a relationship. In order for the response to be valid, it needed to be at least 500 characters long. After the description of the interaction with the device, the respondent was presented with some questions

specifying the timing of the interactions (0-6 months), they emotions felt, the thoughts formulated during the interaction, the nature of the smart object and the amount of time respondent has possessed the device.

The final stage of the survey included a series of questions about the number and the type of smart objects the respondent possesses and a set of demographic queries concerning sex, age, occupation status and education level. At the end of the questionnaire participants were thanked for their time and their effort.

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Summary

Introduction

The aim of this study is to delve deeper into what relationships between consumers and smart objects mean. In particular, master-servant interactions among the actors of the IoT landscape will be studied. Before facing the core problem, it is of interest of the research to describe the main parties involved in such a scenario and the characteristics of the crucial aspects composing the relevant context. It will be explained what smart objects are and the reasons why it is important the keep track of their contact with human beings.

In the first chapter, the relevant context will be outlined. The Internet of Things environment as well as the formal definition of the actors involved will be provided. Growth and developmental potential will be explained and the major drivers of consumers' resistance to smart devices analysed.

The second chapter will delve more into the relationship between consumers and smart objects. Anthropomorphism as a possible answer will be proposed. The relational nature at the basis of consumers-objects interactions will be assessed, supported by Horowitz norms on interpersonal behaviour. The specific analysis on the master-servant model as an interaction style between consumers and smart object will be carried out at the end of the chapter.

Finally, the third chapter will explain the empirical research at the end of the study, structured to better understand master-servant relationship categorization. The methodology employed and results will be highlighted.

Chapter 1 – The general context

The first chapter will be used to explain the context where the actors of the research behave and what enables consumers' interactions with smart objects.

The characteristics of the Internet of Things and of smart devices will be uncovered, as well as the relevance of studying the topic.

The potential economic growth of the sector will be evaluated and the impact of the introduction of innovations will be discussed: not only for what concerns their hyper-connected togetherness but also for what regards the human intervention in such a technological community.

The drivers of consumers' resistance to smart objects will be considered, since some of the conceptualizations reported will be discovered in the empirical research carried out in the third chapter.

The topic above-mentioned will lead to a more in-depth analysis of smart objects-consumers relationships as well as of specific master-servant interactions that will be exposed in the second chapter.

1.1 IoT environment

Day after day, technology is increasingly changing the way in which people interact with objects, with other people and with the environment that surround them. Companies are following and enhancing this trend with innovations that would be unimaginable just a decade ago: home automation systems that switch on lights when the homeowner leaves work, internet-connected cars that are able to run autonomously, t-shirts with biometric sensors that deliver data about the person wearing them. The impact of these innovations makes it necessary to study the evolution of the Internet of Things (IoT), not only in terms of product development and diffusion, but particularly for what concerns people's shifting expectations about computer-mediated social relationships.

1.2 Formal definition of the Internet of Things and of smart objects

Definitions here applied puts a crucial stress on the core subject of the research: interactions between consumers and objects, that are no more a function of the person but rather a separate and autonomous member of the relation that contributes to the outcome of the consumer experience.

The IoT represents a complex and interactive environment with fundamental characteristics organized from Hoffman and Novak (2015) along four dimensions: network, components, interaction, and programmability. What are, in particular, the actors involved in Internet of Things' ecosystems? As Hoffman and Novak (2018) synthetize, it consists of the billions of devices that are able to communicate with consumers and other systems through the Internet. The definition, however, lacks to elaborate the explanation of which the devices involved are and of which nature they are composed. Moreover, in another work from 2018, the authors explain that "consumers' interactions with smart objects – those devices, services, and AI systems that have Internet connectivity and some level of intelligence – undoubtedly have a relational nature" (p. 2).

1.3 Growth and development potential

By 2025, the Internet of Things industry is expected to reach $3 trillion of value: this number could only briefly synthetize the revolution that is ready to invest consumers and businesses in the next few years, not only presenting new opportunities for manufacturers and companies but also changing completely the way in which today is considered and studied consumer experience. Indeed, the problem is socially construed, and it will interest an audience that will increasingly incorporate smart devices in their everyday life. On the other side, firms would take advantage from the analysis of this research problem to enhance their strategies and their product development processes. For this reason, the matter at hand will be studied through individual experiences' narrative and will be generalized to understand broadly how a specific kind of relationship between human and smart object can arise, develop, grow and decline.

1.4 Resistance to smart devices

After having defined consumer-object's relationships landscape, it must be taken into account the study of the key drivers of consumers' resistance to smart devices: indeed, "the success of any innovation in smart services depends on the value perceived by consumers in having it" (Mani and Chouk, 2017, p. 76). In this regard, two studies of Mani and Chouk will be consider, analysing the different tenets of consumers' resistance to IoT set of products. In broad terms, consumers may manifest resistance "either because it poses potential changes from a satisfactory status quo or because it conflicts with their belief structures" (Mani and Chouk, 2017, p. 78). In this sense, threats and barriers inherent in the smart objects' word emerge since the revolutionary strength of the IoT raises significant challenges and ethical issues. Innovation resistance could encompass three different forms, according to Mani and Chouk (2017): *passive*, if the consumer feels unwilling to adopt the innovation; *active*, if the consumer hesitates in an adoption decision because the innovation is seen to appear too risky; or *very active*, if the consumer decides to engage in actions or attacks against the acceptance of the innovation.

All of the above considerations will contribute to the understanding on a deeper level of relationships established between consumers and smart objects engaging in reciprocal exchanges that will take place in the second chapter.

Chapter 2 – Master-servant relationship

The second chapter contributes to the understanding of what encompasses consumer-object relationships.
The first theoretical assumption refers to a large strand in consumer's behaviours literature. Afterwards, insights from the branding literature are employed: if it is possible to human beings to feel "something" towards mere "things", it has been demonstrated that is also possible to create brand affection. Why the two previously described theories are possible? Literature suggests that consumers feel the natural tendency to anthropomorphized "things" to facilitate the approach to real non-human world and to build relationship with

them. The third section will go in depth in the relational nature of consumer-object interactions that emerges from the literature review carried out in the first part of the chapter. A note on the interpersonal motives that drive interpersonal behaviours will be given, with the theoretical support of norms provided by Horowitz (2006). At the end of the chapter, a gap in theory is individuated.

2.1 Consumer-object relationships

The present section contributes to the understanding of consumers-objects relationships. The first theoretical assumption is about the topic of people becoming attached to objects and brands. Why this happen? What are the main motives? What does this attachment lead to? Which are the emotions and thoughts involved? The ideas here analysed and employed in the research are mainly from Belk (1988) for what concerns people-objects relationships and from Fournier (1998) for people-brand affection.

The thesis Belk followed is that "*we regard our possessions as parts of ourselves*": in this sense, Belk has formulated the idea of "extended self", according to which it "is seen not to be limited to external objects and personal possessions, such as our body, clothes and money, but involves also people, places, and group possessions which contribute to the building of our self" (William, 1980, p. 291). Generally, the incorporation of the above-mentioned "items" into the self requires different processes, such as contamination and habituation: "while in the former both good and bad aspects of objects are able to attach to us through physical contact or proximity; the latter is related to the maintenance of multiple levels of the self, through the habituation of viewing our family, city, and nation to be a part of who we are" (Belk, 1988, p. 140). Another important way through which people learn to regard an external thing as a part of the self is the appropriation or the control of an object for own personal purpose. This kind of mastery of the device increase the perception of the reflection of a person's identity in it. McClelland in 1951 suggested that "external objects contribute to the building of our self when we are able to exercise power or control over them, just as we might control an arm or a leg" (Belk, 1988, p. 140). Generally, "the greater the control we exercise, the more closely the object should become allied" (Belk, 1988, p. 140).

In 1998, Susan Fournier proposed that "brand could be considered as active relationship partners, and not merely passive objects of marketing transactions" (p. 344), studying the human tendency of anthropomorphizing inanimate objects. Moreover, she proposed different core conditions, which need to be satisfied in order to qualify relationships in the interpersonal domain. The most crucial one is connected to relationships involving reciprocal exchange between active and interdependent relationship partners. Indeed, "for a relationship to truly exist, interdependence between partners must be evident: that is, the partners must collectively affect, define, and redefine the relationship" (Fournier, 1998, p. 344). As proposed by Fournier and reported by Hoffman and Novak (2018), "this anthropomorphism helps consumers see brands as making active contributions to the brand-consumer relationship. […] Consumers' interactions with brands have meaning that extend beyond purchase and immediate consumption, and are embedded in a broader, socio-material network of interactions" (Hoffman and Novak, 2018, p. 2).

2.2 Anthropomorphism

As seen in the previous section, human tendency of anthropomorphizing inanimate objects plays a big part in product adoption and in retention processes.

In the regard of objects consideration, two main lines of thinking has been highlighted to describe human-object interaction. On one side there is the concept of anthropomorphization, namely the attachment of human appearance to non-human subjects, transforming them as person with life, feeling and thought (Shi, 2017). The most approved theories in this sense are HCI (*human-computer interaction*), HRI (*human-robot interaction*) and CASA (*computers are social actors*). On the other side, theories based on object-oriented ontology support the idea of two ontologically equivalent parts in the interaction (human and non-human). Objects-oriented ontology has been developed from Hoffman and Novak (2017) in their assemblage theory, that this thesis will investigate further in a subsequent section.

2.3 Consumer-smart object interactions have a relational nature

The first theoretical contribution to be applied here to delve into the relational nature of consumers-smart objects interrelations is the description of interactions between consumers and smart assemblages developed by Hoffman and Novak in 2015. In IoT contexts, assemblage refers to objects/devices working together with human and, thanks to their interactions, emerges the ability to do things that none of these components could perform on their own (Hoffman and Novak, 2015). By applying the distinctions between property (a defining characteristic of a component, answering the question "what it is"), capacity (the activated/exercised properties in the assemblage, "what it can do"), and tendency ("what an assemblage can become") made by De Landa (2006), Hoffman and Novak (2015) emphasize that the IoT assemblages are constantly changing and that through on-going relation of the parties, new capabilities can emerge.

Consumers-object assemblages (Hoffman and Novak, 2017) could be considered as an outcome from four types of interactions' models. They are the following:

1. *consumer-centric part-part interactions* between consumers and objects;
2. *consumer-centric part-whole interactions* between consumers and assemblages.
3. *nonconsumer-centric part-part interactions* between objects and other parts such objects or consumers;
4. *nonconsumer-centric part-whole interactions* between objects and assemblages.

Since the interest of the research is on human relationships with smart objects that are able to impact the networks they are a part of, the thesis will focus on the second and on the fourth type of interactions where consumers or objects interact in part-whole relationship within consumer-object assemblages. In this context they both could express a) agentic roles as when they enable or constrain the consumer-object assemblages, and b) communal roles as when the consumer-object assemblage enables or constrains the consumer/the object (Hoffman and Novak, 2018). At this point, four consumer/object experience's categories result from part-whole interactions:

- self-extension experiences where the agentic transfer of the consumer's/object's capacities into the assemblage leads to the capacity of the part to enable the whole;
- self-expansion as a communal interaction where features that characterized consumer-objects assemblage's identity are absorbed into the consumer's/object's sense of self;
- self-restriction as consumer's agentic expressive role in part-whole interaction, that leads the consumer/the object to constrain the assemblage;
- self-reduction experiences that involve the consumer's communal expressive role in part-whole interaction, where the assemblage has developed the ability to constrain the consumer/the object.

What are the types of consumer-object relationship styles that result from such experiences? Four categories are detected as follows and they permit to formally connect relation models to consumer experience frameworks (Hoffman and Novak, 2018):

A. *master-servant relationships – complementary relationships*. This interactions' category results as one of the most stable and it is likely to continue: the actors involved are prone to resolve conflicts and to reinforce the relationship;

B. *master-servant relationships – non-correspondent relationships*. While it is true that opposite values on agency lead to the master-servant style, it is also true that opposite values in the communion index represent less stability in the relationship as well as diminishing possibilities of continuing the interaction;

C. *partner relationships*. The similar values on agency means that partner styles are less unfluctuating than complementary master-servant styles. In this model, it is likely that the consumer will experience frictions with other actors and that, for this reason, he or she will express tendencies to shift toward a more complementary style, increasingly separating agentic roles;

D. *unstable relationships*. Unstable styles express similar values on agency (non-reciprocity) and opposite values on communion (non-correspondence). The actors behave in ways that are opposite to what it is expected to be raised on both dimensions.

Another interesting research on relationships between smart objects and consumers is the one conducted by Belk et al. in 2019. The study focuses on relationships that users build with voice-controlled smart devices through continued use. The empirical analysis highlights three groups of segments for what concern the type of relation built. Summarizing, "the informants described the relationship with their VCSA in three different ways. One group described it as a sort of servant–master relationship, with the VCSA being the servant (VCSA as a servant). Another group explained it the other way around (VCSA as a master), while a third group described the relationship as one between partners (VCSA as a partner)" (Belk, 2019, p. 701). Authors classified sample's answers in a threefold structure that organizes the results within the realm of interactions.

Indeed, for each of the relationship encountered Belk studied the nature of it, the feelings and emotions that unfold during it and the consequences of it.

2.4 Norms by Horowitz

Instead, Horowitz et al. (2006) examine the organization of motivational constructs and study interpersonal motives to clarify the meaning of behaviours: the most relevant part for the proceeding paragraphs of the present research is the definition they provide for the categorization of interpersonal motives. On one side they put a communal motive, theorized as "a motive for connection with one or more others; it is a motive to participate in a larger union with other people" (Horowitz, 2006, p. 69). On the other, the agentic motive "emphasises the self as a distinct unit; it focuses on the person's own individual influence, control, or mastery over the self, other people, and the environment" (Horowitz, 2006, p. 69). These two conceptualizations will help to better define master-servant relationships.

2.5 Master-servant characteristics

Following the theoretical approach of the preceding parts, the interest of the present research is about the subject as master and object as servant model. The focus arouses as a consequence of the number of theories that sustains control as a crucial way through which people learn to regard an external thing as a part of the self. This kind of mastery of the device increase the perception of the reflection of a person's identity in it. McClelland in 1951 suggested that "external objects contribute to the building of our self when we are able to exercise power or control over them, just as we might control an arm or a leg" (Belk, 1988, p. 140). Generally, "the greater the control we exercise, the more closely the object should become allied" (Belk, 1988, p. 140). Important insights on this relationship's model will be derived by the above-mentioned study on VCSA conducted by Belk. Indeed, Belk et al. point out that assuming the position of the pole that exercises control requires a certain degree of mastery: "the device will only do as it is told if it is told properly. (…) Furthermore, this master position probably requires a certain personality or set of expectations. Someone who feels a lack of control in his or her interpersonal experiences might seek the role of master with VCSA assemblages" (Belk, 2019, p. 704).

2.6 Research question and empirical research

The research question can now be formulated since the problem has been described in its crucial aspects. The rest of the thesis will be dedicated to the study of one key relationship between consumers and smart objects. The choice of such a relationship was dictated both by the numerous theoretical cues collected during the literature review and by the relevance of the results emerged from the empirical research that follows. The quantity of answers to a survey formulated to investigate in-real-world interactions between people and smart devices reveals a clear trend for subject as master and servant as object models.

Furthermore, a theoretical gap in the following interaction style is detected: Hoffman and Novak (2017) as well as Belk (2019) and many others attempted to give a conceptualization of the problem. The explanations sometimes lack in cross-device applicability, sometimes in excessive theoretical description and insufficient practical application.

Chapter 3 – The empirical research

The central topic of the analysis consists in the description of the master-servant relationship, from the object's as well as from the subject's point of view.

3.1 Method employed

The methodology here applied to gather consumers' insights on their relationships with smart objects is a qualitative methodology, since the data in the study are obtained through open-ended and conversational communication. The technique deployed in the study is the critical incident technique (CIT). In a marketing perspective, the technique is adapted here to identify the emotions, thoughts, effects and roles from the subject's side and attributes and roles played from an object's side. The categories highlighted are based on specific events' incidents and are extendable for managerial application.

3.2 Coding process

RELATIONSHIP STYLE	NUMBER OF ANSWERS
User-service provider	10
Master-servant	49
Partnership	8
None of the above	10
Total	77

Table 1 – Answers per relationship

In order to identify the characteristics of the respondents in the sample it has been performed an analysis of segments contained in master-servant relationship model. In particular, gender, age and education level will be considered. This has been done with the aim to investigate how the population of the sample is characterized. Respondents identifying their relationship with smart objects with the master-servant model, presents the following characteristics. For what concerns the gender, 22 responses belonging to women and 15 responses belonging to men were collected. 12 people do not specify the data. Regarding the age, 26 responses belong to respondents with less or 25 years old, 2 response belong to people that have between 26 and 30 years, 9 people have more than 31 years. 12 people do not specify the data. Education levels detected are high school diploma (9), bachelor's degree (13) and master's degree (15). 12 people do not specify the data.

In the present section analyses of data will be carried out, according to six relevant dimensions for the purpose of the study. As mentioned above, object's side and subject's side will be taken into consideration. Based on each dimension, the text of the responses will be coded in order to emphasize different aspects of the specific dimension. First, on the object's side we are going to analyse the attributes of the smart object, investigating whether the respondent highlighted the interaction abilities of the smart object, its efficacy, or a humanization process. Secondly, the research proceeds with the study of the subject's side dimensions behaviours, effects suffered, emotions and thoughts. First, we will examine the behaviours displayed in the interaction with smart objects, investigating whether they resemble literature theorization. Then, the effects suffered during or right after the interactions will be categorized into physical and psychological improvement and physical and psychological worsening. For what concerns the subject's emotions and thoughts, the investigation research whether the respondent expressed positive or negative comments. In the first place, a general analysis on the two poles will be performed. Afterwards the relevant association trends will be examined. In particular, satisfaction and simplification of daily activities association, as well as frustration and technology's obsolescence and surprise and willingness to discover more will be explained further.

Object side: attributes and behaviours assumed. The dimensions emerging primarily from the texts of the answers that comprise the object's realm in the master-servant model were attributes and behaviours assumed. Each one will be deepened in the following.

Attributes

Attributes	Interactions abilities
	Efficacy
	Humanization

Table 2 – Object's attributes

For what concerns smart object's attributes' dimension, in the answers of the respondents three main patterns emerged: interaction abilities (with negative and positive shades), efficacy, with negative and positive poles as well, and humanization, a trend strongly highlighted from the literature analysed previously too.

Expectations were that the interaction abilities positively affect the relationship experience. Indeed, what emerged was that when the user fails to communicate properly with the object, the relationship's experience was described with negative words. Disparaging comments on interaction abilities were found in those cases where the smart objects did not understand slightly complex orders.

Regarding humanization processes, it appears evident that the most felt experiences arise when the object is strongly anthropomorphized by the respondent. This finding is in line with previous theory.

Master-servant. In master-servant relationships, the object is submissive, and it is not capable of work autonomously. It displays no agency. The user expects it to fulfil the requests given and the object tries its best

to succeed. From the answers emerged a strong tendency of humanize the servant as well as crucial consequences when the servant fails its mission. As seen before, when the object understands orders and shows its "intelligence", the authoritarian possessor feels satisfaction and pride. On the other hand, when its interactions abilities lack, the master exposes anger and disappointment, leading this to a negative evaluation of the experience.

Answers show an enthusiasm in possessing such a relationship with the object: it derives from the ability of perfectly understanding task and to perform them successfully in front of an amazed audience. The servant is loyal, and it permits its master to feel happy and proud of the relationship's experience.

On the other side, negative experiences that derive from communication inefficiencies shows a humanization process in giving disparaging comments to the servant. For what concerns humanization processes, it is clear that respondents consider devices such as Siri as having human resemblances, defining it "her" in Italian, talking with it like with a real person and mostly expecting from it answers pertaining to a human being. Participants highlight the problem of the little capacity of smart assistants to understand complex sentences and queries. It is evident that this bring about a whole negative experience and the interaction is no more the one from a master dictating orders to a servant, but it recalled king and jester relationships where the former makes fun of the latter: however, the negative interpretation of the experience highlights far more the consideration of the object as with "humanlike properties, characteristics, or mental states to real or imagined nonhuman agents and objects" (Epley, Waytz, Cacioppo, 2007, p. 865).

The attributes recognized are in line with previous literature' findings.

Behaviours

Behaviours	Serve
	Poke in
	Work diligently
	Take care

Table 3 – Object's behaviours

The behaviours that devices perform, as seen by consumers, that are identified in the sample represent a specular image of what the literature definition of the smart objects explains, with some insights that are worthy to be analysed. What emerge are five pattern that range from "serve" to "take care" affectively. Now the different relationship's interacting modes will be reviewed in respect of these smart object's behaviours.

Master-servant. Master-servant interactions provide a number of insights about object's behaviours, ranging from positive to negative attitudes. This two-fold nature is found in the theory as well, where, as described in the survey, the individual plays the role of the master of the smart object, who is its servant. The individual (master) is an authoritarian owner, which gives orders to the smart object (servant) and expects it to fulfil its requests. The smart object is submissive and incapable of acting autonomously, it tries to obey orders in the better way, but it is not always capable of it. When he succeeds, they both feel positive emotions (e.g.,

happiness, satisfaction, pride, etc.), thus creating a lasting subordinate relationship; when it fails, both feel negative emotions (e.g., the subject can feel anger, disappointment... and the smart object can feel a sense of frustration, sadness, etc.) cracking or breaking, in this case, the relationship of trust previously established.

As a servant, the device tries its best to succeed in completing tasks. When it pleases the master, it has been seen as a serving parent, who affectively takes care of its owner.

On the other side, when the servant is incapable of understanding master's queries or to perform them properly, it is considered like serving the owner with a sort of limited capacity of understanding.

In worst scenario, even if the object in this relationship style does not have agency, some respondents describe the device as poking in their daily life, because it activates itself absorbing words, that were not directed to it, as orders. Clearly this is a failure caused by insufficient interaction abilities in the system that leads to disappointment and frustration.

With more neutral shades, numerous narratives describe the object-servant as interpreting the role of an employee who diligently and respectfully accomplishes the task its boss assigned it. In most of the cases, the employee is not depicted with positive compliments or negative insults, it is considered as doing its duty.

What emerges in this part of the study, that is of particular relevance, is the behaviour pattern of poking in in consumers' daily activities as never detected in previous studies: since servants are seen as entities without any degree of agency, a nosey attitude could result as misleading. In this sense, the present research uses this label to identify such cases where objects, as a consequence of a technological insufficiency, perceived words and orders as aimed at them, while those are only bits and pieces of human conversations.

Subject side: behaviours, effects, emotions and thoughts. The analysis proceeds with the study of subject's side dimensions: behaviours, effects, emotions and thoughts will be taken into account. First, the research will examine the behaviours respondents seems to enact during relationships with smart objects. Then, a study of what are the effects of such relationships on the subject will be proposed. For what concerns the subject's side of emotions and thoughts' dimensions, the analysis will state whether the respondent expressed positive or negative comments to describe both. At the beginning, the polarity of emotions and thoughts in the different relationship will be considered. Afterwards, only the most relevant will be identified.

Behaviours

Behaviours	Dictate
	Manage
	Bully

Table 4 – Subject's behaviours

In the text of the answers, a reflection of the theory for what concerns the roles that respondents play in reacting to objects' interaction it appears evident. Behaviours consumers enact are almost specular to images derived from objects' behaviours.

Master-servant. In master-servant relationships' answers, the uncovered trend shows that subjects are strongly persuaded of their role of master in respect to the smart object. They are conscious of their authoritarian as well as superior condition, they behave as masters and possessors and feel entirely entitled to dictate orders to the servant. The subject feels joy for the competency of the servant when it successfully completes tasks, but he/she is also ready to break the relationship in the case in which it fails to please the master. As masters, they impose agency upon objects dictating orders.

For what concerns a more neutral and detached mode of behaviour interpreted by consumers, a relevant pattern is unfold when people act as bosses, managing all the activities the object should perform in a detached manner, with professionalism. This categorization is a mirror for employee-object roles.

For what concerns a role that to date has not be detected by the preceding literature review, insights on attitudes of bullying emerge. Respondents fiercely report their experiences of disparaging comments, insults and jokes of the smart device because of its technology insufficiencies. Bullies are conscious of victims' limitations and draw pleasure in prevaricating psychologically the objects.

Effects

Effects suffered from subject	Physical improvement	Simplification of daily activities
		Creation of a routine
		Freedom of movement
	Psychological improvement	Less stress
		Security
	Physical worsening	Overwork
	Psychological worsening	Disregard

Table 5 – Effects on subject

Another pattern that can be observed through subjects' descriptions of interactions' experiences is the effects suffered by the participants during or as a consequence of the relationship with the smart object. It emerges that the effects suffered could be categorized into four dimensions: physical and psychological improvement as well as physical and psychological worsening, depending from the smart object. It must be underlined that, in the coding of the answers, an influence of interaction abilities on the effects suffered by the subject has been detected.

Master-servant. Master-servant answers are the collection of the most insightful effects suffered by the subject during and after the relationship's experience.

For what concerns the physical improvement category, in a number of cases the servant put a lot of effort in completing the task and delivering simplification of daily activities and to a freedom of movement.

A series of positive interactions that leads to simplification of daily activities and to a freedom of movement leads as well to the creation of a routine pattern as highlighted in a number of different texts.

It is also possible that the servant, performing repeatedly and correctly master's orders, contributes to a psychological improvement experienced by the subject. This leads to the perception of a sense of increased security and less stress suffered by the master.

Master-servant coded answers provide information on the negative effects suffered by the user consequently to or during the interaction. Physical overwork is experienced when the object not only does not understand orders, but it also force the subject to do them her- or himself, conducting the relationship to the breaking point.

Psychologically, the subject experiences feelings of disregard when the smart object does not listen to orders and not understand what the master is trying to ask. The frustration that derives from disregard could lead to a cracking of the interactions.

While psychological improvements and physical and psychological worsening are acknowledged by the literature, a contribution that the research has made is the unfolding of three physical enhancements caused by smart objects. Simplification of daily activities is an effect further analysed in the following sections.

Emotions and thoughts

The most relevant insights could be guessed through the coding of texts in the light of emotions and thoughts felt by the respondents. They are often expressed verbally, while sometimes they could be argued from the context.

The investigation proceeds towards negative and positive poles. Firstly, positive and negative emotions and thoughts will be analysed in their emergence during the relationship's experience. Afterwards, the most relevant ones for each dimension will be studied more in depth.

Master-servant. Master-servant relationship's subjects often show a mixed pattern, expressing both positive and negative emotions whether the completion of orders dictated is successful or not. Thus, master-servant's respondents tend to experience conflicting emotions during their interactions with smart devices. However, in general, the positive feelings were the predominant percentage.

In the table below, the most common emotions expressed by participants are summarized. On the positive side, happiness, pride, satisfaction, surprise, trust and comfort were reported. The negative emotions encompass frustration, bother, physical labour, mistrust, disappointment and finally anger. Another noteworthy point is that in the population, little emerging of neutral emotion is verified.

Emotions	Positive	Happiness
		Pride
		Satisfaction
		Surprise
		Trust
		Comfort
	Neutral	Neutrality
	Negative	Frustration
		Bother
		Physical labour
		Mistrust
		Disappointment
		Anger

Table 6 – Subject's emotions

Subject's thoughts during the relationship's experiences are examined in terms of positive or negative valence as well.

Master-servant. As in emotions' analysis, the master/servant group was characterised by a distinct split between positive and negative thoughts; indeed, respondents have expressed a large percentage of positive opinions, well balanced with technology's intrusiveness and dependency mechanism's ideas. Another noteworthy point is that in the population, each respondent expresses a determined emotion, as to say no substantial narratives of neutral thoughts were found.

In the table below the most common thoughts mentioned by respondents are showed. Among the positive ones, opinions on satisfactory results, simplification of daily activities, gamification of daily activities, technology's enthusiasm and willingness to discover more could be encountered. The negative thoughts concerned technology's intrusiveness, technology as being obsolete and dependency.

Thoughts	Positive	Satisfactory results
		Simplification of daily activities
		Gamification of daily activities
		Technology's enthusiasm
		Willingness to discover more
	Negative	Technology's intrusiveness
		Technology is obsolete
		Dependency

Table 7 – Subject's thoughts

According to the empirical research's purpose, in the following paragraph a qualitative analysis on relevant emotions and thoughts for master-servant relationships will be performed. In particular, the investigation will go more in depth in some aspects that emerged both from the literature review and from a numerous set of answers coded.

Relevant patterns' associations that could be identified in master-servant relationships are satisfaction (emotion dimension) and simplification of daily activities (thought dimension), frustration (emotion dimension) and technology's obsolescence (thought dimension) and finally surprise (emotion dimension) and willingness to discover more (thought dimension). These variants of the two dimensions were chosen on the basis of their coupled recurring pattern inside the texts.

These associations are particularly crucial for the investigation because they represented a substantial contribution of the research in the landscape of master-servant relationship's studies.

Satisfaction and simplification of daily activities. As previously stated when reflecting about object's attributes, the two main dimension of interactions' abilities and efficacy were strictly correlated especially in the realm of master-servant relationships, where whether the completion of tasks results successful or not determines the continuing or the breaking point of the interaction. Satisfaction emerges when orders are carried

out efficiently and is quite often related to the variable of simplification of daily activities according to participants' experiences. The answers collected show a trend from respondents in matching feelings of satisfaction when one or more tasks are performed entirely from the servant, preventing them from dealing with a lot of boring day-to-day operations.

Different smart objects have been included in episodes linked to the positive emotion of satisfaction: smartphones, tablets, smart TVs, virtual assistants and others. Indeed, findings suggest a positive correlation between satisfaction and the efficacy attribute as well as with simplification of annoying daily tasks, especially in master-servant contexts. A useful insight could result in the correlation of the two variables in emotions and thoughts dimensions.

Frustration and technology's obsolescence. When respondents report a feeling of frustration, most of the times it is consequent to the inability of the object to understand complexity in the dictated orders. A lot of participants wish for an update in communication skills performed by smart devices, with the resulting implication of a smoother conversation scheme. Furthermore, technologies' obsolescence is not only perceived during wording phases, but is also refers to inaccuracies that emerge during interactions and that lead to feeling of frustration. Particularly in the master-servant context, such technologies' shortcomings could bear consequences for the continuing of the relationship.

In negative scenarios, respondents underline the need for an update of the current technologies' status. This powerful insight could be deployed from a managerial perspective to invest more in communication decoding studies for objects equipped with artificial intelligent. Both the perspectives here incorporated from the answers show the emergence of a second emotion right after frustration is perceived. The respondents mistrust the objects that fails to match expectations as a consequence of insufficient technology.

Surprise and willingness to discover more. When consumers are initially suspicious, the efficiency of the smart device can make a difference in the relationship. Mainly for what concerns master-servant models, efficiency is the most desired outcome from an interaction. A lot of respondents highlight their suspicious approach to the device at the beginning. When the smart object proves its competency and please the master with its services, the subject feels surprise and uncovers a willingness to discover more. In the sample analysed, a set of interactions during which the servant surprises the master with efficient exchanges results in a desire of the subject to experience more the technology at hand and to use a greater number of devices together.

The enthusiasm that results in discover more of smart devices' realm originates from a series of successful interactions where the device demonstrates its attributes properly, namely efficacy and its interaction's abilities. Surprise is a pattern emotion that is common with innovation in technology. When smart devices amaze with their characteristics, in subjects is created the desire to experiment more and more. This is another powerful managerial insight for companies working on systems of interconnected products that can be sold in bundles.

Conclusion

According to a gap analysed through the literature review, an empirical analysis has been conducted. In particular, for what concerns the master-servant relationship, theorization sometimes lack in cross-device applicability, sometimes in excessive theoretical description and insufficient practical application. Moreover, the relevance of the narratives encountered, and the number of answers provided about the model have justified the choice of this subject for the empirical research.

The objects' side and subjects' side have been studied under the categorization of different dimensions: from the texts of the answers that comprise the object's realm displayed attributes and behaviours were extracted. The analysis then proceeded with the study of dimensions from the subject's side: correspondent behaviours assumed, effects, emotions and thoughts were taken into account. Firstly, the research examined the roles respondents adopt during relationships with smart objects. Then, a study of what are the effects of such relationships on the subject was proposed. For what concerns the subject's side of emotions and thoughts' dimensions, the study analysed whether the respondent expressed positive or negative comments to describe both. Initially, the polarity of emotions and thoughts in the different situations was considered. Relevant patterns that could be identified in master-servant relationships were satisfaction (emotion dimension) and simplification of daily activities (thought dimension), frustration (emotion dimension) and technology's obsolescence (thought dimension) and finally surprise (emotion dimension) and willingness to discover more (thought dimension). These variants of the two dimensions were chosen on the basis of their recurring coupled pattern inside the texts.

Limitations. In the collection of data, respondents were given the definition of what master-servant relationships signify in the Internet of Things landscape. In a context where an open dialogue is permitted, participants in the qualitative analysis could report more insightful evidences, leading to a larger categorization of the nuances of other relationship experiences.

Moreover, the research should be developed on a larger scale to capture substantial insights.

Managerial insights. Two important cues for the managerial perspective emerge from the relevant pattern of emotion-thought associations in master-servant relationship's interactions' descriptions.

In scenarios where frustration is connected to technology's obsolescence, respondents underlined the need for an update of the status of current technologies. This powerful insight could be deployed from a managerial point of view to invest more in communication decoding studies for objects equipped with artificial intelligence. Both the perspectives here incorporated from the answers show the emergence of a second emotion that is perceived right after frustration. The respondents mistrust the objects that fails to match expectations as a consequence of a lack of technology. Trust is therefore an important driver of products' adoption.

In contexts where surprise and willingness to discover more get along, another idea arises. The enthusiasm that results in discovering more of the realm of smart devices originates from a series of successful interactions where the device demonstrates its attributes properly, namely efficacy and its interaction's abilities. Surprise

is a pattern emotion that is common with innovation in technology. When smart devices amaze with their characteristics, in subjects comes the desire to experiment more and more. This is another powerful managerial insight for companies working on systems of interconnected products that can be sold in bundles: the more a device is efficient, the more the master is interested in discovering more of the IoT world, leading to an increase in purchase intentions.

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