

Experience, Usability and Sense of Things

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Abstract. This research presents the relation of sense of objects with usability and user experience as it is influenced by the context of use, the interaction with apparatuses and the transformation of the perceived value through a narrative of experience. The research analyses subject meaning and significance factors with usability and experience concepts in a pervasive scenario of ecology systems and cross-channel interactions.

Keywords: User experience · Semantics · Usability

1 Introduction: Third Wave of Computing

The important change of traditional design of objects to the idea of interfaces as design artifacts (late 80's and early 90's), had Bonsiepe [1] as one of the first to see interfaces as a communication object, and a "bridge" between humans, the tool and the objective. Resmini and Rosatti [1] point that Bonsiepe was "thinking inside the box of Industrial Design concepts" and, ten years later, with faster microcomputers, inside cellphones, cars, cameras, houses, appliances etc., capable of communicating with other devices, through a diverse technological possibility of connections, it became clear that the "bridge" is beyond interfaces. This perception changes the way of projecting and evaluating projects' results.

According to Renzi and Freitas' Delphi investigation [2], the future scenario of technology and interaction in the next 5-10 years will bring digital devices more present in people's daily tasks, through the use of common objects, integrated environments and wearable devices. Advancing even more in the third wave of computing (many computers to one user), our digital empowerment becomes ubiquitous and integrated by a dynamic ecology, transforming human-computer interactions in human-information interactions. Resmini and Rosatti's [1] manifest presents Pervasive Architecture Information as a concept further than information spatial organization. It is to develop products under informational and structural scope, for open and expansive systems, what Norman [3] calls system thinking:

"No product is an island. A product is more than a product. Is a set of integrated and cohesive experiences. Think of all stages of a product or service – from initial intentions and it's first use to the need of help, service and maintenance. Make it all as one integrated system. That's Systems thinking".

McMullin and Starmar [4] emphasize the necessity of communication through multiple channels in order to push users into an ubiquitous and holistic experience. And we, designers, should embrace a holistic path to transform multiple and separated interactions into one narrative flow. Resmini and Rosatti [1] add: “HOW” is more important than “WHAT” when information architecture is evolving dynamically. The authors, based on the expansions of information architecture, denote some transformations from the traditional information architecture to a pervasive thinking:

1. Information Architecture becomes an ecosystem – When different medias and different contexts are integrated, no artifact is an isolated and singular device. All artifacts become elements of a great ecosystem, with multiple links and interrelations that must be developed as parts of one whole process of experience.
2. Users become intermediaries – they are participants that contribute to the ecosystem and actively produce new content, or edit (add) to something already published, inserting links, comments or critics. The traditional distinction between authors and readers, or producers and consumers, becomes a thin line.
3. Static becomes dynamic – The active role of the intermediaries (users) makes the structure perpetually unfinished, perpetually in change and open to continuous refinement and manipulation
4. Dynamic becomes hybrid – These new architectures embrace new kinds of media. As well as the line between producers and consumers are thinner, the same occurs with different medias. All experiences are bridge or cross-media, embracing a diverse environment.
5. Horizontality prevails over verticality – the correlation of elements is predominant and over rule traditional top-down hierarchies. In an open architecture and always in metamorphoses, hierarchic models are hard to keep and maintain, since users push the system to spontaneity, ephemeral or temporary semantic structures.
6. Product design becomes experience design – when every artifact, by its content, product or service is part of an ecosystem, the focus change from planning individual devices to planning and developing experiences that permeate artifacts in one whole journey.
7. Experiences become cross-media experiences – experiences connect different environments and medias in ubiquitous ecologies, a process that all parts contribute to build one whole experience journey.

2 Making Sense of Objects Through Its Use

The ISO 9241-110/2.15 [5] defines user experience as “a person’s perceptions and responses that result from the use and/or anticipated use of a product, system or service”. The definition emphasizes that experience occurs before, during and after the direct use of a system. John C. Thomas, PhD, from the IBM J.T. Watson Research Center sees the processes of user experience as narratives. Similarly, Renzi’s research [6] presents the user experience of integrated interactions in a cross-channel system as one whole journey, composed by short scenes, where part of the user experience happens outside the system.

Vilém Flusser [7] alerts to the fact that the control the experiences of others is unattainable, since each experience is attached to individual conditions and expectations. For such unique and private sense, an experience can't be generalized. Therefore, design products can be projected to fulfill part of the whole experience, but possibilities of "scenes" of the narrative are multiple and hardly with determined path. For the author [7], designers can only project system structures that potentially generate experiences.

Absorption of information becomes conducted by distinguishing relevant experiences from irrelevant ones. Based on references, needs and expectations of use, each user will instinctively categorize and choose interactions to fulfill their journey of experience. The understanding of users' perception and common journey can help designers project and evaluate results to better make integrated experiences and possibly break paradigms in the concepts of new digital devices, on either industrial products, information systems, architecture or social environments [8]. For Krippendorff [8], the practices of design have to be reformulated by repositioning its focus from functions to the meanings that objects help build relations in society. It is the pursuit of meaning derived from human interactions with objects.

The author, in his article *On the essential contexts of artifacts or on the proposition that design is making sense (of things)* [9], affirms that although conveniently ambiguous, the phrase "Design is making sense" could be read as "design is a sense of creating activity" that can claim perception, experience and esthetics as its fundamental concern, or it can be regarded as "products of design are to be understandable or meaningful to someone", concerned with the subjective meanings of objectively existing objects.

Krippendorff defends that technological structures and the functionalities of systems/objects have to be integrated as background scene to what really matters: the self-identification and the values of significance related to devices inserted in society daily interactions. His concept of understanding artifacts through its use is in accordance to Lockdown's Design with intent [10], where the system/object influence the user behavior as much as the user influence the system/object behavior. Due to this continuous interaction, Lockdown suggests the importance of planning a system to influence positively user behaviors in situations where is important to strategically direct the use of a product, service or system.

When instigated by something new, users' preconception of how it works is based on their closest references, understanding of cultural conventions and similar experiences to build a mental model of its functionality. The better the understanding of its functions to the novelty's real purpose, the better is the product affordance. And each time users interact with a new product, their comprehension of use becomes clearer as they familiarize with the procedures and learn. With the continuous process of learning, users' references change, as do their mental models and perception of functionality.

Alva Nöe [11], a philosophy researcher, points that perception is an activity of thinking, to act from cognitive processes. Not something that happens, but something that is done. Like a blind person understanding his/her surroundings using the tip of his/her cane, the world is perceived through successive interactions over the time. According to Nöe, perception can be mainly conceptual because just someone in possession of appropriate conceptual skills is capable of having a particular experience.

It couldn't look to you as if the ballerina tripped if you didn't know what a ballerina is, or what tripping is, and it couldn't sound to you like a backfire if you didn't know what a backfire is. [...] The fact that there are different standards for concept possession doesn't alter the fact that some perceptual content is framed precisely in terms of what perceivers know about their worlds [11, p. 184]).

Dr. Alok Nahata, from Nutraceuticals, in an interview at Researchgate.net, defines perception as organization, identification and interpretation of sensorial information, with the intent to represent and comprehend the environment. Every perception involves signals, received by the nervous system, resulted from physical stimuli of sensors. However, perception is not a passive receptor of these signs. It can be molded through learning, memory and expectations. The human brain perception system enables people to see the world complete and stable, even when the received information is incomplete or with rapid variations.

Krippendorff [8] argues that Design is to give sense to things. And to understand these meanings, it is important to relate objects to contexts. The thinking of the form has to be based on its use and the symbolic contexts (social, cultural and psychological) involved in the interaction of users with the projected environment. Its intangibility is directly connected to the common language of a society, where digital systems work as means to convey information with multiple perspectives, multiple consumers and multiple editors in dynamic structures.

Frascara [12] points that Design has to influence behavior, attitude and knowledge in an effective and ethical way, moving from just solving problems to identifying them. Designers should be responsible for discovering the user needs and elaborate structures to enable results to change people's lives: "we need to move from interaction design between people and objects to interaction between people". In "People-centered design: complexities and uncertainties", the author suggests the necessity of an interdisciplinary work with Design in order to impact people in different levels and to urge users to act, fulfill needs and satisfy desires.

The generation of meanings through use occurs after the tangible purpose has been conceived, that is, the semantic validation of the experience comes only posteriorly. During the planning of the product and its form, the criteria for the creation of subjective meaning is oriented mostly based on the understanding of affordance and universal values of perception.

Krippendorff is very influenced by Gibson's definitions of affordance and the notion of perception of the world beyond forms of objects and spatial relations, to a broader understanding of interactions possibilities with objects, even when facing human limitations to describe what is perceived. According to Kripendorff, users perceive what they can learn, not necessarily what is disposed for observation. Humans' perceptions are programmed to foment sense and significance to everything, based on own references, conventions and previous experiences.

In a dynamic cross-channel scenario, where users permeate different objects to build a journey and fulfill objectives, each object/device's meaning is directly linked to the context of use and which part of the journey it is integrated. For instance, using the example of Renzi's research [6] on designers using an integrated system to help them manage their studios, the choice of which device to input or edit relevant information

regarding project or financial management to the integrated system, were based on levels of privacy of information, location of the user, type of action, urgency and context of management decision. Each one of these parameters influenced the meaning, the significance and the experience of use. In the cited example, it was also acknowledged that parts of the users' experience journey occurred without any digital device.

3 From Using Isolated Devices to a Pervasive Experience

In 1990, Nielsen and Molich [13] developed a set of ten usability principles to be considered when planning a system with a visual interaction interface. The principles are well known as the “ten usability heuristics” and became a base for the usability evaluation technique, well known as heuristic evaluation. A guide anticipated for helping develop systems for single devices with interface. As new apparatus surged over the years, with different sizes of display and different kinds of interaction, other authors presented new perspectives of usability heuristics for new contexts and possibilities: Apted [14], Inostroza [15], Neto and Campos [16].

For the purpose of cross-channel scenarios, where systems are a dynamic ecology, usability heuristics focusing on singular apparatus are not enough to evaluate or guide the whole journey of experience.

As usability covers the easiness of using, effectiveness and learnability with a system using a device, the research on user experience analyses the whole experience of the user with system, the scenario and circumstances in which the user may open the system from different devices interconnected. Using Jarred Spool's lecture [17] (Fig. 1) as an example of comparison between usability and experience, he shows that Six Flags' detailed map is focused on helping users to perform tasks in a pattern of use (people get in the park, choose the closest ride, get in a long line, ride the roller coaster and then choose another ride and re-start the cycle), while in Disney's map is hard to visually understand specific rides, as Disney is more interested to be a place people take their kids for an adventure. An experience.

While activities are distinct things (tasks) that happens (are performed); experience is making sure everything blends and is connected, even afterwards when people leave the park. The concept of the whole Disney experience in building new memories goes far beyond specific isolated tasks. It considers the whole “adventure” that starts even before the arrival at the airport.

The Disney experience goes beyond single rides as it is a dynamic ecology. And as well as the physical exploratory walking with the family creates a narrative, digital devices can be part of the experience in different contexts within different parts of the users' journey. And for each short scene of the experience, different senses and significances can emerge.

Specifically regarding digital experiences for Disney, there are a number of options for download and use, compatible with different devices, and some of these options were purposefully planned for specific lengths of the experience journey. The app “Disneyland Explorer” (Fig. 2), for instance, brings an overview of the park and helps build expectations while making trip plans. The family can see parts of rides as in an interactive picture book



Fig. 1. Map of six flags amusement park and map of disneyworld.

with music, motions and videos. While the app “Wait Times for Disney World” (Fig. 3) focus on the period inside the park as it helps users see the waiting lines and make decisions on where to go first. Users can see many information windows at the same time and have a sense of the overall timelines. Although users might get carried away by the expectation of the adventure and use the app months before the trip, the major probability is to use it while in the park, as the app wouldn’t help much outside of it.

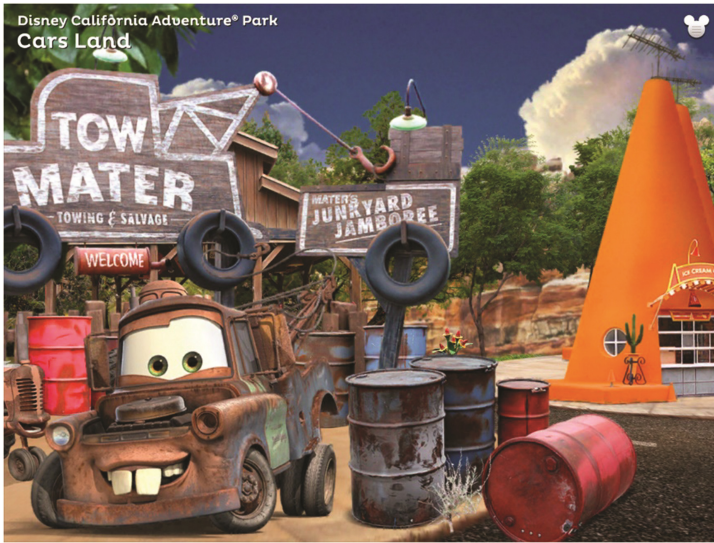


Fig. 2. Display example of the app disneyland explorer showing of the park’s features for interaction and preview of the rides.

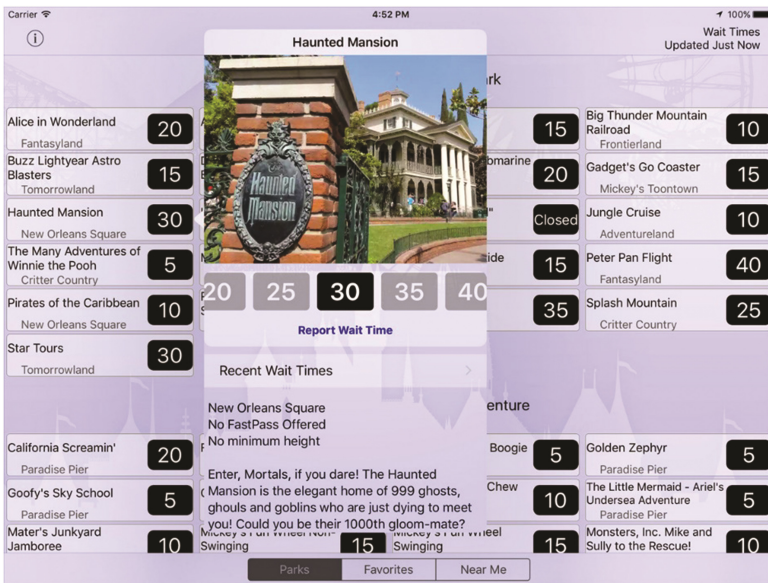


Fig. 3. Display example of the app wait time disneyland showing the waiting time in line for different rides.

The app “My Disney Experience” (Fig. 4) helps users put together the memories of the experience and organize the adventures of the day. The app unifies information

regarding scheduled features (Akershus Royal Banquet Hall, dinner reservations, fast pass etc.), waiting times for each ride, shows and all data collected from visitors (users) photo pass (an online collection of all photos of the family taken by Disney photographers). Comparing all three apps, the “My Disney experience” is the most complex and more feasible of use previously and after the family trip, as it can certainly be part of the trip planning and the memories gathering after it.

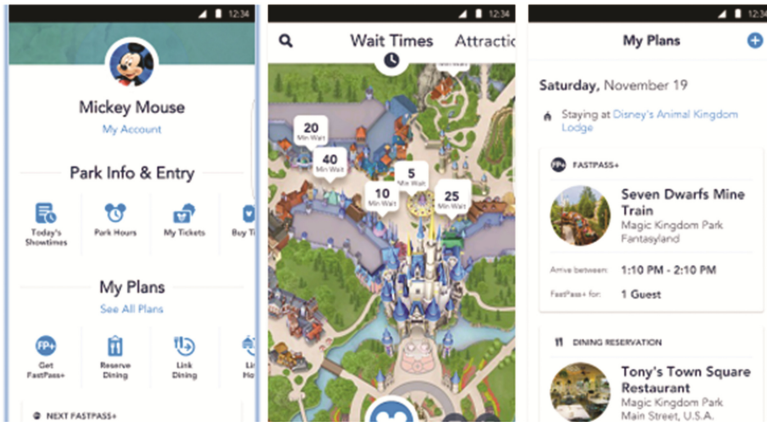


Fig. 4. Display example of the app my disney experience with events throughout the parks

Except by the common Disney brand and their connection with the amusement park, they have no similarities of interaction patterns or visual structure. Nevertheless, all three examples of apps can be part of the Disney experience, as each app seems to be used in different parts of the journey. They can be accessed by different types devices (with different display sizes) in different contexts of use, which can result in different senses of meaning. The expectations, the users and contexts will influence the sense and significance of interactions and objects, as at least one of the examples can be used months earlier the planned trip.

But, as Flusser alerts about uncontrolled experiences, all three apps may not be used at all, as they are possibilities of interaction, but not essential to build a narrative. Many parts of the full journey may not include any apparatus and each experience is attached to individual conditions and expectations.

4 Conclusion

The sense of objects and systems changes with its usage, influenced by different contexts in which it is inserted, by specific scenes of the experience journey and by references and expectations of each user. The perception and analysis of the form is developed through interaction and learning and it changes continuously as perceptions can be molded through memory and expectations, affecting and transforming perceived values

within the journey. During the interaction with apparatuses, the experience is induced by perceived meanings of the system use and its contextual significance.

When the evaluation of the formal project outcomes is restricted to usability precepts, there is a risk on focusing too much around data visualization and functionality. In this respect, the emphasis given to the language of form seems to be heavily influenced by a modernist view, linked by the pursuit of neutrality, simplification and based on a so-called “universal common sense”. However, such objectives don’t fully meet human perceptions because the act of perceiving is based on probing and recognition, and should be defined as a type of subjective and private interpretation, as pointed by Nöe or Flusser. Through the potential malleability of contemporary medias, design projects have the technological capability to foster such subjectivity and individualism.

Findeli and Frascara [18] value the user experience and the empathy process derived from meanings and significances of use. Projects’ results are understood and validated through interactions with the system and analyses of users’ narrative journey to understand the touch points and possible contexts of use. The mapping of the journey and the moments that could bring a family to instinctively use the system, not necessarily by need, but by empathy or desire of use, derived from the sense of objects and significance of the moment, can help designers, if not to control the users’ experiences, to at least contribute to make users enjoy, fall in love with the journey and build narrative memories.

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