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NÃO-OBJETOS: A PERCEÇÃO DE USO DE OBJETOS INTELIGENTES. O CASO DO *SMARTPHONE*

RESUMO:
Este artigo faz parte de uma investigação com vista à obtenção do grau de Doutor em Design, na área do Design de Produto.

A definição de *não-objetos* através do estudo da perceção de uso é o objetivo do nosso trabalho. O foco nos objetos inteligentes, nomeadamente no smartphone, vem da crescente universalidade destes objetos na vida quotidiana, que está a originar novos comportamentos pessoais, sociais e de trabalho. Pretendemos averiguar, entre outros pontos: como os utilizadores percecionam os objetos inteligentes, especificamente, o smarpthone; se a prática do design apreende as características ambíguas deste tipo de objetos; perceber quais os objetos inteligentes com mais aceitação na vida quotidiana; ter uma ideia mais clara sobre o tipo de uso de smartphones: funcionalidades, uso para trabalho ou pessoal; entender da importância de o smartphone ser um objeto pessoal; e se os utilizadores têm a noção da sua dependência e de como este provoca distanciamento e distração face a outras atividades, pelo seu uso compulsivo.

Revemos aqui a metodologia empregue no trabalho de pesquisa, e que usa a revisão literária de conceitos-chave e de autores relevantes, e um questionário, com o objetivo de perceber se os objetos inteligentes, em particular os smartphones, podem ser definidos como *não-objetos*.

PALAVRAS-CHAVE:
Objeto inteligente; não-objeto; *smartphone*; usabilidade; perceção.

NON-OBJECTS: THE PERCEPTION OF USE OF INTELLIGENT OBJECTS. THE CASE OF THE SMARTPHONE

ABSTRACT:
This article is part of a research conducted with the aim of obtaining the degree of Doctorate in Design, in the Product Design area.

The definition of non-objects through the study of perception of use is the aim of our work. The focus on intelligent objects, namely the smartphone, comes from the growing pervasiveness of these objects in daily life, which is leading to new personal, social and working behaviours. We intend to investigate amongst other issues: how users perceive smart objects, in particular smartphones; if design as a practice embraces the ambiguous traits of these devices; understand which smart objects have more acceptance in daily life; to have a clearer notion regarding the use of smartphones: functionalities, personal or work related use; understand how important it is for the smartphone to be personal; and if users are aware of being dependent of these devices and how it provokes distancing and distraction in relation to other activities through its compulsive use.

Here we review the methodology used in the research process, which includes a literary revision of key concepts and relevant authors, and a questionnaire, with the aim of understanding whether smart objects, smartphones in particular, can be defined as non-objects.

KEYWORDS:
Smart object; non-object; smartphone; usability; perception.

INTRODUCTION

This research arises from a continuous interest, both as designers and users, in the way we interact with smart objects, how we perceive them and how and if we perceive the use we make of them.

The starting point of our investigation comes from Marc Augé's theory of non-places – '*Non-places: An Introduction to Supermodernity'* (Augé, 2006 [1995]) –, in which the author characterizes functional large scale urban public spaces (airports, bus and train stations, shopping centres, etc.) with identical traits such as similar architectural features, materials and even signage, as non-places, stating that the users of such places don't recognize them as places of memory, of identity. Augé stated that we had to relearn how to think about spaces, "for we live in a world that we have not yet learned to look at". (Augé, 2006 [1995], p. 29)

IDENTIFICATION OF THE PROBLEM

In our study, focused on intelligent objects, namely the smartphone, we intend to relearn to think about objects. Can this concept of non-places be transported into the world of product design? We wondered if, in a mass-produced world, we could also identify and name a category of objects as *non-objects*? The ubiquity of smart objects in our lives, the perception users have of them and how design addresses the rapid turnover of such products. In our case study of the smartphone: can we name it *non-object*?

In our investigation, the parallelism with Augé's essay is in the sense of analysing how the author describes non-places as places of passage, of transitory use, but instead of spaces our focus is on the over-stimulation of innumerable similar and repeated objects resulting from super-production cycles.

As Penny Sparke states in her book, '*An Introduction to Design & Culture in the Twentieth Century'* (Sparke, 1986), cultural values are reflected in mass consumption. When a new trend appears and is accepted by the masses, a whole cycle starts: demand, use, disposal. The new products to cater to the new trend will be copied and developed and redesigned and restyled, over and again, until, or if, the trend passes. The need to revert production cycles, to transition towards a circular economy, the return to nobler materials, eco-friendly ones, is very real and present.

The following infographics (Image 1), presented by Phillips (Phillips, 2014) in their leaflet '*Rethinking the future: Our transition towards a circular economy'*, presents this transition very clearly.

We also base the need of our investigation on the book by Uta Brandes, '*Design by Use'* (Brandes, 2009), where the author remarks on the need for an extended understanding of design, the broadening of the discipline to embrace "theoretical studies and empirical research, and organizational and communicative competencies as implicitly as it includes the generation of design products." (Brandes, 2009, p.9)

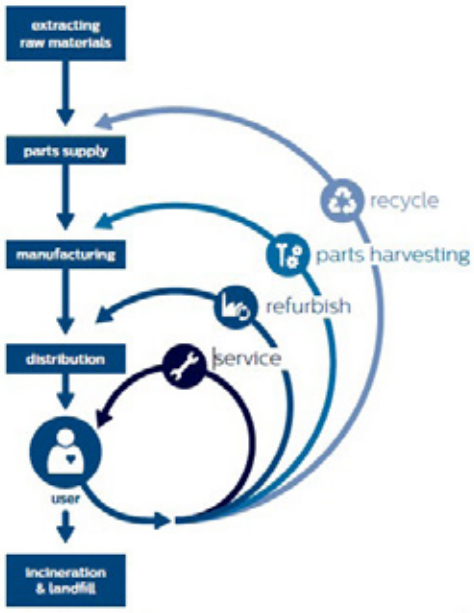

Image 1 · Towards a Circular Economy, Phillips, 2014

METHODOLOGIES

This in an investigation for design. As a reference for our methodology, we based ours on the example of Uta Brandes in '*Design by Use'*, as the authors of this book were also aiming to coin a term: *Non-Intentional Design (NID*).

We identified the areas of knowledge in Design that are related with our topic, and which would help us understand and substantiate our theme. We also developed and carried out a questionnaire, to gather feedback data from users of intelligent objects, specifically users of smartphones.

Our research started by reviewing and researching literature, films and tv series versing the themes we considered essential to create a base of understanding and knowledge on the path towards the definition of *non-objects*: non-place (the basis of our forming idea); product design (field of study); objects: analogic, intelligent (or smart), including concepts such as the Internet of Things, and Katz & Lukic's '*Nonobjects*' (Katz & Lukic, 2011); perception, including phenomenology of perception, interaction design, usability, haptic perception, screen design; the telephone and its development and history up until our object of study, the smartphone.

Our selection of the smartphone as object of study derives from the fact that, worldwide, this is the most ubiquitous of smart objects, as can be seen on the chart below, from the Global Web Index (GWI) database (Image 2).

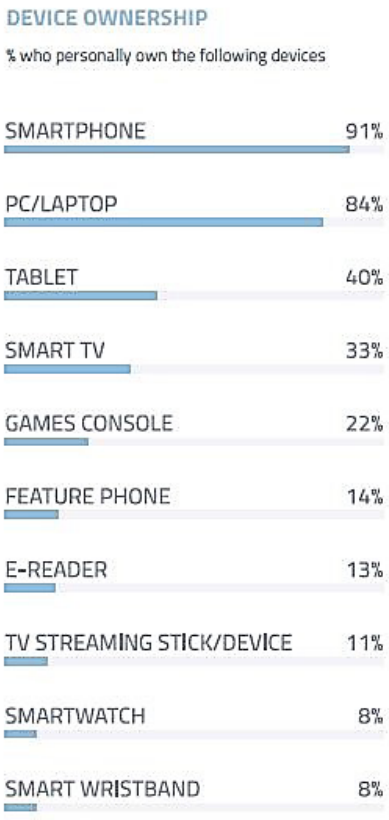

Image 2 · Device Ownership. *Graphic from the GWI Device Flagship Report Q1 2017, www.globalwebindex.net*

DEVELOPMENT

We now present the main points we arrived at through our literary review on the previously named subjects and concepts.

PRODUCT DESIGN, OBJECTS

"For many centuries, or millennia, man has been making prostheses of the limbs, such as knives, spades, bows and arrows, shelter and clothing, [...]; he therefore cuts more easily, digs, sews, changes places more rapidly and kills from afar." (Morgantini, 1984, p. 21). In this statement, made by Maurizio Morgantini in his essay *Man confronted by the third technological generation,* the author writes about analogic objects, which help us carry out actions which would otherwise be difficult or impossible to carry out with our bare hands. The author further develops the theme, explaining second-generation objects, those with electronic power embedded in them, capable of reproducing images and sounds, for example, are the prostheses of the senses; and that third-generation objects are those which are extensions of our mental faculties. Although at the time Morgantini wrote his essay, smart objects were not mainstream, it is this third-generation type of objects which are the focus point in our investigation, specifically the smartphone, as this object is identified as the most ubiquitous of all smart objects, worldwide, as shown previously. This essay was important in helping us define the type of object we were dealing with, as prostheses of our senses and of our mind.

SMART OBJECTS

John Thackara wrote about the presence of technology in our lives: "If the rapid electrification of everyday life just three generations ago is any guide, embedded computing will not prove controversial for people. Electric motors, too, soon disappeared, where they remain, in vast number, humming away inside a swarm of everyday household products. With pervasive computing another new presence has come into our lives, and it, too, lacks visible form or expression." (Thackara, 2005, p. 199) Thackara alerts us regarding Artificial Intelligence's pervasiveness in our lives.

We live surrounded by smart objects, from smartwatches and fitness wearables, to smart cars and smartphones, from smart homes to smart cities: all these objects have embedded virtual data as the base for their functionality. Although there is a significant difference in scale regarding the examples we just

named, they are all part of a larger invisible 'object': the Internet of Things (IoT: the structure that transforms people and smart objects into partners, through web connectivity, cloud-based activity and communications). These objects empower us to access more information, complete tasks and develop work in a more informed manner. They mimic some of our cognitive functions and choices, through algorithms built into software and applications to provide us with customised updates, information on areas which are identified as of interest to us, users. This may translate into news feeds, information on almost everything, from social media updates to the latest music available... tailor-made influx of data, including advertising and services.

In our research, we focus on smartphones, which fall into the category of mobile, or portable smart objects. Erkki Patokorpi sums up the key features of mobile technology, in an article called '*Abductive Reasoning and ICT Enhanced Learning: Towards the Epistemology of Digital Nomads*': "The core features of mobile technology are said to be mobility, interactivity, contextuality, ubiquity, pervasiveness, personalization and collaboration." (Patokorpi, 2006, p. 101) This summing up showed us pathways on which our questionnaire could direct questions.

NONOBJECTS

Not only but also because of its name, Barry Katz and Branko Lukic's book, and ongoing project, named *Nonobject* (Katz & Lukic, 2011) must be referenced here. Although Katz and Lukic use the term *Nonobject* to name their project, the body of Lukic's design explorations, they are not in any way using a scientific approach to the term. They use it to name objects created by exploring the space between user and object.

The type of objects presented by Katz & Lukic bring our attention to the 'background' of our interactions. As can be seen in the image of the *Tarati Touchless* cell phone (Image 3), Lukic projects artefacts which force the user to acknowledge the interaction with the object.

Image 3 · Tarati Touchless (Katz & Lukic, 2011, p.99)

PERCEPTION, INTERACTION, USABILITY, EXPERIENCE

We reviewed key authors such as Maurice Merleau-Ponty (Merleau-Ponty, 2002 [1945]), regarding phenomenology of perception, James E. Gibson (Gibson J. J., 2015 [1979]) and Donald A. Norman (Norman D. A., 2001) regarding concepts of affordance and the perceptual processes, Jonathan Chapman (Chapman, 2005) regarding diminished returns, Pieter Desmet (Desmet & Hekkert, Framework of Product Experience, 2007) regarding product experience, amongst others. We conclude that the way in which a person constructs the perceptual referential which will enable understanding, interpreting and experiencing the artefacts and environment of our made world might be compared to a Babel's tower, an unending adding and changing and rearranging of ideas, experiences, and references.

Delving into the perceptual process, and into the information objects convey to users even before interaction takes place, James Gibson wrote about affordances and how he distinguishes between attached and detached objects and explains that the "detached objects must be comparable in size to the animal under consideration if they are to afford behaviour." (Gibson J. J., 2015 [1979], p. 124) In this line of thought Gibson states that, to be graspable, "an object must have opposite surfaces separated by the distance less than the span of the hand." (Gibson J. J., 2015 [1979], p. 125) Smartphones are detached objects that (usually) match this description, affording the notion that we can pick them up with one hand and interact with and experience their functionalities.

As Rafael Cardoso wrote in his book '*Design para um Mundo Complexo' (Design for a Complex World)* (Cardoso, 2016, pp. 68-69), whenever we investigate the meaning of an artefact, we must question: who is looking at it? In search of what? The author stresses the importance of putting our point of view regarding an experience in understandable language (verbal, visual, or other) and those representations will necessarily aggregate the senses and affect the understanding of the artefact. Cardoso also explores the materiality of things in his book, as well as the influence of the digital, areas of great importance to our research.

Quoting Pieter Desmet: "Objects do not exist in a vacuum: they are part of a complex choreography of interactions." (Desmet & Hekkert, 2007) Product design, as a discipline, is responsible for the design of artefacts, and, therefore, responsible also for that choreography of interactions. Just as Augé explored the perception and use of spaces – architecture – towards the definition of non-places, we strived to achieve the same on Smart Products Design level, to define *non-objects*. That structure, the choreography of interactions, forces us to look beyond functionality *per se* in the object's relation to the user, and to broaden our horizon of research, delving into the realm of experience: the emotional response triggered, it's interpretation; the aesthetics perception, the product's ability to delight one or more of our senses; and the meaning of objects to their users, both semantic and symbolic. "Product experience is a multi-faceted phenomenon that involves manifestations such as subjective feelings, behavioural reactions, expressive reactions, and physiological reactions". (Munari, [1971] 2015, p. 113). The following infographics (Image 4), adapted from Desmet's article, could also illustrate Munari's point.

Image 4 · Model of core affect with products, relevant emotions. Infographics adapted by Marta Fernandes

INTERACTION DESIGN, INTERFACE DESIGN, SCREEN DESIGN, USABILITY AND USE

Interaction Design is the practice of Design based on user-centric notions, with feedback from potential and actual users of products, with the aim of creating products which will be used and desirable. The designer must be empathic concerning the needs and expectations of users as well as being able to work with technology in favour of their needs and desires. As a concept, interaction design is usually associated with the interaction between man and machine, and that is what interests us in our research.

Returning to Brandes's study, the author identifies the functions assigned to use as: "personal concepts of order within a collection of things; possession of things as an act of control over them; possibilities of interaction in social contexts through their possession; symbolization of meaning and memories." (Brandes, 2009, p. 10) All these factors should be taken into account when designing a new product, namely a smart one as the smartphone.

Ezio Manzini wrote essays regarding the notions of the relation of users with electronic devices (Manzini, *O eletronicodoméstico*, 1993), in which the author explains how important it is a product's identity and to take into account the cultural setting it was designed to fit into, leading to an aesthetic of relations between user and object; On the subject of interactivity (Manzini, *Interactividade*, 1993) the author describes the growing dialogue between user and object, as the latter is imbued with more abilities of feedback, as technology moves forwards; and finally, regarding the 'skin' of objects (Manzini, *A pele dos objetos*, 1993), digressing about the tendency for dematerialization of objects, precluded by the miniaturization of circuits and video screens, and that, although objects maintain their three dimensions, their surface is the main interaction point with users. (Manzini, *A pele dos objetos*, 1993, p. 40). As Baudrillard wrote, back in 1968, "In other words, only man's 'extremities' now have an active part to play in the functional environment." (Baudrillard, *The System of Objects*, 2005 [1968], p. 51)

Although all Manzini's texts date from the last century, they could not be more current. The relevance of surfaces design has gained exponential importance and is integral part of most smart objects, designed with a tactile surface - a touch screen - which allows users to interact with them (haptic and visual perception). Screen design and software design also take on important roles in the design process, working alongside

the product, interface and interaction designer. The touch screen of these objects is the portal through which users access the many functionalities built into them and/or added by the users. Interface design and screen design are responsible for the ease with which users navigate these functionalities, their usability, and will dictate whether a product is successful or a failure.

THE TELEPHONE, SMARTPHONE

In our study, we trace a timeline of the evolution of the telephone, from the early days of Alexander Graham Bell, not forgetting the payphone and the multiple shapes, forms and functionalities which were added to the telephone over the decades, up until the first cell phone, tested by Motorola in 1973. This informed our study regarding changing social behaviours and how the equipment evolved to be of more personal if not exclusively personal use, in relation to these technological developments, and specifically analyse the smartphone and social behaviours which are a direct result of the use of these devices (Image 5). It is our belief that owning and using systematically a smartphone has changed the way we interact with each other, the way we use analogic objects which are mimicked by smartphones and the way we perceive ourselves in society. In an interview given to Tom Bilieu, on Inside Quest (www.insidequest.com) Simon Sinek, author, motivational speaker and marketing consultant (Sinek, 2016), advocates that we should stop using the smartphone as much as we do, warning about the addictive behaviour which develops from using social media, about how personal relationships and the development of trust are at risk because of extensive digital communication in lieu of personal communications. We believe, as Sinek does, that a balance can be reached, although it is not easy to do so.

Image 5 · A smartphone held in one hand.
Photography by the author.

RESULTS AND CONCLUSIONS

This is an ongoing research project and the subject chosen is so volatile and ever changing, that it is our belief this is the starting point of a continuous investigation, regarding Smart Products Design, in all its variants, Service Design, Psychology and Marketing. Our questionnaire, with 501 respondents, was invaluable in providing information to answer our research question and address our objectives, allowing us to reach our conclusions, consolidating knowledge acquired through our literary review.

The smartphone is a very personal object, which was categorically confirmed in the answers to the questionnaire, and users rely on it to perform a growing number of tasks and to store important data and memories in. The disposal behaviours of smartphones are not what would be desirable, as most people keep their old smartphones instead of recycling them. A clear majority of users would not go back to an analogic version of a cell phone, showing that the smartphone is embedded in our personal and social lives.

We have concluded that smartphones may indeed be named *non-objects*, as they are used as platforms to access functionalities and services, most of which are web or virtual-based. And these functionalities are not limited to only one, connected with the shape of the object, but rather many other functions which suppress the utility of other objects.

Indeed, if a smartphone stops working, all it takes is a new device and to download our data and apps from the cloud to have ‘our’ smartphone again. We may conclude that the operationality of these objects is more important than its appearance or physical shape, and therefore it is easier for the user to dispose of them.

Product Design’s role might be to find a balance point while projecting these devices, making them more prone to individualization (and therefore less disposable), made of recycled materials which truly help the environment, and by making these objects more durable and cherished.

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