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Smart Solutions, “Smart Aesthetics”?

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Abstract: Smartness is generating several new contentions in terms of pragmatic aesthetics and interaction design, stimulating a debate on how design and advanced technologies can impact on reshaping human lives and behaviors. Many issues are currently arising not just in relation to the appearance of smart objects or spaces, but also in terms of relational communication, pleasurable experiences, and perception. It’s time to think of what will rule the aesthetic of this new artificial. Thanks to tangible examples of smart furniture, including prototypes and concepts at a very experimental stage, the analysis will help to zoom on Next Design Aesthetics, also based on the methodologies applied while delivering a course on Smart Solutions for domestic environments within a Design School. However, the chosen examples will support our assumptions, clarifying how technology should be increasingly integrated in contemporary lifestyle, though never overhanging human nature.

Keywords: Smart Solutions, Aesthetics, Internet of Things, Smart Aesthetics, Interaction Design.

1. Introduction

Is the implementation of smart solutions in functional objects of common use leading to the definition of a new branch of aesthetics? Is the semantic value of the adjective “smart” so relevant that a new focus on what is currently arising in terms of emerging technologies is so increasingly needed? Heading to a definition of Smart Aesthetics requires a first focus on the general meaning commonly granted to the adjective “smart”. Indeed, besides being a synonym of “intelligent”, “clever”, “quickly”, “neat”, “technological”, “stylish”, it seems relevant to highlight also its specific connotation of including all these multiple meanings at the same time, enhanced by the powerful impact of a mnemonic acronym dating back to the specific context of business English of the 80’s.

It was almost consequential that, across the years, the term easily shifted also to electronics and technology, becoming now increasingly related to specific contexts and solutions, that will be further analyzed in this paper. These premises imply that a rhetorical approach to what led the authors to relate the adjective smart to the world of philosophical aesthetics should be provided. Briefly looking back to the history of modern and contemporary aesthetics, it is possible to underline how the field of such a now openly multifaceted and multilayered discipline has gradually expanded up to include several aspects of everyday life. What we refer today as *Aesthetics of Everyday Life* traces back its roots to the context of late twentieth-century Anglo-American aesthetics, which represented itself a new frontier of a discourse, redesigning the outlines of its modern and then contemporary domain. Considering the term aesthetics as a synonym of philosophy of art or not, was indeed a real issue for several years, and finally acknowledging that the scope of the discipline could easily overtake the border of the art world, expanding to whatever is pleasurable even in everyday life, certainly marked a turning point for the whole Western culture. Eastern cultures in general do have instead in their roots a strong heritage in retracing beauty and pleasure in whatever aspect of life, so that aesthetics does not even need to be organized in a structured rhetoric, contrasting then the clear separation between fine arts and all-that-is-not- fine arts, that has so strongly characterized the history of the West, as deeply analyzed, for instance, in *Everyday Aesthetics* (Saito, 2007). A true consolidation of such an expansion of the aesthetics' boundaries throughout everyday life is provided by analyzing mainly the concept of aesthetics in terms of experiencing objects with aura, as stated by Thomas Leddy, while recalling the concept first expressed by Walter Benjamin already in the 30's. Since Western culture seems to be ready to accept openly such an expansion of the semantic area of the term, the link between this philosophical discipline and everyday life officially deserves the attention as a challenging topic of research. However, it is broadly recognized how all contemporary studies in everyday aesthetics derive their inspiration from John Dewey's pragmatism, as expressed in *Art as an Experience*, first published in 1934, where the term "aesthetics" was directly associated, for the very first time, to "experience" with no specific boundaries or limits, including then those aesthetics judgments that we constantly make in relation to design objects (Forsey, 2012), that consequently inspire to develop a rhetoric of what can be defined as the aesthetics of the smart solution, that is to say, *smart aesthetics*, referring to the experiences generated by emerging technologies and their impact on the inner self, as on communicational and pragmatic issues.

2. Shifting towards an aesthetics of smart solutions

2.1 From touch to gestures: smart aesthetic experiences

Many recent developments in aesthetics studies have then gradually led to bring into line the pragmatic side of each aesthetical experience, stressing then on the importance of the user. One of the most prominent scholars in the field of Pragmatic Philosophy, actively involved in design thinking practices, especially in those regarding interaction design, is no doubt Richard Shusterman. First attaining to Pragmatism through some premises of his analytical aesthetics research, in the middle of his career, around 1980's, he started to develop a research that will turn of great help to justify the need of smart aesthetics today.

"Working with real rather than hypothetical critical discourse exemplifies a fundamentally empirical orientation that I later found repeatedly emphasized by the classical pragmatist tradition. James and Dewey highlight experience not only as a crucial cognitive ground, instrument, and mode of assessment for theorizing, but also as the essential locus for realizing aesthetic values." (Shusterman, 2011)

Based on these premises, reckoning how contemporary design is shifting towards the world of smart solutions, integrating objects of common use with the most innovative technical breakouts, generating what is now widely renown as *Internet of Things* or just *IoT*, shows how focusing on some different aesthetic paradigms and a consequential analysis of such a challenging frontier of design is now arising as a pure necessity. "All these smart and intelligent devices raise the question of how we will be able to relate to all this smartness" (Norman, 2014, p.23), and indeed analyzing them further, per different points of views, may help to get a clearer overview of the actual scenario. Which are then the implications, the factors gradually enhancing the determination of an unedited user's aesthetic experiences, while dealing with objects embedded with electronics, software, sensors, actuators and, of course, network connectivity, enabling the objects themselves to collect, elaborate, storage and exchange data? And which are, at the same time, the reactions of the users, so often stimulated by these new aesthetics experiences, while relating themselves with an environment now about to be entirely redesigned in terms of space, shapes, materials, communication, services? Are smart solutions really requiring the attention of further studies in terms of pragmatic aesthetics to define a new discourse leading to what is likely to be a new branch, such as smart aesthetics? "As soon as a product or a service combines digital technologies, sensors, and network connection capabilities, is ready to get smart" (Brugnoli, 2015), and indeed such a new family of products is generating a new kind of aesthetic experiences, impacting on domestic scenarios both at a technical and at an emotional level (Bengisu-Ferrara, 2015). Inquiring about the power of objects to redesign environments and behaviors may nowadays appear redundant, as a conspicuous literature exploring the impact of physical things on societies, lifestyles and emotional responses, in terms of philosophy, semiotics and more recently aesthetics, already attests the importance of design in reshaping lives as well as economy. From Flusser to Maldonado, from Buchanan to Latour, considering functional objects as powerful tools to reshape the world, to the point of defining design *Politics applied to things* (Latour, 2008) has been gradually legitimized. And if exploring how the perception of traditional design objects has deeply impacted in terms of aesthetics experiences, encoding now new attitudes, new feedbacks, new gestures, new communicational issues, moving forward towards the implications generated by the *Internet of Things*, is inevitably arising as a new consciousness, as well as a new necessity, to be considered on a double perspective: that of *Digital Natives* - our students - and that of *Digital Immigrants* – those not born in the digital world, (Prensky, 2001). It is widely acknowledged how digital revolution has redesigned contemporary societies, translating information and emotions into signs. A process already started with the invention of the first personal computer and still on going. "The transformation of objects into signs has been greatly accelerated by the spread of computers" (Latour, 2008, p.4), but the turning point of what we can call, referring to smart solutions, kind of a second phase of digital revolution, is now mainly represented by such a shifting from the physical "touch" into "gestures", with all the implications regarding the impact on users' body as well as mind. From the traditional paradigm of seeing-reaching-grasping and its step forward that led to the aesthetics of the touch, we are now heading to a challenging aesthetics of smart solutions, implying mainly hand gestures, like simply waving, empowered to activate or deactivate tools and systems. This could be a brief overview of what we will be literally experiencing in the upcoming years, while currently updating functional objects to a full digital era.

However, if several issues regarding the interaction between individuals and design objects had already arisen in what we can refer to as the old-fashioned world, challenged by the implementation of screens, monitors, displays, already turning interfaces into a stage where all the interactions between users and objects take place, opening new doors of perception, as well as ergonomic bridges to action, recalling what Giovanni Anceschi said already more than twenty years ago, so now it's time to move even further. It is now considered as an evidence that designing not just the object,

but also its interface, is part of a 360° design project, in line with the principles of visual design, as attested since 1991 by the full expression *interaction design*, first launched by IDEO co-founders Bill Moggridge and Bill Verplank, to refer to “the whole creative thinking generating the interactive experience between user and object/machine, (user experience) following up to a human-centered approach” (Ferrara, 2015). Indeed, it is appropriate to remind “where would we be without the graphical user interface GUI, with its desktop metaphor of files” (Parsons, 2009, p.111), how would we interact properly with phones and tablets, now inseparable mates framing thoughts and sharing of our everyday lives?

Richard Shusterman, for instance, is applying the principles of pragmatic aesthetics to interaction design, developing his own branch of researches in relation to an emerging interdisciplinary approach, rooted in philosophical theory, that he called *Somaesthetics*, aiming to an “integrative conceptual framework and a menu of methodologies not only for better understanding our somatic experience” (Shusterman, 2013), also in terms of bodily perception and interaction. So, how do emerging technologies impact on clinically healthy individuals? Is a smart user experience valuable in terms of personal welfare and pleasurable interaction?

2.2 Investigating body-mind comfort of a smart user experience: ideations and outcomes of a didactical approach.

Human mind is such a complex and sophisticated system though relying on basic associations and combinations of visual and non-visual stimulations, able to activate what we commonly call emotions. Experiencing different emotions and filing them according to pleasurable and unpleasurable responses plays a big part in the process of knowledge and in the intriguing relationship human beings engage daily with space. While designing new objects, embedded with emerging technologies, to let them not being immediately rejected by potential users, the role of metaphors, for instance, reinforcing the link with existing shapes, rituals or kind of traditional/common behaviours can accelerate the process of integration in everyday life in a sort of process of *re-mediation* (A. Beyaert-Geslin, 2015), literally resizing and customizing, while undergoing through a kind of a process of redesign.

“Metaphors have been the focus of psychological and linguistic research for some time and it is agreed that these linguistic figures are fundamental elements of speech and not just poetic devices” (Bottini, 1994, p. 1241)

In their generical meaning, indeed, metaphors can really work as precious activator of appropriation processes, in terms of acquaintances with anything new.

“The comprehension of new metaphors is a complex cognitive accomplishment, involving contextual analysis and the identification of similarities among realms of experience normally considered dissimilar” (Bottini, 1994, p. 1241).

While training design students, for instance, during a course entirely devoted to smart solutions for domestic environments, still referring to a standard methodology applied in product design, the evocative power of metaphors helped to challenge the whole creative thinking, unlocking ideas likely to turn into projects and eventually prototypes-to-be. Briefing students with three/four potential scenarios, having them set some personas to refer to, encouraging benchmarking and a mood board research, brainstorming and discussing how to make technology look cosier and appealing in relation to archetypes and existing iconic objects, payed off with interesting results showing how new generations outline the current shifting towards these new arising world-reshaping solutions. This has been the core of the essential guidelines defining the methodologies applied by authors during a

course recently delivered at the Design School of Politecnico di Milano, effectively integrated by the lectures provided by professional designers, companies' CEOs and experts researching the influences of light, sound, sensors, waves on human body and mind. Smart users experience inevitably impact differently, but if the gap during the transition from the old to the new is filled with references recalling traditional schemes and any kind of already well-known solicitations, then the acceptance and the experience itself turn inevitably less extraneous and much more comfortable. Students were often encouraged to submit surveys and gather information to produce statistics and tangible analysis of needs, expectations, and desires, that inevitably showed how unlocking the versatile potential of smart solutions could turn even more effective if based on something capable to evoke a world of reference. The returns provided by the design companies involved in such a challenging strategic didactical approach, confirmed these general attitudes detected. The intent of briefly illustrating this didactical experience is that of linking it to the considerations expressed by Norman in 2013 about human centred design and the design of everyday things, referring not just to the ideation process usually attained by design professionals, but also by design students. Stressing then on the importance of training new generation of designer to think strategically and critically, "developing a going wide attitude" (Frii Dam; Yu Siang, 2016) in terms of concepts and outcomes during the ideation process itself.

"One of my concerns has been design education, where the focus has been centred too much upon craft skills and too little on gaining a deeper understanding of design principles, of human psychology, technology, and society." (Norman, 2013)

To provide a tangible reference to the mentioned course, we include the images and a brief explanation of three of the projects realized by four groups of three students each to apply emerging technologies to a baby's product design scenario, defined as *Cradle-Pod*, where anthropological and ethnographic archetypes, as well as past memories, fused with smart solutions, stimulating an argumentation also in terms of smart aesthetics. The first one, named *Nuage*, shows the challenge of embedding advanced technology within an archetypal shape, such as that of a ceiling- hanging cradle, now endowed with a decoder of a baby cries, set to send notifications straight to a smartphone in case of specific needs and to activate white noises to calm down and relief the baby in case no external intervention is required. The attempt of the students was that of integrating and embedding technology to turn all the new functionalities into a sort of discrete and non-altering plus, encouraging the use, rather than intimidating and discouraging.

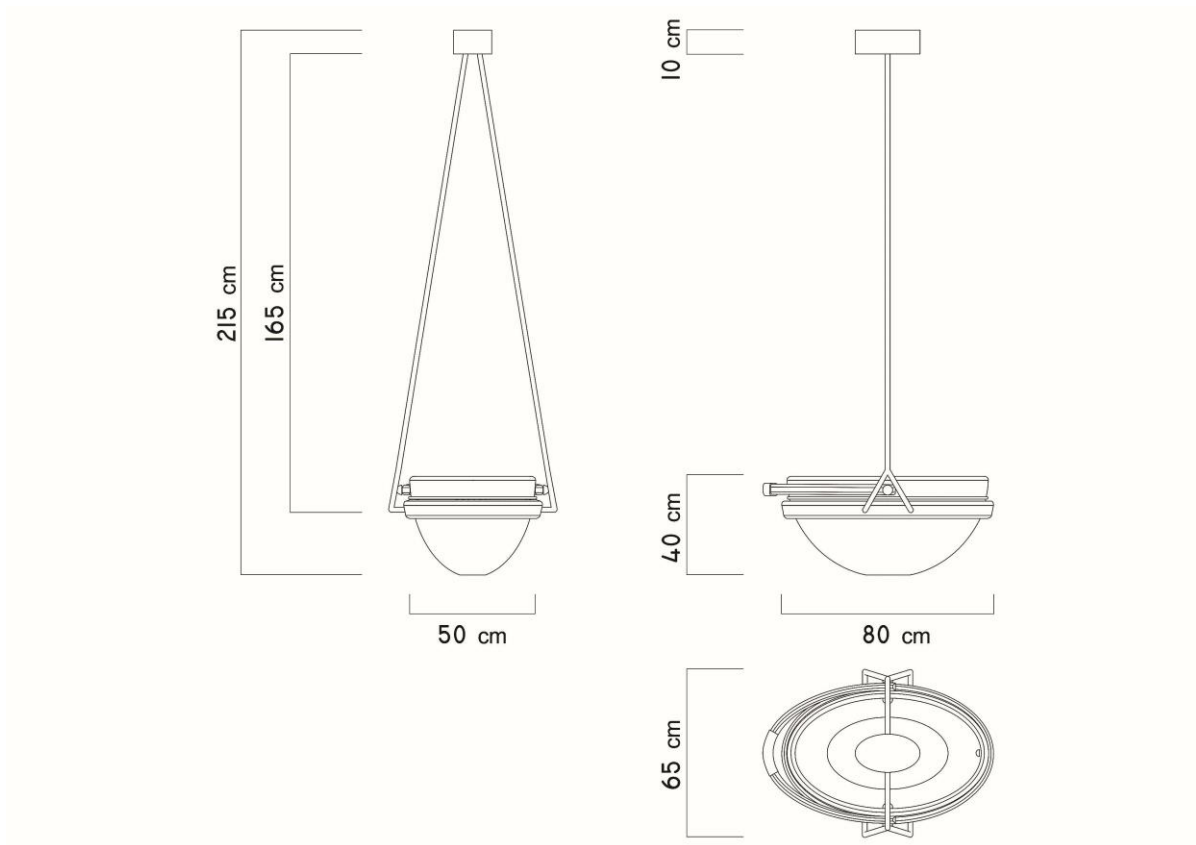


Figure 1. B. Boccoli - C. Tessari - M. Viganò, *Nuage – Ceiling Hanging Cradle – Technical Drawings*, 2016



Figure 2. B. Boccoli - C. Tessari - M. Viganò, *Nuage – Ceiling Hanging Cradle – Render*, 2016

The other project we decided to include in this paper was named *Coozy* and, taking inspiration from vintage wooden stackable toys, it consists in a kind of modular robot-shaped led lights source and projector to calm and entertain the baby along different phases of their first years of life. It produces also white noises and it is easily rechargeable thanks to a system of conductive magnets, though each module can be recharged also a part. The materials suggested for the realization are silicon rubber, polycarbonate, and wood. In this case the students tried to accomplish the goal of creating a smart toy, likely to grow up, due to its modular essence and multiple performances, just as kids do, that’s to say with white noises and lights at a toddler stage, to a projector to entertain children further on in their first years of life.



Figure 3. A. Pettenuzzo - E. Spadoni - S. Tartaglia, *Coozy – Multipurpose Smart Modular Robot* - 2016

While, thanks to another project, called *Mushrooms*, a smart set of connected objects: *Mushroom L*, detecting what goes on in the room where the baby sleeps, eventually emitting white noises and warm lights to reassure and calm down; *Mushroom M*, informing through blinking alarms when the baby wakes up, easy to be positioned almost anywhere, thanks to a sucker, and *Mushroom S*, to be situated in the cradle to measure body temperature and monitoring the heartbeats, students explored how *IoT* can turn into a domestic scenario, likely to be part of everyday life in less than few years.

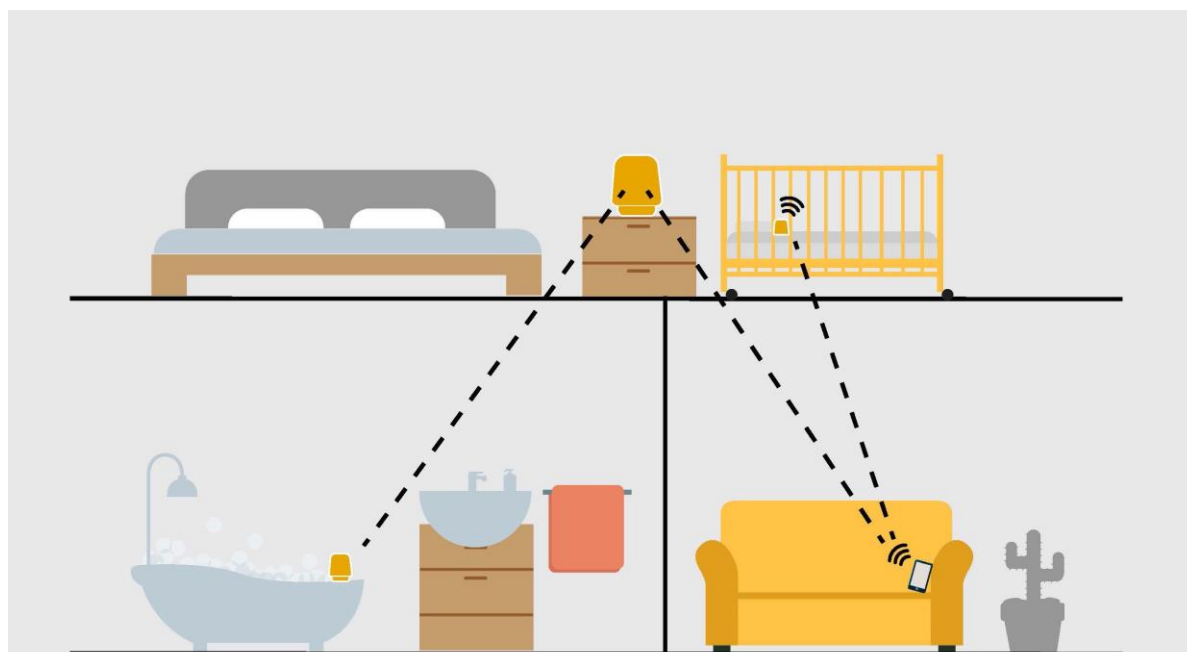


Figure 4. A. Bettega – M. Fancellu – A. Fumagalli, *Mushrooms – Smart IoT set*, 2016

Such a didactical experience shows the increasing awareness by young generations towards issues related to wellness in terms of body and mind comfort to be provided since the very early stage of human life. All these outcomes can but foster new aesthetical studies as well as new pragmatic implications in relation to the end user, the baby, in the given cases, but also to the mother.

3. Behind Smart Aesthetics: Smart Design Thinking

If metaphors can help to facilitate the integration of smart solutions with daily life, to explore further products and user's behaviours, we need to focus on what lies behind these physical things in term of current smart design thinking. We decided to zoom then on those design studios/companies already defining concepts and solution in relation to the IoT contexts to investigate further the ideation processes and the design of products looking as true pioneers in such a new smart scenario. Our attention was first captured by San Francisco Fuseproject design studio, founded by Yves Behar. One of Behar's most recent products, the smart cradle Snoo, inspired our students for the ideation process of the Cradle-Pod concept, confirming how innovation should anchor its roots on a solid ground of not just archetypes, but also organic referential forms. Reproducing a womb-like motion, Snoo rocks back babies to sleep if crying, just calming them down. The presence of microphones, sensors and speakers embedded in its structure do not interfere with the warm and baby-custom comfortable space, though helping to turn a functional object into a smart pod effectively nursing a baby. Also, the fact that Snoo doesn't recall a traditional robot or piece of technology was made on purpose to naturally blend into the cosiness and warmth of a baby nursery. This perfectly illustrates the case of *présence formelle* -formal/physical presence -and *présence fonctionnelle* - functional presence - (Beyart-Geslin, 2015, p.428), characterizing machine and robots in general reproducing features and functionalities of humans as well as living organism in general, that only humanoid robot tend to unify completely in just one entity, hybridizing then the concept of living and non-living objects in which can be usually divided all the physical things in space, humans beings included.



Figure 6. Yves Behart - Fuseproject Studio, Snoo Smart Cradle, 2015

Apparently, since the very beginning of the ideation process of *Snoo*, Fuseproject product designers clearly defined the concept of a product parents would trust, so that it had to be minimal yet substantial, natural and honest (Fuseproject, 2015), in that sense its design was to be high quality-refined, able to embed its multiple functionalities in its structure, avoiding any over technical kind of perception, encouraging its use not in terms of advance robotics breakthroughs, but rather on the highly to be trusted ability in creating a cosy a warm environment without replacing human elements. The problem of trusting or not a technological advanced object, especially if conceived for babies, is one of the most difficult challenge to overtake while dealing with innovation. Apparently, all originates from the fact the humans do not feel as being any longer the masters in dealing with the object itself, as ignoring what hides within, as first detected by Abram A. Moles already in the late Eighties. This issue started to concern philosophers analysing science and technology issues already more than thirty years ago, at the very beginning of the mass digital era, and it got bigger in relation to the evolution of the mechanisms and then software getting increasingly sophisticated. Luckily, the advancements also in terms of interaction design, as “people’s use is what interaction design shapes digital things for” (Lowgreen, 2016), have enormously facilitated the acceptance of innovative solutions and smart products, also converting all the challenging researches about usability, human factors engineering, ergonomics and psychology in a common focus on user experience. And as already reminded, since when John Dewey first associated the word experience to aesthetics, a new path was opened in terms of philosophical discourse. A proper rhetoric of smart aesthetic will be organically structured only when the diffusion and then the use of smart products (of course besides smartphones and similar objects, already belonging to kind of a separated category themselves) will spread around almost entirely replacing the non-smart physical world. In the meanwhile, we can only explore with a keen eye on innovation and smart user experience what is currently going on, encouraging design students to embark on this new path. Another example of

integrating smart solutions within a domestic environment, only at an experimental phase yet, is provided then by Italian design company *Falmec* that has recently shifted to smart light design, air purifiers and ionizers, currently developing new solutions to integrate in a smart home ecosystem. After redesigning the traditional concept of kitchen hoods, now turned also into a fully decorative piece, hybridized to perform multiple functions, *Falmec* is investing in *IoT* to create cosy ecosystems to interact effectively with users, turning the purification of a domestic environments into a custom refined full experience, where sensors, algorithms, and mobile apps help users to get to monitor every aspects, interacting with other smart products and also with platforms, managing the entire home environment (i.e. Apple Homekit or Google Home). Of course, it will be possible to analyse more in details such an innovative solution, once put on the market.

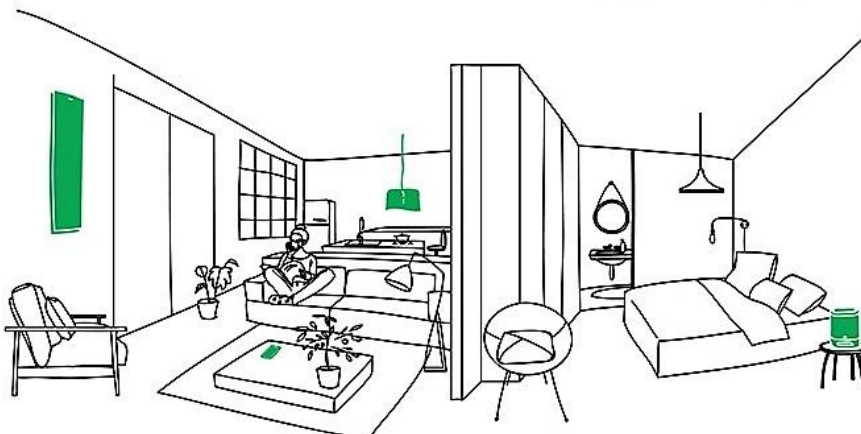
The examples provided aim to zoom on what is currently on, and on different stages, in terms of implementation of smart solutions in the world of product design in the specific context of domestic environments. It's lighting a fire on an emerging field likely to booster further studies in terms of aesthetics and pragmatics, embracing also the challenging field of *smart materials*, equally responsible of generating a new shift in redesign and perceiving reality now taking shape around us today. We refer to all those designed materials, such as *shape memory materials* for instance, *halochromic materials*, and *augmented materials*. This is just the first step of what we think is due to arise as a new branch of next aesthetic landscape, in which methodologies and approaches in term of design, as well as critical studies, are currently being tested. We just wanted to open a door, starting exploring what will become increasingly present in the upcoming years.

Falmec Connected Air Interaction Design Proposal

The idea behind this proposal is to integrate Falmec products as part of a smart home ecosystem. The objective is to create an air purifying experience that is focused into users user needs and behaviours using innovative functionality and technologies.

Using the functionality already embedded and implemented new sensor and innovative algorithms it is possible to refine the Falmec experience creating an ecosystem that works not only as an air purifying suite but as complete house monitoring solution.

Through the use of the mobile application users have the ability to control every aspects of the experience and receive relevant, timely and predictive notifications that improve user's everyday life.



Home Monitor
Predictive
Scalable
Personal

Figure 5. *Falmec Connected Air Interaction Design Proposal*, 2016

What deserves attention in such an arising landscape of smart domestic solutions is no doubt the openly and well-declared aim of generating new, desirable full experiences.

4. Conclusion

Design is definitely changing, due to one of the most radical shifts of modern era, and designers themselves are getting more concerned with contexts rather than just focusing on single objects. The new generation of designers, is indeed more conscious and critically engaged in creating products and systems aiming to provide users with psychological and physical wellness. Relieving body and mind, improving lifestyle standards and implementing new pleasurable experiences looks as the core of contemporary design research, and once more this highlights the need of speaking in terms of *Smart Aesthetics*, while referring to such an interactive sphere now about to embrace everyday life. In a time of changing paradigms, aesthetics has to respond to a call and start detecting what is happening in terms of perception, awareness, reactions, involvement, language, habits, usability, behaviours, relationships, identification, pleasure and emotions. If designers are, accordingly to the classification provided by Norman Potter, “culture diffusers” and “culture generators”, (Potter, 2002, p. 12) even in the middle of “l’age transesthétique” – the trans aesthetic era (Lipovetsky-Serroy, 2013, p. 25), their role in changing the world has to be increasingly central, versatile and at least as smart as the new arising paradigms. We wish that cross-field studies may be implemented shortly to start analyzing directly how smart solutions can impact on clinically healthy individuals, to explore further these new arising frontiers of next aesthetics and next design.

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