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REDOING Narratives & the Role of Designers
Room 3.21 // Thursday 1 June // 10.30-12.30

Title	Presentation
REDOing Design Education: A Framework Proposal for a new Value Creation Process	Nicola Morelli and Amalia de Götzen
Designing Garments to Evolve Over Time	Vibeke Riisberg and Lynda Grose
New Visions and the Designer's Role in Strategically tackling Complex Problems and Conceptualizing Holistic Sustainability	Susan Evans
Learning through Disruptive Interactions	Circe Henestrosa and Harah Chon

REDOING Materiality & Intangible Design
Room 3.6 // Thursday 1 June // 10.30-12.30

Title	Presentation
Design Thinking in Practice - Introducing Design for Renewing Bank Services	Justyna Starostka and Per Richard Hansen
Introducing Designing Attitude in Dementia Care	Anke Jakob, Cathy Treadaway, Lesley Collier and Fiona Fowler
Exploring Situated Making in Media Technology Education	Linda Paxling
Wandering Eyes: Reframing Ethnography and collecting Hints for the Design of Products and Systems for Domestic Environments	Margherita Pillan

Wandering Eyes: Reframing Ethnography and collecting Hints for the Design of Products and Systems for Domestic Environments

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Abstract: The role of ethnography in design is amply recognized, especially in the creation of innovative solutions, such as those requiring an active involvement of final users, and in the creation of digital products and services. On the other hand, observation on field is a delicate activity that, to be fertile and inspiring, requires empathic connection with the context, and no anxiety to get to conclusions.

The paper discusses some critical factors of teaching and performing ethnography in design, and proposes an innovative approach suitable in design and education. It also reports the design insights produced by an extensive observation of human behaviours in domestic environments, aimed to investigate daily activities, and based on this approach. The research focuses on functional and emotional/affective factors of experience at home; it also investigates attitudes and values of Italian users with respect to technology based innovation. The results refer to the realm of home automation.

Keywords: Design, experience, ethnography, interaction design, home automation

1. Introduction

In the design of innovative products and services, the observation of user behaviours in real contexts is recognized as a basilar and an important activity, aimed to investigate user needs and local constraints, and, in the time, the topic has been amply investigated and amply discussed in literature (Rogers, 2011). Authors such as David Benyon (Benyon, 2005) recognized that, in order to orient and inspire the development of innovative products and services, designers can focus on selected typologies of users (i.e. travellers, retailers, scholars, ...), on contexts (working spaces, hospitals, homes, etc.), and also on single activities

(reading, writing, cooking, driving, and so on). The identification of needs and constraints through research and ethnography in rea, and their representation through design tools such as personas, user journeys and others, has been practiced since decades (Cooper, 1999), but the real effectiveness of this approach should be better discussed and analysed on the base of experience, so to update and improve of design methods and techniques.

Design oriented ethnography is fundamental for design: designers should perform observation on field when they deal with contexts they are not familiar with, so to create solutions that are suitable and meaningful with respect to the constraints, needs and values of the context itself. Ethnography provides evidence based insights about specific contexts, behaviours and cultures, and it is a key research activity that can be used both in preliminary project phases and in subsequent activities so to prove hypothesis and intuitions. From the point of view of education, ethnography supports students in understanding the variability of human attitudes and cultures, so broadening they design perspectives.

The aim of improving the techniques apt to investigate people needs and attitudes can be very important in the design of technology based products and systems that are intrinsically disruptive, such as those dedicated to home automation. The development of useful and desirable innovative solution in fact, requires the understanding of the main factors influencing the final experience produced by their use, and the ability to predict the final level of appreciation in terms of practical advantages and overall satisfaction. For this reason, ethnography in the design of interactive and digital products and services should not only be aimed at the detection of needs that could be solved by some technical inventions, but also should focus on the understanding of the tacit and implicit processes that are related to activities and behaviours, also revealing individual (cognitive and emotional) and social dimensions of experience.

Based on several project and education experiences (Pillan 2012, Pillan 2014), I developed the awareness that observation of behaviours in real contexts is indeed a difficult activity, and some recurrent phenomena can severely affect the final results. The critical issues can be resumed in terms of:

- **Correct attitude of the observer toward the context.** In order to collect suitable information about contexts and users, ethnographic observations require the capability of the observer to get free of prejudices and stereotypes, and to develop an open attitude toward the situations "as they are" and not as they can be already framed by previous storytelling or knowledge. As an instance, in the design of solutions dedicated to elderly people, prejudices about lifestyles and attitude of ageing people can severely influence the observation of real behaviours, so producing misleading results, more based on clichés than to real information.
- **Open mindedness with respect to diversity.** Designers carrying on ethnographic research should be aware that observation activities can elicit emotions in the observer, especially when values, culture and strategies of action of the observer are different from those of the subjects under observation. The ability to collect suitable information and design hints and inspiration is directly related to the ability of the observer of suspending evaluation and judgement during observation, as it has been amply investigated by Sclavi (Sclavi, 2003). In order to deal with this unavoidable and intrinsic difficulty, empathy and sense of humour should be part of the observing practice.
- **Ability to deal with complexity and contradictions.** In order to obtain suitable information about people attitudes, values and habits, the

observation on field should embrace the fact that, very often, there are gaps between intentions and behaviours, and between declared values and factual actions. Indeed, we can learn very much when we can detect contradictions and further investigate them. As an instance, we can learn much if we investigate the reasons why a user neglects to use a product, or uses it in a peculiar way, despite the fact that he or she appreciate its characteristics.

- **Attention to details.** The ability to discern *information* from *noise*, and to distinguish useful data and significant trends from anecdotes and peculiarities, is a very critical and important one. All human being tend to 'see what they know' and to pay attention to what they recognize (Ware, 2008); the ability of collecting hints through the observation of subtle and feeble signs is a complex task requiring education and practice. In some cases, extensive observation involving data significant from the statistical point of view can produce suitable results, such as for the unobtrusive remote observation of use for mobile apps. But statistical data are seldom collected in physical environments and usually they focus on pre-defined variables under exams. In physical environments, the attention to details can produce knowledge that cannot be otherwise generated, and that in not included in the expected phenomena.
- **Efficiency of the process.** Observations on field are time consuming, require organization, dedicated facilities and the involvement of skilled experts. Furthermore, very often it is difficult to organize observations in real contexts, such as public spaces (retail stores, stations, hospitals, transport facilities) or private ones (homes) without interfering with activities so not to alter the normal processes. While contextual design research should be carried on with ample resources in terms of time and means dedicated to observation, in my experience, the actual resources dedicated to research on field are very limited both in professional practice and in education experiments. Quite often, information about user behaviours and attitudes are obtained as a "second hand" information, or are simply based on common sense and personal experience. I argue that the lack of first-hand knowledge reduces the creative potentials of a design process and increases the risks of developing a non-adequate solution.

This paper aims to give a knowledge contribution useful in dealing with the criticalities mentioned above or, at least, with some of them, both in teaching and in the design practice.

2. Ethnography and digital design

Between other fields of application for the design of digital solutions, the realm of products and services for domestic environments is presently demonstrating an interesting vitally, after several years of false starts: the progresses of AI based solutions, and the development of systems for seamless automation of personalized environments, open new perspectives, while the design of technology-based products and services attracts new interest.

Digital technologies and IoT –Internet of Things facilities can be used to support more sustainable and convenient lifestyles, to allow a more effective control of the use of energy resources and better comfort, to provide solutions for independent living of people with special needs, to produce new forms of aesthetic and functional qualification of the domestic environments, to integrate entertainment

and personal communication and information in responsive spaces, to allow remote interaction with objects, people and spaces. On the other hand, the history of the design for home automation in the last decades demonstrates that it is not trivial to invent technology based desirable and appealing systems for the domestic environments: it is not sufficient to add "smartness" to a refrigerator and connect it to the web to make it better and meaningful; few people really want coercive domestic appliances taking care of our diet or, at least, very few want them in the way we can design them now.

As discusses, between others, by Don Norman in his book The Design of Future Things (Norman, 2007), the design of the interactive features of products for daily use and of the automation of the contexts we live in require intense experimentation and critical thinking about the future scenarios. Anyway, technology based products and services appear progressively more capable to respond to both practical and non material requirements of users, and designers need to develop new knowledge and skills so to better exploit the creative potentials of digital systems.

In the present state of the art of interaction design, ethnography provides insights about local and global cultures of living and lifestyles so to produce design principles to orient the design of innovative products and systems; it also provides helpful information to develop and optimize specific solutions in terms of usable and desirable innovation. For these reasons, the issue of upgrading and making more efficient ethnography in design is meaningful for the design education and profession.

In the following of this paper an approach to ethnography at home is presented. The approach is focused on the investigation of the tangle of emotional and cognitive processes that compose user experience and not on user practical needs. In order to fulfil the goals, designers performing observation on field should be trained with respect to the specific competences of design for experience; they should own knowledge about emotional and cognitive dimensions of activities e decision making and they should be aware that ethnography research is a complex activity, also eliciting emotions in the observers and engaging them in terms of performance and more. Furthermore, the approach is based on the assumption that, in order to produce meaningful results, ethnography must be carried on with no explicit finalization and with no anxiety to obtain immediately good solutions for design. In other words, ethnographic observation must be addressed toward an alternative goal, so distracting the designer performing the observation from the temptation to achieve to early conclusions, and to not reduce his/her ability to harvest information on field with an open mind.

The approach was tested in an education experiment involving almost one hundred students in a university course of Interaction Design for the students of the third year of the Bachelor at the School of Design at Politecnico di Milano. This activity produced a large harvest of materials, also including pictures and video, documenting behaviours and habits in domestic environments. The analysis of the so collected documents demonstrated the fertility of the approach and produced several hints inspiring the design of innovative concepts, out of the schemes of the existing solutions. Furthermore, it produced some general insights about lifestyles values that characterize the Italian culture of living at home, so producing knowledge to orient the development of innovative products and services.

3. Collecting evidences of experience at home

In the spring semester 2016, I involved the students of my course on Experience and Interaction Design in an experimental activity aimed to verify the assumptions of this approach and to collect information useful in the design of technology based solutions for home.

The key factors of the here reported experience can be expressed in terms of the following goals:

- perform experiments in order to understand how to conduct observation on field with low impact on normal procedures and ways of act;
- collect information on the user experience related to daily in its complexity, i.e. including feelings, attitudes, affections involved in gestures and tasks, and in the interaction with domestic spaces and objects;
- separate the act of observe activities in real contexts from the process of generating new design concepts;

As a preliminary preparation, students received lectures on design for experience (also referred to the framing proposed by Forlizzi, 2004 and Gorp 2012), on interaction design, and on models of emotional and cognitive processes provided by brain scientists such as Kahnemann, and Panksepp (Kahneman, 2012; Panksepp, 2012).

The lectures and discussions evidenced the connection between conscious and non-conscious evaluation processes and emotional arousal (Sclavi). IDEO cards were also presented as a practical tool orienting observations.

In the experiment, the students were asked to form groups of three members and to focus on one single simple activity between those taking place in common domestic environment. The list of proposed activities included tasks such as "getting ready to go to bed", "preparing the list of goods to buy", "managing the laundry", "leaving home", "entering home", "making gymnastic" and so on. Each student was asked to perform observation individually in his/her personal home or in a domestic context that was familiar; after the observations, the members of the group met to compare and discuss the different results so obtained and to produce synthesis. Students were free to organize their activity in the way that appeared more convenient for them and less disrupting for the observed subjects, ranging from tacit and non-interfering observation, to video-reporting. The observer could develop a dialogue with the users under observation so to ascertain feelings and attitudes, or could also ask the observed subjects to express their flow of thinking during activities.

As a very important characteristic of the process, students were asked to document and report whatever attracted their attention or produce any emotional effect on them, without any worry to be out of focus in the observation, and, mainly, without any haste of getting any sense out of it.

From the education point of view, the experiment was successful: the students declared that it was useful and that it helped them in understanding the complex tangle of values, emotional reactions, cognitive processes and so on that are involved in the daily activities we perform in an automatic or semi-automatic way.

I argue that revealing the real complexity of experience related to a task or activity is an important step to produce valuable design inventions.

The experiment, as some student declared, was also useful in enhancing their personal sensibility and ability to *listen* and *see* the world, and recognize some little signs as meaningful.

4. Formatting rules

The above reported didactical activity produced a great quantity of documents that were successively analysed from different perspectives; the analysis produced results in terms of:

- information useful in a discussion of the approach adopted in ethnography and to improve it;
- hints concerning specific activities, also apt to inspire the creation of innovative products and services;
- knowledge of general interest concerning attitudes and values of inhabitants of domestic environment in our local contexts, useful in the development of products and services for any purpose in domestic environments;
- insights on lifestyles and local culture of living at home, useful in the investigation of motivations and needs that could find suitable response in the development of solutions for home automation.

With respect to what we learned about the approach adopted in the process, an important result of the experiment concerns the role of empathy in the relationship between designer/observer and observed subjects. In the education experiment, we proposed to the student to conduct observation either in their personal home or in the one of somebody they were familiar with mainly for practical reasons. As it possible to observe in the videos documenting the observations, the confidence and familiarity between observer and observed subjects made more natural the process, and most of users shadowed in their activities appeared willing to expose their activities and thinking, and to share habits and feelings.

Ethnography at home is unavoidably intrusive, but, from what we learned, the preliminary construction of an interpersonal relationship between observers and observed subjects, based on trust and empathy, could provide the ground for more effective research.

The collected materials are a rough but fertile source of inspiration and reveal unexpected facets of the experience, even when the observations focused on very simple tasks.

As an instance, I report here the results concerning the observation focused on "making and using the list of goods to buy". The documents dedicated to this very basic activity, as expected, evidence a variety of different behaviours; some people regularly include in their routine the compilation of a list of goods for domestic consumption, (such as food, detergents and so on); some, instead do it as they notice that stocks are going to deplete; others do it as soon as things come to their mind; others never take note of missing items and simply prefer to remember, only to regret not knowing what to buy when they are at the supermarket. Besides the obvious findings, the observation provided other findings such as that the act of compiling the list of goods to buy, in several families or in some groups of roommates, is an activity that follow rituals and is an opportunity and pretext for social interaction. While making the list, parents talk with children about wishes and expected moments of pleasure, or they discuss with them qualities and criteria of choice for goods. With older sons and

daughters, or in non-parental cohabitant groups, the compilation of the list is intertwined with all the possible dynamic of social interaction and reflects roles and rules of living together. Both, in families and other typologies of cohabitant groups, the conversation about the goods to buy is intertwined with the exchange of news about personal events and programs, and with the playing of social organization within home, revealing a situation much richer than one could think for this practical task.

On the other hand, "compiling and using a list of goods to buy" is an activity involving memory and planning abilities and, therefore, especially for ageing people, it is often accompanied by different concerns about the capability of keeping under control the tasks of daily life as a sign of personal performances. In other words, the simple task of compiling the list of food items that should be bought is often related to some symbolic dimensions of experience, and with the sense of self and of the role played with respect to social relationships.

For some observed people, the mere act of compiling a list is capable to re-frame the shopping as a tedious accomplishment instead than an opportunity of enjoyment.

Despite the triviality of the example, I consider it as relevant and I argue that the development of every innovative product or service to be used at home should be carried on considering the complex tangle of symbolic and social values that are connected to each activity performed at home. In last years, several technology-based solutions that appeared as promising from the point of view of practical functions, instead encountered refusal of users. In my opinion, in several cases, the new solutions, despite their practical convenience, failed to encounter the favour of users because of the implicit consequences of their use on more ephemeral yet important consequences of their adoption with respect to social and emotional dimensions of life. The adoption of some technological solutions has also the power to affect the sense that people have of themselves, and of change the mental strategies of attention and memory. These potential consequences should be investigated and, possibly dealt with, within the design of innovative products and systems.

If we compare these finding with the features of some smart appliances recently presented in interior design fairs, such as refrigerators provided with cameras to be inspected at the distance through a smart phone so to get the information about the needed items, several of these new products seems not convincing and appear as quite far from actual needs and feels, at least in my country. Still, there is much space to develop other, more meaningful inventions, based on the application of digital technologies, more coherent with need of new value in terms of awareness and control on healthy habits and lifestyles, and responding to the desire of playfulness and pleasure in daily life, based on a deeper and more articulated understanding of the relationship that people have with their home and home-mates.

5. Lifestyle and local cultures issues in the design of technology based innovation

The collection of documents reporting the observations reveals the different dimensions of experience with respect to some other domestic activities.

As an instance, interesting results pertain a bunch of apparently different activities such as "leaving the house", "entering the house" and "preparing to go to bed".

Despite the obvious diversities between the three different situations, each one characterized by different tasks, they all appear to be characterized by intense emotional and cognitive engagement (due to the anxiety of having under control the correct accomplishment of duties and the status of material objects such as the locking of doors and windows). On the other hand, the engagement is due to other factors, less practical and more difficult to frame. Furthermore, despite the variety of attitudes, worries and behaviours exhibited by people with different age and with a different role in the house, most people seem to follow consolidated procedures so to cope with the complexity of "having done everything in the right way".

Also the act of "entering the house" includes emotions and cognitive efforts: it is not only a list of material tasks, such as "opening and closing the door", "turning on lights and heating appliances", "getting free of bags and coats", and so on.

"Entering the house" can be a most pleasurable instant of delight since it coincides with the end of a working day and to the moment of re-entering the shelter of the personal domestic freedom, but can also be a moment of anxiety, since it is the transition between two different dimensions of life, and with the re-assumption of social and domestic affections and responsibility.

We frame as similar these three activities since, for most people we had the chance to observe, they all correspond to a process of change of context/change of state, i.e. with a situation inducing persons to develop strategies of even rituals to sustain them.

Again, from the non-finalized collection of behaviours, we can be inspired so to produce new paradigms of products and services.

From what we learned, there are ample opportunities to create valuable products and services using technologies and to support the management of the functions connected to "opening and closing the house", both for leaving and for sleeping, but, at least for the Italian users, the automation should provide awareness of the state of the single parts of the house instead than provide total blind management by the system.

Furthermore, the systems in charge of safety and security at home could be improved from the point of view of the experience if designed so to include personalization with respect to the social organization of the inhabitant groups.

As a last design hint that I report in this paper, it is worthwhile to mention some interesting results concerning habits and lifestyles of ageing people.

About this topic, we collected information on "spend time at home". The documented activities include knitting, meeting with friends, making gymnastic and so on. As preliminary result, that would need further investigation, several people seemed to share some common factors and, notably:

- the need to have external stimuli to be encouraged, even more time in a day, to be active;
- to have the control on the home environment and daily routine so to have convenient lifestyle from the point of view of wellbeing;
- to have a *steady* domestic environment, where personal memories, preferred objects and overall organization are kept constant.

Again, these non-finalized results appear as fertile with respect to the development of innovative products and system, and to the purpose of understanding how the solutions that are today available on the market should be

personalized and optimized in order to be suitable and desirable for our local users.

The research also produces design knowledge in terms of more general insights that can be used as guidelines for the development of interactive products and services, some of which are here reported.

The approach to ethnography for design at home, based on observation on field not finalized to the development of specific solutions, but focused on single activities is fertile from the point of view of inspiration for innovative concept generation but also from the point of view of critical analysis of the products and system generated for a global market, but that not always are apt to encounter local acceptance.

For all the activities under exam, the research produced information about our local culture of living at home, and revealed the complexity of every single activity performed at home, evidencing that the way we perform activities in domestic environment has implicit yet strong and effective connections with our personal identity and sense of self; with the way we interpret the social interaction with our home-mates, also including affections, roles and practical organization; with emotional and cognitive processes associated to our values, habits and feelings with respect to issues such as privacy, safety, security and lifestyles.

The research also produced the convincement that there are ample opportunities to develop innovative products and system for the Italian users, despite the slow trend in the adoption of digital solutions for home in our local context.

In order to develop suitable products and services for our local culture of living at home, the research point out three different directions for application that seem more promising:

- the remote control of products and spaces;
- the customization of solutions based on progressive implementation of automatic systems, in an approach that consider the constant dynamic evolution of needs and interests that could find a response in digital products and services;
- the development of system that allow the automatic management of functions while supporting a direct control of the state of single elements.

A fourth direction seems to be interesting but, at the same time, appears to need further investigation. It concerns the development of systems to support a better use of energy resources, as an instance of those involved in the management of thermal comfort at home. While the advantages of such systems appear as evident from the point of view of economical convenience and from the point of view of the development of more responsible and sustainable behaviours, it is a difficult design goal to develop control systems and interfaces that could be used to manage this function while ensuring best perceived comfort and acceptable models of interaction.

6. Conclusions and final remarks

From the point of view of education, teaching ethnography in design programs and involving students in dedicated exercises is very effective to the purpose of training their ability of embrace the variety and complexity of the world. On the other hand, design oriented ethnography is a complex activity, requiring time and abilities that can only be partly transferred through a didactical process.

In my research, I learned that the final results of ethnography can be negatively affected when the designers performing observations are exceedingly focused on partial elements of the user experience, or, worse, when they are much oriented to find, here and now, a winning idea (a "killer application") leading and motivating all the following design activities. The haste (or, maybe, the anxiety) of performance distracts the designers involved in research on field from the goal of a neutral observation of people behaviours. In observation on field, we are exposed to a vast amount of information, some of which capture our attention and can be interpreted immediately; some, instead, requires time and thinking before it can be framed and elaborated. The collection of videos and pictures during observation with no finalization, supports the post processing of data and information, and allows the development of non-trivial knowledge and inspiration. The above reported experiments produced useful results and confirmed the suitability of an approach to ethnography for design based on strict separation between the activities dedicated to the observation on field and those aimed to the creation of innovative concepts: "cold" documentation of user experience and research with no finalization can produce specific design hints and general interest insights.

Theoretical knowledge about emotions and cognitive processes is useful in ethnography for two reasons: first: it supports the observation of behaviours and attitudes from a holistic perspective, including functional and emotional dimensions of the experience; second: this knowledge makes designers (and students) aware of their own emotions involved in every phase of the design process, included the research ones. Every design experience is rich of emotions and events for designers, and it requires the ability to confront individual visions and proposals with those of the other actors involved in the project (Trabucco, 2015). This is true both in professional activities and in education project studios. When observation on field is conducted without the haste of producing immediately results in terms of design choices, designers feel free to collect data, information, stories and feelings with an open attitude. They can also focus more on their own feelings and emotions, enacting experiential acquisition about the contexts. The experiments reported above, demonstrated that the materials collected in this way, provide the ground for subsequent design of interactive solutions focused not just on the functional issues, but also on other dimensions of the experience that can determine the desirability of the innovative solutions.

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