Emotional Design: How Pleasurable Environments Can Generate Value When Creating Smart Products

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ABSTRACT

This article sets out to examine the relationship between men, the built environment and everyday objects so as to better understand what pleasurable products are and how designers can act to establish a symbiotic relationship between them and men, by making them more user-friendly, attractive, reliable and efficient. It is known that the "attraction" by a product is a form of positive emotional relationship. Therefore, assessing the various currents that place emotion as a necessary component in human life is fundamental if we are to understand and determine how people feel, think and behave in relation to others and to products and environments. A review of information contained in some studies that deal with the subject will be necessary to reach a better understanding of the subject and especially for a future methodological proposition about how to act in a methodological way when creating more pleasurable products and environments. Concepts like Affordance, Emotional Design, Interaction Man-machine-environment, Intelligent Environments and so forth, will be addressed throughout the paper in order to identify and discuss the physical, emotional and technological aspects that complicate life and, very often, minimize levels of satisfaction of our relationship with products and environments.

Keywords: accessibility; attractiveness; emotional design; technology; satisfaction.

INTRODUCTION

The objective aspects related to products and environments have been widely studied by scientists, designers, engineers, ergonomists, marketing professionals, architects, in general. This includes many methods used to determine the functional aspects that consumers prefer. Similarly, research in ergonomics investigates how consumers interact with products. On seeking to minimize discomfort and maximize efficiency, we shall seek to broaden these professionals' vision to other correlated areas and those that add great value to the human - environment relationship.

We have given far too much value to "material things" for too long, and live in a world that is essentially superfluous and particularly consumerist world, where products have acquired personality, charisma, relevance, and especially status. However, something has changed in the twenty-first century and the subjectivity of things has started to become integrated into discussion circles within industries and design and architecture offices, thus gradually replacing the concept of materiality (price) with immateriality (value). Thus, the meaning of companies

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and products has changed. Currently attributes such as price, quality, aesthetics, functionality and image are offered to consumers with a view to increasing their perceived value, in which intangible attributes are presented to the market to create.

For the Czech philosopher Vilém Flusser (2007), possessing things has become less attractive than the possibility of making good use of information. However, human beings still depend on machinery, tools and environments to relate to the world and those around them. Therefore, products and environments continue to exert fascination in people, either because of their physical and spatial characteristics, or because of their immaterial with which we today value today and perceive the value of brands, since they reflect our personality, culture and social position. And, because of our affect and admiration, we have been making them stronger and ever more omnipresent in our daily lives.

"Besides the design of an object, there is also a personal component which no designer or manufacturer can offer. The objects in our lives are more than mere material goods. We are proud of them, not necessarily because we are displaying our wealth or status, but because of the meanings they bring to our lives. A favorite object is a symbol, which induces a positive mental attitude, a souvenir that brings us good memories, or sometimes an expression of ourselves. And this object always has a history, a memory and something that connects us personally to that object in particular, to that particular thing "(NORMAN, Donald. Emotional Design. Rocco, p. 26, 2008).

In his article on "The complexity of contemporary living spaces," Rosane Badan (2010) reflects the thinking about interior design - "*spaces that surround man, whether residential or commercial*." This activity makes up a universe that is able to highlight how a certain individual will activate his BEING in a given location. Generally, this mode is determined by two visual commands: one, gives "tips" regarding the behavior of a person in relation to that space, while the other, corresponding to the history of each person, shows how this person was brought up (BADAN 2010 apud GURGEL, 2009). For her, "this circumstance makes us believe that the space lived in is actually our extended EGO." The human habitat is a reflection of who we are, of how we act, vis-à-vis various situations, the indicator of our reactions. The home can be compared to the skin that covers the private sphere where we sleep, eat, keep things that are important to us, receive friends; i.e. the place where we live and we feel protected (GURGEL, 2007).

Thus, the design of products and environments is of fundamental importance in people's lives and their attractiveness and efficiency therefore depend on designers' ability to understand the needs and limitations of the relationship between man-machine-environment, by making the "dialogue" a fitting one on adding intelligent devices to our lives in ways that facilitate our activities, complement our skills and increase our pleasure, convenience and accomplishments, but not stress. According to Norman (2010), "on introducing automation and intelligence into the machines we use today, we need to be humble and recognize the problems and potential hazard of failure. We also need to recognize the huge discrepancy between the functioning of people and machines, given that people have unique capabilities that cannot be copied into machines, at least not yet. In general, responsive systems are valuable and useful, but they can fail when they come across the fundamental limitations of human-machine interaction, in particular the lack of common ground between the parties."

THE INFLUENCE OF PLEASURE (ANDA THE EMOTIONS) ON THE USE OF THINGS

The concept of affect refers to a large variety of psychological states, such as emotions, feelings, moods, sensations and passions. Each of these affective states varies in duration and its impact and causes different interactions. These emotions are more relevant to one´s experience with the product because they imply a special relationship between one´s affective state and an object or environment in particular: if one is afraid of something, angry at someone, happy about something, and so on (Frijda 1986). Other affective states such as feelings and states of mind, do not involve a specific object, whereas in the study of affectivity, the reactions to products is the starting point.

Pleasure is an emotion if it is merely used as an equivalent to "fun" or "satisfaction." In this type of connotation, many authors include pleasure in the taxonomies of emotions in their published studies. On the other hand, this outlook on pleasure seems to be very close to the current situation. Research studies in design refer to pleasure as a benefit of the product that is only exceeded by the need for it to work properly. In other words, pleasure refers to the emotional benefits that complement the product and its functionality. Therefore, pleasure covers all the pleasant emotional reactions of which the experience of having fun is just one example. Therefore, pleasure is defined as any pleasant emotional response prompted by a product of design (DESMET & HECKERT, 2002).

The characteristics of the products which prompt feeling pleasures are still far from being thoroughly known and mastered by designers because they depend on subjective perceptions and certain consumer preferences, in which aesthetic pleasure may perhaps be the most relevant, since it is caused by the appearance of the product. But how is the judgment that consumers make influenced by the appearance of the product? How can we design products and environments in accordance with the desires and tastes of the consumer? The pleasure afforded by the product depends on how these are represented by users.

For Rafael Cardoso (2012), the characteristic appearances of objects remind us of our experiences, habits, and even people that we associate with the context in which we are accustomed to coming across them. Again, the primary identification mechanism of feeling is memory (...). This is about a psychic transfer of value based on the principle of association. That is, the mind associates one thing with another, generating a correspondence between them that does not necessarily exist outside the experience of each (...). When we see a person that we admire endorsing or manipulating a product, we tend to transfer the real or imagined qualities we ascribe to that person to the object manipulated.

What are we to think of the abstract attributes of the product which do not derive from the concrete factors of the product? The abstract attributes of the product may exist even without a direct link to its physical attributes. However, not all the physical aspects of the product are distinct and separate parts, with clear definitions of their boundaries. If we think about concrete attributes, such as a button or a color, we think of a specific part with a certain quality. If we think of an abstract attribute, such as elegance, simplicity and safety, we can connect it to more concrete attributes of the product. For example, the safety of a car can be connected to certain physical attributes, such as seat belts, airbags and ABS brakes. All of them are distinct parts of the car but safety may be also associated with more diffuse aspects such as the sound of the locking mechanism of the door or the most robust shape of the car. Often consumers cannot associate these abstract aspects to specific parts of cars and are not able to describe them in concrete terms. Nevertheless, they can evaluate them, and this influences their perception of quality. Probably abstract attributes are linked to these diffuse characteristics of products, whereas pleasure is connected to these diffuse qualities of the product (NORMAN, 2008).

PRODUCTS AND PLEASURABLE ENVIRONMENTS FUNCTION BETTER

Several authors have researched the subject to describe the meaning of pleasurable products in an attempt to elucidate various issues that lead to assigning certain characteristics to products so that they can provide pleasure to users. Jordan (2000) adopts a classification in which pleasure is presented in 4 distinct types: (I) Physiological Pleasure: relates to the body, to sensory perceptions and first impressions; (II) Social Enjoyment: deals with the relationship between people who are close to each other, with social-economic status, and with cultural status;, (iii) Psychological Pleasure: addresses the satisfaction of emotional, affective and cognitive needs; (IV) Ideological Pleasure: involves ethical, moral, nationality or belief values. It also includes two additional features that can be related to pleasure: functionality and usability.

Generally speaking, Jordan´s studies on "likeability" or "pleasurable products" suggest the need to celebrate and respect human diversity, to understand the benefits that people expect from a product, to evaluate what it takes to produce such benefits, to design products that bring a real joy to people's lives.

If we reconstruct the years between 1850 and 1930, new generations of professionals dedicated themselves to the task of shaping the structure and appearance of artifacts so that they became more attractive and efficient. Their motto was fitting objects to their purpose, from which the phrase "form follows function" was popularized. However, this statement came to be questioned in the 1960s because in order to realize the ideal of fitness for purpose there is a need to have a more or less coherent notion of what purpose is to be met. At that time, the industrial manufacturing paradigm was still mass production. Currently, industry is taking great strides towards flexible production by seeking to adapt itself and segment its products to meet the demands for differentiation. (CARDOSO, 2012).

The author questions this canon by quoting Socrates to refute the idea that having a good form is what is suggested by the function of the object. Nothing may be used unless for the purpose for which it was designed, where the emphasis of the phrase "form follows function" rests on use and not on form, which makes the affirmation very significant because it shifts the discussion from objects to people.

For Cardoso, "there is no function, there are functions. We have the bad habit of using the word "function " imprecisely to cover concepts and values that are very different from each other (…). What is more common, and far more emblematic, is to employ the term "functional" to describe the appearance of the object."

In the book Design and Emotion, Deana McDonagh and Paul Hekkert (2003), the authors show that different characteristics may influence the attractiveness of consumer products. The characteristics of functionality and style are the ones that most influence the positive evaluation of products, while usability is of relatively minor importance. Among the features considered unpleasant, functionality plays an important role, both because the product does not work and because there are other better products on the market. Poor functionality is the main factor of dissatisfaction with products, more so than bad usability and poor style. As for style, it was observed to have little importance as a factor that displeases. It can be argued that a positive style acts as something that is attractive to people but its absence does not disappoint them. On the contrary, the lack of functionality and usability factors causes the user to be much more upset. Moreover, over time people become accustomed to the style which ends up being little noticed, which does not occur with functionality and usability. Deficiency in usability has a greater influence in creating negative feelings, if compared with good usability to create positive feelings. Therefore, poor usability has a greater impact on the relationship. Good usability tends to increase the productivity of the product, therefore the user’s, although functionality and style have a relatively greater importance in this case.

Another important dimension for a product is its being suitable for the environment. In a certain sense, this point applies to all human behavior: what is really preferred in one environment may be inappropriate and rejected in another. As an example, clothes that are appropriate for going to night-time establishments are inappropriate to wear when discussing business. "The distinction between the terms needs and wants is a traditional way of describing the difference between what is really necessary for a person’s activities (need) versus what the person wants (wish)." Needs are determined by the task. Wishes are determined by culture, by advertising, and by the way people see themselves and their self-image.

Product designers and marketing executives know that wants may be more inspiring and powerful than needs and so they are the determining factors in the success of a product.

With respect to the emotional aspects attributed to products and environments, Donald Norman states in his book *Emotional Design - Why we love "or detest" the objects of everyday life* (2008), that "one of the ways in which emotions work is through neuro-active chemical substances that penetrate certain cerebral centers and modify perception and behavior and the parameters of thought." That the emotions are inseparable from cognition is part of a system of judging what is good or bad, safe or dangerous, and of formulating "value judgments that allow us to survive better." They are constant guides in our lives, affecting the way we behave, think, make decisions and interact with each other. For the author, "emotion makes you an intelligent person." Without emotions, one´s ability to make decisions would be impaired.

An important theme of the book is that much of human behavior is subconscious, below conscious awareness. Consciousness comes later, both in evolution and in the way the brain processes information; many judgments have been determined before reaching the level of consciousness. Both affect and cognition are information processing systems but have different functions. The affective system makes judgments and quickly helps one determine things in the environment that are dangerous or safe, good or bad. The cognitive system interprets and explains the logical sense of the world. Affect is the generic term that applies to the system of judgments, be they conscious or unconscious ones. Emotion is the conscious experience of affect, the nauseating and afflicting feeling that you may feel without knowing why. The anger of Harry, the used car salesman who charged too much for an unsatisfactory vehicle (...). Notice that cognition and affect influence one another: some emotions and affective feelings are motivated and driven by cognition, while affect usually clashes with cognition (NORMAN, P 31 , 2008.)

In his studies on emotion, Norman and his colleagues suggest that human attributes result from three different levels of brain structures: " the pre-programmed, automatic layer called the visceral level, the part that contains the brain processes that control everyday behavior known as the behavioral level, and the contemplative part of the brain, or the reflective level " (NORMAN, 41 , 2008). Each level plays a different role in the integral functioning of people and so each level requires a different design style. According to Norman, these three very different dimensions are always intertwined in any design. It is not possible to have design without all of them, although the most important thing is to notice how these three components combine emotions and cognition at the same time. This occurs despite the tendency to try to put cognition in a position that is antagonistic to emotion. "While it is said that emotion is hot, animalistic and irrational, cognition is cold, human and logical." This contrast comes from the long intellectual tradition that prides itself on logical and rational reasoning. Emotions are out of place in a sophisticated and well educated society.

"They are residues of our animal origins but we, human beings, must learn to perfect ourselves and overcome them." The three levels can be mapped in terms of product features in the following manner: (I) Visceral Design: appearance; (II) Behavioral Design: pleasure and affectivity of use; (iii) Reflective Design: self-image, personal satisfaction, memories.

Norman argues that emotions are inseparable from cognition, thereby forming a necessary part of it." Everything we do, everything we think has a touch of emotion, which is often unconscious. For their part, our emotions change the way we think and serve as constant guides for appropriate behavior, distancing us from evil and following us to what is good." For Norman, parallel to the emotions, there is also another important point: aesthetics, attractiveness and beauty. According to him, "the only way to satisfy a wide variety of needs

and preferences is to have a wide variety of products." Many product categories are specialized, each of which caters to a different public, precisely because there is a wide variety of styles and shapes for various needs and preferences. Market segmentation is the term is used for this approach.

SMART TECHNOLOGIES FOR PLEASURABLE PRODUCTS

In the book "Design of the Future" by Donald Norman (2010), the author suggests that in the future we will have smart homes that able to anticipate our needs, cars that find their own way and park by themselves or refrigerators that monitor our diets. However, this technology is already a reality, even although it is still necessary that the relationship between man-machine be rethought by designers so that communication and users' feeling of satisfaction are full." The technology that gives no opportunity for discussions, explanations or debates is a poor technology." The so-called "smart systems" were very presumptuous, says the author, since they believe they know what is best for us. However, their intelligence is limited, created by designers who seek to anticipate the innumerable situations of everyday use without doing so on behalf of the user's safety and convenience. To the extent that our technology becomes more powerful, its failure in terms of collaboration and communication is increasingly critical. Collaboration means to synchronize the activities themselves, as well as to explain and give reasons. It means to have confidence, which can only be formed through experiences and understanding.

Machines monitor us with the best of intentions, seeking to offer safety, convenience and precision. When everything works, they can then be useful, and may even perform tasks better than people. These self-same mechanisms that are useful in normal situations may reduce safety, comfort and precision when unexpected situations arise, thereby causing users discomfort, and to feel frustrated and angry. According to Norman (2010), the proper way to bring about a harmonious interaction between humans and smart devices is to improve the coordination and cooperation of both parties (...). But whoever designs these systems must know how to judge the differences between machine and man. A machine is not intelligent, intelligence is in the mind of designers. The mind does not perceive the world in the same way that people do and it fails to understand the objectives, the environment and the motivations of the people with whom it must interact and the special circumstances which invariably surround any set of activities. Machines lack the condition necessary to consider the impact of their actions on the people around them. In laboratories around the world, scientists are working on new ways to introduce intelligence from machines into our lives. "There are experimental houses that feel all the actions of its residents, turning lights on and off, adjusting the room temperature and they can even select music. The list of projects is impressive in factories is impressive: refrigerators that refuse to let you eat unsuitable food, gossipy bathrooms which tell your doctor secretly about the state of your bodily fluids (...)".

In the 50s, the psychologist J. C. R. Licklider tried to determine how people and machines could interact with grace and harmony, in a "symbiotic relationship" in his book "Man-Computer Symbiosis". Symbiosis in this sense would be the merger of two components - man and machine - in which the mixture is smooth and fruitful, and the resulting collaboration beyond what each can do alone. We need to understand how best to accomplish this interaction, how to make it so natural that training and skill are not generally required (NORMAN, p. 26, 2010). People have evolved complex systems of perception and action, emotion and cognition and machines need analogue systems to perceive the world and act in, they need to think and make decisions, solve problems and reason. And they also need something like the emotional processes of people, the mechanical equivalents to surviving better the hazards and risks of the world,; they need to seize opportunities, predict the consequences of their actions and reflect on what has happened and what will still happen, thereby learning, and consequently improving their performance (NORMAN, p. 42, 2010).

Perhaps the essence of the problem is in the conception of design of systems, where the figure of the designer is predominant. In the paper "Metacreativity in Design: an overview of radical innovation in Brazil (2012), Rosane Badan and Edoardo Bianco, make clear, using the work of Andrea Branzi (2007), that the essence of design is to make sense of things. "This differentiates it from any kind of innovative process and explains the reason why this practice is considered an important means to create competitive advantages: design innovates meanings - and these are the meanings that have made the difference in the contemporary market." The authors emphasize the need for designers to use methodological tools such as User-Centered Design, Design-Driven Innovation and Radical Metacreativity that permit companies to differentiate themselves from their rivals. These concepts depend immensely on the designer’s ability to imagine and investigate new meanings for products by means of a "full and detailed exploration of society, culture and technology". The problem is that one of the greatest difficulties of design today seems to lie in the fact that this activity gives more importance to the methodologies than to personal culture, thus losing the ability to make use of this precious resource, say Bianco and Badan (2012). The paper at bottom discusses the model of radical innovation and its differences in relation to the model of incremental innovation, and even praises the qualities intrinsic to professionals who work with such characteristics, in which attitudes, skills, repertoire and diverse capabilities become "distinctive features" in this methodological approach.

Similar concepts can also be found in the book *Designing Pleasurable Products* (2000) by Patrick Jordan, in which Attitudinal Design becomes a very relevant and current methodology in the confrontation with the relationships of the products. Such material elements mediate social relations, promote attitudes that society values, mark significant points in time, provide comfort and well-being, they are fun, they surprise and make us laugh, thereby making this relationship something that is far superior to a simple act of consumption. For Lucy Niemeyer, D.Sc. in Semiotics and disciple of Jordan´s work, Attitudinal Design can be divided into 6 categories: (I) Relational Design: this promotes social interactions and makes co-existence more harmonious; (II) Educational Design: this promotes humanitarian and civilized actions that are on behalf of the collective good; (III) Mood Design: this harmonizes itself with the atmosphere of the context; (IV) Spa Design: this fosters well-being, it relaxes, it slows one down; (V)

Design-me or Fun Design: this may be individualized and transformed according to the occasion and user´s wish; and (VI) Amusing Design or Fun Design: this surprises, it makes you laugh and makes the routines of life fun.

CONCLUSIONS

The future of things is in products with knowledge and intelligence, that know where they are located and who their owners are, that can communicate with other products and the environment itself. It is in the possibility of machines becoming mobile, of their being able to manipulate the environment physically, of their being alert to other machines and also to the people around them, and being able to communicate with them.

People have a tendency to ascribe beliefs, emotions and personality traits to things, commonly called Anthropomorphism. Today this attitude proves to be very significant to the extent that machines have expanded their cognitive and emotional capacities, even although the lack of common ground is the main cause of our inability to communicate efficiently with machines. Very often we designers are forced to use limited or outdated technologies due to our budget and we try to imagine how the world would look to the machine or environment. Indeed, we should infer what will happen and what decisions machines and environments should take so that there will be no unwanted occurrences and that the interaction with the user is the most pleasurable possible. We should seek to develop more natural interactions with products and environments, using richer, more informative and less intrusive signals, via lights, sounds and physical marks which do not require specific prior learning and exploit the simplicity of the perception patterns of human recognition – in an implicit and very effective communication.

Both interpersonal communication and access to information sources have been increasingly mediated by devices for transmitting electronic information at a distance and the relationship between these devices and their users have been supported by increasing degrees of interactivity. As an example of this observation, we cite the research group Nomads.usp - Nucleus for Studies on Interactive Living Places, University of Sao Paulo, which has been analyzing the influence of ICT in the home by exploring the so-called "hybrid spatialities." Researchers have sought to understand, analyze and produce criteria that set out to rethink the design of living spaces today, by considering its recent history and the changes occurring in family groups, their current behavioral trends and the inclusion of ICT in this space (REQUENA and TRAMONTANO 2013).

Therefore, it is necessary to create responsive, intelligent, autonomous, adaptive systems (smartness) and, above all, ones that are enjoyable. Providing noticeable and effective affordances is also important in the design of things today, especially for the things of the future, where they will have to learn from us as much as we learn from them, to adapt and infer our feelings and intentions, thereby minimizing conflicts of interest and extending the pleasure and satisfaction in using them.

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