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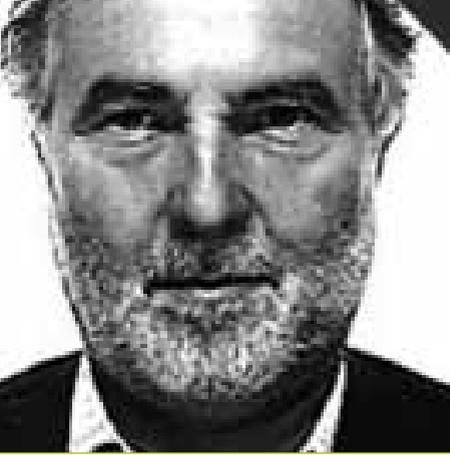
DOCTORAL PROGRAM IN INDUSTRIAL DESIGN AND MULTIMEDIA COMUNICATION

Chair:
Prof. Francesco Trabucco

The doctorate programme final objective is the training of a high profile researcher, whose aim is to develop research either in academic or industrial contexts. Relevant steps connected with such a training are the refinement of analysis techniques, the development of critical abilities, the organisation of an original contribution to knowledge in technological and industrial culture, the proposal of innovative approaches and visions for the theory and practice of industrial design and multimedia communication, the building of increasing skills in research planning, research strategy building and research management.

Aim of the activities carried out in the course is the production of specific researches by the single students. This work is accompanied and supported by the research activity carried out form the students in the Research Units and by crossing activities like classes, labs and thematic seminar.

The doctorate programme is articulated into two directories:

Industrial design

Industrial design, following the meaning adopted within this doctorate, is intended as a discipline acting within the industrial culture and accompanying its transformations. Among its main tasks is to deal with industrial products configuration as well as with all those factors investing the process of shaping products themselves. In this sense, this school specific meaning goes to use, function, social and individual consumption of the products (the functional, symbolical and cultural factors) as to manufacturing (techno-economical, techno-systemically, technoproductive and techno-distributive factors). Through the lenses of such a perspective, adequate relevance is recognised to product planning, service design or further remarkable border areas intersecting different disciplines, such as multimedial communication, technological innovation, firm organisation, management and environmental planning. All themes are expected to be faced with the support of the conceptual tools of research in its theoretical, critical, historical and methodological articulations.

Multimedia communication

On its side, the section of communication design is meant to provide a suitable training to the resolution of complex problems in the field of multimedia communication. The training programme - based on historical, critical, theoretical and planning approaches - will involve the design of communication in any applied aspect:

from the design of interfaces to the design of communication systems (teleeducation, e-commerce, data banks), from corporate image manuals to communicative strategies, from typographic design to the design of icons and signals. The programme contents are expected to face the resolution of visual communication and communication design either with conventional technologies or with multimedia-multisensorial ones.

Trajectories

In the continuity with the activity assumed in the last decade, the complex of the issues investing the theme of innovation will represent the conceptual trajectory of the whole program. The attention to innovation-related phenomena are due to various factors, partly internal to the dynamics of the discipline of industrial design, partly motivated by the perception of the growing complexity of the innovative process, thus fostering in-depth analysis and new approaches which can legitimately be faced within the doctoral programme. Whatever the motivations for the analysis of technological change and innovation, this trajectory of enquiry highlights the factors and fundamental ingredients of the process of development, transition and transformation of industrial products, services and systems. As a starting point a broad view of innovation is assumed, being a dynamic process involving the development or improvement of new products, services, technologies, processes, institutions, systems, strategies. Such an extended view of innovation includes the range of economic and social activities - in areas such as communications, corporate strategies, market dynamics, education, public institutions - so relevant for design action as product design in its strict sense.

The programme, for both industrial design and multimedia communication directories, is articulated into four training trajectories, toward them the research themes should converge, they are as following:
· *Research skills*: learning how to carry on research activity;
· *Research practice*: highly intensive thematic areas where research skills may be practised;
· *Research thinking*: learning how to compare research activity and research culture, how to acquire abilities of competence transfer, how to design opportunities of application;
· *Research outcomes*: producing an original contribution to design knowledge.

Two professional profiles are expected:

Profile A:

· A scholar-researcher devoted to planning research, building a research culture, divulging research and whose main task is to sustain the operability of research in industrial design and communication design, fostering their cultural foundations (inter and extra-disciplinary). Allocated either in academic or professional contexts, this figure of researcher is expected to produce: research knowledge, methodologies and tools, research education, training and updating.

Profile B:

· A high profile researcher capable to identify problems, to select objectives and to detect solving strategies within the industrial context: an analyst for tacit or implicit problems, a generalist for desirable interactions in design solutions, a designer in a wider sense, with specific skills in positioning a design problem in the correct dimension and perspective and whose task is to favour and direct the transition from design hypothesis to design solutions in industrial contexts, exploiting limits, constraints and opportunities.

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THE RELATIONSHIP BETWEEN SHAMANIC CULTURE AND DESIGN
Analysis of the Brazilian phenomenon

Rosane Costa Badan

This thesis is about design in the historical-anthropological field. The hypothesis is that there is an experimental fundament based on the Shamanic practices which shows itself in the Brazilian contemporary design.

The analysis starts from the macro-space of inhabited districts, entering the homes and analyzing the objects. However, the general context is divided into three blocks: the first one involves the indigenous material culture, another regards the Brazilian contemporary design; and the last one deals with the "favelas". The objective is focused on demonstrating that the designer in Brazil is able to put together the Shamanic and Western logics in order to create products full of renewed energies.

In the first moment of the research, I try to demonstrate the indigenous way of thinking. The focus is stressed on the Shamanic experience and cosmology as an essential thing in the structure of their material culture, villages and houses. In this context, myth and rite are two native structures that provide elements capable of proving a relationship between the indigenous culture, the "favelas" and the Brazilian design. That is why the mythical thought elaborates frames overlaying small parts and fragments of events, while

the characteristic of the ritualized mythical time is to be circular, always spinning around itself.

Discussing this mythical structure in the inhabited environment is the next proposal. The scope is to look for the similarities between the indigenous village and the "favela". According to the analysis, all of the spaces of the "favelas" are totally linked, be them domestic or public, as if they were a large internal space. This aspect could lead to an analogy with the inside of the native villages in which the family and public spaces, and the people themselves determinate a kind of maze to the community dwellers.

In a similar way to the indigenous who collects fragmented materials in the forest to be used when building his house, the inhabitant of a "favela" looks for heterogeneous rests of materials in the city to build his shack. After having presented the logic of the external space, the goal is to show the logic of the internal space, mainly of the indigenous houses or "malocas". The "malocas" are often monumental collective buildings, made of palm leaves with the purpose of taking more than a family in. In correspondence with the circular and fragmenting logic of the mythological narratives,

inside the "malocas" the natives hang things freely. This gives them the freedom to transform the aesthetic of the inhabited space continually. This action of transforming the indigenous space is analogous to the logic of the inside space that regards the "favela" shack. There, the transitoriness of the things also allows transforming freely the environment without excess between the object and its use.

In relation to Brazilian design, its logic is to transform things through subversion and the new processes of juxtaposition. Design in Brazil is made of a fragmented set of cultures which interconnect and juxtapose themselves. But, in regard to its origins, design descends from Western culture and indigenous culture. In an effort to individualize the kind of influence Shamanic thought has upon the mind of the contemporary designer, signs of a symbiotic relationship between two universes emerged: one supported by European and autochthonous parameters; and the other, structured from the Shamanic cosmology. Thus, considering the indigenous universe, I proposed a diagram divided in four layers in order to present the cosmology of design in Brazil: cannibal world, anaconda world, jaguar world and harpy eagle world.

In the cannibal world, projects result from a modern repertoire which interprets and transforms the ancestral vernacular. With the anaconda world, even if the conceptual approach of design suggests hybridization with the indigenous culture, morphology identifies itself with modern Western style. In the world of the jaguar, the designs are solid, compact, and conduce with themselves the strength of nature. In regard to the world of the harpy eagle, its designers carry out three basic actions: re-cycle natural things, re-use the useless industrialized materials, and re-contextualize the industrialized products that cost a little.

After having identified the logical features of each of the four worlds better than the chronological ones, I realized that among them, the harpy eagle world presented a more evident correlation with the magic manifestations from the Shamanic universe. That is why I deepened an analysis which would consider mostly the context concerning this world in order to present the results of the thesis.

Firstly, I noticed that there are three key principles drawn from the native culture in the Amazon, which can gather enough evidence to "support" the project phases of design in Brazil. But before talking about these principles it is important to underline that for the indigenous people beliefs, creation is not necessarily constituted by the individual and the divinity, but by the man and his objects. In such sense, the contiguity as one of the three structural principles of the Shamanic cosmology creates an identity

among the things connecting similar fragments. The second principle is the correspondence. According to the shamans, there is something which defines the limits among the elements of Creation, associating a being to another through resemblance. In design, this principle re-contextualizes the original function of raw matter, subverting what before "seemed" to be a thing (a footwear) in a completely different meaning (of furniture, for example). The third principle is the experimentation. It puts in evidence the possibility of continuous creation and of reinvention of the elements of the *cosmos*. In design, such act corresponds to the "Shamanic experimentation". While this experimentation emphasizes the possibility of transmutation of a human being into the body of another animal, in design, it transforms the things subverting the residual matter (urban or natural). This kind of subversion establishes a relation between the things which correspond among themselves, but are not necessarily equal. In a process of contiguous juxtaposition of the secondary materials, the logic of subversion attributes new functions to the final product, breaking the structural paradigm of an original object. In this way, to permit the elements in design to contradict themselves with the objective of creating an ambiguous, but exchangeable game, may free in people unpredictable emotions, transcendental sensations and suggestion of the sacred. Therefore, adding the mechanisms of the Shamanic thought to the rational thought

could bring new perspectives to design. The Shamanic magic looks for simplified solutions; its components are already available in the environment; it transforms the form of the beings and the things inverting their roles; and it considers the things from their totalities and not from their separate parts. Such Shamanic thought is a kind of attitude which seems to materialize itself in Brazilian design. The aim is to search for the icons, to find new correlations, and to transform the various components scattered around the world into creative expressions in order to help man to achieve a less materialistic human condition.

In conclusion, the results of the thesis show that there is a cyclical correspondence between the contemporary world and the ancestral world. The theoretical bridge that connects the four manifestations is the three principles of native cosmology: contiguity, correspondence and experimentation. Finally, this thesis has sought to find signs of another form of rationality in magic. Perhaps, looking at the different Shamanic manifestations still preserved in almost all continents of the world, other alternative strains to think the design can be discovered.

TACTILE PATHS FOR DESIGN
Sensorial strategies to explore reality

Francesca Gambardella

The research gets into a wide research area of the UdR Materiali&Design at the Politecnico di Milano, dedicated to the investigation of expressive and sensorial aspects of design products, above all material qualities.

Specifically, we decided to investigate the expressive reality of common products, to evaluate on one hand which kind of product properties are simply and universally perceived using a tactile exploration, and on the other hand to verify the existence of a tactile pleasantness.

The main aim of the research is to investigate and to evaluate the different processes of perception and the relationship between consumers and objects, with particular attention to material properties and sensorial potentialities. Specifically, we intend to underline how touch is underestimated as a learning tool able to extrapolate data from reality and to create mental images. That idea brings to the prejudice that for the blind is difficult or impossible to read reality and that a lot of daily activities are impracticable and the greatest part of information is inaccessible.

The awareness that touch could be a very important tool for knowing reality underlines the importance of a reasoned and aware tactile exploration,

instead of casual and instinctive one. The aim is to make evident the importance of a correct formation of mental images during tactual interaction with objects and the necessity to sensitize the designers in order to project not only shapes or technical properties, but also tactual and expressive potentialities.

That kind of tactile experience is daily but not so conscious, so often is very difficult to understand the tactile sensations perceived and to choose the correct terms to communicate how we feel the objects and its qualities.

Specifically, using the term 'tactile' we intend to talk about the haptic perception, considering that the interaction by touch implies a lot of different exploratory movements necessary to catch the properties of the manipulated object.

This kind of perception is very different from the visual perception which is quickly and immediate because it needs slow and onerous strategies and explorative procedures to get information about object's shape, dimension, position, distance.

For this reason, from a qualitative point of view, the tactile performances are appreciably inferior respect the visual performances, about discrimination thresholds,

number of errors, period of time. However, there are some properties which are simply and often only perceived using touch, like materials, weigh, rigidity, temperature.

For this reason results very important to understand and to use conscious and structured touch, applying strategies like explorative procedures used every day from blinds to interact with reality.

Studying the different modalities to perceive the reality, we need to underline the idea of mental image, which is an iconographic representations of reality created by the brain after a sensory stimulation.

A correct creation of mental images represents not only a correct modality to understand reality and to recognize objects, but also a simple way to communicate with the others, so it is important to use our senses in a correct and functional way.

The research is structured in three different parts that, on the whole, investigate the different aspects of the tactile relationship between users and objects, evaluating the daily life of the 'normal' people and the blinds. Common aim of the three parts is also to underline the importance of the sensorial education, that is necessary to use our senses to the best of our ability.

This kind of education is important not only for the blind, who are obliged to use touch during the daily exploration of the reality, but also for people who can use sight, to appreciate the potentiality of the tactile exploration and the existence of a "tactile beauty".

The first part of the research intends to investigate touch from a physiological point of view, studying the different processes that contribute to receive and decode the signals from the reality.

Moreover are presented the different strategies that we put in practice during the manipulation of the objects in order to extrapolate information about their qualities and to recognize them.

From this first part is possible to extract some important considerations:
· touch is an important instrument with which we can receive information otherwise lost or not correctly noted. We have to use touch in a conscious and structured way and to educate our senses to refine our perceptions
· tactile perception is a voluntary action and it derives from the relative movements between user and manipulated object
· there are some encode gestures that we apply unwittingly and universally to determine qualities of reality
· the correct use of the tactile strategies contributes to the correct creation of mental images

The second part of the research analyses the relationship between sensoriality and design products, making a review of

objects designed with attention to tactile aspects. The aim of this part is to underline the importance to understand the potentiality of the touch also for the designers, who had to be careful to sensorial qualities of their products in order to create surplus value.

The final consideration of this part are:
· is important to be careful to the expressive and tactile aspects also from a methodological point of view
· a better design of tactile aspects creates surplus value
· there are different kind of touch, like emotional and functional

In the third part, the will to investigate the different characteristics and peculiarities of tactile interaction with common objects brings to the ideation and rationalization of what will have called 'Tactile paths. These are a classification that wants to evaluate and categorize different typologies of tactile interaction between users and common objects. We have conceived five possible paths:

_proximity _material _place _product _haptic

that are defined on the basis of the different tactile strategies and properties of the products that contributes to characterize the sensorial relationship between users and objects. The conceptualization of 'Tactile paths' contributes to underline some objects properties used to create two different experimental sessions. The different aims of the experimental sessions are to evaluate the explorative procedures and the

discriminatory potentialities of touch, and to verify the existence of a tactile pleasure and how the properties of common objects can influence it. The final aim is to underline that also touch, like sight, can contributes to define what is beautiful and what is bad. Specifically, the first test concerns the perception and the quantification of different properties of ten common objects manipulated by twenty users, men and women of which ten blind.

Main aims of this test are firstly to create a reasoned collection of typical gestures and terms that can characterize the tactile experience, and secondly to quantify the intensity of the perception of six different properties during the manipulation.

The second test concerns only three properties, material, dimension and shape, declined using three typologies of objects, respectively five spoons, five cans and five glasses.

The aim of this test is to investigate the existence of a tactile pleasantness and after to identify which kind of properties can influence it, asking to users to touch objects and organize them from the favorite to the unwelcome.

This research has permitted to underline the importance of the development of touch, which is a potential instruments to reach information from reality. After that, we have underlined that some properties are equally perceived and quantified by different users when they touch the same object and that some kind of qualities are considered more pleasant than others.

PRO-OCCUPANCY
Microenvironments design for urban condition: between performativity and belonging

Elena Enrica Giunta

The research proposal is grounded in a reflection about **contemporary urban-public space**. The background hypothesis is that are observable, under a variety of conditions due to recent changes, emergent behaviors in the *use* and, even earlier, in the *design* of space and public space in particular. If critically observed and parameterized, these behaviors could serve as important indicators for the culture of design. The research is developed based on two clusters of questions: the first one is useful to define both specific *characteristics* and expected *qualities,* as perceived in public spaces (defined as "relational spaces"); the second cluster, aimed to define a specific area of intervention, for the Interior Design, whose visions and instruments would be eligible to answer to the growing gap between the expectations/ needs of consumption and the correspondant design quality of urban-public spaces.

Briefly, the results of research according to the two clusters of questions, above mentioned.

Qualities and characters of contemporary "relational spaces"
These definitions are shaped from the phenomenological

observation of urban-public spaces; the analysis has been filtered based on parameters belonging to a socio-anthropological, even philosophical, vision of the project. The analytical interest is focused on *"how"* urban-public space is understood and enjoyed, in the forms that have been classified as "colonization". Collected examples are all design interventions about urban interiors, conceived with an "exhibit logic".

"Reversibility + participation = belonging"; this trio of keywords might be translated into design parameters. These latter would be used in a matrix as criteria for mapping the collected cases. Therefore, *reversibility* becomes "degree of structuration of spaces' physical component" (layout) and *participation* means "user potential to intervene in the process of signification of the place" (pre-determined use *vs.* extemporaneous one). The framework, designed by these criteria, is established as essential new reference for the understanding of design needs which the contemporary project is called to answer.

The observation of the mapping (in Figure 1) an interesting, dense area that find place on

the harmonic diagonal: places designed *to play* with systems of objects; enabling spaces *able to structure and to be structured* more as *setting* than as pre-set *habitat*.
The collected case studies make recognizable four main design scenarios (**called "the Barbarian *types*"**) defined as: "spaces of uncertainty" (Cupers and Miessen, 2002) vs. pre-set *habitat* on disharmonic diagonal, *enabling spaces* and "crossing spaces" on the other one. The research is focused on this new trend (relative to the latter pair of scenarios), with its character and design potential. The role of *social component* (the *Bodies*) increases in importance and becomes determinant for the project; in synergy with the *physical* one, it makes liveable the space. It is arguable that the quality experienced by the user, in these spaces, is direclty connected to the performative potential (a sort of inner transformative attitude of places) which can be perceived, in use. *Performance* becomes a crucial design dimension: it is intended as a new variable for the project able lending to the convertibility, admitting more exhibit/living "situations" (in time or simultaneously), supporting the *mechanisms of meaning* of the users.

### Reflections and criteria for Urban Interior Design
Whether to retrieve the psychological definition of "sense of places" (by Canter) and deepen its constituent elements, it is possible to highlight what he calls the "physical component" (which is "the matter" of an interior designer). Zooming in, we find the "social component" (or in other words the Bodies, as visualizes below) placed on a par with the more traditional subject of design reflection: the system of objects and the system of containers.
Each inhabiting place is primarily seen as a relational field or, in other words, a specific "Environmental system" shaped by the interaction between three main elements: the Bodies, or the social component; the Objects, or inanimate actors of the inhabiting scene; the Spaces, or the whole of physical containers..

The quality of a contemporary urban space or, in other words, its positive occupation/ inhabitation as one perceived as hospitable and enjoyable, is directly proportioned to the number of potential "exhibit situations" allowed in its interior. *Performativity* and *quality* are here understood as terms, useful to evaluate the user satisfaction, related to the *range of interaction* allowed by the system.
As a first, instrumental outcome of the research, the Urban Interior Design for public space might devise a **"model of reading"** for the project, structured by a triad of basic elements: frames, boundaries and scenic objects. These
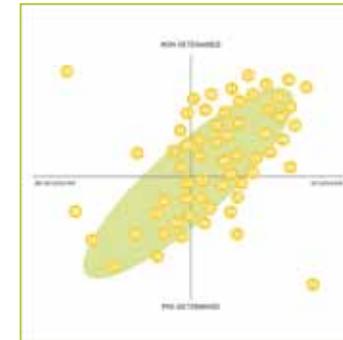
1. Matrix for the mapping of Case Studies (*Giunta, 2008*) and identification of the main area of interest (the green one) for the research
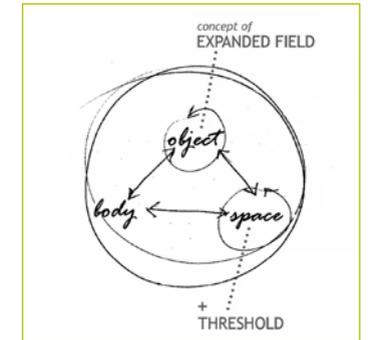
2. "Environmental system" diagram (*Giunta, 2007*): model of links in between the constituent variables

elements are also considered constituent elements of space (not just reading/evaluating ones of existing) and, therefore, also used as conceptual tools.

The idea of *space as product* is exceeded by the one of *space as process*; the latter is considered like a "device", able to meet the reconfiguration request of interiors, which should be completed by users, designing them (living in) almost in *real time*. Effectively, the project for an urban interior could work as a *"script"* or informational content: a small "program" that can accept input by the user without substantially changing its structure. other words, the project acts as an open "micro-sequence of information" (i.e. the system of constraints that structure the potential use of space and its equipment) being "executables" only if mediated by users' actions, which operate in a *relational field*.
In this sense, it seems clear that the culture of Interior Design needs for new forms of process displaying: applied research aims to contribute to this point

proposing a second product: the *story-layout* is an "tool of notation" able to visualize the three constituent variables (due to a design vision) of the space, above described. The tool takes inspiration from established practice of noting, mixed with representation techniques borrowed from the performing arts.

In conclusion, the thesis would document some **design experiences** by which, at different level, research findings has been tested and refined; applied experiences allow to enlarge the background of the whole of thesis' results, from which a series of rebuts might emerge.

COLLABORATIVE SERVICES IN UBIQUITOUS NETWORK
Exploring design for social innovation and sustainability in network society

Miaosen Gong

The phenomena of collaborative services and production are emerging and booming in two contexts by different ways: they emerge as *Creative Communities* (EMUDE, 2006; CCSL, 2007; Meroni, 2007), on one hand, in everyday life such as Car-Pooling and Co-Housing; on the other hand, in cyber space they appear as *Open Source Method* (Mulgan, Steinberg &Salem, 2005) initials, such as Linux and Wikipedia. The former are groups of people, creatively and collaboratively, solve everyday life problems by themselves, and their behaviours imply environmental sustainability and increase the social fabric. The later are volunteer-powered, internet-enabled and geographically-dispersed *Networked Information Economy* (Benkler, 2006). As matter of fact, with diffusion of *Information and Communication Technologies* (ICTs), the two spaces become nearer each other. In particular, high diffusion of *Mobile Communication Technologies* (MCTs) arise *Ubiquitous Computing* (Weiser, 1991), *Personalized Network* (Wellman, 2001) and *P2P Relational Dynamic* (Bauwens, 2005; 2008). The synergetic relationships between virtual spaces, physical spaces and social spaces evolve to a hybrid space, *Space of Auras*

(Casalegno & Susani, 2005), which is more conductive to social interaction between people and their communities.

The research starts with hypotheses:
1. Design could play important roles in promoting social innovation with a new paradigm;
2. The convergence between social innovations in everyday life and radical innovations in cyber spaces could catalyze new transformation of our lifestyles towards sustainability;
3. Mobile communication and ubiquitous computing, bridging physical spaces and cyber spaces, could be key enabling technologies in this convergence.
My principle concerns in this research are:
1. How MCTs enable collaborative services; what are the values of them;
2. How collaborative services evolve in this convergence;
3. How design interventions promote them.
Around these concerns, I conducted three empirically-based research activities through mixed approaches between phenomenological and action research: one cases study and two research-based design projects. The cases study, *Connectivity for Social Innovation*, aims to investigate

the creative applications of mobile communication for social changes all over the world and identify the promising cases of collaborative services significantly enabled by MCTs. The two design projects, *LSF07: Digital Service and Collaborative Network*and *Chita08: Collaborative Service and Mobile Communication*, aim to explore the potential solutions of collaborative services in ubiquitous network society. As results, by cases study one hundred cases with an ad-hoc format are collected and fifteen of them are finally selected as typical promising cases of collaborative services in ubiquitous network. And they are defined as "*Mobilized Collaborative Services*".

The discussions are based on the experiences and results of research activities. Through promising cases and design proposals, the thesis inquires by three steps respecting to three research concerns. And the discussions of later steps depend on that of former ones.
The first step of discussion is on how MCTs enable collaborative services. the entire cluster of cases and proposals and analyzing the relationships between mobile communication and enabling solutions of them, I synthesize three
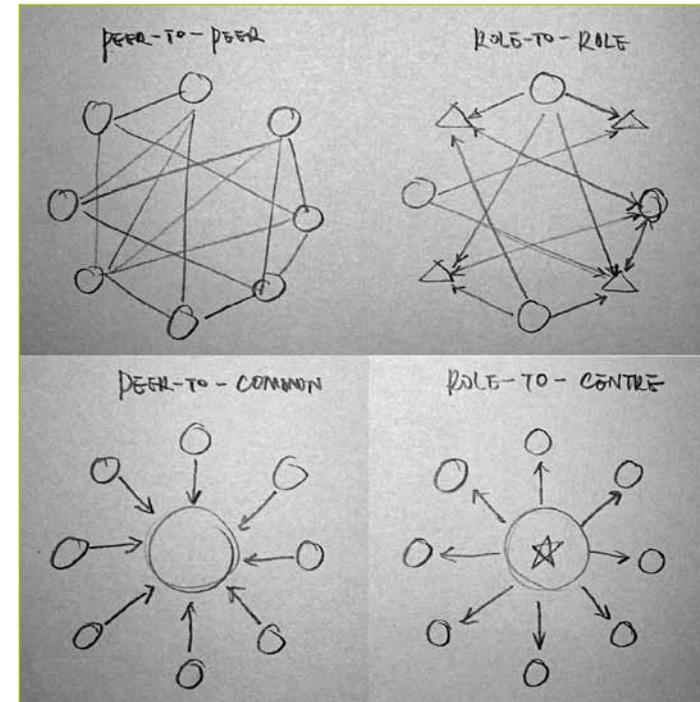
1.

perspectives of quality of mobile communication and ubiquitous computing: "*Personal, Portable and Pedestrian* (Ito, 2004)" (3P), "*Anytime, Anywhere* (Perry, 2001) *and to Anyone*" (3A) and "*At The moment, in The place and to The individual* (Casalegno & Susani, 2005)" (3T). Through each of them, I take the insights of values of mobile communication in enabling solutions: "Individual, Autunomy, Identity", "Accessibility, Being connected, To be ready, A common platform" and "Instant interaction, Contextualization". Secondly, the thesis inquires how collaborative services evolve in ubiquitous network. By comparison study in systems of solutions and interactions of services, I define a conceptual framework of spaces of auras in mobilized collaborative services,

proposing four kinds of network and interaction structures: *Peer-to-Peer (P2P), Role-to-Role (R2R), Peer-to-Common (P2C) and Role-to-Centre (R2C)*. P2P is a flat and decentralized network, it enables the direct interpersonal interaction. R2R is a special case of P2P, the actors' positions in system are specialized by their particular roles. So it enables the role-oriented interpersonal interaction. P2C is a flat but relative centralized network. It directly enables interaction between actors and the dynamic common that actors contribute and share. R2C is an extreme case of P2C where the common is institutionalized to be a centre. The network is highly centralized. It enables interaction between centre and actors individually. them into a wider phenomenon context, I find that

*Peer-to-Peer, Role-to-Role*are usually implicated in the cases of creative communities; whilst, *Peer-to-Common and Role-to-Centre*are usually implicated in cases of wide open. Therefore, mobilized collaborative services evolve by the convergence between them.

Furthermore, the thesis reflects above findings to design implications from three aspects: by two design projects, I conclude service design experiences on the mobilized collaborative services in terms of design processes and methods. Based on the MCTs' values in enabling solutions, I generated pilot design guidelines on the situations that mobile communication is favourite and necessary to be used. According to the framework of spaces of auras, I further defined pilot design strategies for each type of mobilized collaborative services.

In conclusion, the thesis does not attempt to provide conclusive answers to the questions defined, but instead explores to contribute to a better understanding of the subject matter. The contributions include: Identifying a group of promising cases and developing a group of design proposals and synthesizing as mobilized collaborative services; Shaping the mechanics between mobile communication and collaborative services it enables; Defining a conceptual framework of mobilized collaborative services; Generating tentative design experiences, guidelines and strategies on social innovations.

THE RULE & THE IMPRINT
Graphic Design Tools' Constellations

Claude Marzotto Caotorta

INDUSTRIAL DESIGN AND MULTIMEDIA COMMUNICATION

The research focuses on the role of craft-based techniques within contemporary graphic design. For the last decade the potential of manual tools, craft-based techniques and old equipment has been increasingly reassessed as a key element in personalized creative processes. A growing number of publications about "handmade", "tactile" or "craft" features in visual communication, testifies a cutting-edge scene emerging among practitioners. Within this trend there is more than a visual style. Designers who really integrate craft-based techniques within their toolkit create "constellations" of craft and technology. They often blend and match different procedures in non-linear, flexible processes which are not counted by any of the single elements that compose them. Digital technology provide designers with a flexible platform for technical crossbreeding, allowing handmade elements to work as experimental devices the main feature of which is the "unavoidable contrast and tension between regulation and freedom, uniformity and divergence" (Jury 2004). Such practices are unlikely to be described as methods. They are spontaneous tactics deviating from the standard use of tools, like the users' tricks in "everyday creativity" investigated by de

Certeau (1980). That is why the investigation choose to proceed on a double scale: on one hand, it observes graphic gestures and practice tricks, focusing on users' operations rather than on specific techniques; on the other hand, it addresses a wider theoretical landscape in order to contextualize the considered practices both historically and among other contemporary design experimental fields. Concerning methodology, the research embraces the extended epistemology of the participatory paradigm by Heron & Reason (1997), articulated in four interdependent ways of knowledge: experience, presentation, theory and practice, the latter being the completion of all of them. The design of small prototypes plays along with the research development, fostering a tight dialogue between theory and practice. The experience at Alexis Rom Estudio | Taller Vostok, a visual design studio in Barcelona where hybrid technical constellations are part of the everyday activity, allows a seamless exchange between theoretical findings and practice. The experimental integration of "odds and ends" of craft within graphic design practice takes part in the post-digital approach, according to which "designers more often design

by manipulation than by determinism", personalise their processes and exploit technology to take back the physical procedures of making, in order to explore the "uncertain world of translating ideas into matter" (Sheil 2005, 2008). From an historical point of view, contemporary generative design follows and updates some of the main statements of the 20th Century visual avant-garde, that is chance heuristics, the intrinsic value of the "process of making" and the objective quality of the "organic form" (Kepes 1944, Moholy-Nagy 1947). Reassessing the relevance of the handmade within the design process, post-digital crossbreeding toolkits raise problematic disciplinary issues such as the role of the craftsman in designers' self-representation and, more generally, the dialectic between progress and anachronism, that is technical survival. Moreover, while design theory adopted bricolage (Lévi-Strauss 1962) only as a metaphor, usually mistrusting it as a practical process (Louridas 1999, Lawson 2004), post-digital hybrid constellations seem to venture into an escape from what de Certeau called the "odd chiasm" between theory and technology – the former going towards the indeterminate while the latter

keeps on defending its rational functionalism from interferences and ambiguity. The mainstream opinion about progressive substitution of all craft-based techniques by the digital one is discussed considering the theoretical landscape behind the terms "analogous" and "digital", referring to information theory and Bateson's stochastic learning processes (1979) that alternate analogous events and digital selection. A compared analysis of Aicher (1991) and Deleuze's (1981) essays, which apply cybernetic terminology to design and painting processes, allows to develop a working hypothesis: analogue and handmade techniques would supply visual noise and variation essential to the dynamics of the project's complexity. The cultural conflict between analogue and digital categories in then considered in the realm of art history, through dialectic couples such as imprint and drawing (Didi-Huberman 2008), and index and grid (Krauss 1985). The imprint, that is a direct physical transference of a form from one surface to another, is a technical pattern that includes the very essence of all printmaking processes. Due to its inherent impurity, which involves slight and complex physical variations that make it never totally predictable,

1. Alexis Rom Estudio | Taller Vostok: odds and ends of craft and do-it-yourself tools integrate digital processes

2. Imprints' workshop, Politecnico di Milano: work in progress

the imprint procedures has a heuristic value. Didi-Huberman traces the surviving of imprint in art history as the hidden counterpart of drawing in occidental visual culture: an anachronistic device that has been kept out of sight by the academic tradition until 20th century artists began to exploit it explicitly as a means of "visual experimental thinking" (Molderings 2007). The contemporary use of craft-based techniques discloses a 'craft design' survival besides the 'design-by-drawing' (Lawson) approach to modern graphic design. The research findings have been tested in a workshop at the Politecnico of Milan (two editions, 2008 and 2009) through prototype tools and techniques, designed to encourage students to

investigate and develop their own process of making beyond default software options. Students experienced that physical interaction with materials may lead to unexpected visual findings, which can be easily integrate in computer-aided process. The workshop helped to define basic design instances that will be considered in future teaching activities. The research contributes to contextualize the investigated topic within historical and contemporary design practice and, connecting technical hybrid constellations with concepts such as the stochastic processes and the imprint paradigm, proposes consistent theoretical tools to interpret the integration of analogous and digital procedures within the process of making.

DESIGNING FOR PEOPLE, EFFECTIVE INNOVATION AND SUSTAINABILITY
Introducing experiential factors in an observational framework to evaluate technology–assisted systems

Tinauli Musstanser

INDUSTRIAL DESIGN AND MULTIMEDIA COMMUNICATION

Introduction

The world at large today is equipped with technology, sensors, scanners and instruments. The introduction of this pervasiveness of technology and communication has brought about a need to control the evolvement of interaction and communication models and even more importantly the need to evaluate the evolving interaction models and interactions in technology assisted systems. This thesis presents a framework that sets the path for designing effective and innovative systems. The core focus of the thesis is on defining of a process that facilitates in the evaluation of technology-assisted systems from the point of view of the end-user.

The framework consists of an observational strategy and enlists a set of procedures and processes for designing effective systems from a user's point of view. The observational strategy is based on evaluation of the system from various perspectives that are termed as experiential factors. The framework also facilitates in understanding the richness of the experiential suitability; identification of strengths and weaknesses of the systems and eventually points out the areas which can be improved.

The presented framework is thoroughly applied on a project titled, "use of digital pen and paper in a classroom scenario" and the essence of the suggested framework are kept in mind while the creation of another project, titled, "trash track".

The earlier project is regarding a digital device that has not made

an impact in the market for over ten years. The study here focuses on understandings why the product has not bloomed, highlights the inefficiencies and suggests possible scenarios for the possible usage of the digital pen and paper. The later project is about creation of a smart tracker that enables the tracking of trash. *A complete version of the thesis and relevant materials can also be accessed at (http://www.designdeeds.org).*

Research Objectives

The core focus of the research is on defining of a process that facilitates the evaluation of technology-assisted systems from the point of view of the end-user. The conducted research has the following objectives and goals:

· To understand how an end-user actually feels about technology-assisted systems and pervasive use of technology.

· To understand and highlight the key usability like factors that determine and facilitate the evaluation of technology assisted systems from a true end-users perspective.

· To propose a framework that facilitates the evaluation of technology-assisted systems. The framework would focus on "*the definition of an observational model that facilitates in the evaluation of existing systems or created systems*" and "*Setting-up of processes and tasks in the pre-design phase*"

· Creation of new systems that are interactive, innovative and enable scenarios that did no existed prior to the suggested system.

Experiential Factors and the Interaction Design Observation Model

The framework is based on the use of experiential factors and also presents a method to facilitate the evaluation process. The experiential factors include Learnability, Usage, Error and Feedback, Comfort, Collaboration, Affect, Guidance and Support, Accessibility and Sustainability. The method facilitates the evaluation process in a spiral model like structure (in the sense of iterations). The phases include: understand, observe, create, experiment, evolve, improve and analyze. The visual representation of the generic framework can be seen in the Figure 1.

The Digital Pen and Paper Experiment in a Classroom

The digital pen had been in market for more than a decade but has not been very successful. Also, the digital pen seems to be a futuristic yet basic (in terms of its appearance) but has not really made the rightful impact. The basic idea here was to re- understand the technology, perform an evaluation on the interactive model and present with a better interactive model and possible scenarios on where and how the digital pen technology could be used. The guidelines set by the proposed strategy were successfully applied on the use of digital pen and paper. The student in mostly felt positive about the use of the technology but the installation procedures and difficulties were the general cause of frustrations. The difficult interaction model was also not appreciated by the users of the digital pens.

EXPERIENTIAL FACTORS	IMPACT VALUE	
	USAGE SURVEY	PROJECT COMPLETION SURVEY
AFFECT	*	3.889
ACCESABILITY	3.100	3.389
LEARNABILITY	*	3.074
GUIDANCE AND SUPPORT	*	3.111
COLLABORATION	2.600	2.911
USAGE	2.700	2.333
COMFORT	4.000	2.333
ERROR AND FEEDBACK	*	*
SUSTAINABILITY	*	*

Table 1. The calculated impact factors on the use of digital pen and paper experiment
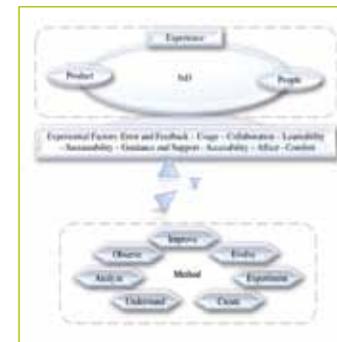
1. Experiential Factors and the Observation Model

2. Trash Track Poster

Creating Trash Track

The multifaceted project titled trash track was successfully created. It enables a scenario where 100 percent recycling could become a possibility. The project also initiates a new direction towards understanding how trash really moves in the Cities sanitation system and brings attention to 'removal chain'. Various stakeholders were found keen on understanding where different products end-up. Some of the questions included: 'what will happen to it', 'where would it end up', 'who will be the next owner', 'was it recycled', 'where can I get the particular item to get hold of it' and etc. The project also promotes a strong behavioral change. The project contributed in making a trash tracker and created a phenomenal impact on the media, on people and on researchers from around the world. The project after the first deployment was repeated on different scales in various Cities. The project was exhibited in USA at Architectural League of New York and Seattle Public Library. The process of further analysis of data is ongoing at the Massachusetts Institute of Technology (http://SENSEable.mit.edu/trashtrack). A poster of the project may also be seen in Figure 2.

Conclusion and Future Works

The thesis sets the direction for

extensive research in use of highly interactive systems in everyday life. It also presents a scenario where the use of technology takes the background and present a scenario where technology is truly for people and not people for technology. The positives from the use of digital pen and paper in the class room and the creation of a project to enable trash tracking both concluded successful integration of pervasive use of technology, especially trash track where a world where the idea of "internet of things, i.e. every thing is connected and addressable" was conceived as a reality. On the other hand the thesis presented a methodology to ensure the evaluation of interactive and technology-assisted systems from a true end-users perspective. This would enable a seamless integration of pervasive technologies into routine life.

Further research in the area of use of invisible technologies through the use of pervasive technology could also be carried out in various scenarios of everyday life.

SEEING WHAT THEY ARE SAYING
Diagrams for socio-technical controversies

Donato Ricci

It seems that the traditional modes of accessing, observing and representing social Complexity are changing thanks to the opening of enormous databases and new tools to access heterogeneous flows of information. This hypothesis redefines a new emerging cultural form to capture, explain and discuss the complexity of reality, but it should be reshaped and extended. On one side, theoretical remarks should concern the access to the date, which, gathered from different fields of studying, produce a new relationship between qualitative and quantitative; on the other side, empirical experimentations should be deployed on the modalities through which these spaces are synthesised and translated into narrative devices. These two aspects, only apparently sequential, can be summarized into a new dimension about knowledge space that overcomes the epistemology borders: it is emerging an area study labelled as *knowledge visualization* , quite similar to the *information visualization* and to the *information design*, that aims to depict spatially knowledge domains. The *cartography of controversies*, the applied version of the Actor-Network Theory, is one of the example of this new way of exploring

and understanding these new information and knowledge domains. One of the most innovative elements of cartography of controversies is how the description of he analysed complex social system is performed. The cartography of controversies aims at overcoming some of the limits of the traditional textual narrative description by exploiting the potentialities of the *information visualization* and of the *information design* to observe social phenomena. Visual models could help in describing, in a tangible manner, the different position assumed by the actors of a controversy and their point of view. Diagrammatic modes of visualization seem to be particularly adapt to achieve the above mentioned goals. In this context diagram are considered as operating devices able to describe and unveil also the nested and latent connections of a system. In this research field have been conceived, first conceptually and then in an empirical form, two diagrammatic tools to manage the three main dimension of a social complex system: time, actors and interactions. The proposed approach discussed is different from others in which the main effort is to develop formal model and algorithms for computer

simulations, and where visual codes are strongly codified. Here, the objective is to set up a visual language mixing up digital information to depict, through the observer interactions, how agreement areas and disagree ones are generated.
This research has seen, since its very beginning, a profitable collaboration with the Mobility and Transportation Laboratory of the Politecnico di Milano, in order to test on a real case both the theoretical concepts and the diagrammatic tools of this research. has been found the most interesting case to be tested: the remote control of dangerous materials transportation in road. This work, from a technological point of view posits itself above information and discursive flows, related to a controversy developed in the Internet. With adequate tools, such as crawlers and ad hoc research engines the traces of a controversy emerge and they can be observed. The data gathering finds in the Internet not only a precious *box*, which contains the elements to reassemble the network and the dynamics of a controversy. Stemming from the previous statements, the *Turtle Project* has been conceived. It is made up by a series of tools and devices able to explore controversies and could be

defined as an observation environment of the discursive controversies.
In developing the research and consequently the project three steps have been carried out:
1. from the textual fragment to a visual object.
2. from the phenomenon implicit structure to an explicit and visual one.
3. from a unique perspective to a multiple one.
The diagrams here presented have not to be considered as devices able to provide the reader with definitive answers, but instead as tools to be used in drafting better questions to be asked to the system. Their novelty relies more on their capability of *formatting* data, rather than their visual aspects. It could be stated that diagrams are like *finding engines*, rather than searching engines, they are able to provide entry points to better examine the faced issues.

1. Turtle Timeline: Creating the relationship beetween discoursive fragments
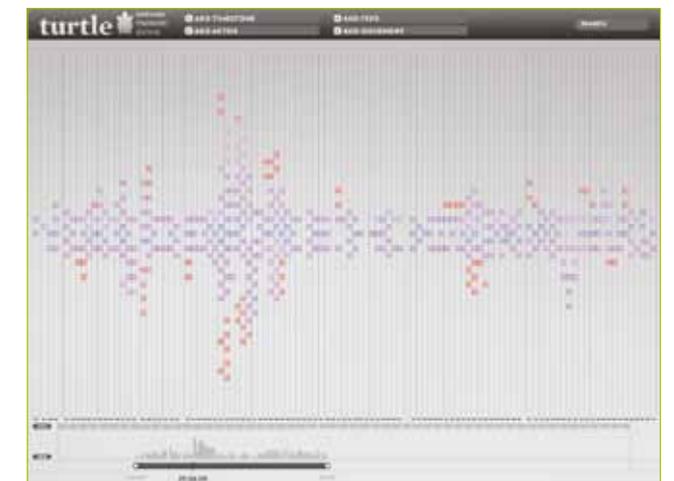
2. Turtle Timeline: Above the diagram after six months of observation
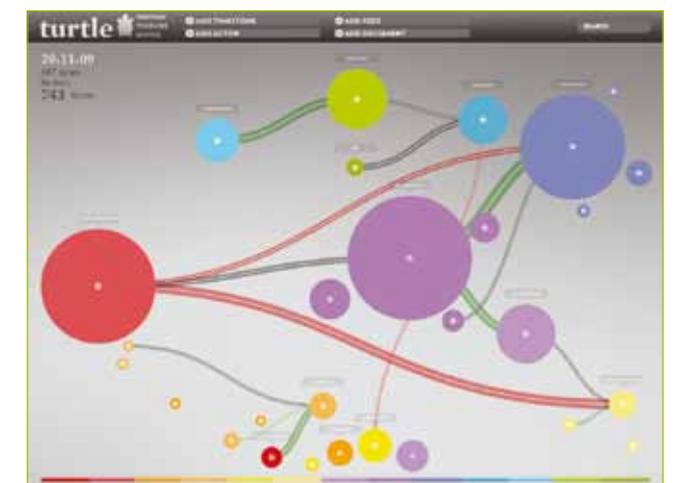
3. Turtle Dynamics: the graph after six months of observation

ACTIVE AGING BASED SOLUTIONS
A contribution to service design for aging population

Maria Rosaria Scelsi

Objective of the research

The aim of the present research is to develop specific knowledge on the topic of designing for aging population and to translate it into conceptual and operative terms in the ambit of service design. The intention is enhancing a future dialogue among the group of research of Politecnico di Milano and national and international institutions in the fields of university, politics, public sector and enterprises. As regards the project, the priority objective is reading a contemporary social phenomenon and studying frameworks and tools that allow the designer to elaborate proper solutions able to favor and support in progress social changes. The research investigates *what* design can do with reference to the phenomenon, and *how* it can operate. The intent is identifying an approach peculiar to the project action in such emerging context and drawing a theoretical framework, a model of interpretation of the phenomenon and a set of project-driven guidelines.

Difficult ambit

In the present doctoral dissertation the activity of theoretical research begins in connection with some experiences developed
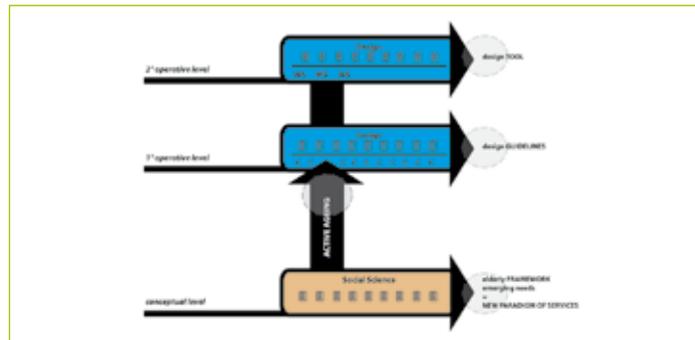
1. Phases of the methodological process and outcomes of the research

in the didactic ambit of the contribute of design with respect to emerging social problems, new scenarios and new needs. It enters into the wider debate of the Faculty of Design of Politecnico di Milano about the disciplinary opening of design towards new fields, new project demand and new tools with which facing them. The research has started with the growing demographic aging phenomenon. The question is what strategic role design can play in this phenomenon. In particular, research has immediately pointed out a gap in the designing connected to the phenomenon. In fact, the research ascertained a mature offer of products for aging population – as well as a remarkable literature and experience in the field of product design – but a lack of specific services. The need to fill the project gap was

supported by the analysis of the needs of the reference target, which has pointed out some needs that go beyond the physical ones; in fact, psychological and social needs are often completely neglected by the daily life system and by designing. Such results have driven research to focus on the contribute that service design can give to the target the unit of research is referring to. Actually, the practice of design is gaining a more and more important role of support and guidance in the processes of social development and innovation. It promotes the development of ad-hoc services, carriers of innovative logics of integration, participation and extension of the concept of well-being for the individual. As a result, there is a shift from a vision of supplying-oriented services to a vision of enabling-oriented services. The research
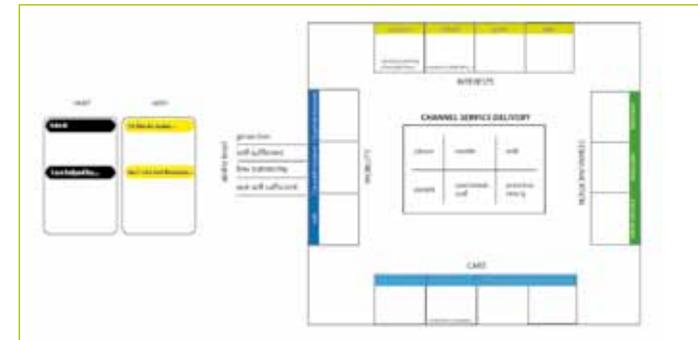
2. Tools of co-design with the user: cards and generative map

moves in the ambit of the aforementioned coordinates to explore and foreshadow a new operative paradigm of services addressed to elderly population.

Conceptual hubs

The first crucial aspect of the research is the adoption of a new attitude towards the category "elderly population" with the aim to consider them not genetically "weak" or "disabled people". On the contrary, the aim is considering the phenomenon positively "towards the support and promotion of active aging, or *successful aging*, according to the definition used by OMS". Therefore, the point is considering elderly people not only as an individual "needing" services that satisfy their needs, but also an individual "able to" offer him/herself to give a service and support the community.

The second conceptual hub of the research is the way knowledge coming from other disciplines may be *designerly* transferred to designing. In accordance with Arbnor and Bjerke (Arbnor & Bjerke, 1997) it has been built an "operative paradigm ", that is a sort of methodological toolbox that allow us to operate in the specific area of design with a coded approach originating from the disciplinary ambit of social sciences.

Results

The questions that have accompanied the pathway of the present research are: *What does the present dissertation add to theory and practice of services design? How does it support a specific designing for aging population?*

At the end of the pathway it is possible to identify:

· A project-oriented contribute focused on elderly population with the aim to outline: peculiar needs, the transposition of the theoretical concept of active aging on an operative level that allow to configure and describe the diverse dimensions of "well-being" for the elderly person, and possible guidelines;
· a methodological contribute
· that formalizes a tool of co-design with the user, able to promote and drive designing actions addressed to the re-thinking of existing services or to the generation of new services.

FEEDING THE CITY
Peri-urban sustainable agriculture as a driver for territorial development through a Service Design approach

Giulia Simeone

Problematic area

Periurban agriculture, as we refer in this thesis, is the one which deals with agricultural activities (farms, agritourism, leisure, education…) very close to the city, which work both with intensive production methods, and organic ones; which grow products (vegetables, breeding, milk and eggs) both for commercial purposes, and to deliver services to urban population. According to Fleury and Donadieu (1997), the expression "peri-urban agriculture" qualifies every kind of agriculture which is significant to the urban project, whatever the trigging purpose is: local food provisioning, social functions, green belt environmental management.

Aims of the research

The research question ask how Service Design can intervene, with its own methods and tools, to define, develop and give back territorial quality to peri-urban areas with agricultural allocation, thanks to new forms of relation between the city and its countryside.
The aims of this research is to skip from and analytical frame, where the qualities of the territory are identified (qualities are intended as those best practices that work according to sustainability parameters), to an action plan, that boost and diffuse them, through a Service Design intervention.

This thesis is anchored in three main hypotheses:
Approach
The first hypothesis borrows the Positive Psychology approach, that acts by boosting individuals' qualities to ensure authentic wellbeing and happiness: likewise, we think that, starting from social innovation cases in the territory, it is possible to boost local resources, working on the qualities (Seligman and Csikszentmihaly, 2000) existing in the context, to prevent territorial degradation and give it prosperity and quality of life.
Effectiveness
According to this hypothesis, such quality of living in the territory, can be revitalised by activating collaborative services (Cottam, Leadbeater, 2004), stimulating inhabitants' pro-activity (concealed or showed) and by using conciously local resources (Magnaghi, 2000; Petrini, 2005).
Vision
The vision hypothesis figures out a scenario where Service Design can support strengthening the latent territorial capital and regional food sovereignty (Latouche, 2008 and Petrini, 2005), by distributing and sharing resources (Johansson, Kisch and Mirata, 2005), that, if interpreted in the bioeconomy perspective (Georgescu-Roegen, 2003), can be the guidelines that lead the Service Design intervention for the territory.

Research phases
1. **Strengthening up the theorethical framework**
This is a cross phase to build the theorethical framework and to make a reconnaissance of the state of the art about the topic and the discipline.
2. **Observing best practices for the quality of the territory**
In a first phase of the field research some cases have been observed, in order to define and estimate the notion of territorial quality. This analysis pointed out a first definition of relational territorial quality.
3. **Observing best practices for food production, distribution and consumption**
The result of this phase is a catalogue of best practices clustered according to their scope. Afterwards, these cases have been analysed through the lens of collaborative services. From that, some meta-design elements came out. These elements are the design ingredients to be used when dealing with territorial issues from a Service Design perspective, and represent one of the original findings of this research.
4. **Observing Service Design for sustainable territorial development cases**
Here are showed four cases, from different nations, of Service Design for sustainable territorial development.
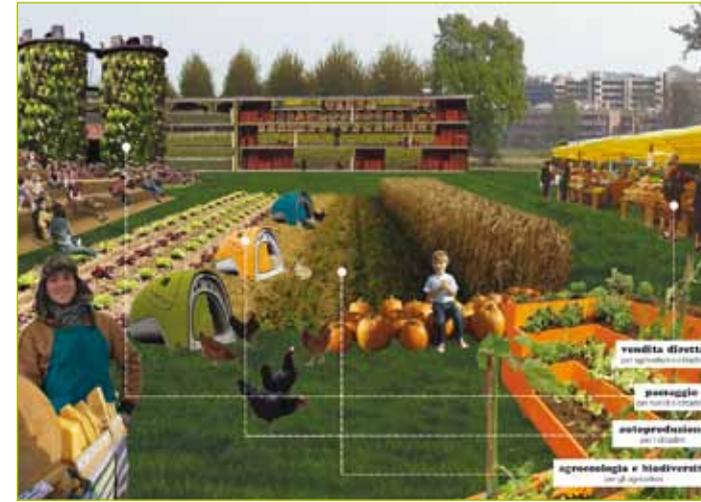
1.

2.

The aim of this analysis is to observe running projects to understand and compare different methodologies and different outcomes, given different contexts.
5. **The scenario project: Agricultural Park South, Milan**
Is a fundamental research project run in 2006-2008, granted by the Italian Ministry of University and Scientific Research. The aim of this

project was to outline a theoretical and instrumental paradigm for a new way to design urban settlements, by proposing and envisioning a scenario for sustainable local development in the big peri-urban area of Agricultural Park South of Milan.
6. **Research proposal development**
This project, with the knowledge acquired in the previous phases of this

doctorate, allowed us to develop other projects in other contexts, and to formulate a proposal for the development of such a scenario (see: findings)

Findings:
The main outcomes of this research can be seen in two levels:
· The first one, theoretical, is the adjustment of a Service Design methodology for the community based and sustainable territorial development. This methodology is applicable in every field of service design for territorial development but, for what concerns this research, it has been interpreted on agri-food topic, as the first and most coherent field of application according to author's experience and expertise. The output of this theoretical outcome is the "Design Handbook for Sustainable Territorial Development".
This tool includes basic values, guidelines, process phases, tools and expected results, and aims to give an aid in approaching sustainable territorial development issues, according to a Service Design perspective.
· The second level, application-oriented, is the activation of a applied research project "Feeding Milan. Energy for change" promoted by INDACO dept. of Politecnico di Milano, Slow Food Italy, University
· of Gastronomic Sciences, and granted by Fondazione Cariplo, Comune di Milano and Provincia di Milano. It will allow the application, and the proof check, of the foresaid methodology
· and it will fit with Milan Expo 2015 topic: agri-food, helping Service Design to play a defined and acknowledged role in terms of scientific research and applied project.

WAYFINDING IN COLOUR
For a chromatic narrative of objects

Pamela Visconti

The aim of this research is the study of color as a planning element, which can cause variations of perceptions and meaning within the dialogic process established with an object at a physical, psychological and cultural level. In particular, color was taken into consideration as a *total* and *extensive* sense that involves and surrounds the human body. As such, color generates a sensorial and expressive complexity which, if adequately designed, is able to produce narratives and define a new perception of objects.

In the first part of the research, the analysis focused on the importance and potential of the planning intervention of design in this specific field. To this aim, a conceptual map was drawn to organize chromatic objects - namely those objects which, at different levels, exploit color as an element that produces perceptions, material quality and new narratives. In a dimension where object, language and color are in relation with each other, three categories of dyeing were identified: *paradigmatic, contextual, rhetorical.* Such three categories identify three dialogic systems, each with specific characteristics of expression and planning.

01. COLOUR COMPASS
Starting from the chromatic objects analysis, we created

an interpretative model of the different attitudes of colour, which can be an orientation tool for the designer for a fully-aware colour project.

This model was then applied to the fashion field, in order to understand the meaning of designing extensive color in today's textile/fashion market -that is, a kind of colour which is, at the same time, matter and sense, icon and linguistic system. The analysis moved from the idea that a need for change and a for a different approach to consumption is increasingly perceived in the fashion field. Today's political and economic situation forces us to put the idea of the precocious ageing of the product into question, and to seek biological productive assets, in terms of both the primary resources used, and of the treatments performed in the later stages of production.

Therefore, in recent years there has been a significant increase in the demand for biologically-certified textiles. These products not only have a low environmental impact, but they are also more respectful of the human body once they are worn as clothing items. As one of the fundamental elements of clothes, color can but be part of this re-configuration process. Color is at the heart of alternative routes to the conventional

1.

processes performed in the industrial field. In this light, colorings with less polluting waste, though still industrial, were introduced and regulated by law. Moreover, there is an increasing interest towards plant dyeing, viewed not only as an ecological process, but also as an opportunity to outline new project options.
In this context, the use of natural dyeing is a very relevant trend, which has recently attracted the interest of the scientific community. Indeed, the practice of natural dyeing is not only viewed as a technical alternative, but also as an ideological planning possibility in itself, highly coherent with today's market trends. In other words, natural dyeing is a language with its own structure and grammar rules; it is an end and a means at the same time, which can introduce issues concerning its physiological aspects, its material quality, and the ideology of sustainability.
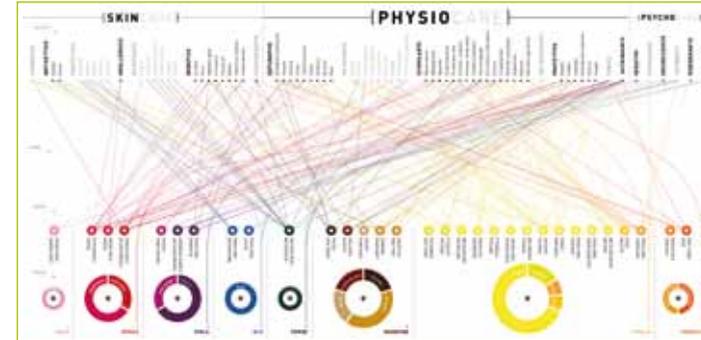
2.

In particular, this research analysed natural dyeing from three different viewpoints, which emerged from the interpretative model developed. Firstly, natural dyeing was viewed as a potential source of well-being, thanks to the properties of dyeing plants in terms of respect and defence of of the human body (*Paradigmatic colour*). Secondly, the analysis of textiles and finished products led to the definition of the aesthetic principles of natural dyeing. In doing so, it was possible to understand that the limitations of natural-dyed products could actually become their strong points, as they could build an alternative product identity to that of synthetic-dyed products (*Contextual colour*). Finally, an international mapping of those brands which today, on a small or large scale, produce natural-dyed clothes, led to the identification of the values behind the choice of these

dyeing techniques, and which constitute the identity of these particular products (*Rhetoric colour*).

02. *bio*TOUCH COLOURS
bioTouch Colours is a tool to identify possible, unexplored applications for natural colours.

Tanalysis pointed at scenarios where color can stimulate new identities and new project strategies, in which the nature-product relation would not only respond to technical and environmental needs, but it would also be the key to creating new product concepts. This can be done through the re-definition of the idea behind seasonal innovation, through the promotion of a new aesthetics and through an increased level of perceived well-being.

03. NATURAL COLOURS: RESULTS
– *bio*TC – bioTOUCH COLOURS
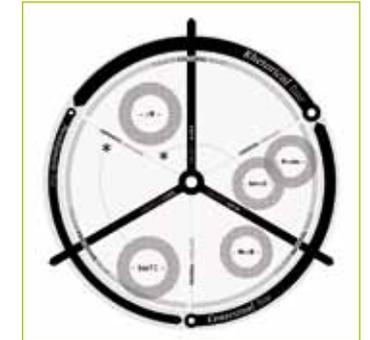
3.

Map of the well-being potential; a tool for the definition of design opportunities and consumption contexts; a potential tool for the creation of added value.

– *e*V – EMERGING VALUES International mapping aimed at the identification of the reference value context. identification of the urgencies of this sector.

– M*vs*B – MARKET TREND vs BIO TREND Re-definition of the model of chromatic choice and change in the conception of seasonal renewal.

– P*vs*Im – PERFECTION vs IMPERFECTION Re-assessment of productive processes and of the product's quality standards.

– Ist*vs*C – INSTANT vs CYCLE Re-definition of the value chain.