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ENVIRONMENTAL DESIGN

Conference proceedings of the
Ist International Conference on Environmental Design

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Environmental Design

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*Keywords: Environmental,
design, system, project,*

Introduction

Environmental Design represents a cross-discipline, in virtue of both interaction with other sectors and different theoretical contributions it is enriched by from time to time, and of the variety of dimensional scales in which it is characterised.

The main purpose of this field of study consists in creating a living environment capable of satisfying the changing needs of people and of adapting to the related environmental changes, through the use of flexible, reversible and completely environmentally friendly systems, drawing upon available resources, which can possibly be reinserted into the natural life cycle.

After the 70s a new soft technology began to be defined, in contrast to that of industrialised processes and of politics of construction operations supported by large multinationals, and contrary to the model of consumer society and to the uncontrolled development of the megalopolis. In practice, a technology based on non-destructive interventions, on the use of natural materials and light construction systems, and above all based on respect for the carrying capacity of the environment.

Among the most important innovative contributions, that of Victor Olgay¹, who introduces the climate as a material in the project, considering technology as a complex system, in which place, resources and culture are elements that interact with each other in the project, is very important. Within the new culture of environmentalism unexpected and fascinating concepts merge, such as the importance of the sociological and anthropological aspect in the transformation of the environment, the respect for culture's autonomy and traditions of the place, attention to the available energy resources and awareness of their possible depletion, and above all the importance of the concept of limits in the evolutionary path of modern society.

Environmental design

Environmental design bases the design of new "products", the outcome of the best compromise between environmental and technical-economical parameters, on the evaluation of the environmental impacts and on the choice of materials, forms and structures. One should be aware of the fact that not just targeted and partial technical solutions are necessary, but also overall and possible scenarios able to rethink the culture of project and that of production.

An anthropological approach is necessary not only for interpreting man-object, man-material, man-technology relations, or for carrying out ethnographic explorations at the beginning of the project, but also for creating a perspective from the point of view of relations themselves.

1. Olgay, Victor. *Design with climate. Bioclimatic approach to architectural regionalism*. Princeton University Press 1963.

And to consider the anthropological dimension of design prior to the humanistic one, in the exercise of its work within the extent of science and technologies dimension, in the forms of inhabiting, working and creating community, in order to define objects, networks, interfaces and services.

And prior to establishing relations between facts, ideas, forms, being aware that forms not only constitute the background, but indeed that which gives form, therefore the way of being of a specific civilization, culture and age. Design makes its anthropology emerge, which analyses behaviours, images, needs and desires, and interprets them, assigning them forms that make them exist. And, together with it, to highlight its epistemic values, open up to an important and possible shift from a culture of the project, meant as an internal reflection, phenomenology of design practices, to the way of being of contemporary societies, from which projects, knowledge and communication are realised.

It is truly due to design's way of working by project that it is a cross discipline and frees itself from the rigid logic of the field, putting into practice that "think different", from which innovation generates and due to its "boundary character", which withdraws and uses knowledge and techniques deriving from other disciplines, bringing them to daily life and translating them into concrete and virtual artefacts, in programs of action and communication, besides elaborating its own.

And this brings us to the central role of design humanism in the current redefinition of ethics within environmental issues in their anthropological aspects, which implies a way of thinking and of putting a design process into practice in a systemic way, and lead us into the dynamics of interrelation between local and global in which territories and communities that inhabit them innervate².

Regarding design and the environmental issue, technology today also takes on an important role: the industrial product is closely connected to it, and the objects display, all along, a technological content that refers to the production process, to the architecture of the object or to its functionality. That which appears currently relevant is the multiplication and invasiveness of technologies, their new way of appearing (virtual or dematerialised) and that which these characteristics determine in behaviours and in the project global process.

As Donald A. Norman writes, "the challenge consists in enriching our lives with intelligent devices capable of accompanying us in our activities, equipped with abilities complementary to ours, in order to let us obtain more results, more well-being, more choice, not more stress"³.

Science and technology may be suitable instruments for facing environmental and social problems and, at the same time, for satisfying the requirements and needs of contemporary society, but they are still too "highly energy-consuming" and high impact. The great challenges, scientific discoveries and technological innovations, inevitably connected to the world of artefacts, show repercussions on our behaviours too: the designer able to manage new technologies, to find innovative applications and to orient the research in the most correct direction in order to satisfy real needs and within a sphere of sustainability, takes on a determining role.

Another particularly significant aspect is that of environmental psychology, which has given a central role for the awareness of socio-physical space to the perception processes of the environment: its aim is that of clarifying the relations between environmental ownership and people's response modalities. Environmental psychology has had to share this interest with other disciplines of the environmental sector like design.

In environmental psychology the empirical research has been inspired by the most classical theories on perception, focusing attention, in particular, on the study of the perceptive responses people give to physical-spatial characteristics of the environment. Only later was interest widened also to the relations between the moment of awareness and that of action.

Environmental perception is therefore a collection of perceptive, cognitive and emotional processes through which individuals acquire awareness of the socio-physical environment and the information necessary for the development of cognitive frameworks, of which mental maps constitute a particular process.

2. http://designforculturalheritage.files.wordpress.com/2010/06/dh_fiorani_paper.pdf

3. D.A. Norman, *The design of future things*, Basic Books, New York 2007

Spatial perception is not a mere reproduction of its physical properties, rather it is a “mental construction”. Psychological-environmental research on this subject has examined various hypotheses like those that foresee differences in the structures of cognitive maps between individuals, or that regards the limited quantity of spatial information that individuals are able to elaborate, or still those that underline the necessity to have maps available for positioning or transportation.

The concept of cognitive maps was defined by Tolman⁴, who in his famous experiment on latent learning demonstrated how rats, when placed in new routes to reach food, were for the most part able to orient themselves. Tolman concluded that rats had constructed mental maps of different labyrinths that they then used to reach food. Later research applied the concept of cognitive maps to human situations, considering it as a cognitive process through which the individual orients himself and understands the surrounding world. The cognitive map is the mental image of space and is a process and not a characteristic of the individual, it is the product of experience resulting from interactions between the individual and his environment. It provides the individual with information to situate himself, orient himself and reach objectives. We can say that the cognitive map fulfils 3 functions:

1. adaptive, of solutions for problems associated with space;
2. symbolic, of communication: elaboration of environmental symbols upon which the subjects agree upon for interpersonal communication;
3. expressive of personal identity: they act as a support for the development of personal identity in that they call upon memories, emotions... in fact they are personalised.

The second case regards: evolutionary processes of cognitive mapping, that from Siegel and White have been divided into 5 stages:

1. the initial phase is constituted by a force of photographic knowledge which is carried out through the memory of single and isolated spatial reference points.
2. in the second phase single spatial points are used as references to organise routes.
3. in the third one there is a first integrated organisation of the awareness regarding distinct and limited parts of an environment.
4. in the fourth is the formation of an objective reference system that is expressed in the ability to orient oneself.
5. in the fifth is the coordination ability of routes within the reference system.

Lynch was the first to observe the ways in which people form mental images of the environment and of the city in particular.

Sensorial design is a more sensitive way of constructing the relationship with the environment upon people's needs, creating sensorial ergonomics, a synchronicity between the individual's physiology and the physical situation. Thus, colour is manifested as a great illusionist of a thousand faces, able to convince us to feel sensation for another, useful to shaping the environment according to the objectives. It is therefore fundamental to know and wisely use such ambiguities and illusions whose colour constantly influences us because the psycho-physical influence is experienced unconsciously.

Many times we find the words “environmental design” close to the term ergonomics⁵. If we start from the meaning of the term ergonomics and in particular the relation between man-machine-environment it is easy to understand how this field, ergonomics, is part of the environmental design complex.

The quality of the relationship between the user and the means used, in the wider sense of the term “means”, is determined by the level of ergonomics. The most important requirement to determining this level is safety, followed by adaptability, usability, comfort, pleasure, comprehensibility, and so on.

4. Umberto Galimberti, *Enciclopedia di Psicologia*, Garzanti Libri, Milano 1999.

5. A scientific field that, using the knowledge and facts provided from various fields of knowledge, studies the man-machine-environment system with the aim of finding optimal solutions, suitable to man's psycho-physical capacities and limits.

To determine a quality value for the relationship between a person and the technology used, ergonomists consider the work (the productive activity that requires the use of physical and intellectual energy to reach a predetermined objective) to be carried out and the user's request, the equipment used (dimension, form, arrangement), and the information for its use. Ergonomics is based on many disciplines and sciences in the study of human beings and of their environments, among which anthropometry, biomechanics, mechanical engineering, bioengineering, industrial engineering, industrial design, kinesiology, physiology and psychology.

An object that is not easily useable or not safe will be an object difficult to use, one which requires a lot of cognitive strength: it will therefore be "not very ergonomic". Among the various studies aimed at reaching adequate ergonomics, that of the kinesphere is among the most important, in order to calculate the space used for the user's maximum movement ability. This refers, in any scale, to a small daily instrument like, for example, a fork, up to a large organism such as a city.

Conclusion

When I was a student, the words of some professors clarified for me what the role of a designer, a figure I aspired to become, should be. Maldonado believed the work of a designer should be that of a technician intellectual, who had an important social role, from which came responsibilities towards the community.

The originality of Maldonado's approach lay above all in the context in which he carried out his critical discourse. With great clarity, Maldonado demonstrated that in every attempt to act against the causes and effects of our environmental situation one must always begin with regaining design hope, that is reconstructing our faith in the revolutionary function of applied rationality on a new basis. Design, writes Maldonado, "is the most solid link that connects man with reality and history"⁶. He believed man to be inseparable from the context, in which consistency, ethics and identity of the individual were reflected.

Design capacity, like the capacity to produce both belong to man's operative universe and it is up to him to adopt the most constructive behaviours to change that which does not work. According to Buckminster Fuller, on our planet everything can be found for everyone; during a conference at San José State College, he said: "*when man will be able to do much more with much less, to be able to care for others at a higher level, then there will be no more serious reasons for war. In the coming years, given that man will succeed in this, there will be no more serious reasons for war*".

6. T. Maldonado, *La speranza progettuale*, ed. Einaudi, Milano 1992.



Visual, Haptic and Urban design

Color | Light | Plan | Achitecture | Garden | Cityscape | Landscape

Advances in representation tools for built environment assessment

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Keywords: Environmental design, identity, local character assessment, place-visualizing toolkit, representation codes, urban pattern documentation, measured drawing, pattern book, color mapping

Abstract

Environmental representation through the documentation of typological components of settlements and landscape, i.e. landscape zones, patterns, architectural types, textures, materials, color and community intangible issues, is devised to address design strategies. Explanation of landscapes' values through its benchmarking, consists of several mapping actions and adoption of tools: 3D modelling, environmental mapping, places representation. The chapter presents a strategic process based on local character assessment through a place-visualizing toolkit from documentation and color representation to design coding: visualization of landscape' values and multimedia survey pipelines implementing processes, methods and tools for the narration of tangible values and intangible assets.

On 10 November 2011 UNESCO's General Conference adopted the *new Recommendation on the Historic Urban Landscape* by acclamation, the first such instrument on the historic environment issued by UNESCO in 35 years. The *Recommendation* is a "soft-law" to be implemented by Member States on a voluntary basis.

The historic urban landscape (HUL) is the urban area understood as the result of a historic layering of cultural and natural values and attributes, extending the "historic center" or "ensemble" concept to include the broader urban context and its geographical setting. This wider context includes notably the site's topography, geomorphology, hydrology and natural features, its built environment, both historic and contemporary, its infrastructures above and below ground, its open spaces and gardens, its land use patterns and spatial organization, perceptions and visual relationships, as well as all other elements of the urban structure. It also includes social and cultural practices and values, economic processes and the intangible dimensions of heritage as related to diversity and identity [1] [2].

This paper presents a strategic process based on local character assessment through a place-visualizing toolkit that includes urban identity and pattern analysis, color representation and design codes. The process has been tested on the information and documentation systems of some historic urban landscapes in Italy.

1. Background

The Historic Urban Landscape approach moves beyond the preservation of the physical environment and focuses on the entire human environment with all of its tangible and intangible qualities. It seeks to increase the sustainability of planning and design interventions by taking into account the existing built environment, intangible heritage, cultural diversity, socio-economic and environmental factors along with local community values.

The research develops the concept of design of *historical urban landscape*, a strategic design process that includes theories, methodologies, tools and techniques of project which have as scope of application the system of cultural heritage intended

in the cognitive, social and symbolic of a community: from traditional artistic, demographic, anthropological, monumental and environmental heritage, to territorial and urban systems and to the intangible cultural heritage, such as diffuse knowledge, practices and intangible expressions and the new contemporary cultural heritage such as places of culture and events. It is therefore a strategic field of industrial design based on the integration of different skills and techniques without neglecting social innovation in order to propose a site-specific meta-design including both configurative-formal that procedural-methodological applications engaging the complexity of cultural heritage.

According to the 2011 Unesco *Recommendation knowledge* and planning tools should help protect the integrity and authenticity of the attributes of urban heritage. They should also allow for the recognition of cultural significance and diversity, and provide for the monitoring and management of change to improve the quality of life and of urban space. These tools would include documentation and mapping of cultural and natural characteristics. Heritage, social and environmental impact assessments should be used to support and facilitate decision-making processes within a framework of sustainable development; and also regulatory systems should reflect local conditions, and may include legislative and regulatory measures aimed at the conservation and management of the tangible and intangible attributes of the urban heritage, including their social, environmental and cultural values. Traditional and customary systems should be recognized and reinforced as necessary.

According to this statement, an analytical process has to be undertaken to highlight the perceptual and cognitive phenomena through the triad vision, memory, and use of environmental images; these are related to the potential for *representability* of a place, the *imageability*, and to its pattern which allows the orientation inside a place, the wayfinding.

Kevin Lynch to describe the city's image formation coined the two terms imageability and wayfinding; in the first case, the figuration of a place that is the quality which confers to a physical object, a high probability of evoking in each observer a vigorous image and, in the second case, the orientation that allows to move into a place, distinguishing and naming its parts [3].

Traditional city expresses, through its formal and chromatic factors, its environmental, ecological and social character and giving materialization through the built environment to its deep and hidden references related to place-identity.

The urban pattern is organized in a logical and hierarchical sequence of places, an organic language based on their understanding and practical use. For proper intervention in the urban environment it is important to characterize the method for the layered knowledge of pattern features; a pipeline base on survey and representation of local characters highlighting urban and environmental quality indicators and degradation of public spaces and built environment.

This action allows the rehabilitation and subsequently the development of sites and the improvement of urban quality, for example through elimination or impact reduction of incongruous works. Some Italian regional ordinances have recently introduced the term "incongruous work " as the starting point for the promotion of urban quality; an incongruous element is devoid of logical consistency and disproportionate, does not correspond to the needs and expectations of users because it is "inconvenient," according to common sensitivity and in analogy with other places perceived as best-practices. A specific reference comes from visual impact, size, structural and functional issues of so-called incongruous artefacts: formal incongruity is given from composition, color, style; functional incongruity from size, and incompatibility with the urban context; and then economic incongruity, very important for local community governance policies because encompasses the concept of sustainability too.

The urban lexicon is the epitome of all architectural rules that define the final image of the built environment, so shape, density, materials, use of color and construction techniques reveal the identity of a place and highlight the characterization of the space. The research presents a methodology of graphic survey and color design by collecting typological and morphological templates; codes (subsequently referred to specialist areas) are the vehicle for translating these design intentions in the built form but at the same time they are also tools of representation and communication, that show unambiguously the urban image. Traditional city is the environmental and social landscape of territories, not only from the point of view of the urban form

but also because of the system of functions and relations that are rooted within its own pattern. Since design is a way to improve cultural and symbolic characterization of urban patterns, the research proposes methodologies to address the landscape unit documentation and integrated actions for regeneration and color design.

The investigation describes the urban pattern through its morphological, typological and structural characteristics. Identity of places, as a point of reference for determining what is and what is not incongruous, is not an abstract concept because, within a city, constitutes a central concept through the multiple layers produced by a process of cultural contamination.

It is therefore necessary to improve and protect the environment with multiple interventions about pattern, form, surfaces and incongruous materials; it is important to mitigate the effects of “noise” on the identity of places.

2. Environment, Identity, Chromatic value

Urban pattern analysis points out a set of principles through the investigation of signs, shapes and colors as key design elements for landscape characterization. Color is perceived as an expressive medium to fill the spatial vacuum according to the local habitus; use of color palettes, textures and traditional building techniques mark cultural relations and symbolize expressions: without color these relations are not living and not actually visible while this is the local-source way to materialize place identity.

Cities are complex systems that express multiple color identities; each area has its own “spatial color” as well as that morphological and it depends on many factors: brightness, materials, color and contrast, type of space, the size of the buildings. Color therefore represents an explicit attribute that expresses the spirit of place; a concept that belongs to some of the projects of modern and contemporary age: Le Corbusier, Bottoni, Van Doesburg and Barragan, just to list a few, that used color as an artifice to give sense and perfection to reality and its shape.

Bruno Taut in 1925 reminded us that: “... as soon as you get rid of superfluous, color turns out to be certainly as the only natural means to define spaces...” “, to give meaning to shape, to mark distinctly the character of a place. His invitations were partially unheeded because of the ideological predominance of the “non-color”, a material which reveals its texture (such as in the works of Wright); rationalism and purity of modernism expired in a sort of Lutheranism, the birth of globalization and landscape unification [4].

More recently, the color designer and theorist Attilio Marcolli (1988) reminded us of the importance of perceptual phenomena related to color to his design in the urban scene. His memorable research about the town of Venice expanding the concept of “city and color” to the concept of “city-color” and referring to a “symbolic theory of colors” investigating relationship between the sensitive effects of color and our habits, our relationships-mental environment, our ways of thinking and our cultural traditions [5].

The effective exploitation of a natural or constructed landscape must become, in the words of Eugenio Turri, “a private experience, to bring to individual consciousness, even if it is one of the great territorial facts, to be understood as collectives and even planetary”. This need is accomplished through the recognition of minimum units of territory, which defines coremi and the elementary units that characterize iconically and perceptually identity, named *iconemi*. City and related representations that become color’ palettes, graphic codes, layout description, and pattern books, as was characteristic already for the Roman city in the passage from the Republican age, characterized by the use of terracotta and warm colors (earth and clay), to the one of Imperial Rome with the extensive use of white marble [6].

More investigations report about the so-called *City-color* such as the Indian town of Jaipur, the Pink City, or Jodhpur, the Blue city: color is the result of a slow process of evolution and site adaptation taking advantage from local resources or art and crafts tradition or color palette imposed as a conceptual choice that started to rule the place. Unilateral decisions and synthesis of arbitrary choices related to a symbolic form of representation and management of a place, setting a standard that in the modern town governance is a concept of design strategy and place-branding too.

The approach theorized by Eugenio Turri, coremi & iconemi, was introduced in

the European Landscape Convention (signed in Florence in 2000) that pinpoints the importance of “landscape units”, where city and its landscapes can be understood as a unique anthropogenic ecosystem. According to the Convention, landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.

To analyze and map such a complex system, survey campaigns and typological descriptions of different pattern have to be edited; from the morphological point of view but also highlighting the intangible and invisible components: the way of settlement, housing typologies, building traditions and local resources, the nature of habitat and landscapes, and then social and cultural representations of communities. [7] [8]. Color is one of the many codes under which the city and is therefore needs to be framed and interpreted correctly through cultural systems and information technologies appropriate.

Space representation through color does refer to one of the possible ways of representing; giving evidence also to the perceptual phenomenon values related to the environmental light; the identity code of a space can be transmitted in a more systematic and complete manner.

The principle with colors appear in different tones is caused by the environmental light; an energetic phenomenon that creates color or the spatial variability of color; tone and its tuning, according to the specific place features, determines the value of a spatial context. This is the process through which the city contributes to the determination of the living space of a community and the formation of its image.

One of the best landscapes where the relationship between urban space and its chromatic component are evident is the town of Venice, where Attilio Marcolli concentrated his studies, from the concept of city and color to the concept of *color-city*. Marcolli argued that Venice is not only a topographic city, it is above all a heliographic one. The interaction between the built and the unbuilt environment creates the color-city, where conditions of color and shade are integrated in the spatial and topological conditions, forming a city that can be defined as a tonos-topos combination. Marcolli considered perceptual phenomena related to color as manifestations of a color-space topology.

3. Representation tools

Environmental design has to support communities in their quest for development and adaptation, while retaining the characteristics and values linked to their history and collective memory, and to the environment.

In the past decades, owing to the sharp increase in the world’s urban population, the scale and speed of development, and the changing economy, urban settlements and their historic areas have become centers and drivers of economic growth in many regions of the world, and have taken on a new role in cultural and social life.

Urban heritage, including its tangible and intangible components, constitutes a key resource in enhancing the liveability of urban areas, and fosters economic development and social cohesion in a changing global environment. As the future of humanity hinges on the effective planning and management of resources, conservation has become a strategy to achieve a balance between urban growth and quality of life on a sustainable basis.

Methodology is applied to the system of cultural and built environment intended in the physical understanding of a territory and a community: from traditional, artistic, demographic, anthropological, monumental and environmental heritage to territorial and urban systems and the intangible cultural heritage, such as knowledge, practices and intangible expressions and the new contemporary cultural heritage such as places of culture and events.

Representation of different environments, according to their typological components (landscape, architecture, textures, materials, and colors), is devised to encourage a strategy of valorization. Explanation of landscapes’ values through its benchmarking, consists of several mapping actions: from modelling to environment representation and visualization.

The mapping process should lead to the formation of “images” which are subsequently transcribed according to an interpretative grid; the representation code parameters like unity and variety but also stability and continuity must be recognizable because of their unique relation with the concept of place. Images “build” the form

of settlements and it reproduce their configuration, giving evidence to the structural relationships and between the functional components. [9]

The tested methodology follows a three-phase process for historic urban landscape documentation: analytical survey, representation and interpretation of architectural composition, materials, patterns, textures and pigments and chromatic dominants within buildings and blocks.

According to the 2011 Unesco Recommendations, *“research should target the complex layering of urban settlements, in order to identify values, understand their meaning for the communities and present them to visitors in a comprehensive manner.* So It is essential to document the state of urban areas and their evolution, to facilitate the evaluation of proposals for change and to improve protective and managerial skills and procedures.” Representation and data visualization allow to target the smart side of knowledge (not only a technology-oriented status quo recording process) that combines multi-dimensional and multi-scalar issues and expresses the values of an asset and its quality through actions of revelation, and legitimation, in particular puts in place, processes, methods and tools of representation and narration of material values (goods at any scale) and intangible assets (identity, community, representations, etc.). The methodology proposes a strategic pipeline of reading and interpretation which systematized the production of representations such as a charter of values, a visual catalogue of quality that marks the narrative track on which to build subsequent activation pathways and place enhancement. This process allows to show the color interaction enhancement showing the color combinations within the block elevations and giving a visual information. It is therefore a strategic contribution, therefore, that binds to design scenarios possible applications in terms of communication, exhibition spaces, the design of platforms and communication artefacts and configuration of urban spaces and public spaces with high-quality, event planning, etc. offering opportunities for knowledge, experience and appropriation of assets.

Place identity visualization allows to recognize, communicate and manage the awareness and recognition of the potential of the socio-cultural asset but also to represent concepts and new meanings related to the transformation of this heritage, not just exclusively conservative, but also for sharing knowledge with new generations of users.

The act of seeking the sense of place through the representation of its identity is a prerequisite to integrate it into the strategic design process; the critical documentation and the several forms of representation address the perceptual and conceptual mapping process. Further analysis allow to highlight stability and continuity features describing also places through the fundamental parameters of unity and difference. Place-making and its benchmark is inextricably associated with the concept of the limit and boundary, these spatial characteristics, combined with a physical and perceptual boundaries, are the representation of the pattern language.

The tools of urban representation require the definition of standards and prescriptive graphics regulations for the maintenance and rehabilitation of landscape units and city patterns; appropriate design codes with a strong graphics level, can organize information and management addressing the achievement of urban quality.

For this purpose it is necessary to investigate methodologies for the documentation of identity of places, the town character assessment, and increase the awareness about diffuse values that are relevant to the urban habitat; through a critical analysis of the built environment they are delivered the appropriate guidelines for interventions related to pre-existing hamlets highlighting, in synthesis, their genius loci. [10]

These guidelines, drawn up by the use of design codes, are always generated from a targeted survey that highlights, through a systematic cataloging action, characters and a greater recognition of the urban landscape; it is necessary to emphasize incongruous elements so as to define, during the operation, which is the lexicon to be followed, and its compatibility according to available technologies, constructions techniques, craft expertise and the availability of local materials.

Design of the built environment or place-making processes can alternatively be based on space-related landscape units, less entrenched but also linked to the rapid transformation of a sequence of emotional images related to three main layers: chromatic landscapes, iconic units and iconic objects.

Chromatic culture is the fundamental background that enables color to transform its role and to take on an anthropological significance that characterizes the urban landscape as a phenomenon of color appearance where the meaning of the color is rooted in the local culture. [11]

The topos is a part of a landscape, with specific directions concerning the perceptual, symbolic, relational and therapeutic issues of built form, which interacts and influences the recipient as user, citizen and consumer. In this framework the methodology proposes the mapping of chromatic dominants as series of iconic landscapes.

Cities (and territory) are systems that express multiple chromatic identities, where form and chromatic ones are the mostly perceived from people; each urban area has its own "chromatic spatiality" as well as that morphological one that depends on many factors: brightness, materials, colors and contrasts, type of space, size of buildings; color therefore represents an attribute that explicitly represent the spirit of place. The landscape chromaticism is the expression of a sophisticated conceptual meaning, which identifies and highlights the architectural and environmental features of an historical pattern.

Color is an element linked to local traditions, habitus of a community, the so-called spirit of place; has implications on the anthropological character of a place, carries out a distinctive action and provides a great aesthetic-perceptive result to the image of the traditional city. So this habitus has to be preserved, maintained and designed through site-specific tools.

Referring again to the 2011 Unesco Recommendations, "Knowledge and planning tools should help protect the integrity and authenticity of the attributes of urban heritage. They should also allow for the recognition of cultural significance and diversity, and provide for the monitoring and management of change to improve the quality of life and of urban space. These tools would include documentation and mapping of cultural and natural characteristics. Heritage, social and environmental impact assessments should be used to support and facilitate decision making processes within a framework of sustainable development."

In the design of historic urban landscapes, color schemes are based on the topological importance of landscape units; the analytical documentation about of these units allows to record the urban transect and the pattern book. [12] The book of types of the urban settlement, the pattern book, highlights color and topological configurations of the city, whose strategic relevance was highlighted by Marcolli.

The urban-to-rural transect is an urban planning model created by New Urbanist Andrés Duany and tested in several built towns worldwide [13]. The transect defines a series of zones that transition from sparse rural farmhouses to the dense urban core. The pattern book is a design-and-picture repository, which feature images, models and drawings of buildings, spaces and lexicon of the urban environment. The one designed by ADAM Architecture (and commissioned by the Prince's Foundation and the Duchy of Cornwall) for the future development of Newquay is an important reference. The book is not prescriptive; rather it provides town planners, architects and builders with a useful resource of typologies and details for the design of urban space and buildings. It is intended to guide new development in a way that will provide continuity throughout the urban fabric and strengthen the built character of the town. The book suggests how urban and architectural patterns may extend into new areas and thereby reinforce the best of the existing with the new. Careful analysis of urban forms ensures that buildings of suitable character and scale are designed and built in a natural and cohesive way. [14]

These strategic and richly illustrated documents, are a synthesis of research applied to color and the topological configurations of communities, color identity in relation to the traditional regional habitat, the geography of color. It highlights the peculiarities of color in relation to geography, history and tradition and becomes a site-oriented regulatory system that reflects local conditions and may include codes and recommendations for the conservation and management of the tangible and intangible attributes of the urban heritage, including their social, environmental and cultural values.

Through color it is possible to interact with form and its perception, to overcome the conflict between surface and volume, describing the nature of static and dynamic composition and developing the necessary sensitivity to chromatic and spatial issues. The analysis of color's features through a scientific survey highlights the use of natural construction materials (stone and timber), the characterization of finishing technologies and façade decoration according to traditional techniques of construction. Further information coming from site-specific measurement addresses brick masonry types, façade composition, decorative elements built in stone or brick works textures and color hues for painting metallic objects (balustrades and ironworks) and glazing timber works (windows and doors).

Color image of the traditional city is based on a palette of colors that vary from region to region (chromatic regional samples), depending on locally available materials and use of various finishing techniques of architectural surfaces. These color investigations are required to characterize the urban landscape as a sequence of chromatic minimum units and pattern minimum units that provide a comprehensive and integrated maps of hues and related building materials.

The information necessary for the project must be collected with synthetic graphics tools organized in the form of typological data bases, 3D models, graphics glossaries and vocabularies collected in a document called Color & Pattern Book, an extension of current urban design tools as described before. The critical investigation about façade classification and its main components proposed four categories of incongruity; this approach have been tested and applied in the Color Plan of Morciano di Romagna and Meldola in the Italian region of Emilia-Romagna.

Urban pattern documentation and 3D modelling encompasses integrated methodologies and tools: photogrammetry, image-based 3D modelling, orthophoto and 3D libraries; representation codes recorded also the multiple layers of settlements and landscapes describing both the horizontal sequence of planes that features about morphology.

The comparison of survey techniques and data management is based on several aspects: management of the documentation process, flexibility of measuring system, data processing and interoperability, graphics standards, geometric accuracy and data model coherence. The use of photography and image-based 3d modelling techniques allows economy and efficiency during the image processing and ensure a cost-effective workflow and operating process. [15]

An application of this methodology has produced a typological urban code of pattern components validated for the first time in the historic center of Fontana (a small village of Sasso Marconi, Bologna, Italy). [16] [17] In the two recent case studies of Morciano di Romagna and Meldola, the historical centers were documented through a three stages methodology: analytical documentation of the physical environment; color analysis and documentation of color tuning and color design for each single façade (and then studying color interaction within each block street elevations). [18]

Conclusion

The place-user interaction processes (knowledge, documentation, narration) have to be conceptualized, led and coordinated by strategic design techniques for cultural heritage, communities and historical landscapes (regeneration, activation and re-activation), developing also specific skills of communication and representation as a language of the meanings. Future and emerging trends are strongly involving visual and multimedia contents into design tools like integrated strategies for documenting complexity are bringing to user new and emerging tools that are far from an efficient application. The future development of the methodology aims to develop tracks for 3d modelling, imaging, and representation standards according to the wide scenario of digital environments. The interdisciplinary research aims to develop new methods and tools for 3D modeling and analysis of physical cultural resources and assets (e.g. cultural heritage sites, monuments, historic landscapes, etc.) beyond simple digital reconstruction based on 3D clones. [19]

In this way the impact of IC tools encompasses a wide spectrum of actions:

- the creation of 3D libraries of the main architectural elements in historic urban environments. Such digital libraries will contains common architectural entities (e.g. columns, arches, crossheads, etc.) and will be procedurally generated with parametric shapes, possibly containing sub-components, thus forming a hierarchy representation (with nodes and relations).
- the establishment of an integrated methodology based on aerial (drones) and terrestrial-level acquisitions to produce high-fidelity 3D data for the successive generation of segmented and enriched BIM of historical urban scenarios
- the development of digital representations for better understanding, preserving, and protecting European assets, GIS and BIM.

- the realization of pilot projects on Unesco sites to make operational the advanced 3D tools implemented in the project and valorize these heritage areas through fruition and multiple access for all.

The approach requires collaborations across disciplines, technologies and sectors, such as statistics, history, cultural studies, anthropology and other areas of humanities and social science research on one side, and creative practice and digital developments in areas such as design and visual arts on the other side. The design of historic urban landscape also implies the integration of a range of traditional and innovative tools adapted to local contexts. Some of these tools, which are developed as part of the process, can involve a series of stakeholders and local actors, facilitating civic engagement and helping local communities to develop visions and identify key aspects of places and landscapes. [20]



Figure 1. Environmental images of places & cities and local identity assessment. The strategic process of analysis, documentation and narrative: pattern analysis, orthophoto and elevations, 3D modeling and color palette.

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Historic Indian cities: towards retaining the identity and livability through design

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Keywords Environmental design, identity, local character assessment, place-visualizing toolkit, representation codes, urban pattern documentation, measured drawing, pattern book, color mapping

India is a land of rich diversity, a combined result of its geography, the varied climate, physiographic features and the imprints of social and political agents spanning centuries. One of the oldest civilizations in the world, it holds into its many folds, a rich cultural heritage. The urban history of the country dates back to 2,500 BC, with the Indus Valley civilization. The archaeological remains of the cities of Mohenjodaro and Harappa testify the highly developed urban patterns and systems during this period. This was followed by the Vedic civilization founded with the coming of the Aryans in 2000 BC, whose synthesis with the original inhabitants, resulted in Hinduism. Many cities of this era are still living and inhabited. The Buddhist period, in the 7th and early 6th century BC, saw the making of the sixteen great powers and the monarchical states, which still exist as cities and places. The invasion of Alexander and his deep interest in Indian philosophy has also left its imprints on the land. The Mauryan empire (322-185 BC), the works of the Ashoka the great, the extension of territories, from Hindukush to Bengal, Afghanistan, Baluchistan, valleys of Kashmir and Nepal, the conquest by war giving way to the conquest by piety, are narrations imprinted on the landscapes. The Gupta period can be called the Golden age of Indian history, which saw the making of many famous cities and regions, recorded in the history for their prosperity patronization of the art, music and literature. Its weakening between 5th and 6th centuries A.D., invited the invasion of the Huns. In the beginning of the 7th century AD, Harshavardhan consolidated the territories of northern India and opened exchange of ideas and knowledge with China. The Pala rule of 8-10th centuries A.D. saw the making of the university towns of Nalanda and Vikramshila. During the end of this rule, the Muslim invasions started through Bengal, Arabs from the west and ultimately the attack of Mahmud of Ghazni, in 1018 and Malik Kafur in the early 14th century A.D. The foundation of the Muslim rule in India was finally laid with the invasion of Muhammad Ghori in 1175 A.D. followed by the Mughal empire from 1526 A.D. The Mughal Empire also saw the periods of Shivaji in the west, Sher Shah Suri in Delhi and the rise of the Sikh power. These periods superimposed extensive reconstruction and development activity in the pre-existing places. India came under the influence of the British East India Company in 1757 A.D., and finally it came under governance of the British Monarch on 1st November 1858. The country regained its freedom on 15 August 1947, after centuries of foreign rule.

All the above historical happenings have resulted in an interesting intermingling of various cultures and transformations of the built mass and urban spread through the ages. The strong cultural roots reflect themselves in the way the cities have been conceived, built, rebuilt and reconstructed.

The role of memory of historical events, the patronage of the rulers, the fairs and festivals, the trade and commerce, all find their place in the forever evolving design of the Indian cities.

The Indian city of today displays an outgrowth of modern needs and thinking,

but rooted in the history of culture and traditions. This can be best explained through a tree, securely rooted in the ground, bearing foliage and fruits as visible components. This foliage will be beautiful, shiny, the fruits tasty and the flowers fragrant, when the roots are nourished, healthy and alive. This is an Indian city.

The modern aspirations of an Indian city have resulted in sudden transformations of pre-existing urban forms into modern typologies, crisscrossed with a network of services. The original courtyards in the built up mass of the city disappeared, getting built up in response to more floor area in the city centres. The cities turned their back to the natural heritage. River

ways, stream ways and lake edges were used to lay out the sewage networks. The green in the open spaces, and many gardens disappeared, either converted to stadiums, playgrounds or built up with houses and buildings. Public spaces required for the fairs, festivals, processions disappeared and these spilled onto the roads, causing intense traffic discomfort and stress on the roads. The transition has been from energy efficient to energy intensive living patterns and unfortunately, from an intense character to facelessness.

An Indian lifestyle is deeply rooted in traditions. It could be very modern, equivalent to an American or European lifestyle, but still the prime events in the life are conducted with traditional fervor and character, viz. the birth, marriage and death ceremonies, and the same holds good for the fairs and celebrations of festivals. For example, the continuously inhabited ancient city of Ujjain, witnesses the coming together of millions of people every 12 years for the holy bath in the sacred river of Kshipra. The city has shown great resilience by successfully supporting, for centuries, floating populations of strengths almost 40 times their own, spread over a month, with about 5 million in one day. Besides these intensive gatherings, there are many fairs and festivals stretched throughout the year, which are celebrated in togetherness of people from all over the country

It is said that it is difficult to resolve a problem that is not precisely defined. Therefore, it becomes imperative to understand the Indian cities, to be able to respond to it effectively by way of design.

The above necessitated an in-depth study of the drivers of the imprints left on the historic urban landscapes of Indian cities. The following defining criteria have been arrived at:

- C-1-Criterion.1: Urban population and its composition.**
- C-2-Criterion.2: Sacred river**
- C-3-Criterion.3: Ancient routes / Pilgrimage trails**
- C-4-Criterion.4: Rulers, Princely States, Presidencies, events**
- C-5-Criterion.5: Landscape Elements**

Many historic Indian cities have been checked against these criteria and it holds good. However, three cities have been selected as samples to conduct a detailed check and to arrive at the directions for future development, so that the identity and livability of the historic cities can be retained.

1. Urban population and its composition.

The population of India as per Census of 2011, is of 1,210,193,422 persons. The highest populated state is of Uttar Pradesh carrying 16.5% of the country's population, followed by Maharashtra (9%) and Bihar (8.6%). But the samples have been drawn from the state of Madhya Pradesh, which carries 6% of India's population. The justification is based on the Air pollution (particulate matter) numbers from 252 Indian cities by Central Pollution Control Board (Hindustan Times Bhopal, 2-11-14). These numbers show that 8 out of 10 top polluted cities are the developing ones, rather than the developed ones. For example, Gwalior in Madhya Pradesh has a particulate matter suspension of 313 ug/cu.m. (2014) in the air which is even higher



Figure 1-2. Two different gatherings on the banks of river Narmada at Maheshwar. Top: Tazia procession of Muharram, bottom: Shivaratri festivities

than Delhi, the metropolis capital of India, which had topped the dirty air chart from 2009 to 2014. The city of Gwalior was not on Indian hazardous air pollution logs five years ago.

Madhya Pradesh lies in the centre of the Indian subcontinent, also known as its heart, second largest state in the country by way of its area. Therefore, it is important to keep this large heart retain its identity and remain livable, through design interventions.

2. Sacred river

India has seven great rivers which are considered as sacred from time immemorial. The river Ganga, with its shimmering white-and-gold character signifying purity, offers salvation and freedom from the cycle of birth and death, river Yamuna, which is blue like Krishna signifies Romance, river Saraswati (now extinct) was white and elegant like a swan signified Knowledge, the dark and elusive river Narmada signifies detachment and surrender, the river Godavari characterized by the colour saffron signifies devotion, the silvery river Kaveri signifies wisdom and the river Krishna characterized by colour green signifies courage and valour. The sacred Hindu mass pilgrimage is held every twelve years on confluence of rivers Ganga, Yamuna and Saraswati at the city of Allahabad, on the banks of river Godavari in the city of Nasik, on the banks of river Ganga in the city of Haridwar and on the banks of river Kshipra in the ancient city of Ujjain. The Maha Kumbha fair at Allahabad is the largest gathering of pilgrims in the world.

3. Ancient routes/ Pilgrimage trails:

Since India possesses a rich historicity, and is known for its beliefs, faiths and spirituality, it has many historic routes and paths which were traversed by the pilgrims. It is amazing to see the vast number of people travelling in different times of the years, driven by belief and faith, traversing difficult terrain oblivious of the hardships of travel. The cities falling on these routes would cater to the needs of these travelers. These travelers would, traditionally become guests of these cities and the entire city rises to take care of their hospitality. The cities of Madhya Pradesh lying on the ancient path followed by the hermits dwelling on the banks of River Godavari going northwards in search of Buddha, are Mahishmati (now Maheshwar), Ujjaini (now Ujjain) and Vidisha.

4. Rulers, Princely States, Presidencies, events:

The city design is affected by the patronage of the rulers, princely states and the presidencies. Major natural or man induced events also leave their lasting imprints. India has seen a spectrum of rulers, indigenous as well as foreign. This has resulted in an amalgamation of urban design and architectural styles. Somewhere it shows a destruction of existing to be superimposed by the new order, at places it is abandonment of the existing and expanding towards the newer areas or expanding of the periphery and at places the new development is knit into the existing, both co-existing for centuries.

5. Landscape Elements

The landscape elements are taken as climate, geology, geomorphology, topography, hydrology, flora and fauna. The cities are settled in a particular place guided by any or all of the above landscape elements, and in turn leave their multifaceted impacts on these. A disregard to the landscape elements results in the degradation in the quality of life, environment, aesthetics or the harmony of co-existence with nature.

The following four cities have been selected as samples of Indian historic urban landscapes, after checking through the above criteria:

Bhopal: The city satisfies the criteria 1, 3, 4 and 5. The city has a population of around 2 million persons hailing from different parts of the country (C-1). Bhopal was on route of the ancient and medieval trade routes (C-3). The city was founded in the early 11th century AD with the making of the lake called Bara Talab by the illustrious Hindu King Bhoj. It was taken over in the mid 18th century by Dost Muhammed Khan, an Afghan plunderer and laid the foundation of the Islamic Princely state of Bhopal by encircling the city with walls. The city saw the continuous 100 year rule of Queens (Begums), which was the most constructive era of the city. The last Royals of France, the Bourbons, have settled in Bhopal and had occupied commanding position in the Princely state during the rule of the first Begum.

The state was a friend of the British and enjoyed a first class status during the colonial period. It was merged in the Indian Union after India attained freedom from the British rule and was made the capital of the state of Madhya Pradesh in 1956. This necessitated a rapid growth befitting a capital city. The city spread to newer areas southwards towards untrodden lands.

Therefore, the city bears the imprints of the period of King Bhoj, military activities during period of Dost Muhammed Khan, nurturing attitude during the rule of the Begums, The French influence brought by the Bourbons, the Colonial influences, and the post independence modernistic development. Besides the imprints of the patrons, the city bears the recent impact of the Gas tragedy (1984), wherein thousands of people died in one night when the poisonous methyl isocyanate gas leaked from the infamous factory of Union Carbide. Besides the dead, this event left its impact on the ecology and debilitating effect on the survivors. This resulted in the change in the occupational patterns of thousands, leaving its impact on the city fabric (C-4). The historic city has settled on the banks of the man-made lake called Bara Talab made by King Bhoj (1010 AD). More man-made lakes followed with the Chhota talab (late 18th century AD), and the three cascading lakes of Shahjehanabad (19th century AD). The lakes were possible due to the geological and the topographical structure of the land. The city is interspersed by many hills and the geologic structure is of Vindhyan sandstone base with basaltic outflows. The pleasant microclimate generated due to the lakes reflects itself in the design of buildings and urban spaces. It has a rich flora and fauna, with a National Park situated right inside the city (C-5).

Maheshwar satisfies the criteria 2-5: The town is settled on the banks of the sacred river Narmada (C-2). It was an important destination in the ancient routes of India, in both the pilgrimage and trade trails. The pilgrimage trail still lives on (C-3). The city environs has a history dating back to the stone age.

Its urban history starts from the 6th century BC, with various rulers through the centuries, the most recent imprints being those of the 18th century by the Holkar Princely state with capital at Maheshwar. Ahilya bai Holkar, the remarkable queen, has left a lasting impact on the city, and thousands of people throng to the city to pay homage at the venue from where she managed the social, political and administrative functions of her kingdom in an unparalleled manner.

She built temples and public facilities throughout India, including the famous Vishwanath temple at the ancient city of Varanasi. She is also the founder of the famous Maheshwari fabric, the art of weaving which still lives and forms the major occupation in the city (C-4). The city is laid on the banks of the river Narmada, which emerges from the ground in Amarkantak in the east and flows westwards to fall in the Arabian sea. The city of Maheshwar is situated on the confluence of the Maheshwari and the Narmada river, atop a natural earthen mound. It has a moderate climate and a rich diversity of flora and fauna (C-5).

Gwalior satisfies the criteria 1,3, 4 & 5: The city of Gwalior has a population of 1.38 million persons hailing from all parts of India as it has some offices of central Indian Government and the military installations. It was made the capital of the Madhya Bharat state from 1948 to 1956, after India got its independence. (C-1). It was part of the ancient trade routes (C-2).

The most spectacular period in building and urban design ranged from the 15th to the early 20th century A.D., the most recent princely state being that of the Scindias. The Gwalior fort was built by King Mansingh Tomar (1486 AD-1516 AD). The modern city is a coming together of 3 cities, the old Gwalior of the 15th – 18th Century A.D., Lashkar of the 19th-early 20th Century A.D., Morar, the Colonial Cantonment, with the Gwalior Fort on the Gopachal hill of 2nd – 20th Century A.D.

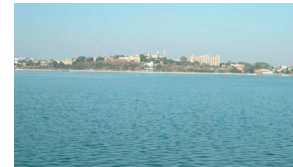


Figure 3-4-5. Map of Bhopal; the Bara Talab, the lake of Bhopal; Palaces at Iqbal maidan (from archives)

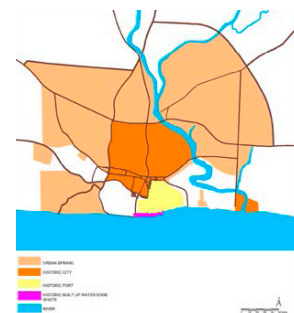


Figure 6-7-8. Maheshwar city plan; Ahilya fort from river Narmada; weavers with Maheshwari fabric

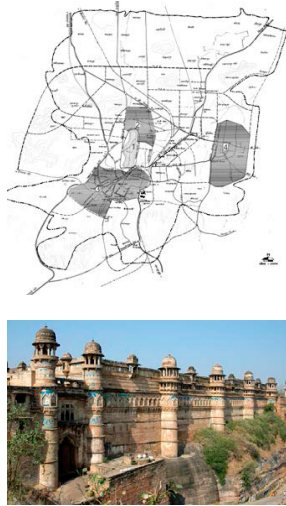


Figure 9-10. Gwalior: the coming together of 3 cities with the Fort in the centre; Gwalior Fort

acting as a fulcrum. It is therefore the coming together of various urban planning and architectural styles ranging from the exquisite style of the Tomars, to Mughal to the Maratha influence of the Scindias and the British Colonial. The magnificent Jaivilas palace of the Scindias was designed by the Italian architect Michael Filoze in 1861 AD, on an invitation by the Scindias.

The Italian gardens of Phoolbag is a mixture of Italian, Hindu and Mughal garden design and was inaugurated by the Prince of Wales in 1922 AD. This brought a new dimension and imprint in the urban character of the city (C-4). The Gopachal parvat, a table top hill with rocky, almost vertical, slopes becomes the reason of Gwalior being located here. In later periods, the urban development moved downhill, covering the foothill and the valleys, where flowed the river Sonrekha. The area is rocky, with extreme climate, but a rich flora and fauna (C-5).

The big question now is how to retain the identity, and in the process, the livability, of the historic Indian cities?

The reply to this question makes it imperative to study what is happening around the world for retaining the identity and livability of historic cities. Is the issue addressed in the development plans of these cities? A journey was made through the international charters where urban heritage was the concern, national and international tools for urban heritage conservation, prevalent theories and the development plans of the selected cities. The findings are shown in Table 1. It is seen that the theories are giving the required importance to identity and livability of cities, the international tools also to some extent, but a focused approach needs to be developed for the Indian cities.

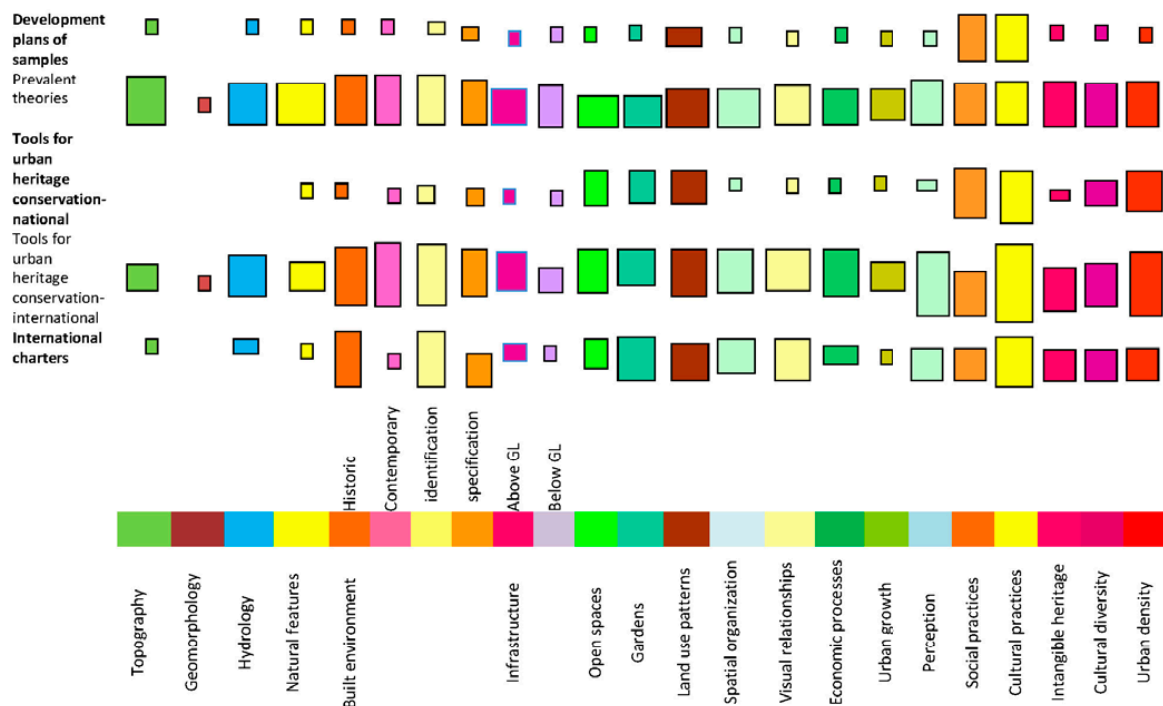


Table-1

The sample cities are resplendent with built and unbuilt heritage, but suffer from fragmentation, the links between which have been severed due to ignorance or apathy. The development plans of these cities do realize the importance of conserving the urban heritage, but in the absence of rules, regulations or guidelines, the urban heritage is fast depleting, fragmented and isolated. The story of the city is not coherent due to the many missing pages. The urban heritage exists in the cities as spots in a cheetah skin. If we are not careful, our heritage will become extinct like cheetah has from our lands. The character of our cities will be lost, giving way to facelessness. The loss of identity will result in disinterest and stress.

The cities are for the people. It is very important to know what they want. Do they really want to retain their historic identity? And what is their perception for a livable city?

To explore the above, a sample group of people belonging to all walks of life were approached. They were housewives, teachers, journalists, tradesmen, social workers, priests (Hindu, Muslim and Christian), office administrators, shopkeepers, musicians, common man, students, politicians and professionals. They were asked to fill in a questionnaire titled “My City”. A simple question was put forth, “Are you happily residing in your city? To evaluate your concern/ satisfaction/ aspirations as resident of your city, Please assign values from 1-10 (1 being lowest and 10 being highest) to the aspects of your city as given below: (Please tick your choice of value)”

1. Environment:

- Hills,
- Lands,
- River,
- Gardens, vegetations, birds,
- Air
- Water

2. Are you happy about the Historic Context of your city?
3. Are you happy about the Cultural Context of your city?
4. Beauty: Natural, Man-made, Both
5. What type of built environment do you prefer? Air-conditioned spaces / Climate conscious designs with comfort levels achieved naturally
6. Water supply system
7. Sewage and waste water disposal system
8. Garbage disposal system
9. Heritage - Natural, Tangible, Intangible
10. Any other aspect of the city
11. What identity and character of the city would you like to have or retain?
12. What are your aspirations for your city of the future?

My City

District: Bhopal Name of the city: Bhopal

Your name: _____ Age: _____

Address: No. 10, Sudarshan, Laxmi Park, Bhopal (Bhopal 462002)

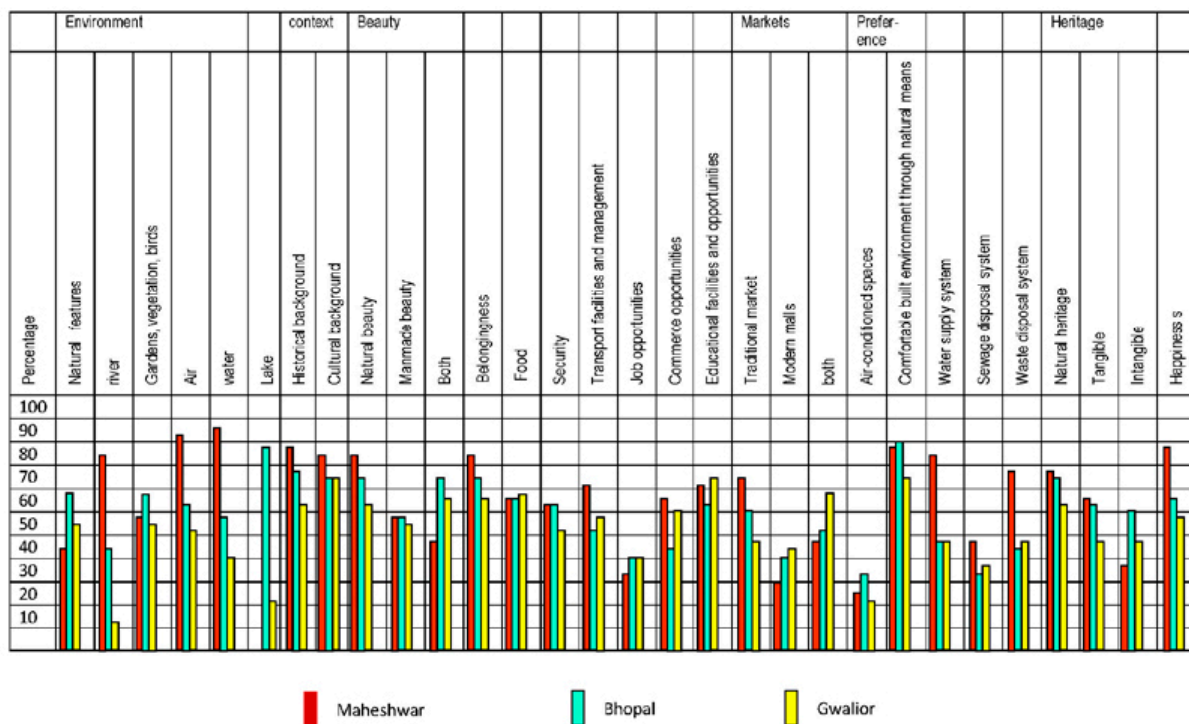
Profession: _____ Education: _____

Are you happily residing in your city? To evaluate your concern/ satisfaction/ aspirations as resident of your city, Please assign values from 1-10 (1 being lowest and 10 being highest) to the aspects of your city as given below (Please tick your choice of value)

	1	2	3	4	5	6	7	8	9	10
Environment										
Hills, Lands										
River										
Gardens, vegetation, birds										
Air										
Water										
Lake										
Are you happy about the Historic Context of your city?										
Are you happy about the Cultural Context of your city?										
Beauty										
Natural										
Man-made										
Both										
Availability of food?										
Security?										
Belongingness?										
Transportation facilities and management?										
Job opportunities?										
Commerce opportunities?										
Educational prospects and facilities?										
What type of market do you like?										
Traditional										
Modern										
Both										
What type of built environment do you prefer?										
Air-conditioned spaces										
Climate conscious designs with comfort levels achieved naturally										
Water supply system										
Sewage and waste water disposal system										
Garbage disposal system										
Heritage										
Natural										
Tangible										
Intangible										
Any other aspect of the city										
What identity and character of the city would you like to have or retain?										
What are your aspirations for your city of the future?										
Please assign value between 1-10 to rate your happiness/ satisfaction as the resident of your city										
Your signature										
Savitri Raju										
Professor										
School of Planning and Architecture, Bhopal										
email: savitri@spabhopal.ac.in, livingheritagealliance@gmail.com										

Please assign value between 1-10 to rate your happiness/ satisfaction as the resident of your city.

Table-2



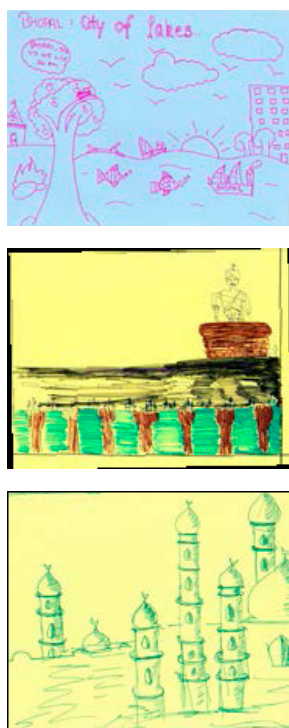


Figure 11-12-13. Childrens' perception of identity of their city Bhopal. Top: identity is lake and bio-diversity, middle: lake with the statue of its creator King Bhoj

Question numbers 10, 11 and 12 expected descriptive responses. At 13, a summing up has been asked by way of their rating to the overall happiness/ satisfaction as the resident of the city.

The responses of 200 persons in each sample city are presented in *Table 2*.

Even though the transport facilities and management, job opportunities, sewage, garbage and water supply is getting less marks, the overall happiness has received 68%, 88% and 58 % marks in Bhopal, Maheshwar and Gwalior respectively. The historic lake of Bhopal, air, water, sacred river and historical background at Maheshwar, cultural background and educational opportunities at Gwalior emerge as the most valued assets that people identify with and which contribute to their happiness and livability of the cities.

Therefore, it is seen that the people do want to nourish their roots, their identity, and that the quality of air and water becomes most important components for livability.

"Mention the name of a city, and the mind of a listener who knows it, will most likely identify it with a visual image, one of its landscapes." (Price, E.T., "Viterbo, Landscape of an Italian City", *Annals, association of American Geographers*, Vol. 5 (1964) pp 242-75)

"Bioregion: Both to a geographical terrain and a terrain of consciousness- to a place and the ideas that have developed about how to live in that place" (Peter Berg & Raymond Dasmann, 1978).

After surveying how the adults think about their city, another experiment was done to understand how the children look at their cities. The sample group of 200 children was drawn out of underprivileged colonies from all parts of Bhopal. They were given drawing sheets and sketch pens and a time of half an hour. They were asked to draw their perception of what is the identity of their city. About 70 percent of the children drew the historic lake and its surrounds, the bird in the sky, the flower on the tree and the fish in the water, and the statue of King Bhoj, the creator of the lake. 20 percent of them responded to the city's historic skyline as its identity. Only 10 percent of the children responded to Malls, non-descript buildings, roads and traffic as the identity of their city. Therefore, it can be said that the historic lake and the historic skyline form the identity of the city of Bhopal.

It implies that the design interventions need to be planned in response to the defining criteria of the Indian cities. The older form has evolved and survived through the ages, is time tested, and therefore need to be given due consideration in the modern plan of the city. This will help in arriving at an environmentally sound design, with clean air and water, where heritage is a part of the environment.

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Notes:

National Standard for the Acceptable limit of particulate pollution in the air : 60ug/cu.m
 "How cities as entities have developed as physical configuration of sheet spaces and many type of physical structures."
 "Each society leaves its mark on the landscape creating forms that reflects the aspirations and problems of its days."
 "Each successive society has both a custodial role and a creative role."
 "The lessons of the past are written large in the landscape, if only we can read the script!!"
 - Larkhan, P. (1995) , Constraints of urban history and form upon redevelopment.

The historical cityscape and the new expansion in albania: the case study of berat

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Introduction

The paper is focused on the study of the Albanian historical landscape, developed under the Ottoman influence. The case study selected is Berat, an ancient centre in the south of Albania, World heritage since 2008.

The study started from the approved theory of the diversity between Balkan and Western urban morphologies, especially in terms of module of urban aggregation and design of open spaces. The analysis of the historical Albanian cityscape is based on the study of the development of the neighbourhoods, the formation of centre and the relationships between urban context and landscape in Berat. The paper investigates a broad historical framework that goes from the sixteenth century to the present, as the most important historical events have influenced the urban morphology and social life. Furthermore, the knowledge of local legislation on the protection of the urban heritage is necessary for the understanding of the contrasts between protection and new development.

1. The structures of the Balkan cities

Since the Romantic period of the nineteenth century Western chronicle writers or travellers were impressed by the great contrasts that Balkan cities offer under the Ottoman influence¹. They were fascinated by the strong differences between the inner spaces and outer spaces. The first one were tidy and rich the second one chaotic and spontaneous. Although Westerners, during their visits to the Balkans perceived more the mess and chaos of the system of roads, narrow, winding, sloping and inadequate.

The Western cities were based on a different urban model, which focused on the importance and design of the public and open spaces. In them the road system and squares were the most important unities, as opposed to the Ottoman model. This is the reason why the Western travellers were not able to understand the structure of the Ottoman cities, in fact them assigned a universal value to the to the linearity of the axes and the regularity of the open spaces. These elements are secondary in the city Balkan, because its expansion takes place through the aggregation of large urban modules that is the neighbourhood called mëhalla. The development of the mëhalla has a centripetal tendency, therefore the relationship with the other mëhallas is

secondary and so the contact with them does not require major axes or important squares. Therefore, unlike western cities where urban morphology is the result of merging of individual house parcel, in Balkan cities the module is a bigger unity represented by neighbourhood. It means an organic urban structure bases on the module of the mëhalla.

1. The theory on the Balkan city on which the study is based, was formulated by Cerasi 1986.

Considering neighbourhood as the urban module is important to understand the process of aggregation between the modules. It is based on the principle of urban continuity, interrupted only by strong natural elements and not the precise division and clear boundaries of each module. Therefore mëhallas live in osmosis between them and give homogeneity to the city.

2. The urban development of Berat

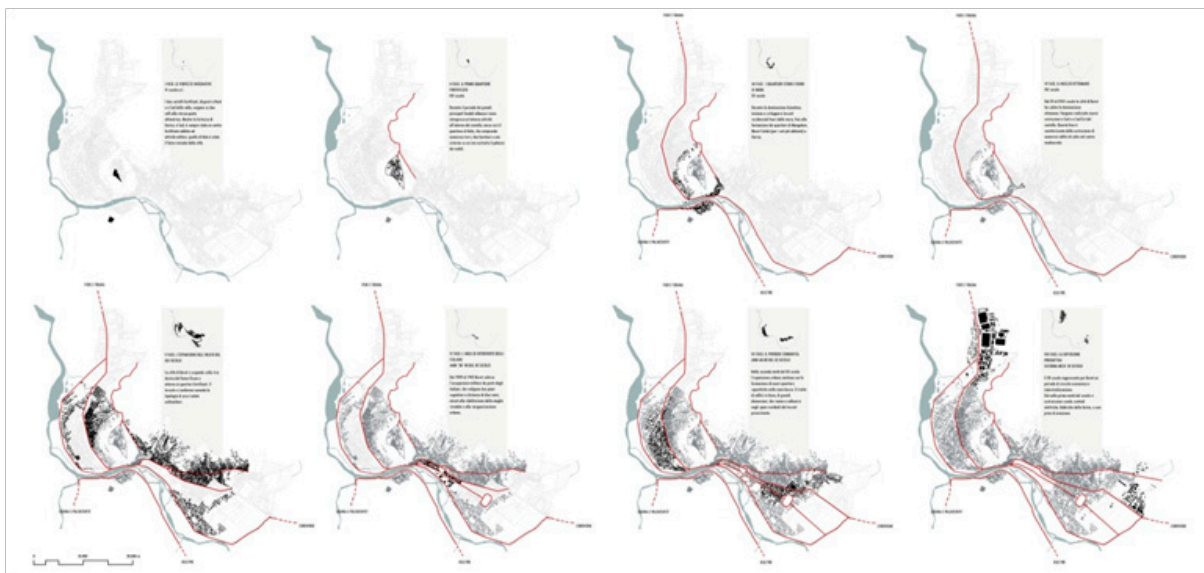
2.1. The formation of the neighbourhoods

Nowadays Berat presents a very well preserved historical city centre that is part of the World Heritage until 2008, as rare examples of an architectural character typical of the Ottoman period. In fact in the current urban form is clearly distinguished the ancient nucleus represented by the citadel. The citadel is located on the hill to the right of the Osum River, in front of it there is another fortification site (Gorica Castle), now in ruins, which had only defensive functions. This urban morphology, consisting of two fortified sites on two hills facing each other, has been effective for the defence of the valley around the river. The city has expanded through the formation of new districts (varosh) around the citadel, before those neighbourhoods were fortified, later no more due to the long periods of peace². The first one was formed in the thirteenth century and was located on the south of the castle, in a sloping topography from the walls up to the banks of the river. The middle or poor classes lived in the neighbourhoods outside the walls; consequently the buildings were simple and constructed with poor materials. The dwellings were close to the walls of the citadel or stood against the walls in order to seek refuge in it, in case of attack.

During the fourteenth century the Mangalem and Gorica neighbourhoods were formed, the first one on the feet of the citadel near the banks river and second one just in the opposite position beyond the river. Inside the citadel the number of dwellings was increased as the quality of buildings and the neighbourhood inside the walls took the name of Kala that in Albanian means castle.

In the fifteenth century the Ottoman Empire succeeds in win over Albania after a long period of resistance. After the conquest, the cities lived a long period of peace that favoured the urban expansion.

Figure 1. Berat, Identification of the phases of the urban phases (PoliBa Master Thesis)



2. The information on urban development and the nature of space and was described by Evliya Çelebi; he was a famous Turkish chronicler, who traveled for 40 years in the territories of the Ottoman Empire from 1640. The notes collected durations his travels formed a ten-volume book entitled Seyahatname (book of travels). The part devoted to the visit in Berat in 1660-61 (Book VIII) has been translated and analyzed by Samimi 2007.

Particularly in Berat was formed the first quarter completely open in a totally flat area that develops after and around the building of the bigger mosque of “King”. After that were formed the district around the mosque of “Lead”. It was developed around the mosque from the middle of the sixteenth century in a location far from the core of the citadel and in a flat area, not built earlier as too close to the riverbank so and difficult to defend from attacks and floods.

In the sixteenth century, when the Ottoman conquest was completed, it's documented the denomination of the neighbourhood with the ottoman term *mëhalla*.

At the beginning of the seventeenth century the process of urban expansion had reached the maximum dimension, which the historical city centre preserves even today. During the eighteenth Berat lived a prosperous period demonstrated by the construction of larger and good quality buildings (for the feudal class), and the consolidation of the urban structure and roads. In fact in 1780 the only bridge, which connected Gorica with the rest of the other quarters, was done in stone giving monumentality to the entire city.

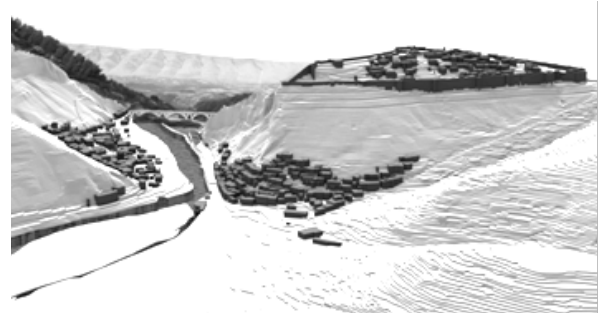


Figure 2-3. Berat, photo of Mangalem and 3d reconstruction of the historical centre (F. Pashako)

The street network is based on the main axis that connects Kala with the river. The second axis, transverse to the first, was and is, extended parallel to the river on the Kala side from the entrance of the city (on west) to the end of it (on east). From these two main axes started the connections with other neighbourhoods and the bazaar, besides within each neighbourhoods branched countless paths, often as cul de sac. The relationship between water and land is another important element of the urban structure. The river was a natural border and a great resource for the city, although it was a generator of problems, for all the neighbourhoods. Those close to the river had the risk of flood, those on the top of the hill on the contrary had to provide water through the convoy of rainwater into underground tanks.

The described *forme urbis* was consolidated during the nineteenth century and remains unchanged throughout the twentieth century. Moreover it persists in the modern era except for the transformation of bazaar in administrative centre (30s-40s). During the 60s, the city was spreading in the western, outside the historic core. This new development was guided by the will to protect and preserve the historical centre. Therefore was also built a new centre that provided the necessary services for the residential area without competing with the historical one, in monumentality and aesthetics.

In conclusion it can be affirmed that the urban development of Berat runs from the fifteenth to the twentieth century and its expansion is based on the creation of new neighbourhoods. Therefore the urban module is defined by the *mëhalla* and not by the housing cells. This seems to be an ancient tradition easily recognizable in all the expansion phases, that bring to an urban morphology compact and well related with the territory.

2.2 The city centre: firstly bazaar than administrative centre

In urban morphology, in addition to residential, commercial and productive areas had an important role since they often had a greater extension. The production area had two locations one was made up of the agricultural land around the city while the second was centred in the market (bazaar). The bazaar extended from the



Figure 3-4. Engraving by Edward Lear, 1848. Photo of 1980, source:IMK

area south of the citadel along the river up to the mosque of Lead. It was not only the place for the exchange of goods but also the seat of the workshops of all craftsmen, the inns and hotels (han). Generally, the structure of the bazaar was one floor, but in the seventeenth century, the shops with two floors became more numerous. The facade was made up of wooden wings and a large tent to protect the merchandise and customers from the rain. The bazaar also included bezistem, a fenced area for the sale of the most valuable merchandise.

The inns but most hotels (han) were placed along the river banks, as considered a quiet and relaxing place. Particularly in Berat the hans were near the ends of the bridge, so in the city there were at least two; one in Mangalem and other in Gorica. However, some sources report a total of sixty hans, in cities and suburbs, reflecting the importance of the bazaar of Berat and its various merchandise (handicraft, agricultural, livestock), a reference for the entire Albania but known even abroad.

At Berat the bazaar in the seventeenth century, according to the description of Çelebi was divided into different streets (sokak) according to the type of goods. Each sokak housed a different process, the most common were: processing leather (tabakhane), footwear (opinga), metal kitchenware (kazanxhi), etc.

It had a horizontal development, started from the bridge of Gorica and concluded at the mosque of the lead, the only vertical element was represented by the high clock tower located in the centre close to the six coffee colored and well decorated. Always based on the testimony of Çelebi, in the market were placed approximately sixty corporations. The number seems supported by the large extension achieved by the market, which was kept until 1912 as documented by a plan of the time.

In the nineteenth century the Albanian economic model changed going from the feudal model to that the free trade model. Besides the stronger imports from the West put in crisis the craftsmanship world. As a consequence the bazaar lost its importance, even after the dissolution of corporations, until 1925 when it was demolished for the construction of the new boulevard that ran along the river.

The bazaar demolished represented the heart of the new city, therefore it was necessary to rebuild this area. At that time in Albania there was a massive presence of Italian architects³ and engineers who contributed to the design of the master plans and the construction of the most important urban centres.

For Berat, they created two regulatory plans ('32 -'42). In parallel with the indications for the protection of the historic fabric, they defined the character that this area would take, with open spaces equipped with gardens and buildings in the rationalist style with the ground floors for commercial and administrative team while the upper floors for residence⁴. The interventions were completed after the Second World War, more precisely in the 70s, so the implementation of the plan was partial. The open spaces were built, and are also present today, while the buildings preserved the type and the general character but not the architectural details, too expensive for the socialist economy.

3. After the Independence from the Ottoman Emperor in 1912, the Albanian lived the Italian Protectorate since 1921 until 1939.

4. F.PASHAKO in A.B. Menghini, F. Pashako, M. Stigliano, *Architettura moderna italiana per le città d'Albania. Modelli e Interpretazioni*, Botimet Dudaj, Tirana 2012, 69-71.

3. The urban morphology and the cityscape in Berat

The system of the centers located on rough terrain, as Berat, is distinguished by dynamism, marked variety of architectural forms, density of the buildings, perfect ground hugging and maximum use of the ground even with discordant orientations. The settlement system can be defined as a “topographical threshold”, as it takes advantage from the differences in level of the ground, both for the mobility that architecture. So the perfect position for the development of the city is the transition between the hills and the flat area. Therefore the neighborhoods are developed in the middle area, in order to have a free view, good orientation, facility in the outflow and supply of water. The cityscape is characterized by the presence of terraces and urban tissues with the same obliged orientation. Also in all districts there is the constant of the plots with walled gardens which is a primary need of the house of Berat. This results in a strong dichotomy between the inner and outer space. The outdoor area of roads and urban voids seems to be the result of the left over space between the plot of each house. Therefore the road is an ancillary element due to the sloppy terrain, by the disposition of the urban fabrics that prioritize the orientation and the panoramic view rather than facing on the street.



Figure 5. Urban section(drawing: F. Pashako)

The presence of the waterway is an important element for the urban morphology, since it determines the position of the bazaar and then the city center, although there is in each district more than a focal point, often near a religious building or of a fountain. These voids are not the result of a meticulous planning but in between spaces through the residential fabric, however they are always easily identifiable by the presence of vertical plant as cypresses and platanus. They are generally located at the intersection of the main streets. Seconds to them for the urban importance are the heads of the river, where obviously converge more streets and is offered a vast flat area. The relationship with the landscape despite appears very strong is assigned to two main territorial roads that do not generate urban forms. The first one leads to the Mount Tomorri and the other in the opposite direction leads to the sea (Vlora).

They represent the ancient tracks of connection with the territory, but because of their exposure and therefore unable to defend never been urbanized. Although nature is an integral part of the city, partly incorporated (river, urban gardens, terraces) and partly far away, but always present visually because of its majesty⁵.

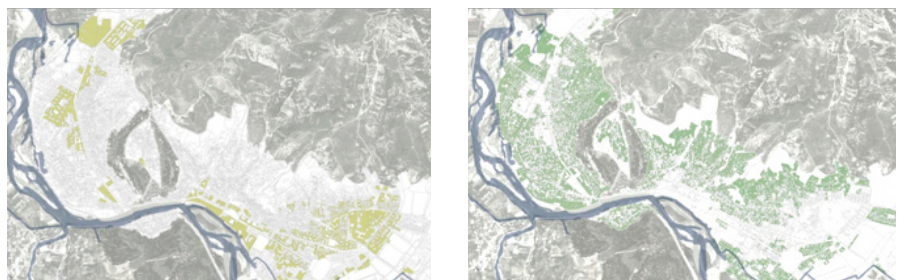


Figure 6-7. Localization of public gardens and green spaces and of private gardens (PoliBa Master Thesis)

5. Master Thesis Dicar - PoliBa, *Architettura domestica in area mediterranea. La casa albanese: caratteri spaziali e principi aggregativi. Ipotesi di riqualificazione del tessuto urbano di Berat*, supervisor: A.B. Menghini, Co-advisor: C. D'Amato Guerrieri, F. Calace, I. Carabellese, R. Carullo, tutor: F. Pashako, students: M. Epifani, S. Greco, T. R. Iacca, D. Lunanova, R. Padulla, M.M. Papagallo, 2011/12.

Berat presents a clear separation between the residential area and the commercial and productive ones. In residential areas there is no trace of productive or commercial activities, they are all arranged in the market. This explains the limited typological contamination and the low organic relationship between living cell and street, since the house does not need to stay on the most crowded streets in order to display goods. This characteristic represents one of the most marked differences with Western city. In addition, the comparison between the residential area and the production shows a strong contrast between the compactness of the first and the permeability of the second. Therefore Berat largely reflects the image of the Ottoman city but at the same time the European medieval one, with large residential tissues with pitched roofs, sloping narrow winding streets, walled gardens, the citadel in a dominant position even if a neighborhood among all the others, and the presence of many vertical elements traceable in tower bells, minarets and cypresses.

4. The policies of preservation in Albania and the status of conservation in Berat

4.1 The Albanian history of heritage preservation

The history of the Albanian heritage protection⁶ has had important moments of awareness: during the Italian Protectorate, and under the communist regime and at the beginning of democracy (1991).

The Italian architects and engineers made an important contribution in the field of infrastructure, which was followed by the creation of the Central Office for Building and Urban Affairs (1939). The institution was dedicated to planning, through the study and development of territorial vocations, and looking for a modern architecture based on traditional grammar typical of the regime. The Italian experience, the awareness of the artistic value of city centres and the progress of their degradation were the basis for concrete protection.

In 1948, the state proclaimed the first List of Cultural Monuments⁷, consisting of 107 different assets: dwellings, fortifications, religious buildings and archaeological sites. However, the first step towards the overall management of heritage took place in 1961 with the protection of Berat and Gjirokastra, the underground of Durrës and the bazaar of Kruja. The historical centres were zoned into three big areas: the museum - area fully protected and with the prohibition of new buildings; the protected area - complementary to the first one but with expansion and new building permits in relation with the context; the free zone or urban expansion unrestricted. The most important buildings were classified as monuments and divided into two categories: the first category included those of particular historic and artistic value, which are preserved in full, allowing small adaptations to the most modern needs, and the second category is applied to the those with important exterior impact in the historical environment, so that are allowed the internal transformations but not external one.

These subdivisions and categories were considered well-advanced, so as to be still valid. The process of protection was also marked by the entrance of Albania in ICCROM (1962), the institution of many restoration workshops and the national participation at the Congress for the Charter of Venice, 1964. In 1965 was found the Institute of Cultural Monuments in Tirana, a reference point for research and restoration with regional offices in all the country.

In 1967, the dictatorship eliminated from the heritage list approximately 40% of religious buildings, destining them to utility functions in order to consolidate the atheist ideology.

Nowadays the legislation is still crossing a transition period that is reflected in a fragmentary law framework, which, for example, protects only the objects of art with

6. F. PASHAKO, in Ugo Carughi (edited by) *Maledetti vincoli. La tutela dell'architettura contemporanea*, Allemandi, Torino 2012, Part II: *La tutela dell'architettura contemporanea all'estero*, pp. 243-245.

7. *Decree on Protection of Cultural Monuments and Rare Items*, N. 568.

more than 100 years. The masterpieces of the modern architecture (20th century) are underproduction thanks to special ministerial decrees. With the establishment of the National Commission for UNESCO in 2000 began fruitful years. Moreover, the law on cultural heritage has been enacted in 2003 (last amendment in 2008) which allowed the strengthening of the Regional Directorates of Cultural Monuments and the creation of the Archaeological Service Agency.

4.2. The experience of preservation in Berat

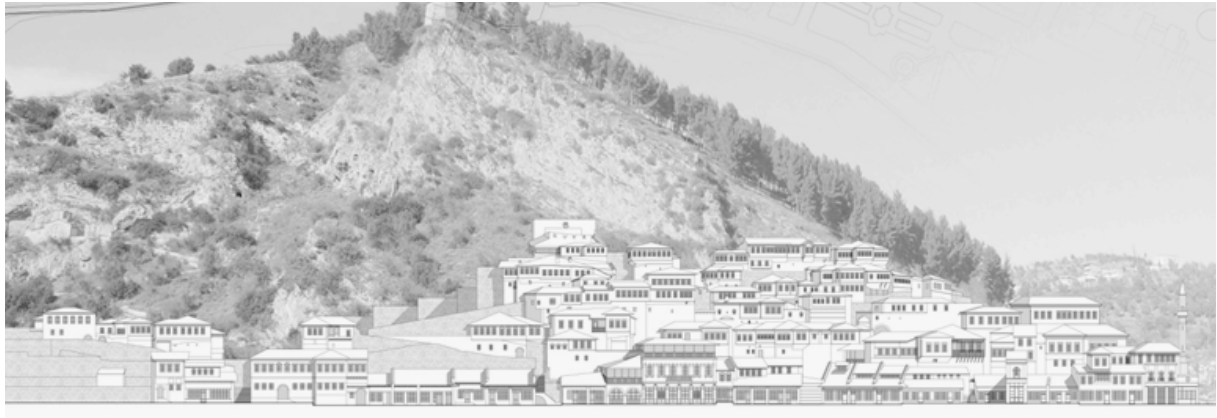


Figure 8. The *mëhalla* of Mangalem (PoliBa Master Thesis)

Berat, due to different reasons is a good example of urban preservation. In particular, until the end of World War I, the city continued to grow within the urban structure previously established, without new expansions.

During the '30s, in the period of Italian protectorate, started the first for the protection of the historical while in the design *ex novo*, in the central area on the bank of the river, was shown great sensitivity to the traditional architecture by transferring architectural features and local compositional principles.

These attempts were the premises to the concrete actions that followed after the Second World War. The awareness of the extraordinary historical and artistic value of the centre and the progress of degradation led to a series of policies for the protection and conservation that took shape with legislative decrees and campaigns of studies and research.

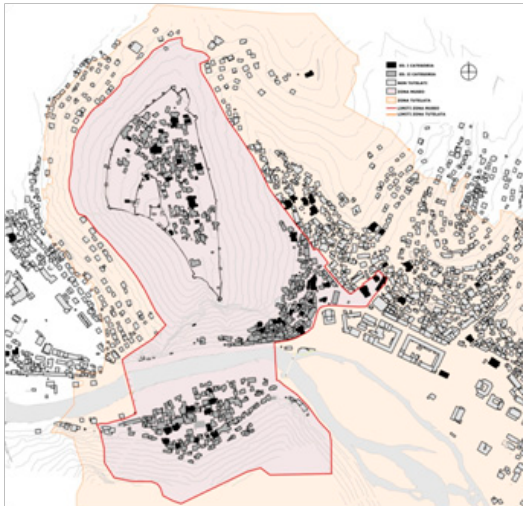
Berat became the first experimental laboratory of restoration and conservation, where after the preliminary studies for the definition of the historical, artistic and environmental artefacts, was carried out the zoning of the old town and the subdivision of the monuments in two categories. The principles used for this process, which provides both conservation work and restoration in style, were the result of collaboration between urban planners, architects, archaeologists and art historians⁸.

The zoning carried out in the sixties persists even today and divides the city into three big areas: the "museum zone", the "buffer zone" and the "free zone". The "museum zone" is the richest of historical, artistic and environmental issues, and includes hill the Kala, Mangalem, Perroi and Gorica neighbourhoods. This area is protected in its entirety for its urban values, architectural and environmental and it are not allowed the new buildings.

The "buffer zone" includes the eastern part of the city, and extends from the border line of the museum area. It has a role complementary to it and here is permitted the additions and the new buildings as long as they have a relationship in volumes and in the facades with the context. The "free zone" includes the remaining part of the city so the expansion built after World War II and the rest.

The protected buildings are close to a half thousand (444). They are divided into two categories: "first category" (64), with particular historical and artistic values, and "second category" (380) distinguished only by environmental value. Furthermore, the protection in the "museum area" includes in addition to the buildings also the free spaces, following the directions of the general plan of the city.

8. For further details *vd.* Strazimiri 1964, 97-125



5. The new expansion after 1991

After the fall of the communist regime in 1991, Albania has experienced a long period of transition political characterised by instability and the phenomenon of emigration and immigration of the population.

About two thirds of the population lived this phenomenon. The immigration at the national level was very massive, who lived in rural areas moved into the closed city, and the citizens of underdeveloped cities have moved to larger urban centres (mostly in Tirana and Durrës)

Moreover, even in these centres people wanted to improve their housing conditions, therefore there was a building boom. It did not follow the requirements of the plans, but the private interest and therefore the informality. A good percentage of the buildings created in the first few moments of “democracy” (‘91 -‘97) was conducted independently by the people who came from other cities, in the green areas between the residential blocks, in public spaces and also in agricultural land.

Obviously this phenomenon has also affected the historical centres, protected and preserved with care during the regime. Some buildings have been transformed with additions, many traditional roofs have been replaced with modern, but what was compromised mostly are the urban voids within neighbourhoods and the buffer zone around the historical centres. In them were constructed buildings of all types (residential, commercial) with modern materials, often of poor in material and aesthetic quality. Moreover, these buildings often exceed the height of the historic buildings or try to imitate their architectural features.

The regularity of such buildings can have dual nature, can be totally abusive or can be the result of government corruption.

Currently protection policy is very strict and many commercial buildings have been demolished, unfortunately is not possible to do the same for the residential one due to the consequences of the social phenomenon of housing. However, it is also necessary to initiate a process of revision of the law in order to include the protection of the spaces in between and to introduce the concept of the protection as an integral part of the planning.

6. Conclusion

The paper brings to the conclusion that the protection will start from the study of the heritage in order to know the specific identity that is to preserve. These means that the cityscape preservation should be focused on of the authenticity of the city. So in the Albanian context it is not only related with the buildings but also some other elements that secondary as open space, nature, landscape that seem secondarily even if represent the uniqueness.

Figure 9. The policies protection and informal house in the bufferzone. (drawing and photo F. Pashako)

7. Acknowledgements

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The Tole of Natural Environment on Healing Spaces

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Key words— Healing Space, natural environment, evidencebased design, environmental quality, patients' needs

Abstract

There are new developments and rise of a new approach for the design of Healing Spaces using evidencebased design methods and patient focused care around the world. Re-assessment of architectural quality in healthcare facilities in terms of environmental aspects and patients' needs is a developing trend. The increased knowledge on the humanenvironment interaction is progressively playing an important role in the planning and design of Healing Spaces. Current research from a variety of academic disciplines reveals that contact with nature provides stress reduction, which in turn leads to improved health outcomes. Nowadays, there is an increasing belief that provision of better Healing Spaces for patients is as important as the healthcare and medication provided. There are studies, which indicate that a simple feature such as a window with an outside view plays a considerable role in the healing of patients. In this paper, the available literature on the effects of environmental design on Healing Spaces is thoroughly studied. The impact of the quality of Healing Spaces on human well-being and its relationship with the natural environments are investigated. Particularly, research data addressing the influence of 'green space' on healing of patients is presented. An interpretation is carried out considering several environmental indicators for assessing the quality of Healing Spaces such as; color, light, odor, noise and 'green space'. Furthermore, a case study is presented to focus on the functional relationship between environmental design and physiological and psychological needs of patients to improve care quality. Finally, a comparative study is presented to highlight the advantages and disadvantages of the environmental design approaches towards evidence-based design according to patients' needs.

Introduction

There is a new understanding and rapid development on the effect of hospital buildings and environments in relation with evidence-based design based on patient- focused care. Reevaluation of architectural quality in healthcare facilities according to the patients needs is visible around the world. Anyone who has had to spend time in a hospital knows well how discouraging and dismal hospital environments tend to be: they are places to be endured, and places that are the settings and backdrops for some of the most difficult times in people's lives. At a point when both patients, and the parents and family of patients are distressed, the physical settings of these places further compound the stress. They are often noisy places of artificial lights, machines that are too noisy and generally spaces that are at once sterile and depressing. However, things are beginning to change and there has been emerging a very positive trend of designing hospitals and health facilities to take full

advantage of the healing powers of nature.

Nowadays, the developments in healthcare industry meet with world standards. The term of patient-focused design and quality which regards on basic necessities to complement patients needs in healthcare facilities. For that reason, there is a huge change in healthcare sector, which has a great impact of designing hospitals. Transformation of this 'new' way of design concept has the significance on healing hospital design.

The main objectives for the paper would be listed as;

- Applying principals to healthcare facility design for the future approaches
- Taking the main consideration as the needs for these spaces in relation with the needs of the patients to provide a better healing environment
- Identify the missing elements of these spaces and suggest new design alternatives for patient-focused design
- Under these circumstances, the paper aims to explore the problems of healing environments in Cyprus and try to make suggestions according to the relation of natural environment on the basis of healing spaces to promote patient-focused design

Evidence-based Design

Evidence-based design has been described as "the architectural parallel and analog to evidence-based medicine" (Hamilton, 2004).

This report assesses the state of the science that links characteristics of the physical setting to patient outcomes as Roger Ulrich who is the professor of architecture at the Center for Healthcare Building Research in Sweden his research is the first to document scientifically the stress reducing and health-related benefits for hospital patients of viewing nature. This and other work has influenced internationally the architecture and interior design of scores of major hospitals. Evidence-based design originally kept a close link to healing environments, focusing on health outcomes as evidence for the effectiveness of these environments (Ulrich, 1992)

Similar perspectives from different researchers have been studied through healthcare design, which will be explained in the following paragraphs.

Roger Ulrich, speaking at the Second International Conference for Health Care in Stockholm (2009) presented an approach to the therapeutic benefits that can be gained from a well-designed environment. He argued that, it provides a key starting point for understanding how design effects medical outcomes. Three components to consider are:

- Psychological: such as anxiety, depression or anger
- Physiological: elevated blood pressure, decreased immune functions
- Behavioral: sleeplessness, hostility.

Ulrich and Zimning, (2006) writes that 'a growing scientific literature is confirming that the conventional ways of contemporary hospitals are designed to contribute stress and danger more positively, that this level of risk and stress is unnecessary.' Under these parameters, the quality of patient-focused car design will be explored in this section under the three themes of in relation with above outcomes;

- Environmental standards
- Spatial standards
- Technical standards.
 - Physiological
 - Behavioral
 - Environmental Standards
 - Spatial Technical Standards
 - Psychological

"Health depends on a state of equilibrium among various factors that govern the operation of the body and the mind; this equilibrium in turn is reached only when man lives in harmony with his external environment" – Hippocrates

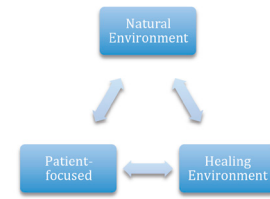


Fig 1 shows the relation of basic consideration factors for the hospital design

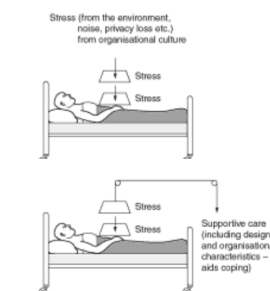


Fig 2 Based on Roger Ulrich's diagrams (Purves, 2002)

Charles Jencks in his book of 'The Architecture Of Hope' argues about architecture for health through welcoming, risktaking, aesthetic and spiritual impacts. Edwin Heathcote with Laura Lee in social and psychological support develops a relation between provocative buildings, arts and healing environment. He asks a question of 'Can architecture make a difference in hospitals, change outcomes and influence patients and doctors?' Jencks, supply ideas consists of hybrid building, city, hospital and human in terms of functionally, physically and psychologically through expressive recognition to a human condition. For that reason, the problems with hospitals can be categorized as overhead lighting, spaces with no views out, miserable seating, narrow corridors which cause mental and physical enervation. The main consideration factors explained as, ambiance, welcoming, domestic, warm. Generic space with public background gardens, architectural gestures, collections and the point in architecture like other arts, must follow its own internal logic in places and do so to create its special quality. (Jencks et Heathcote, 2010)

Jencks used a metaphor of variety of functions 'collective hospital' not an institution like a house, but not a home, a church but not religious, an art gallery but not a museum. Jencks talks about how the hospital will naturally evolve towards more humane and varied building types through the analysis through case studies can be consist of formal types of plans, circulation, landscape, site plan which forms culture, health and architecture relationship as Hospices de Beaune, hybrid of healing, body human relationship which is modern movement by le Corbusier of replacement between the pervasive hospital to look 'hygienic' and supplies set of intimate spaces with light and views penetrating in unexpected places. Tight layered space of garden, more colours, juxtaposition, informal furnishings, window seats, stair landings, water fountains, use of materials, planting, public, private, semi-public, semi-private relationships as t.s Elliot mentions multi-use of spaces. (Jencks et Heathcote, pg.14, 2010)

Importance Of Surroundings For Patients

Understanding the space for health and well-being of people that examines the effects of the architectural environment on the lives of patients by finding alternative solutions to the problems of human behavior as affected by its surroundings by providing to improve the quality of life of the people who inhabit in healthcare environments, through their participation in the design of surroundings. (IAPS Journal, 2002)

Increase knowledge of the human environment behavior through studying the ways in which people interact and adapt to constructed and natural environments, and how these interactions and adaptations can aid in satisfying peoples specific needs. The Journal describes environmental psychology meaning as a psychology of space, which explores the behaviors of people, their attitudes, perceptions and cognitions in relation with their physical and social context as well as the evaluation of differences in the perception of social and physical environments between users and their surroundings. In institutional care environments, such as traditional hospitals and nursing homes, there are a number of stressors, such as a lack of privacy, control, and choice that originate from the environmental qualities and the type of care given. Yet, reducing these stressors by changes in the environment is found to be an effective way to increase positive outcomes. The review clearly showed the lack of empirical studies in the new generation of home-like environments. Yet, the findings that serve as a ground for designing therapeutic environments were systematically underlined in the scope of report.

Nature and the Environment

Natural environment involves with a people's interaction with the space and the use of environment, landscape that gives a cultural meaning to the space.

There s a gap between developing a suitable built environment, which will sustain to the future. Nowadays, by creating healing environments, there needs to be providing sustainable environments. Therefore; the word 'sustainable' refers to the

meaning of continuation of the spaces by the use of materials, light, nature, colour to have the therapeutically effect on patients health and wellness in terms of not only with the use of materials itself, however, as well as the use of these spaces to support people for a long-living healing environment.

Contemporary healthcare facilities, nursing homes, care centers tries to focus on the more about outdoor spaces and explores new ways of bringing the reflection of outdoor spaces into the indoor spaces by creating inner courtyards, providing green spaces in the interior, using nature as an art for patients to make them feel more comfortable and released.

Little priority has been given for the outdoor spaces to make spatial quality of the space more nurturing and caring. In this sense, there is a belief of helping patients to heal faster in the light of comparatively priory traumatic hospital experiences and institutional like care environments.

In this sense, most of the healthcare facilities is not psychologically supportive for the patients. Psychological, soc ial and spiritual needs of patient have been largely disordered in the design of healing environments. For this reason, natural environment, by the need of nature, natural light, green spaces, therapeutically natural materials, green spaces would have been more supportive.

'Design is the manipulation or alteration of various aspects and components of the environment' (p.106)

The main question can be asked in here would be; how would the use natural environment in healing spaces be?

A large number of the hospital environments in Cyprus Island, is not satisfying the needs for the patients. Researches have shown from various studies that, interior and exterior design of these healing environments plays an important role for patients where they would feel in secure with sharing control of their environment which is important to reduce their stress levels for their health and wellness's.

The quality of natural environment on the basis of impact on health outcomes can be found in the following paragraphs.

Healing environments

In 1990's the general dissatisfaction began to receive serious attends from Roger Ulrich's seminar paper on the effect of window views on clinical outcomes was the inspiration to work on environmental quality and patient-focused design.

The word "healing" comes from the Anglo-Saxon word haelen, which means to make whole. One-way to understand the term is as harmony of mind, body, and spirit. The concept of a healing environment is rooted in longstanding traditions of complementary medicine and holistic healing. Unlike modern Western medicine, which focuses on the causes of illness (pathogenesis) with curing as the ultimate goal, complementary medicine looks at the causes of health (salutogenesis) with healing as its core mission. Within the latter tradition, a healing environment has been defined as an environment that stimulates healing processes by strengthening an individual's inner powers (Jonas et al., 2003).

Healing environment is therefore formed of human-to-human, human to space, space to human and space-to-space as the basic keys to understand perception and human behaviour. It is up to user's point of view, which is probably, would be the best description for healing space is, defined space by its territory, by the movement through the space and physical features provided which gives function to it. Space has a meaning, place has a dimension. Healing space is where circulation moves through the space. It is outer reflection of an architectural place.

When you enter to a place, you will have an idea that what it is about. Perceiving things, as it is not latterly added to a person, it is coming within the person himself. To see the visual qualities of a place influence users perception to give that places a character. Size, scale, proportion, form, material, colour, pattern, light texture are the visual representations of a place, of an architecture as well as of a perception and of an environment. The experience of sense of healing space is a highly complex phenomenon. Some theorists argue that the make-up of the human mind favours certain constructs that are universal. The qualities that give a space its particular identity are so varied that it is impossible to list them all, but the one factor that all such places have in common is that people recognise its individuality and unique identity. It is

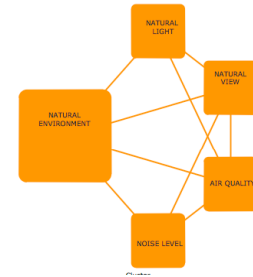


Fig 3. shows the basic tools for a healing space.

the recognition of this unique identity and the desire to retain it that led a number of cities and regions to issue design guides. The aim of many design guides is to try to ensure that a particular sense of place is preserved, but there are many problems. As background relevant to assessing the credibility of nature findings in healthcare environments, it should be mentioned that many studies of populations other than hospital patients have produced strong evidence that even fairly brief encounters with real or simulated nature settings can elicit significant recovery from stress within three minutes to five minutes at most (Parsons & Hartig, 2000; Ulrich, 1999).

Investigators have consistently reported that stress-reducing or restorative benefits of simply viewing nature are manifested as a constellation of positive emotional and physiological changes. Stressful or negative emotions such as fear or anger diminish while levels of pleasant feelings increase. Laboratory and clinical studies have shown that viewing nature produces stress recovery quickly evident in physiological changes, for instance, in blood pressure and heart activity (Ulrich, 1991). By comparison, considerable research has demonstrated that looking at built scenes lacking nature (rooms, buildings, parking lots) is significantly less effective in fostering restoration and may worsen stress

Patient-focused Design

The term patient focused, patient- centred, human-centered have appeared indicating this new emphasis both in caredelivery and environmental design

Research has shown that access to nature, daylight and other wellness factors can result in the patient using drugs and spending less time in hospital. Nature can affect patients positively. It can easily catch person's emotions, attention or interest and in turn can stop or reduce anxiety while bringing about desirable psychological changes. It can reduce blood pressure, ease pain and stimulate patient's senses positively. Natural environment and design have the link in between patient's minds and behaviors. A patient's health can be improved in these environments where the senses are activated and the dynamics between contrast and harmony are in balance..

Research Methodology

Study Design Strategy and Selection of Hospitals The study focuses on patient-user experience in hospitals. This will be carried out with; Comparative study in qualitative investigations under ;

- Observation (Direct observation, photos and mapping)
- Analyzing the selected hospitals (through contextual relations with physical spaces, perception and satisfaction of patients will be measured with surveys and interviews.)

Selection of Field Study

The hospitals are selected due to following reasons;

Chosen hospitals were fully equipped to provide necessary data.

Hospitals accommodate different profile of users in all ages with various symptoms.

Hospitals provide variety of services such as emergency, operation, and intensive care rooms.

Natural environment (accessibility,usage,functionality) of hospital is appropriate for observation.

Type of Hospital	Location	Profile of User
Public		
Bulent Ecevit Rehabilitation Centre	Nicosia, Cyprus	Elderly: above 40 Long-stay
Cyprus Onkoloji Hospital	Nicosia, Cyprus	All age Long-stay
Private		
Near East Hospital	Nicosia, Cyprus	Adults: Above 18 Short-stay
Kolan British Hospital	Nicosia, Cyprus	Adults: Above 18 Short-stay

Table 1. shows the Selection Criteria for the Hospitals in Northern Cyprus

Method

Qualitative Analysis will be mainly used made through,

- Interviews; face-to-face interviews held
- Observation and data recording methods used
- Pilot study will be carried out with
 - Direct observation
 - Secondary source review
 - Photographs and mapping
 - Comparative analysis.

Data Analysis

Bulent Ecevit Rehabilitation Centre is selected for the following reasons;

Geographical location and view to the nature of the building. The hospital is located in Gonyeli, Nicosia, Northern Cyprus on the high hills towards to the mountain view within 3500 m2 area serves to elderly and patients who needs care in all ages. The hospital is established in the year of 2004. The bed capacity of the building is 38 which is three-four bed patient rooms facing to the nature, social gathering rooms, courtyard and service facilities.

Kolan British Hospital is decided to be a chain hospital which has other twelve hospitals around the world based on patientfocused care.

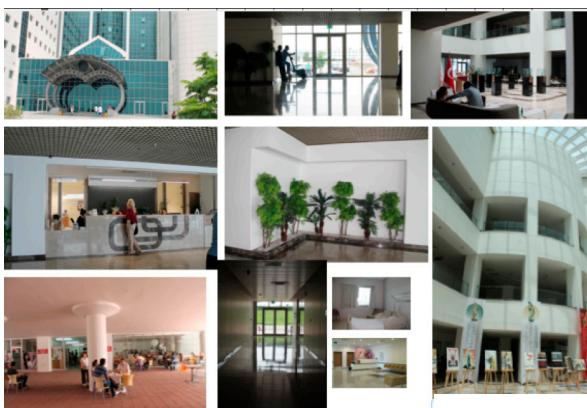
Information About Hospital: is a chain hospital formation of 11 hospitals in Istanbul, Turkey and one hospital in Nicosia, Northern Cyprus started to give service in 2013. Hospital focuses on the qualities of using experienced staff with following recent developments in healthcare. Supporting the rights of patients and their relatives. Functioning in patientfocused care, providing a healing hospital environment for the patients, considering health and safety in the hospital.

Near East- University Hospital- was selected to show private university hospital with more procedure-focused-care. Information About Hospital: The Near East University Hospital, as the first and only private university hospital, was established as part of planned development projects on campus of the Near East University,



Fig 1: Bulent Ecevit Rehabilitation Centre (Author, 2014) top to down: 1.atrium 2.backyard 3. Inner courtyard 4. Social gathering place 5. 4 bed patient rooms facing to the Mountain View 6. Use of aquarium to support home-like atmosphere.

Left to right: 1. main entrance and car parking 2. Welcoming enterance with trees 3.atrium 4. Reception 5.cafe



from left to right: 1. Main entrance from outside 2. Main entrance from inside 3. Atrium 4. Reception 5. Green details inside the building 6. Inner courtyard used as a cafeteria , 6. Circulation space functioning as a corridor and facing nature 7. Typical patient room layout facing to a bad view. 8. Art gallery for treatment units.



Fig 5: Reception- flower details used

Nicosia, Northern Cyprus. Designed and built with a future-oriented structure and equipped with the latest and most sophisticated medical devices, it offers extensive medical services with its highly experienced specialist staff to patients from all over the world. The unmatched technology and quality of service offered at the best possible standards can only be obtained from a limited number of most developed western counterparts. (website accessed 2014)

Discussion

Sterile environments are good in extreme situations to kill germs, however, in daily situations it is not good in patients health and wellness.

In Near East University Hospital, the units are separated travel distances between the units takes time and not efficient. For that reason, initial observations through experiencing of the following hospital could be said more procedure-oriented rather than patient-oriented.

However, Kolan British Hospital has more potential of access within the units in less amount of time and again initial observation for this facility could be more patient-oriented. On the other hand, use of the space in terms of functionality, needs to be reconsidered in both hospitals.



Fig 6: Artificial nature view in treatment rooms for relaxing patient



Fig 7: Art Gallery to show separation of units and the usage of art for Near East University Hospital



Fig 7: Art Gallery to show separation of units and the usage of art for Near East University Hospital

Cases	Lighting		Way-finding		View		Green Spaces		Art		Use of colour		Noise level	
	natural	artificial	easy	difficult	good	bad	used	Not used	used	Not used	used	Not used	quiet	noisy
Bulent Ecevit Rehabilitation Centre	✓		✓		✓		✓		✓		✓		✓	
Near East University Hospital		✓		✓	✓		✓		✓		✓			✓
Kolan British Hospital		✓	✓			✓		✓			✓			✓

Table: Formation of the case studies (Author, 2015)

Use of nature was missing in the rooms of Near East Hospital where, only administration part looks to the nature view, however room windows see the ventilation shaft, which has a very negative effect on patient well being.

Lack of circulation spaces such as lifts, corridors, and staircases and difficult way finding is also observed at the same hospital.

Long travel distances between units are experienced through the visiting time. Separation of units was quite successful, however some specific units were combined together where functionally should not work together. Besides that, uses of art, greenery details, were quite successful.

In Bulent Ecevit Rehabilitation Centre, geographical location of the building and relationship with nature has a great potential, however the general situation of the building was in a bad condition. Three-four bed patient rooms, technically poor, not in a good quality, and not equipped were basic main problems of the centre.

Initial Exploration of field studies formed the way of analyzing the case studies during the summer period under the mentioned themes above, which was based on formation of physical and psychological concepts as well as from different distribution of functions according to the profile of the user and needs of the user. Study aimed to, focusing upon the patient experience within the healthcare facilities to identify problems within this context with these findings; there is a need to rethink the patient experience within healthcare facilities.

Conclusion

There needs to be rethink of creating healing spaces for the promotion of health by creating environments that are not only functionally efficient but also psychologically supportive which responds for the patients needs.

Sustainable healthcare environments would provide to the patients more nurturing and home-like environments based on transitional spaces and accessible, natural patient-focused care designed facilities.

This could be possible with locating the building towards the sun with the use of the natural view, using natural light instead of artificial light indoor environments by providing large windows. Avoiding noise by having single-bed patient rooms, use of inner courtyards as well as outdoor healing gardens by the use of natural materials, use of natural colour to calm patient's emotions. The use of technology in healthcare environments would provide sustainable environments if used properly. Connection with nature has always been a key factor in the design of healing environments. Nature and natural elements, in particular gardens, daylight, fresh air and quiet are recurrent themes that have been applied in the design of hospitals as healing environments throughout the ages.

The environmental factors such as landscape, colour, light, air quality and noise have a direct influence with buildings design and there is a shortage of planning healthcare facilities for the patient's health and wellness. This would be done by the use of natural environment, providing visual connection with the nature, creating therapeutically healing gardens, by the use of

natural light, colour in the sense of increasing the standards of environmental qualities, which helps patients to recover faster.

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Call to action. Design for urban regeneration

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Introduction

About 70% of people in the European Region live and work in urban settings; a factor highlighted in Horizon 2020 pillar “Societal Challenges” call “Overcoming the crisis: new ideas, strategies and governance structures for Europe”. The objective of the European Commission on the topic “ERA-NET on Smart Urban Futures” is to stimulate projects that can provide tools and methods for more sustainable, open, innovative and inclusive urban areas. Concordant with the objectives stated by the World Health Organization (2013) in the document “Phase IV (2014-2018) of the WHO European Healthy Cities network: goals and requirements” that emphasizes the importance of a city’s leadership to improve health and wellbeing, most local governments in the European Region have a general duty to promote the well-being of their citizens. Cities significantly influence people’s health and well-being through various policies and interventions, in this paper we want to point out the importance of those addressing healthy and active living. The strong urbanization of Europe has not only physically changed the city, but has brought with it a less healthy way of life, due mainly to the lack of physical exercise. Sedentary and environmental factors (air quality, water, radiation, noise, waste, climate), being the principal attributes, inactivity represents one of the major risk factors in the development of chronic diseases such as diabetes, cardiovascular disease, and some types of cancer. These illnesses constitute 77% of the cause of death in Europe today. Physical inactivity worldwide causes 3.2 million deaths each year, equivalent to 6% of the population, while 2002 Italian statistics show deaths attributed to this cause at around 5% (28,000 people a year) and as a consequence 3.1% of healthy years lost (WHO, 2009).

The connection between physical activity/nutrition, health status and the increase in some chronic-degenerative diseases has always been recognized. In the past few years contemporary society become a promoter of an “Obesogenic” environment, as defined by the Ministry of Work, Health and Social Politics in the document describing “The state of sanitary health of the country 2007-2008”, meaning both the environment, above all the urban setting that creates barriers to physical activity, and also the possibility of healthy eating. The meaning given to the work environment is not only that connected with the building and planning of our cities, but more generally that of the interaction between the conditions favored by society that sometimes promote obesity. From food advertising campaigns to social policy and the transport industry that through their policies have a great effect on personal choice. To reduce obesity and in general chronic diseases, and have health benefits the duration of physical activity has to be at least 30 minutes for adults and 60 minutes for children (WHO, 2014). One of the strategic thinking fostered by the World Health Organization (2013) to achieve a better lifestyle in the cities focus on health literacy.

The aim of this paper emphasis the importance in the design for urban regeneration of improving physical activities and further the use of urban public space, through a “Call to action”, where people can feel co-producers of their own health.

Right Social Public Health Communication and access to good health information can empower a multifactorial social process through which individuals and community can be more conscious about the benefit in their life of a better lifestyle.

1. Comfort vs Wellbeing

Hyper-technologized society and the loss of a natural balance, this is the current mutation with which we are confronted. Anthropologist Stefano Boni's most recent book focusses on the argument contemporary man as "Homo comfort". The concept of comfort, which appears for the first time in written Italian towards the end of the 19th century, meaning the "ensemble of comfort offered to the occupants of a home or to a means of transport", it is assumed that the most generic sense of the word "comfort", that which renders ease and enjoyment of daily life in a certain environment (Treccani Italian encyclopedia).

It may seem paradoxical how a concept of human "wellbeing", becoming part of our daily lives, has become not only a lifestyle but also a way of understanding with an ability to forge material culture and its own evaluation model, not always with "beneficial" results, on the contrary sometimes damaging.

A humanity that frees itself of physical tiredness thanks to a system that speeds up actions, improving performance, working for us, at the same time loses its sensory faculties and the ability to understand developed over centuries of evolution, creating a dependence on poorly understood technology. A new way of being in the world is therefore defined that is very comfortable, as much as it is alien and not very healthy. Homo sapiens have gradually transformed into a new anthropological species, "homo comfort" (Boni, 2014), comfortable, surrounded by all sorts of technology and alienated from the natural world, more than is needed to live a good and healthy life. Today, more than ever, lifestyles have become ever more sedentary with important consequences on physical health. According to Istat data from 2008, in the Italian population over the age of three 40.3% of those interviewed stated that they neither carried out physical or sporting activities in their free time with more females (45%) than males (35.3%) stating this fact.

With the reduction in physical work, the rise of the car, elevators, and the automation of industry, we move less and become lazier. Multiple initiatives, also public, have promoted strategies with high cultural value and of great economic benefit with the common objective of improving in the short term the lives of citizens and in the long term to reduce the impact of chronic illness on the society and the healthcare system. The need to change incorrect behavior that often put our lives at risk, has brought to light the need to develop a new culture in which "health" becomes a concern of the entire nation and not only of the healthcare system. Central administration, local administration (regional, provincial, council), teaching in schools, in jobs and industry, healthcare professionals, voluntary workers, private and public sector, are asked to work together to develop a synergy for the citizens and to transform good practice into consolidated interventions, putting systems in place, competences, responsibilities of various sectors for the health of each person.

Health promotion for the prevention of chronic illness, connected with an unhealthy lifestyle, is a priority of our age, all the more exposed and subject to problems of this nature. One of the most common pathologies in the world is obesity, today considered as an epidemic in industrialized countries, with almost 2.8 million victims each year. In the past this was a problem typically associated with countries with high levels of incomes, up to a few decades ago exclusively in the American population. More recent research has noted that there has been an increase in this disease in countries of low to middle income, due to rising consumption and the ease with which it is possible to obtain foods of high calorific value and the reduction in physical activity. To these causes can be added those that could be considered "environmental" and therefore relate to our surroundings, in fact the increase in the level of urbanization can discourage people from becoming more active due to fear of violence and crime in outdoor areas, pollution, low air quality, high-density traffic, lack of parks, sidewalks, and sport/recreation facilities.

Work places, for example, are a big contributor to sedentary lifestyles, given that activities are based around sitting behind a monitor, with the prediction of an increase in this type of static work (Tremblay MS et al. 2010). Few studies have examined

the strategies of interrupting sedentary activities in the workplace, future research should move towards the incentivisation of more movement in office settings (standing desk positions and mobile working), and also in school environments (lessons with the ability to stimulate the students dynamically). On a larger scale, reflections should be made on the city itself, in which unassisted mobility is a non-possibility, therefore posing the question: Are cities organized and thought of to be walked? Cycled? What do they offer? Notwithstanding these questions a deeper understanding is required, in this research direct intervention in physical space will not be considered, but instead focus on the promotion and the triggering of physical activity in an urban environment through an action of social communication. The definition and characteristics of social communication, the study into the role of technology that can support the information and critical analysis of relevant examples, represent an important step in the development of a system of communication (multimedia, interactive, etc.) that can answer to a “call to action”.

2. Social communication

Social communication is a phenomenon that has only recently developed in Italy despite the first examples that could be attributed to the experience of ancient Greece and Rome. Research, literature and subject initiatives are increasing in our country, despite the gap with overseas realities the increase is notable. Several causes of skepticism arise from motivations and obstacles, even if social communication represents a sector of great potential in relation to the possibilities on contributing to general wellbeing. Social communication may give us clear and realistic indications about concrete behaviors to adopt, with both individual and collective benefits, stimulating individual consciousness. The adjective “social” means both the value of the contents and the absence of economic/commercial interests that normally define advertisements. The aim of a social communication campaign is to stimulate public opinion on issues of public interest, with the objective of changing behaviors, of individuals and social groups. Today, fortunately, from the State to nonprofit organizations, through different means, we have understood the importance of communicating themes of public interest. The questions faced in social campaigns take into account the language and instruments used, and the analysis of the target group, that become fundamental in the choice of the most suitable model to use. Themes often arise that focus on the sphere of individual liberty, and thus raise ethical issues, make it important that the representations made in the campaigns do not impact on human dignity, and do not over exaggerate to gain the public’s attention. Design in these situations, therefore, should take into account considerations of this nature also in the ideas and in the practical phases to avoid counter effective results.

2.1 Communication for Health

Within in this framework we can position also communication for health, which takes into account issues relating to collective wellbeing. Since the beginning of the last century, issues of health have been a subject of social communication in Italy, applied to problems such as: deadly illnesses, sexually transmitted disease, accidents at home and in the workplace. Such communicative activities are currently made by institutions, local groups, healthcare groups, nonprofit organizations and the tertiary sector. The principal objectives of these forms of communication are those that sensitize the public in respect to a particular problem, promoting healthy ways of living, incentivizing the change of unhealthy behavior and focusing on the “health determinants” (Ministry for Work, Health and Social Policy, 2008). These can be divided into 3 themes: environmental, lifestyle and socio-economic. The themes relating to these look at access to healthcare, social, school and transport services (Italian Association for Institutional and Public Communication, 2006).

The objectives of the campaign could be informative in nature, with a view to generate interest and attention on a problem, or directed towards triggering a change in habits that are damaging to health. The first objective (of the informative type) result in being easily achieved whilst the second (triggering change) are more difficult as they involve the active participation of the target, with the intention to stir “deep

rooted opinions, that often are part of the identity of a person and change behavior that has often been adopted from childhood, in a subtle manner (...), all of this to avoid damage in the future, to the person themselves or others around them" (Caprara & Fontanot, 2005, p.281). The bet of social communication is based on this: in helping people to whom the message is targeted to make a leap of faith, to transform the information into an experience

2.2 Message styles and unconventional strategies

In a vast panorama full of variables, in which target, thematic and message to be transmitted, including communications of health can't avoid the use of different linguistic styles with the objective of attracting with effectiveness the attention of the addressee. Multiple means are employed: from a more reassuring and positive tone to those more dramatic and impressive, as well as more ironic or playful solutions. In the second report on Social Communication (Cucco et al., 2011), styles that are more often used in social communication are theorized and classified, used in messages relating to the promotion and prevention of health issues. A Paternalistic language, a direct and clear style used in the past by the public administration, serves to give a message that make the addressee aware and conscious, evoking a sense of guilt and appealing to sense of need, indicating what the correct thing to do is and what is not.

This type of message is authoritative and for this reason is currently seen as ineffective, especially when directed towards young people. The second style of language is informative, not evoking feelings of guilt but favoring a detailed description more rational and scientific in nature focusing on a sense of need, responsibilities and reason. The reassuring style, positive and pleasing describing health issues using delicate tones and encouraging the possibility of a solution with a happy ending (Gadotti, 2001). The risk is to minimize the problem of giving an ineffective message, above all to young people. On the contrary the fear arousing appeal and the dramatic message, used more in anglo-saxon countries than in Italy, is a message developed with the intent to create fear in the addressee.

Shown in a realistic manner the negative consequences of the behavior should convince the subject to change their damaging habits, whilst running the risk of making the subject vulnerable and in doing so provoke a refusal of the message (Gadotti & Bernocchi, 2010). A sentimental message, on the other hand, resort to the use of images that evoke strong emotions, appealing to the sad aspect of the subject matter, are often the subject of ethical debates. An aggressive message, accusing directly the viewer, identifies them as being responsible for the problem.

The tone is violent and full of tension. A provocative and disrespectful type of message uses shocking images, made to generate astonishment and direct the attention by means of exaggerated and provocative metaphors. The tone is challenging and the use of symbols and metaphors risk not being understood. In the end, the ironic or humoristic message is a good strategy because, as stated by Polesana: "On the contrary of fear arousing appeal, irony does not need to show situations of tragedy [...] all of this using irony is evoked by subtleties and confrontation of opposites [...]. The evaluation of both sides of the coin can/should convince a person about the goodness and validity or not of certain advice or regulation" (Polesana, 2005, p.179).

Alongside these styles the so called transversal strategies, unconventional strategies and web 2.0. In the first case we discuss for example the use of testimonials to give more weight to the contents. To be sure that the campaign will result in a positive outcome it is important to choose the right testimonial (Gadotti & Bernocchi, 2010, p.169), who has strong appeal in the public eye and has to be linked to the issue, reinforcing the fact that they are believable.

Unconventional strategies and web 2.0, on the other hand, increase the possibilities of getting to the target. They use instruments that can capture the attention and keep it alive by taking advantage of the viral nature of the messages spread across the web or identifying people in places with unconventional methods. Of the more common characteristics of these instruments there is a capacity of engaging strongly the public that become a protagonist of the changing process. The most common are: docu-fiction, serious games, flash mob, guerrilla marketing and web 2.0. Social communication and in particular the communication of health issues, independently of the characteristics of a single style, should take into account in the selection of language and communication means: the target of reference, the type of theme to be affronted and the consequential objectives that need to be met.

2.3 Effects of social communication in terms of health

What are the effects that this type of communication can achieve?

Research into the effects of social campaigns demonstrate that often they increase understanding, less frequently acquire knowledge and rarely influence behavior (Arena, 1995). The main objective should be targeting the “common denominator” through building a shared sensibility before giving information. Tamborini defines and categorizes, in *Marketing for Social Communication* (1996), four different types of fundamentals of social change in order of ascending difficulty:

- Cognitive change: the aim is to create consciousness and understanding, informing the target audience. The effect may seem easy to achieve but often is not.
- Action change: this refers to a specific action in a particular moment. The individual in this case, in spite of a favorable attitude, cannot complete the action due to circumstantial factors such as distance, lack of time and resources, indolence;
- Behavioral change: the users should forget old habits, they learn new habits and they maintain them over time. This is a very difficult effect to achieve, for this reason simple mass communication is not enough.
- Value change: focused on changing deeply rooted opinions and beliefs. The campaign that wants to change values are not successful because they operate in a sphere that looks at people's identity.

The question that is posed, regarding the success of social campaigns, as noted by Gadotti (2000), is answered mentioning the paradox of public indifference on issues of public interest, overcome only by making the public at 'large' from passive to active subjects. The result can be easily reached if we do not undervalue the importance of the message that we want to transmit, while treating themes connected with health as messages that have to seem like standard advertising, where the effectiveness is directly proportional to the expressive quality. Gadotti and Benocchi (2010) state “Social advertising has to be, above all, interesting, in order not to pass unnoticed by the addressee that could be defined as ‘lazy users’”.

4. Application and case studies

In what way can social communication incentivize the use of public space? How can design trigger a concrete “call to action”? The following text gives some examples of national and international experiences where the users were engaged in different ways in response to these questions.

On one hand we have initiatives for the promotion of physical activities, usually promoted by public, council or regional bodies that involve the citizens. One of the examples is a project entitled “Bolzano by foot”, fostered by the council, health and tourist agencies to promote people's movement by walking in the city, making it safe to do so in the urban realm. The project was part of a larger strategic plan “Bolzano City Workshop for Wellness”. The project explored multiple parts of the main issues by using new types of communication with the aim of increasing and making walking more important for a virtuous lifestyle for the individual, the collective and the environment. Two different tracks were organized: BO-Walking and BO-Running, for both people in general and more sportive types. Signage was created to provide information about distances, number of steps, routes and calories consumed in reference to running or walking. Wayfinding systems and city maps were integrated within waiting points and main urban nodes giving the time-distance relationship information as well as that of main touristic sites in the area, with the objective of giving more useful information to encourage public participation in physical healthy activities. The initiative was promoted in the city and in community and youth centers, concluding with a festival dedicated to walking in Bolzano.

On the other hand we have platforms and applications that through personal devices stimulate physical activities, focusing on values such as competitiveness, belonging to a community and wellness and health. From Google Fit to Nike+ Running, Nike Training Club, Endomondo Sports Tracker, Moves, Caledos Runner, Runtastic, all apps that monitor time, physique and environment of those training, with each adding their own particular characteristic. For example Google Fit uses

integrated sensors in smartphones, geo positioning, and history on location and can give up to date information on the physical activity of the users. The app is able to understand if the user is walking, running or cycling tracking graphics and developing a fitness plan. It is compatible with Android Wear (smartwatches) and is able to dialogue with interfaces already available in the market. Nike+ Running can monitor distance, pace and time of run, dialoging with Nike Fuel Band bracelet. The rates can be shared on social networks and compared with friend's data. Endonondo Sports Tracker is another app that can send information to your headphones from your virtual coach, to achieve the aims of your fitness program and visualize on a map the route chosen and the performance.

5. Conclusions

Is it possible to imagine an integration of both of the above approaches? Can the initiatives promoted for collective physical activity benefit from the potential already existing on mobile devices? In an ever more Smart city where the smartness level is measured by the inwssystem that is able to stimulate movement of people, ever more used to a sedentary lifestyle, in an urban environment also thanks to the use of technology and with the hope that especially technology can play a positive role in the encouragement of people to move more often (Marshall and Ramirez, 2011).

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Example of apps, dispositive or public initiative to incentivate physical activity.

01. Moves automatically records any walking, cycling, and running you do. You can view the distance, duration, steps, and calories* burned for each activity.

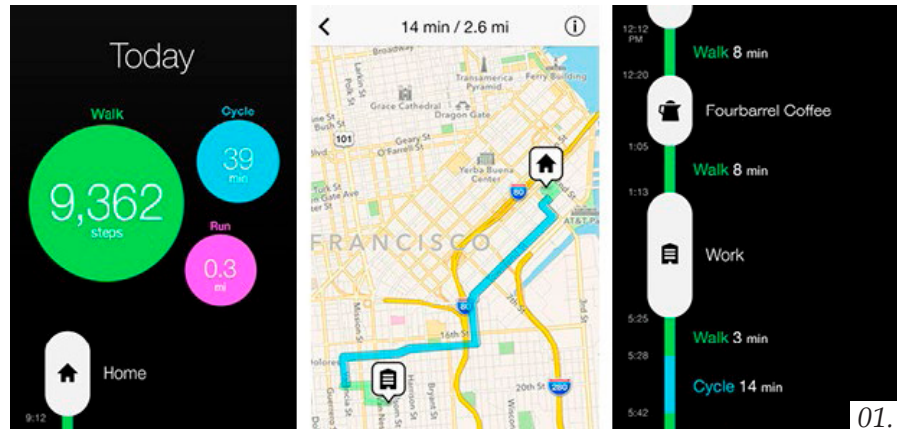
02. Health helps you record a wide array of information about your health and wellness, giving you a single place to log health information and view how it changes over time. It also includes two special features that I think all iPhone owners should use.

03. "Race Yourself", a Google Glass app, allows users to race against themselves, and beat personal-fitness records by completing virtual games. Users can also race against friends or projections of professional athletes, including Olympic sprinter Usain Bolt.

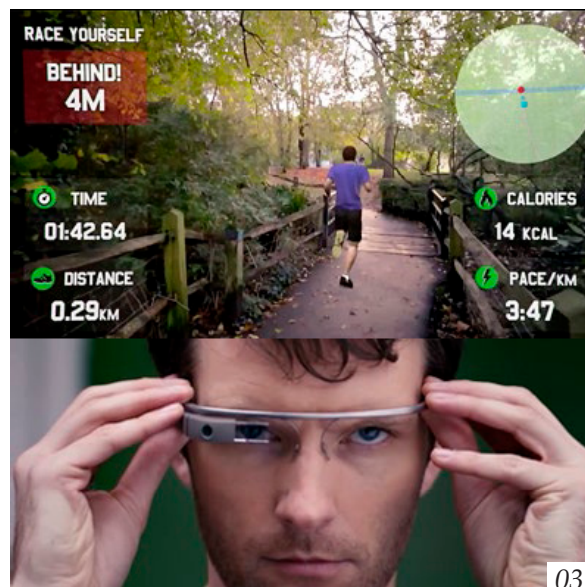
04. A 'brainwave' from the Fitness First marketing team in the Netherlands - public shaming. As someone innocently sits to wait for a bus the billboard flashes the persons weight in red numerals for all to see.

05. Guerrilla Marketing: In Russia, You Workout for Subway. To generate buzz for the Olympics, this guerrilla marketing stunt made you squat for a free subway ride. By passerby's doing 30 squats, they were able to get a free subway voucher. Moscow officials and the Russian Olympic Committee decided to install these exercise-related, ticket-giver machines around major cities throughout Russia.

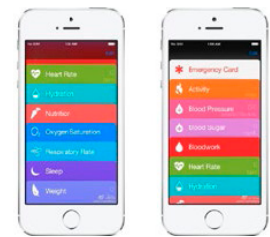
06. Guerrilla Marketing: Bikebecause.com A guerrilla marketing" tactics to shift people's attitudes towards biking by raising questions of convenience, budget and time.



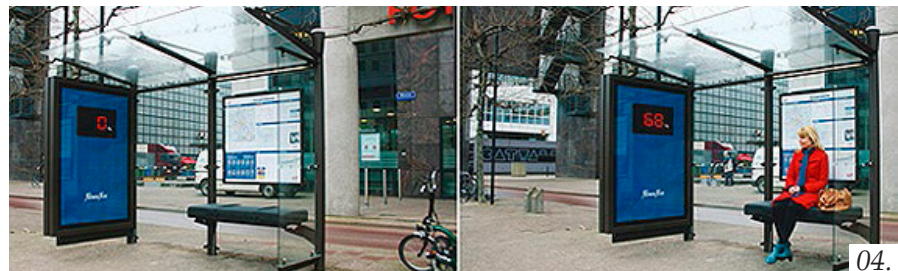
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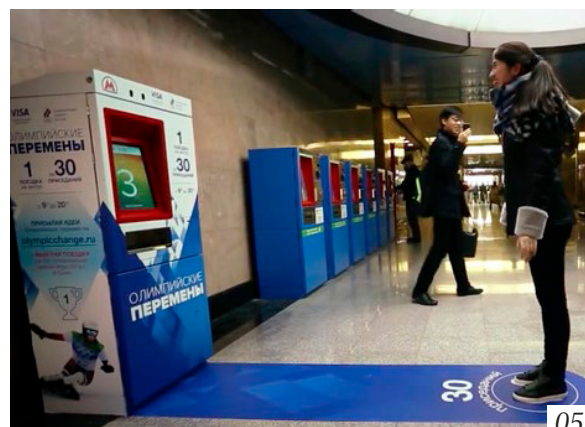
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Systemic approach in material and intangible culture of estrada real (royal road): Territory of serro case

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Keywords: Systemic Design, Handicraft, Estrada Real (Royal Road).

Abstract

The Complex Estrada Real (Royal Road), one of the most important tourist areas of the state of Minas Gerais (Brazil), has been established to strengthen the tourism potential through multiple actions. Spite of assembling material and intangible attractive endowed with great business potential, we can verify that it is not consolidated as a touristic product yet. Among the many problems for its effectiveness, we consider the “death” of the handicraft as one of the most severe, because it represents the extinction of material culture (products) and intangible culture (know-how) of a people. And what are a people without culture? One product that is based on the culture of the territory, the outcome of local traditions and reflects of the labor and pride of its actors, increases material wealth, not only in the economic area, but also the social and cultural area. In this context, the application of Systemic Design reveals itself as a more appropriate approach because it operates under a humanistic vision that values the actors of the process, the resources and the local culture, in the analysis and design of their flows and interrelations, envisioning new opportunities for employment and income, sustainable management of natural resources, and improvement of quality of life and environment.

1. Introduction

Between historic and political, religious and exploitation movements, typical of a territory emersed under a culture of colonization, we come to the main roads that served both for conquest and colonization of the territories, and to mark deeply the history of the birth of Brazil. These paths, known today as Estradas Reais (Royal Roads), represent, figuratively, the deepest scars of their roots, being of great importance and influence for Brazil and for the State of Minas Gerais.

In 1999 it was established one of the most important tourist areas of Minas Gerais, based on the importance of the historical origin of the ancient paths traced by the Portuguese royalty in Colonial Brazil: the Royal Road Touristic Complex which consists of four routes: i) Old Way (run by the pioneers Bandeirantes, connecting the province of São Paulo to the gold mines); ii) New Road (built by the Portuguese royalty, joining the Rio de Janeiro to Vila Rica - now Ouro Preto); iii) Path Sabarabuçu (linked Vila Rica to the town of Sabará, who also owned the gold mines); iv) Path of Diamonds (established by the Portuguese as the official Portuguese Crown Road, which linked Vila Rica to the Diamond District - currently Diamantina - where it were concentrated most of the mining activities for diamonds and gemstones) (Fig. 1). The set of these paths congregate attractive material and intangible endowed with great commercial potential, while celebrating the local culture and its expressions: original colonial buildings, baroque churches built with local materials and compo-

nents, museums illustrating the splendour of the Gold Cycle, unexplored ecological nature reserves, adventure sports as a tourist attraction, pure and healthy mineral water spas, rich cuisine and especially individuals with personal histories and markedly own regional customs [1].

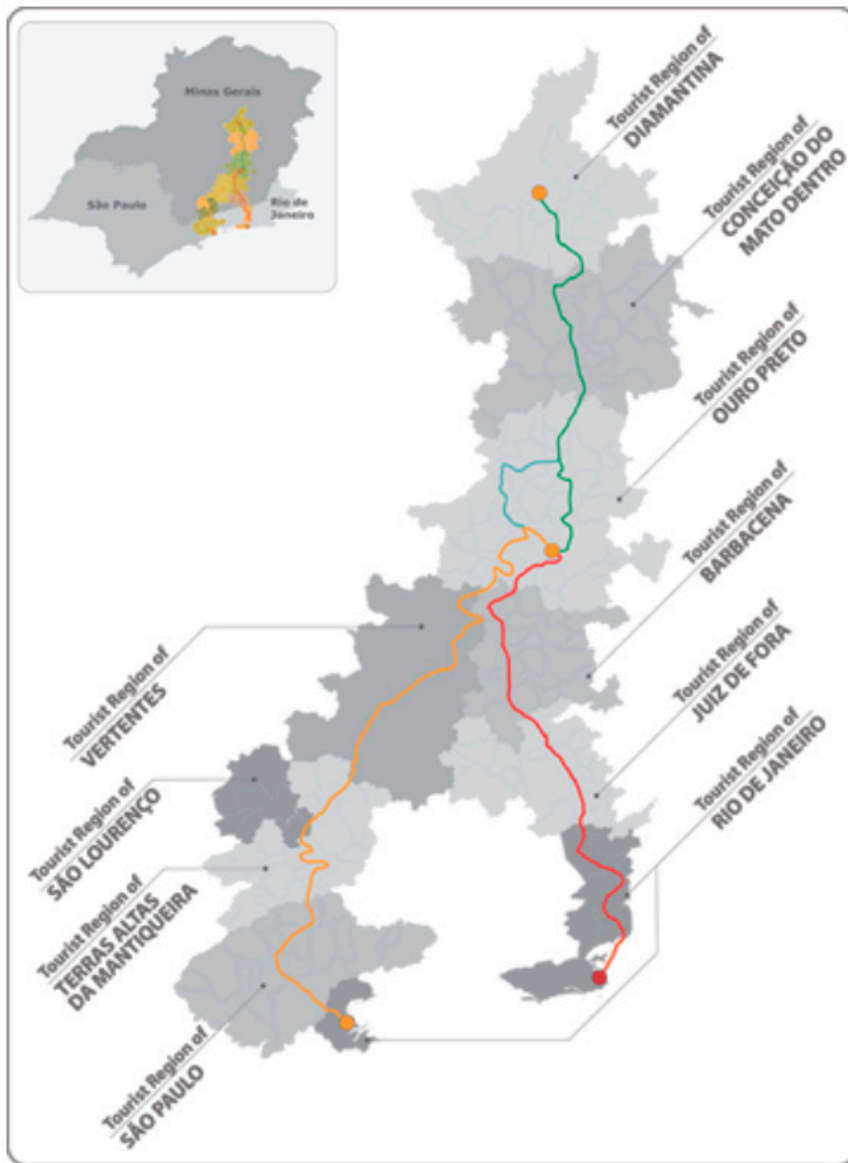


Fig. 1 - Royal Road Tourist Complex and its ways

The Royal Road comprises the most important and multifaceted culture of Minas Gerais, in particular, which is placed from the chronological point of view in Brazilian Colonial period, during which originated the historical and cultural roots of the people from that land. Such period has a unique history with particular actors that are important part of the heritage of the territory: the pioneers, shepherds, soldiers, travellers and hawkers, at that time, built roads linking villages, towns and cities. Back then, arose churches, farms, commercial and handicraft activities, houses of wattle-and-daub, where were articulated social roles that would compose a political, cultural, economic and social vast and rich history. It was born to enhance the tourism potential, both nationally and internationally, aiming to contribute, among others, for cultural tourism¹.

1. "Cultural tourism includes tourism activities related to the experience of all the significant elements of the historic and cultural heritage and cultural events, valuing and promoting the material and immaterial cultural goods. [...] The property of material and immaterial nature that express or reveal the memory and the identity of populations and communities are considered historical and cultural heritage" [2].

For that, there were institutional efforts such as the registration of the trademark Estrada Real (ER), which commercializes a wide range of products such as clothing, chocolates, coffee, pastries, rum, and even a number of utilities like FIAT Doblò Adventure. However, as we can see, these products are decontextualized, it means, none of them relates to the territory in which it lies.

Moreover, with the encouragement and expectation of divulgation, reinforced by the possible recognition of the Royal Road as Cultural Landscape of Humanity by UNESCO, many territories also endeavoured to promote their peculiarities through tourism products, including handicrafts. However, the mischaracterization is also focusing in this area.

We can see this reality in various outlets in the region, where the products have the same formal appearance, establishing then a competitive line with each other, besides not distinguish the aspects that refer to their own localities. The competition eventually stimulates the copy, which is based on

price competition and exploitation of the raw material or of the labor. The product is “born” without identity, differing by a few competitive elements in morphological features, and a gradual breakdown of the aspects of local culture, such as the production of objects completely decontextualized, for example, a Statue of Liberty in soapstone that can illustrate the nonsense of proposals.

This movement occurs, in theory, to suit the market. However, the (traditional) market functions only about the economic value of the product, aimed the global standardization of products, without any connection to the roots of the territory and know-how, moving away increasingly handicraftsmen and their traditions.

In informal interviews with handicraftsmen of the Serro region, it was reported that the craft is “dying” because young people are no longer interested in the activity and moved to the big cities searching for employment and study.

We can see then that there is a confrontation between idealism and possible realities in the Royal Road Program. In fact, the Royal Road is not yet consolidated as a tourist product. Among the several problems for their enforcement (such as infrastructure, internal human resources, services, communication, transportation, etc.), we consider the “death” of the handicraft as one of the more serious because it represents the extinction of material culture (of products) and intangible culture (know-how) of a people. And what is a people without culture?

Thus, this study, still under development, appropriates the diversity of the Territory of the Royal Road to demonstrate that through understanding the inherent relations of local streams and their connections, and the application of Systemic Design², it is possible to identify the sociocultural quality that contains it, assess its implications and especially envision possibilities for socioeconomic development and rescue of local cultures, long-dated.

This study was stimulated by the economic and cultural importance of the Complex of the Royal Road, and reinforced by the important partnership between Polytechnic of Turin (POLITO), Minas Gerais State University (UEMG) e Minas Design Centre (CMD), from a previous project called Estrada Real Project (ERP), which proposed, through design, projects able to articulate and enhance local development, based on the valuation of the identity of land and its fundamental resources – social, economic, cultural and environmental – of sustainability.

The objective of this research is to generate a new economic and development model in the Territory of Serro, long-dated, by creating connections between their production systems, through the recognition of their cultural values (material and intangible), under the framework of the systemic design.

2. Methodology

In the current context of globalization, balancing tradition and innovation (local-global relation) is the great challenge, and to accomplish it is essential to strengthen local competitiveness, integrate actions in the territory, and enhance products and services through the design of networks and alliances [3].

A product that is based on the culture of the territory, result of local traditions

2. The methodology of Systemic Design was developed by Luigi Bistagnino, from Politecnico di Torino (POLITO).

and reflects the labor and pride of their actors, increases material wealth, not only in the economic area but also in the social and cultural areas, interfering directly in the quality of life and self-esteem, extolling the own material culture. A broad overview of the quality of a product (which considers the involvement with the territory, its resources and its community) is fundamental in planning strategies for enhancement of products drive local development [3].

Thus, the application of Systemic Design reveals itself as a more appropriate approach to Royal Road scope, because it acts under a humanistic vision that values the actors and subjects of the process, the resources and the local culture in the analysis and design of their flows and their interrelations, envisioning new opportunities for employment and income generation.

Systemic thinking has a holistic conception, in which the world is seen as an indivisible whole and intrinsically dynamic, considering the context and relationships. Thus, projectual attention is no longer limited to products and goes on to consider the relationships between the productive processes involved and new activities generated in a system of social, cultural and ethical³ values, valuing the know-how. In this model, the various activities of life and production coexist in a participatory manner and have their essential function in the system, none prevails over the other, but each one exists because of others. From the interconnection network of relationships, actions and problems are defined and solved by the actors themselves in the process, allowing the emergence of the phenomenon of autopoiesis⁴.

In this perspective, the territory could then improve their quality of life, preserve their traditions and develop new economies based on their products and services, and establish his own pride as a territory, and also show the particular specificities of each region relation to their cultural, environmental and spatial aspects arranged between the actors and the environment.

So that we can apply the Systemic Design, in other words, to design flows of matter and energy between the productive systems of a territory, through a network of relationships, it is necessary at first understand its context, i.e., its territory in all its breadth. This understanding should involve the history of the place, its physical and climatic aspects, its natural resources, its (social, cultural and productive) activities, mood and the rhythm of community life, as well as its infrastructure. All of these specifics are what makes the area to be unique. Then, the analysis goes to the construction of this current scenario, called Holistic Relief.

In the second phase, are described in depth, all existing productive activities, i.e., it is necessary to investigate all inputs and outputs involved in the production processes of the territory in question. It is noteworthy that according to the linear thinking⁵ output are considered as "leavings" or "discards", however, this concept does not apply in the systemic approach, because they are all considered "raw material".

At this juncture, both the quality and quantity of output have fundamental importance. The quantity allows us to verify if the amount is enough to get into another system, if it may be distributed to other, or not be sufficient to perform the desired activity. On the other hand, the quality assessed in the first phase of the project, if need adjustments, shall be agreed between the parties, since the receiver knows exactly what is essential to your system, and the provider has an interest in providing, as this will have economic value. As we can see, this principle works because both parties benefit, and ultimately, the whole community, because it avoids the "import" of raw materials and labor, then, generating employment and income in the locality itself. The analysis of existing production systems from a given area al-

3. According to De Giorgi (as cited in [4]), the systemic ethical vision is not only a philosophical position, but a need to sustain life and health on earth.

4. Autopoiesis (from the Greek *auto* "own", *self*, *poiesis* "creation") is a term coined in the 1970s by the Chilean biologists and philosophers Humberto Maturana and Francisco Varela to describe the ability of living organisms to produce themselves. The concept of Autopoiesis has been applied in Immunology, the computer man interaction, sociology, economics, philosophy and public administration and in the design through systematic design methodology.

5. Linear thinking comes from mechanistic, rational model, based on the relation of cause and effect, typical of industrial production.

allows us to examine positive and negative points, which are indicative for the design of flows of matter and energy, and may even lead to new productive activities according to local needs and opportunities.

It would be ideal that the production must use the resources from own territory in order to supplement all the needs, i.e., the economy should be self-sufficient. Through this approach, products and processes generated tend to zero emissions⁶. How Bistagnino⁷ recalls, "[...] the nature is teacher and example." The interesting and innovative in this approach is that it is not restricted to environmental issues, which can be considered as a new economic and development model, not only in manufacturing, but in society as a whole [4].

3. Development

It can be said that each region of the Royal Road complex has idiosyncrasies that emphasize quality and which demonstrate an essential strategic potential for differentiation and development of identity from their territories. These are key elements to infer that the Royal Road complex is a fertile

ground for the application of Systemic Design.

Much has been discussed about what or where are the limits between design and handicraft. However, this article does not have the intention of coming to a conclusion, only because we do not believe this is a productive discussion. However, as our whole argument is based on contextualized products and services, focusing on the handicraft is appropriate.

Important to note that we consider "handicraft" the impregnated product of cultural elements, developed by the craftsman, which we defined as "one who sells what it produces", that have the know-how, which has the tacit knowledge, that learned their craft with family across generations, producing objects with a certain identity, a set of characteristics, that relate to the community and with local raw materials.

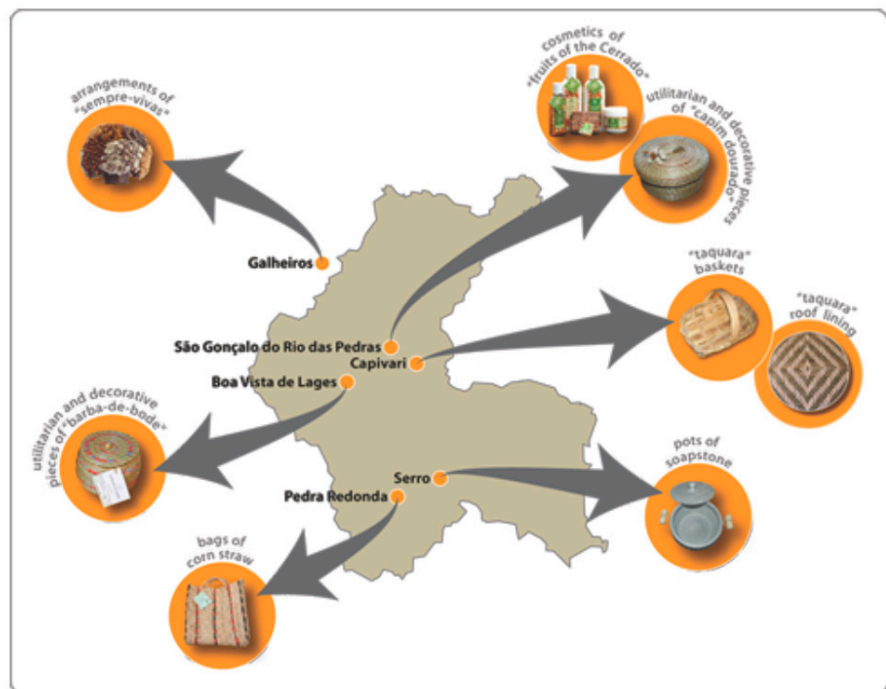


Fig. 2 - Territory of Serro and its handicraft products

6. According to Di Salvo (as cited in [4]), zero emission is commonly understood as the elimination of all emissions, whether in liquid, solid or gas state.

7. Retrieved June 13, 2014, from http://www.edilcamp.it/notizie/108/luigi_bistagnino_la_natura_maestra_ed_esempio.html

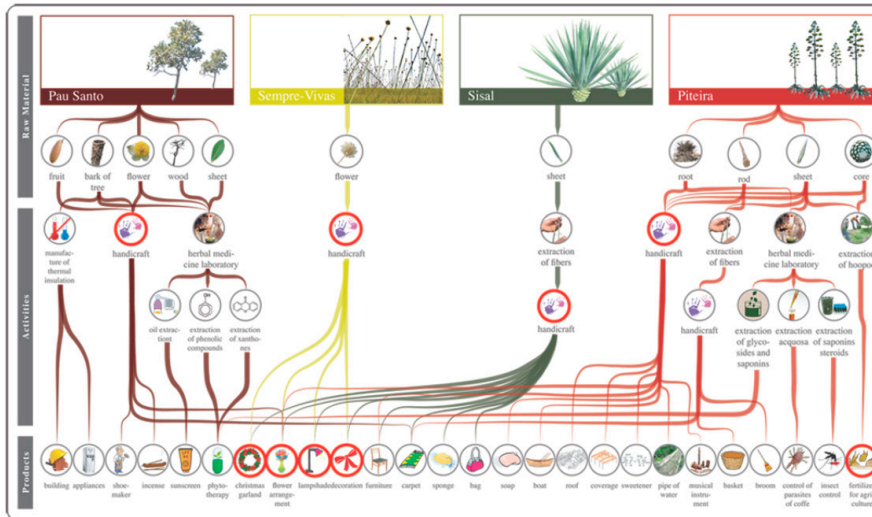


Fig. 3 - Iconographic synthesis of the production system of the arrangements of evergreens

From the drafting and analysis of Holistic Relief of Serro region, an area was delimited for application of Systemic Design, termed Territory of Serro. This is located on the Diamond Path, covers the city of Serro and some of its districts and villages, which are: Boa Vista de Lages, Capivari, Pedra Redonda, Santo Antonio do Itambé and São Gonçalo do Rio das Pedras, in addition of a small village in the city of Diamantina: Galheiros.

Such definition was due because of some favourable characteristics the Territory has, among which we highlight: i) strong presence of handicraftsmen, some of them organized into associations; ii) use of local resources in production systems; iii) many small family businesses; iv) small communities; v) small-scale production; vi) strong link between population and territory. The handicrafts produced in these communities involve: arrangements of "Sempre-vivas" (evergreens); pots of soapstone; utilitarian and decorative pieces of "Capim dourado" (golden grass); utilitarian and decorative pieces of "Barba-de-bode" (beard-of-goat) grass; "Taquara" (bamboo) baskets and roof lining; bags of corn straw; cosmetics made of four fruits ("Mutamba", "Macaúba", "Pacari", "Amesca") of the "Cerrado" (vegetation of the Brazilian interior). It is important to emphasize that in all of them employ local raw material (Fig. 2).

Production techniques are original and passed from father to son for generations. Pieces are sold primarily in the homes of artisans, in craft fairs, restaurants, shops and warehouses in the locality. The field research, conducted between August and October this year (2014), allowed the elaboration of the current description of each of the production systems. This was complemented with studies on the possible attributes and jobs – even in other sectors – each input used for the fabrication of pieces, as well as all output systems. One example is the production system of the arrangements of "Sempre-vivas" (evergreens).

The iconographic synthesis (Fig. 3) allows us to observe: i) the four raw materials entering the system – "Pau santo" (rosewood), "Sempre-vivas" (evergreens), "Sisal" and "Piteira" (agave) and its components (flowers; leaves; fruits; wood; bark; root; and nucleus); ii) activities – handicraft production; oil extraction, phenolic compounds, xanthenes, fiber, pulp, glycosides, saponins and steroids for various applications; production of thermal insulation; iii) products – shoes; incense; herbal indicated to cure and control various diseases; Christmas wreaths; arrangements of "Sempre-vivas" (evergreens); lamps; decorative objects; furniture; rugs; bath sponge; handbags; soaps; boats; homes ceiling; rooftops; water canals; musical instruments; baskets; broom; fertilizer for agriculture; as well as components of other products (cork from "Pau santo" can be used as insulation in refrigerators, heaters and stoves; the oil extraction of timber "Pau santo" can be applied in sunscreen formulations; the extraction of "Aguamiel" of "Piteira" the core can be transformed into healthy sweeteners; the aqueous extract from the leaves of "Piteira" can be used in the control of the red mite of the coffee tree *O. ilicis*, and to control insects like *Ae. aegypti*, *Na. Stephensi*

and Cx. quinquifasciatus. However, only those activities and products highlighted by the red circles are actually realized.

From the simple visualization of iconographic synthesis of this production system, we can understand the various job opportunities and income that this territory can get on with their own resources. We are currently in the process of joint analysis of seven production systems⁸, for then we design the flow of energy between them through relationships, non-existent at this point. As possible outcomes include: development of the area, its people, and the local culture; generating new activities, employment and income; keeping people in their territory; sustainable management of natural resources; and improving the quality of life and the environment.

In this scenario, the production for different markets allows the creation of non-globalized economic systems and indistinct, but specific and contextualized.

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8. The seven production systems under consideration are: arrangement of "Sempre-vivas" (evergreens); utilities and decorative objects of "Barba-de-bode" (beard-of-goat) grass; corn straw bags; soapstone pots; baskets and roof lining of "Taquara" (bamboo); utilities and home furnishings of "Capim dourado" (golden grass); and cosmetics of fruits of the "Cerrado" (Brazilian vegetation).

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Technology of innovative materials

Nano|Surfaces

Innovative Materials and Nanotechnologies for Sustainable Design

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Abstract

In recent decades, and even more in recent years, the quantity of materials for design and manufacturing has been growing as fast as they are broadening the characteristics that distinguish them. The strong and sudden development of materials sciences has consequently led to a widespread renunciation by designers of updating their own material records: the information relating to new materials are sometimes too technical and difficult to interpret, it is often too difficult to make them available, and in any case the number and the variants of these materials are so excessive that they put the traditional model of design in troublesome situations.

Although it is difficult for the designer to be constantly up to date on the matter, it must be pointed out that the consequent lack of this knowledge inevitably becomes a lost opportunity; a truly innovative design is nowadays strengthened by an intelligent and imaginative exploration of new materials, even purposely designed if necessary. Since there is no reason to predict a decline in the speed of development of new innovative materials, it is reasonable to expect that the choice of materials can become even more complex in the years to come, even in connection with new (nano)technologies. It is now more important than ever to understand the properties of materials, whether they involve engineering aspects, such as physico-chemical properties or mechanical properties, or whether they involve sensory-expressive perception, to be able to design, taking advantage of the potential and limits of the material chosen for the design. It's important to underline that materials have never before evolved as quickly and the range of properties has never been as broad as they are now.

Thanks to nanotechnologies the industry is seeing the advent of a revolution that will result in new materials functionalised to meet the most innovative demands of the market and increase the added value of products.

1. Introduction

The knowledge of innovative materials allows the designer to make the best material selection as a function of its application in a given product, and to overcome its limits and constraints in a design path, where materials and technologies become variables of the creation process. The materials rational use is necessary to bring out and enrich the perceptive and sensorial experience undergone by the consumer.

The innovative values of an object can be underlined by the chosen material; in fact its mechanical and chemico-physical properties, as well as its forming, joining and finishing technologies, all participate to the success of a product [1]. The history of design, of products and their shapes, is based on the constant dialectic relationship between a project and new materials and technologies. The central role that materials had in the past is attested by the traditional identification of the evo-

lutionary eras (the Stone Age, the Copper Age, the Bronze Age, the Iron Age) [2].

Though only the most recent developments in chemistry allowed the beginning of a new era based on materials designed by man, during the industrial revolution (XVII-XIX centuries) new instruments and equipment became available, thus increasing the number, efficiency and variety of man's actions on materials.

Nowadays the knowledge of materials properties is essential more than ever, as for both technical and engineering properties, and expressive-sensorial perceptions, in order to produce an aware design and exploit in the most appropriate way potentials and limits of the chosen material.

What must be constantly kept in mind is that such a fast materials evolution has never been observed before. It's also important to underline the wide range of properties of new and innovative materials have [3], [4].

The designer duty is not limited to the selection of the correct material, which best satisfies the design requirements, as product realization is generally not included in design characteristics. A correct design, in fact, must also consider the production process, that is, processes needed to confer a shape to the material, to connect different pieces and to grant the desired surface finishing [5] [6] [7].

Today, a deeply innovative design is favoured by a smart and imaginative exploring of new materials, even designed on purpose whenever necessary. Since there's no reason for expect a decrease in new materials development, it is reasonable to expect that in next years materials selection will become even more articulate and complex, specially as for new technologies.

2. The beginning and the meaning of nanotechnologies

Nanotechnologies are at the basis of a fundamental scientific revolution that has significantly changed the way the creation and manipulation of materials is approached. The term nanotechnology in fact describes a multidisciplinary approach to the creation of materials, devices and systems through the control of matter on the nanometre scale [8], [9].

As for the definition given by the online Oxford English dictionary, Nanotechnology means "The branch of technology that deals with dimensions and tolerances of 1 to 100 nanometres, or, generally, with the manipulation of individual atoms and molecules". This definition has particular importance since it focuses the attention on the structure of the materials, rather than on the technology itself.

In 1959, the winner of the Nobel Prize for Physics, Richard Feynman in a famous speech entitled "There's plenty of room at the bottom"¹ was the first to speak of the great opportunities offered by miniaturisation and the use of nanotechnological structures. Then we had to wait until 1974, when Norio Taniguchi, [10] a researcher at the University of Tokyo, in his paper On the basic concept of Nano-Technology used the term "nanotechnology" in reference to the ability to manipulate matter at the nanometre level.

A nanometre (nm) is one-billionth of a metre (10^{-9} m), or about one eighty-thousandth of a human hair, and materials structured on the nanometre scale can present with properties that are vastly different to those that are exhibited on the macroscopic scale, permitting a number of unique applications.

Nanotechnologies, by controlling the structure of matter at the nanometre level, propose to exploit these new properties in an intelligent way. It is not sufficient in fact to operate at the nanometre level; to be able to talk about nanotechnology [11] it is necessary that the nanostructure permits the attainment, in a controlled manner, of properties that would not otherwise be obtainable.

These ideas can be furthermore expanded by another definition of Nanotechnology, which impose additional dimensional limits and introduces the concept of pro-

1. "What I want to talk about is the problem of manipulating and controlling things on a small scale.... But I am not afraid to consider the final question as to whether, ultimately, in the great future, we can arrange the atoms the way we want... The principles of physics, as far as I can see, do not speak against the possibility of manoeuvring things atom by atom. It is not an attempt to violate any laws; it is something, in principle, that can be done; but in practice it has not been done because we are too big." 29 December 1959, Richard Feynman, meeting of the American Physical Society, Caltech.

property; we can say that “Nanotechnologies deal with materials and systems where: at least one dimension is between 1 and 100 nanometres; matter manipulation involves processes which allow a complete control over composition and structure at the atomic and molecular level; properties which could not be achieved otherwise are obtained”.

The radical added value of the nanotechnologies is to allow, operating at the nanometre level, even with traditional materials, the attainment of different properties from those of the same products at macroscopic dimensions, allowing, on the one hand, the attainment of systems with improved functionality and performance, and, on the other hand, the rationalisation of energy consumption and the minimising of waste products.

2.1 Nanotechnologies: what, how and why

A first consideration can help explaining the principles nanotechnologies are based on: materials which are structured at the nano scale often present considerably innovative properties and characteristics (either physical, mechanical, electric, magnetic, etc.) compared with the corresponding bulk materials (that is, structured at the macroscopic or even microscopic scale) [12].

The main reason which explains this behaviour is the different proportion between the number of atoms present inside and on the surface of the structure. In fact, at the nano scale the intermolecular forces responsible of the attraction among the molecules constituting a material, such as surface tension or Van der Waals forces, acquire primary importance, while other forces, e.g. gravity, become less important.

Materials structured at a nanometric scale, therefore, can exhibit properties which are deeply modified with respect to properties typical of the same material considered at the micro scale, and thus allow unique applications. For instance, opaque substances can appear transparent, inert materials catalyze reactions, stable materials become combustible, unexpected transitions from solid to liquid state are allowed at low temperatures (as an example gold becomes liquid close to room temperature), insulators become conductors, fragile materials can acquire high resistance.

Nanotechnologies aim at consciously exploiting these new properties through the nanometric design of the material. This feature is of primary importance: not only materials must be controlled at the nano scale to fall into the nanotechnology field, but also the nanostructure must exhibit brand new properties that shall be tuned by acting on the structure itself.

2.2 Nanofabrication: top-down and bottom-up

Nanotechnologies can follow two deeply different approaches: the so-called “top-down” approach or the “bottom-up” approach.

The top-down approach is meant to reduce, up to nano levels, the dimensions of the smaller structures by means of physical-engineered methods. The most common example is electronics, which is more and more occupied with components miniaturization.

Nowadays, silicon wafers are produced with technologies like the so-called plasma, which leads to the production of smaller and smaller, more and more powerful, low-consumption microchips. These technologies already allow the obtaining of complex structures which include microchips containing hundreds of millions nanostructures precisely positioned, in less than 100 nm. This opened the way to the changes in the computer industry, from computers as big as the whole room to smaller and lighter devices, which now allow us to have “the world in a pocket”.

Other top-down built devices are the so-called NEMS (Nano Electro Mechanical Systems) that come from the evolution of MEMS (Micro Electro Mechanical Systems). The bottom-up approach is derived from chemistry and biology: by starting from small components, usually atoms or molecules, the assembly process is carefully driven by using them as building blocks to create nanostructures, either inorganic or organic, or biological (for example, with DNA molecules), by exploiting the self-assembly ability of molecules, or their chemical synthesis, or finally the position-driven assembly.

The bottom-up approach can be used to create new mechanisms and materials having extraordinary resistance, flexibility, lightness or durability. Several problems need to find a solution yet, nevertheless this way can lead to the most revolutionary results and to the achievement of the most ambitious goals.

3. What's new with nanotechnologies

Nanotechnologies applications can be tracked down in ancient times, when nano wasn't an issue yet. An example is the Licurgo cup (IV century AD), ornamental element of outstanding beauty, which was made of unconsciously nanostructured glass incorporating 5 to 10 nm large gold particles: the cup seems green if light is reflected on its surface, red if light is transmitted through it.

Nowadays, a few centuries after the Greek hero's age, nanotechnologies are a wide and interdisciplinary field, which is pervading all main science disciplines as nanoelectronics, nanophysics, nanomedicine, nanomaterials, etc. Application fields of nanotechnologies are almost unlimited as well: all main production sectors can be influenced by these new technologies. We can also state with no doubt that in the next decades the nanotechnology field will be essential for scientific and technological competition [13].

The textile industry can play a role of great innovation because it can take advantage of the very elements of the textile substrates, such as lightness and versatility, and integrate them with the new technologies to obtain new products. The textile article therefore becomes a new material capable of providing comfort, protecting, withstanding extreme loads and able to be used in the most varied sectors.

Nanofibres can be obtained with techniques such as, for example, electrospinning, which allows the extraction of very fine fibres from a liquid. These nanofibres are used directly in nanomedicine as materials for the reconstruction of skin or muscles or simply as antibacterial woven and non-woven materials to prevent infection or for bandages.

Another field of application is sport where the performance demanded of products is particularly significant, such as, for example, improved comfort, increased protection, especially with regard to the cold, water resistance, or an increase in performance such as, for example, with hydrodynamic outfits all the way to the addition to the textile of components for monitoring and training.

The benefits that nanotechnologies bring to all sectors include the incremental improvement of the characteristics and performances of products that already exist and they offer the opportunity to create products with new properties that last for the entire lifecycle.

3.1 New technologies

Apart from future scenarios related to extremely advanced applications, many nanotechnologies have already found applications as instruments of technological innovation with reasonable costs, which is a necessary condition to achieve global competitiveness.

The technologies that allow the direct functionalisation of the surface of traditional materials and which can be defined in all respects as nanotechnologies, such as sol-gel and plasma technology. The sol-gel technique [14] allows the fabrication of materials whose chemical, physical and mechanical properties can be modulated to obtain products with the characteristics of designed composition and microstructure.

The totally transparent films, deposited on different substrates give them new properties, acting on their physical-mechanical characteristics, for example, by making a fabric antistatic, or on the optical characteristics, by changing the colour, or even improving its antibacterial level, or allowing the controlled release of aromas or of particular substances. The most classic example of application of the films obtained by sol-gel techniques are "easy to clean" coverings, characterised by very low surface energy that give super-hydrophobic properties to the surface [15].

The starting point of sol-gel technology is a metallorganic or inorganic precursor of the metal element which has to be deposited in the form of an oxide layer (Ti, Si, etc): the precursor undergoes hydrolysis and condensation processes (polymerisa-

tion) to form a solution (sol) containing oxide nanoparticles (TiO₂, SiO₂, etc). By controlling the subsequent gelation of the sol to form a network in a continuous liquid phase (gel) different structures can be obtained: in particular (apart from massive ceramic materials and fibres) nanoparticles, aerogels and thin films. The latter ones can be formed on almost any substrate and confer to the substrate surface diversified functionalities. In all sectors the potential of sol-gel technology emerges clearly; the process is particularly suitable for surface treatment and takes place at ambient pressure and temperature. The opportunity to employ the traditional machinery in use, by means of impregnation, coating or spray to apply the products synthesised by sol-gel, is obviously a plus.

The properties which mostly deserve to be explored are those related to photocatalysis, hydrophilicity and hydrophobicity.

Different, but with just as many advantages, is plasma technology. Plasma is also defined as the fourth state of matter after solid, liquid and gas. Plasma also exists in nature: think of the comets, aurora borealis, lightning and the sun itself, or other types of plasma such as neon tubes used for lighting or plasma TVs.

The objectives of the process of plasma treatments are manifold: modification of wettability, anti-felting of wool, creation of coatings, improving adhesion, increasing dyeability, nanostructuring, metallization, and so on. The areas of application that can take advantage of this technology range from microelectronics to photovoltaic cells, from the biomedical to the automotive, from packaging to textiles.

Plasma treatments are environmentally friendly techniques insofar as they require low quantities of consumables, do not use solvents and do not require any disposal of by-products. One of the main barriers to the implementation of nanotechnologies [16] is the lack of knowledge of the potential they possess, partly because of the fears that this generates in businesses and consumers with regard to health and safety.

3.2 Innovative materials

The uses of nanoparticles, nanocomposites, nanospheres and nanostructures – having at least one dimension in the order of nanometres – allow traditional materials to be given particular features such as being water repellent, dirt resistant, inflammable, up to protection from UV or IR rays, antistatic, antibacterial, or to increase mechanical resistance.

Carbon nanotubes can be integrated in a polymeric matrix to create nanocomposites with increased mechanical properties, which in turn can be processed as normal polymers. Automotive companies use particular paints as coverings for some products: these paints contain specific oxide nanoparticles that improve scratch resistance.

Another example is given by self-cleaning cements, which contain nanoparticles that confer to the material the ability to maintain colour properties more easily in time, by decreasing the absorption of dirt particles, as verified in the case of the church “Dives in Misericordia” designed by Richard Meier (2003) [17].

Aerogels are advanced ceramic materials having nanoporous structure and low density, constituted for 4 – 5% by SiO₂ and for the remaining part by air, which is why they are also called “something about nothing” or “frozen smoke”. They are characterised by very low density and high thermal, acoustic and electric insulation. These materials can be used in buildings (for thermal insulation of buildings through windows and panels), in sports clothing, in household electrical appliances (refrigerators with semi-transparent doors providing high thermal insulation) [14].

3.3 New properties

Photocatalytic properties are typical of titanium oxide films having anatase crystal structure. Anatase surfaces, when exposed to UV light sources, are able to promote the oxidation process of most part of environmental polluting species by acting as a catalyst for the reaction, therefore allowing the degradation of air pollution as well as the decrease of particulate pollution[18].

Photocatalytic properties of nanostructured titanium oxide films obtained by sol-gel can be exploited both for buildings facades and windows, thanks to the UV component of solar light, and for indoor applications, by using UV lamps or preferably UV LEDs.

In particular, the use of photocatalytic air depurators, conditioners and air flow hoods is more and more diffused: these systems allow the depuration of indoor rooms from cigarette smoke and smells arising from cooking. The latest systems which are being studied as indoor photocatalysts are lamps provided with photocatalytic components, since these systems can exploit the barycentric position which is often attributed to the lighting of a room, the presence of electric connections and the existence of a small UV fraction in the light emitted by most lamps. This allows to overcome the positioning problems of the photocatalytic systems in the rooms [14], [19].

Nanometric films deposited by means of sol-gel technology can modify the wettability of materials by making surfaces alternatively hydrophobic or hydrophilic, depending on which properties are needed. This is easily verified by the measurement of the contact angle formed by a drop deposited on the surface.

TiO₂ films greatly increase the wettability of surfaces: this feature is exploited to produce self-cleaning facades and windows, which arises from the combination of the photocatalytic properties and the formation of a continuous thin film of water on the surface that creates a washing-away effect during rainy days. Treatments conferring hydrophilicity can greatly reduce periodic maintenance costs, thus allowing the rapid repayment of the initial investment [20].

On the other side, hydrophobic properties are obtained through nanostructured surfaces imitating lotus leaves (which contain micrometric peaks having a superimposed nanometric structure): this is typically achieved through silica films (SiO₂). Not only surfaces acquire water repellent attitude (e.g. on waved cartons as well), but also a self-cleaning attitude is provided by water drops rolling on inclined surfaces showing this texture.

Oxide films produced by nanotechnologies have nanometric thickness, which is lower than visible light wavelength and thus do not hinder its passage: this feature allows the maintaining of the optical characteristics of transparency of the substrate they are deposited on, being the substrate either glass or transparent polymer.

Therefore, various functionalities induced by different oxides can be exploited as reflection of a significant percentage of IR radiation, which prevents the summer heating of glass-window buildings, leading to noticeable air conditioning savings; or the anti-reflection, anti-fogging and anti-scratching effects, particularly appealing for the production of polymeric lenses for eyeglasses.

4. CONCLUSIONS

In recent years, the amount of innovative materials available to design and production is constantly increasing at a dizzy rate; similarly, also differentiating characteristics are widening. Though the implicit difficulty of constantly being up-to-date the designer must meet with is evident, we must stress out that the consequent lack of knowledge unavoidably turns into a loss of opportunities.

Through the application of new techniques it is therefore possible to produce “multifunctional” materials, with highly innovative properties, radically transforming the way we think about materials.

Nanotechnologies have an application at different levels of the production process; from the insertion of nanometre particles, in the spinning stage or as a coating, or other uses of specific products or techniques for the construction of nanostructures forming the surface of products.

The above discussed features and the reported examples attest the essential role that nanotechnologies can already undertake in the design field, by offering to the designer the chance to confer to products a wide range of functionalities which otherwise could never be achieved, as well as the chance to design new solutions leading to the complete exploitation of these properties.

It can therefore be said that these nanotechnologies will be able in this way to greatly improve quality of life as well as the competitiveness of the manufacturing industry from the point of view of sustainable development.

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Innovative smart panels for building

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Abstract

The aim of this work is the development and characterization of insulating panels able to improve performance and sustainability of cladding systems. The material studied is a cellulose based composite (obtained from the recycling processes of paper and cardboard) that contains as additives Phase Change Materials (PCMs). The production process of the insulating panel has been developed, and its properties have been tested in accordance with the normative: the addition of flame retardant and anti-humidity additives demonstrated the possibility to guarantee safety and durability to the product; the addition of rising agents demonstrated the possibility to obtain a lighter structure with better insulation properties. The results obtained have shown the possibility to realize an innovative and sustainable material suitable to replace panels currently used for building envelopes.

1. Introduction

The study and development of innovative materials for building insulation is more and more important for a sustainable society in order to improve comfort and reduce energy consumption. Cladding systems performances affect the sustainability of a building construction. The present work aims to improve the performance of cladding system products through the development of a new insulating panel made by waste paper and Phase Change Materials (PCMs).

These smart materials have been used for many years in building industry because they are able to store high amounts of heat, which helps decreasing thermal peaks inside buildings and energy consumption used for cooling systems.

Moreover the use of waste paper to produce other recycled cellulose based products is a well consolidated industrial process that also brings economical and environmental advantages. Approximately 22% of the total waste mass is made of paper or cardboard: the current production and collection of recycling paper is marked by an enduring offer excess. The project also plans on providing a sustainable answer to those problems. In this paper, the development process of new insulating panels are described. Firstly, an innovative composite material made of cellulose fibers and PCMs has been developed and appropriate tests have been conducted in order to verify thermal conductivity and flexural strength. Secondly, the introduction of specific additives with flame retardant and anti-humidity properties has been experimented and appropriate tests have been conducted to verify their effectiveness. The environmental improvement of the product obtained consists of the following features:

- the use of widely available waste products such as cellulose as base material;
- the development of a new smart material which is able to increase the insulation properties in specific and critical conditions through the use of PCMs;
- the achievement of a product which is in turn recyclable, because the presence of PCMs, in limited value, does not affect the recyclability.

The properties of the new composite material have been tested and compared to those of a commercial insulating panel. Results have shown the possibility to improve, in dynamic thermal conditions, the insulating properties of building envelopes.

2. Composite material development

The research focused on the development of a composite material based on the use of cellulosic matrix, obtained from paper and cardboard, conveniently loaded and chemically modified to convey specific functionalities. The chemical modification of the fibers aims at improving the manufacturing process, at the modulation of the mechanical properties and their stabilization in time on the basis of new applications. The use of commercial additives aims at the improvement of the thermal insulation properties, fire and humidity resistance.



Figure 1. Productive phases: weighing the right amount of PCMs (a), waste paper (b) and water; pulping (c) and distributing (d) the water-based solution; drying the composite material (e); obtaining the solid panel (f).

Cardboard and PCMs panels have been obtained by mixing pulp and PCMs through an easy process using a pulper. This technology permits to recover and recycle cardboard scraps and functionalize the material by using additives. A 50% percentage of micro encapsulated Phase Change Materials (PX 28 HC, Rubitherm, Germany) has been added into the pulp. During this process commercial chemical substances have been also added, in order to confer flame retardant and anti-umidity properties (Boron salt and Basoplast Basf, respectively). Finally, various foaming

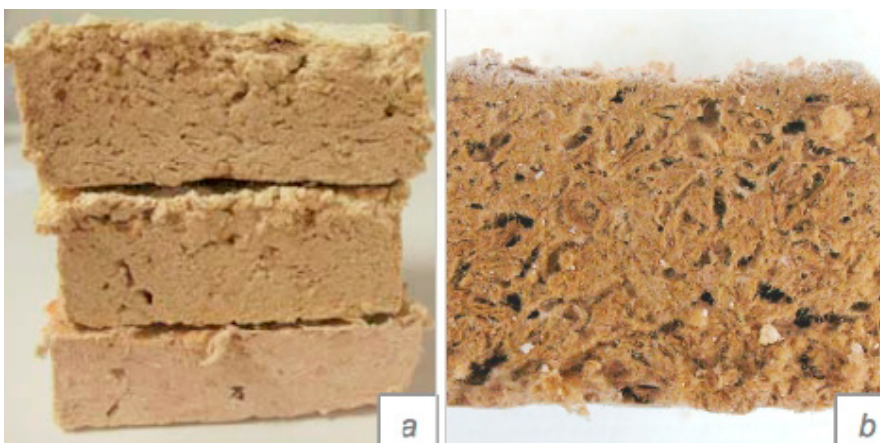


Figure 2. Porous structure obtained through the addition of foaming agents as Brewer's yeast, baking powder (a) and NaHCO_3 (b).

agents have been added into the mixture, in order to obtain porous panels. They dried for 24 hours at 100°C. Different processes (chemical, mechanical or physical modification) have been tested in order to increase the porosity of the composite material. The best method has consisted in adding the foaming agents into the mixture before the drying phase. Different substances have been tested (brewer's yeast, baking powder, NaHCO_3) in different quantity. A good porous structure has been obtained by dispersing NaHCO_3 (30% in weight) inside the cellulosic pulp.

3. Characterization

After the development of the productive process, a sampling of panels have been realized in order to test their functionality in laboratory. Building components should ensure specific requirements in order to obtain the CE mark and to become commercial products. With reference to insulating panels, moisture and fire resistance are the main qualities to be guaranteed, as well as thermal and mechanical properties. Building insulating products have to be evaluated based on their reaction to weather conditions. Standard UNI 12087 provides a water dipping method to quantify the amount of water absorbed by the material. Experiments have been conducted in laboratory, during the material development. Another important evaluation for building insulating panels concerns their reaction to fire. Standards UNI EN 13501 defines the criteria for construction products fire classification. Qualitative fireproof test has been conducted during the material development.

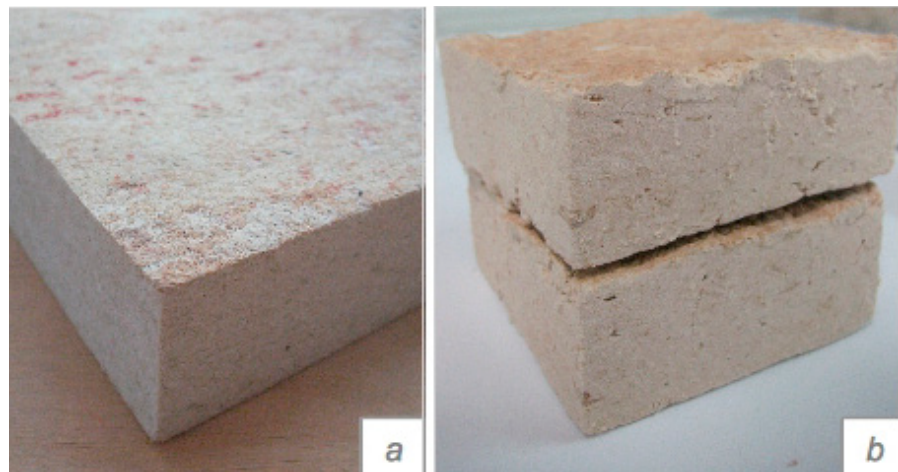


Figure 3. Comparison between standard building insulating panel made of perlite (a) and the new composite cellulose-based panel (b).

3.1 Fireproof test

Flame retardant properties have been evaluated measuring the flame delay time. Through the fire resistance tests, the addition of boron salts resulted efficient to reduce paper combustibility, but it is also necessary to control the fire tendency of PCMs. In order to solve this problem, different quantity of boron salts have been tested, and finally good flame retardant properties have been obtained with 30% .

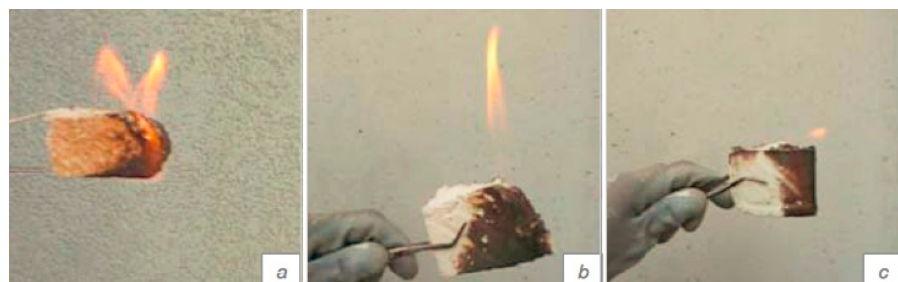


Figure 4. Combustion effects in specimen without additives (a) and specimens with different concentration of boron salts: 15% (b) and 30% (c).

3.2 Waterproof

The water permeability of the material has been calculated through tests regulated by Normative UNI 12087. Water dipping tests verified the good functionality of anti-umidity additives in cellulosic matrix. The addition of 15% of anti-umidity additives resulted enough to guarantee the same water resistant performance as standard panels (pearlite).



Figure 5. Partial water immersion effects on pearlite panel (a) and cellulose panel with different percentage of antihumidity additives: 15% (b) and 30% (c).

3.3 Flexural strength

Mechanical tests were carried out in order to evaluate the mechanical resistance of the panels. The results obtained demonstrated that panels made by cellulosic matrix present lower flexural strength value compared with standard panels, because of their porosity structure. Flexural strength of porous cellulosic panels is around 170 kPa, while flexural strength of standard panels is around 280 kPa. However, the mechanical properties evaluated are acceptable for the application considered in this work.

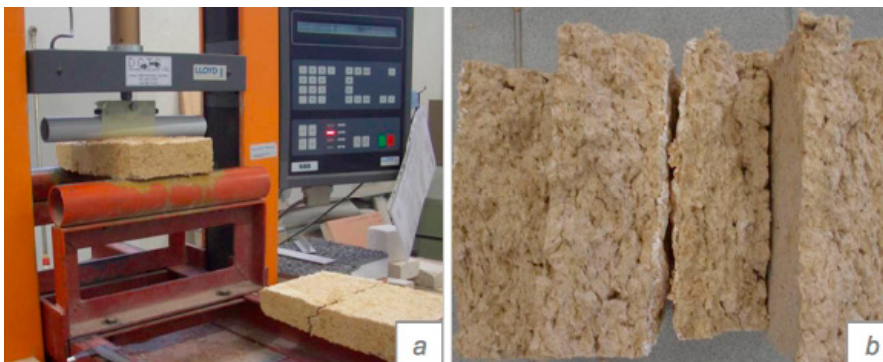


Figure 6. Flexural test device (a) and effect (b) on porous cellulosic panel.

3.4 Thermal conductivity

Heat flow meter tests allowed to calculate the thermal conductivity, according with the processing software SUBB. Results have underlined that the porous material helps to achieve better thermal insulation properties. Innovative composite panels are characterized by thermal conductivity value of $\lambda=0,052 \text{ W/(m K)}$, while standard panels (expanded pearlite) presents thermal conductivity value of about $\lambda=0,060 \text{ W/(m K)}$.

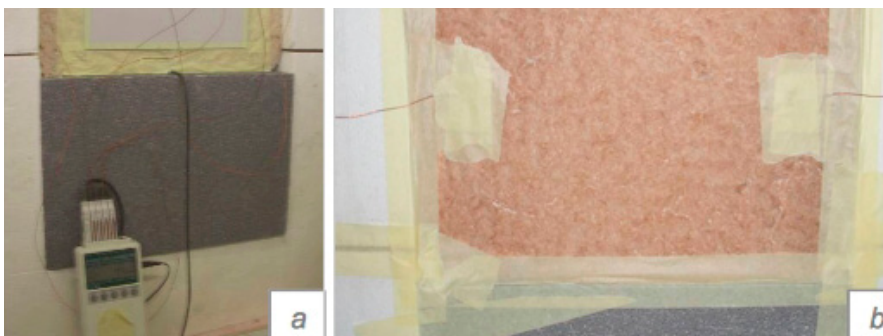


Figure 7. Heat flow meter device (a) and test on composite panel (b).

3.5 Thermal cycle simulation

In order to verify the functionality of PCM panels, in terms of thermal insulation in dynamic conditions, several tests were conducted in laboratory, reproducing the daily temperature variations of the summer season in Italy.

Each PCM panel was placed as wall of a climate chamber, as well as commercial panel (perlite made), in order to compare their insulating properties. During each test, the temperature inside the chamber was controlled and increased from 22°C to 43°C, in 80 minutes.

The temperature variations were measured using a system of thermocouples (National Instrument System acquisition).

Panels made with cellulose matrix and PCMs demonstrated to have better thermal insulation properties compared to commercial panels, commonly used in building construction (pearlite panels). As shown in Figure 8, when the external temperature increases, innovative composite panels are able to better control the rise of temperature compared with standard panels.

The results obtained are related to the amount of PCMs in the material. Because of their great capacity to absorb and slowly release the latent heat, PCMs increase the thermal energy storage capacity of the composite material, representing the most ideal solution to thermal insulation. The use of PCMs allows to obtain little or no change in temperature delaying the rise of temperature during the transition processes: heat storage, indeed, occurs over a fairly narrow temperature range (the transition zone around the PCM transition temperature).

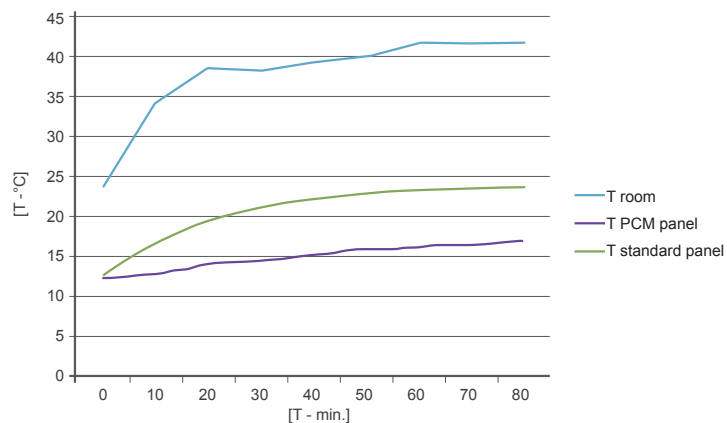


Figure 8. Temperature variation during thermal cycle simulation.

4. Conclusions

In the present work an innovative sustainable material for insulating building panels has been developed. Special attention has been given to environmental sustainability. A new material has been obtained by the recovery and recycle of waste paper and with its functionalization. The developed panel presents a porous structure, contains PCMs with heat storage properties and shows high thermal insulation performance. All the highlighted characteristics confirmed the possibility to obtain an innovative and sustainable product. Moreover, It was possible to improve the performance of the material by adding commercial additives, such as anti-humidity or flame retardant, and conferring significant values improvements for building applications. This material demonstrated to have better properties compared with standard panels used in buildings and it represent a promising alternative to the commercial products.

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Back to nature: novel solutions to enhance food packaging sustainability

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Abstract

Keywords: Sustainability, Food packaging, Natural-based coatings

Commonly employed in food packaging, cellulosic materials are characterized by a biodegradable nature. Produced from renewable resources, paper-based materials can be evaluated as recyclable and biodegradable products. Nevertheless, the level of biodegradability of cellulose-based packaging depends on the substances and processes used to functionalize it.

In order to use cellulosic materials in direct contact with food, indeed, paper-packaging industry concentrates its studies and researches on increasing barrier properties. Usually, cellulose-based packaging need to be functionalized through mechanical treatments, surface coatings, or by coupling paper with aluminum and polymeric films. These traditional surface treatments present disadvantages in terms of sustainability: they cause environmental problems due to materials recycling and recovering process. Papers used as primary food packaging could not be recycled, as food particles contaminate the paper recycling process, and should not be treated for composting because of the presence of non-biodegradable substances as coatings. For this reason, nowadays, the attention on minimizing environmental impact has prompted designers' research to find more sustainable solutions for food pack.

Teaching behaviour change on materials consumption in food packaging introduces to a wide range of design issues, including performance and aesthetic properties, sustainability, and food compatibility. Today, the challenge of food packaging industry is the development of new packaging materials, compatible with food, biodegradable or compostable, and realized with renewable resources.

In the laboratories of the Department of Chemistry, Materials and Chemical Engineering "Giulio Natta" (at Politecnico di Milano), the good results obtained by testing some natural-based coatings, developed by the researchers of CIPACK (Interdepartmental Centre for Packaging) and applied to paperboard materials, let imagine novel scenarios of application in food packaging. Compostable food containers, made of cellulosic materials functionalized by the cited coatings, represent a sustainable alternative to pack, for example, ready-to-eat meals or fast food products. Moreover, this research opens to a new idea of food packaging: a system where packaging meets market criteria in terms of performance and cost, is designed to be functional and safe, is made using renewable resources, and at the end of its life cycle, as the food contained, could be degraded without leaving contaminants in the environment. The design and science-based approaches used in this study allow communicating a positive environmental vision for paper packaging used for food contact applications.

1. Introduction

Consumers represent a key factor to achieve sustainable production and development. In recent times, consumers have developed new concerns about sustainable consumption: environmental protection strategies have been taken into account the social and ethical dimension of the product, its production process and its ecological impacts [OCED, 2008].

Always more frequently, users, together with institutions, claim the application of sustainable processes and technologies in order to improve the competitiveness of industry. This request is particularly evident in the food industry field: during the last years, the research focused on the development of innovative solutions with the aim to increase food quality and safety, environmental matters among all the supply chain. Who plays a central role in food supply chain is packaging. From the nineties, Europe Commission actively promoted programs which faced community awareness about food packaging environmental issues. In 1994, in fact, the "Packaging Directive" had been introduced in order to regulate the European Member States in managing packaging waste. The Directive, named also '94/62/EC' regulation, represents one of the first acts which introduced the concept of prevention and adoption of the sustainable approach in the industrial production. The regulation covers requirements related to packaging reuse, sets recycling and recovery targets, and it establishes programs for the collection of packaging waste. Moreover, the "Packaging Directive" clarifies the requirements for the admission of all kind of packaging on the European food market [Piselli et al., 2014].

Nowadays, packaging research focuses on the improvement of traditional packaging, in particular, applying the guidelines designed first by the "Packaging Directive", then by the "Good Manufacturing Practice (GMP)", or '2023/06/CE' regulation. As a result, the main objective for the food packaging market is to design and develop innovative products characterized by the use of a recycled content, or novel bio-degradable or compostable substances, light weighting packaging, minimizing the use of non-renewable resources, preventing waste reduction even through the employment of intelligent and active packaging systems.

In the renewed attention to environmental needs and requirements, also primary secondary and tertiary packaging have been influenced by what became a mainstream called "green production". A global study, published in 2013, demonstrates that eco-friendly packs are preferred by the consumer, that in the 55% of the cases declares to prefer, even at higher cost, "packaging that is environmentally friendly" [Ipsos, 2013]. Green packaging is expected to become one of the main sustainable business decision for any organization, in order to respond to the consumer demand, contributing to sustainability production and development.

2. Food pack quality and safety

Above all the attention oriented to packaging, consumers constantly demand for the quality of the food packed. Quality has an objective and a subjective dimension: objective quality refers to the physical characteristics of the product (engineering and food technology dimension), while subjective quality is the quality as perceived by consumers. Quality is a complex concept, which changes by technical progress, and is influenced by several factors: "external factors as appearance (size, shape, color, gloss, and consistency), texture, and flavor; factors such as federal grade standards (i.e. of eggs) and internal factors (chemical, physical, microbial). The quality of food is related with the concept of food safety" [Garbagnoli, 2014].

Food safety can be defined as the opposite of food risk: food safety, supported by the research of scientists and food experts, has the aim to prevent and respond to contamination issues. "The combination of increased food protection and the continuing trend for proactive food processing control (maintained with packaging) offers unprecedented potential to increase global food security. Food security is achieved by people acquiring a safe, adequate and appropriate food supply" [Marsh, 2012]. These three words means absence of hazard (safe), necessary supply of calories and nutrients (adequate) and availability of food (appropriate). Food safety has become a major issue of public concern, encouraging the food industry to take steps to rebuild

consumer confidence. Crucial to the success of any food processing effort is primary packaging, which comes in direct contact with the food product. Materials intended to be in contact with food, indeed, are potential sources of food contamination: for that reason, EU Framework Regulation (EC 1935/2004) establishes principles that producers must take into consideration for an appropriate selection of packaging materials. That choice is the most important factor for the assurance of food safety and quality [Kim, 2014].

2.1 Mineral oil food contamination

Food contamination through packaging, indeed, is a frequent and not recent phenomenon. The first toxicological assessments on packaged foods date back to the 80s, when it was found that the limit of migration of contaminants (from the packaging to the food in it contained), has been exceeded putting at risk consumer health. Particularly recurrent in the food packaging market, is the problem of food contamination by mineral oil components: since the mid-90s, has been counted in literature numerous scientific articles on the subject [Grob et al., 2011]. Recent researches have placed again focus of attention at the problem of contamination by mineral oil. The analysis, conducted on the German market in 2011, examined about 120 sampling of food products that has a secondary packaging in cellulosic recycled material. It was discovered that in the 75% of the cases, such food contained traces of mineral oils in quantities which exceeded the limits imposed by the European regulations (0.6 mg/kg). The fact that the mineral oil contamination seems to occur even when the food is not in direct contact with the recycled packaging, endangers the consumer's health. Another aspect that is relevant, is the time that occurred to contaminate the foodstuff: the tests were conducted on goods produced from a few weeks, and that, in most cases had an expiration date of up to two years. It is therefore presumable that the food was destined to absorb a larger quantity of mineral oil by the time. The contaminants most frequently tracked on food (e.g. mineral oil, phthalates, plasticizers, etc.) are characterized by volatility from the recycled material to the food. They

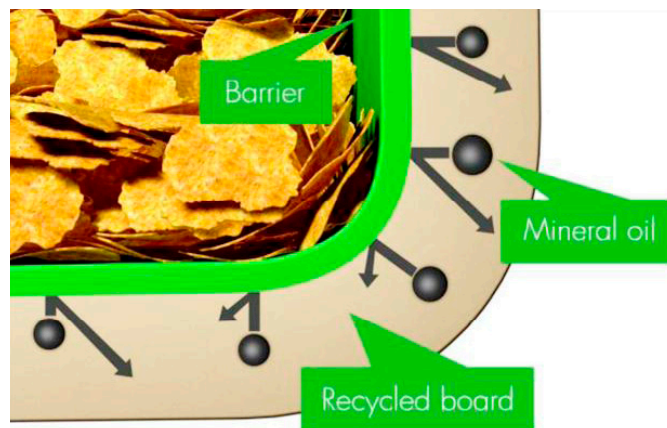


Figure 1. The role of barriers to prevent contamination in recycled food packaging

can, thus, migrate from the cellulosic packaging, which is used for a wide variety of foods (pasta, rice, baked goods, breakfast cereals, eggs, frozen foods, tea and other infusions, etc.).

The case of contamination in cellulose-based food packaging is of particular interest since it has a wide margin for improvement. In detail, the degree of mineral oil contamination depends on several factors:

- **Type of cellulose material:**
The paper and paperboard produced by virgin fibers could be generally contaminated by the inks used in printing, which have a mineral oil-based formulation. The cellulose-based materials produced from recycled fibers, on the other hand, could be contaminated by the same recycled materials (newspapers, magazines, printed books, etc.).

- **Type of food:**
High fatty foods are characterized by a high surface area to volume ratio. If they are packaged in small size packs (e.g. cocoa powder), may more easily be contaminated, as they offer a higher surface for the adsorption of mineral oil saturated hydrocarbons (MOSH).
- **Temperature:**
If the temperature is even slightly higher than the ambient one (higher than 30 °C-40 °C), the migration of the contaminants occurs more rapidly.
- **Functional barriers:**
The presence of a barrier, in particular aluminum-based and polymer-based coatings, can limit the migration of mineral oil hydrocarbons from the packaging to the food. On the contrary, other polymers, in particular polyolefins, have a large chemical affinity with hydrocarbons: as a consequence, they initially tend to accumulate them, and finally they release them into the food.

2.2 Contamination risk in packaged foods

As highlighted in the previous paragraph, some food products are more exposed to food contamination because of their high fat content and as they are subject to hot temperatures (e.g. food packaged when food is hot or food that could be cooked directly in its packaging). Based on information currently available, the potential contamination risk in packaged foods may particularly occurs in: frozen foods, ready-to-eat meals, bakery products, chocolate and cocoa powder, dried fruit, pet food and fast foods.

Case of interest of this research is the market of convenience food, which includes ready-to-eat meals, frozen foods, fast foods and some bakery products. Ready-to-eat meals' success is due to the growth of new lifestyles and small family units. In Italy the consumption of convenience food occurs hardly, as still resists the concept of the preparation and consummation of the traditional meal at home. Although, experts speak about a market that has great untapped potential, especially if compared with the dynamics of the international markets, where the ready meals sector is the mainstay of the food market. In this context, to assure a greater market penetration, the companies operating in the field of convenience food focused on innovation in recipes (e.g. biological food, seasonal foods), in functional packaging, in quality and safety [Fornari, 2012].

Commonly, the shelf-life of ready meals is short, especially for the onset of oxidation processes and growth of microorganisms. For this reason, convenience food's packaging requires in particular an effective barrier to oils and greases, both as they



Figure 2. Recycled packaging for pizza in USA

are highly present in such foods, both because it represents the one of the best condition in order to prevent mineral oil contamination. For foods that do not require a modified atmosphere storage, are mostly used transparent PP, PE and PET trays, sometimes laminated so as to reduce the oxygen permeability. Still less is the presence of aluminum trays, which have been replaced by other packaging solutions: paperboard containers coated or coupled with biopolymer materials [Perdoncin, 2008]. The potential of a sustainable food packaging like the paperboard coated with biopolymers has been object of interest of the CIPACK, a research centre which promotes studies about innovative materials for packaging.

3. Biopolymer coatings: a sustainable approach

The current food safety problems, the increasing attention towards the quality of packaged foods, and the response to the new environmental regulations, led to increase the interest about alternative materials for food packaging. The European food packaging industry prompted the research on sustainable food packaging materials: "Industry needs active, intelligent and sustainable packaging materials in combination with flexible packaging technologies to stay competitive on the global market. The new active, intelligent and sustainable solutions have to be consumer-oriented, ensure the safety and quality of food, reduce food losses, and reduce the environmental impact of food packaging" [European Commission, 2011].

Responding to the market demand for a more sustainable and safe food packaging, the researchers of CIPACK (Interdepartmental Centre for Packaging - Parma, Italy), developed and promoted the use of naturally renewable polymers as an alternative to enhance cellulose packaging barrier properties. Biopolymer-based packaging materials, originated from naturally renewable resources, can be distinguished in different categories [Clarival and Halleux, 2005]:

- A) Natural biopolymers from polysaccharides (chitosan, alginate, agar, pectin, etc.), proteins (soy protein, corn zein, wheat gluten, casein, etc.), and lipids (bio-resins);
- B) Synthetic biodegradable polymers (PLA, PGA, PCL, PBS, PVA, etc.);
- C) Biopolymers produced by microbial fermentation (microbial polyesters and microbial polysaccharides).

CIPACK researchers, in particular, worked on polysaccharide-based formulations that, as coatings, exhibit excellent gas, aroma, and lipid barrier properties. In materials applications, the principal polysaccharides of interest are cellulose and starch (a polymer of glucose), but in paper coating increasing attention is being given to chitosan, alginates, carrageenan, pectin, xylan, etc. As underlined previously, oil and grease barrier represent a particularly interesting property in food paper packaging, because it has relevance both to the chemical structure integrity of the material, both to ensure the product's safety and quality. The main function of an oil repellent packaging for food is first to prevent the oil and grease absorption by the cellulose material, then to protect the user from the contact with fatty substances, and finally to prevent possible migrations from the material to the food packed. Moreover, the use of oil repellent polysaccharide-based coatings in food packaging industry would contribute in the reduction of safety risks related to the use of recycled raw materials



Fig. 3 - CIPACK's natural-based coatings tested at Politecnico

in paper packaging. In the end, the combination of biopolymers coating and paper provides functionality to uncoated paper, and at the same time, permits to preserve the biodegradable characteristic of the material.

4. Experimental tests

Inside the laboratories of the Department of Chemistry, Materials and Chemical Engineering “Giulio Natta” (Politecnico di Milano - Italy), some experiments have been carried out in order to evaluate the barrier properties to oil of the bio-coatings under consideration. The experiments have been conducted in two main phases. The standard method TAPPI 559 cm-12, better known as “Kit Test”, investigated the natural-based coatings’ greaseproof performance, while the empirical test called the “Oil Drop Test” analyzed the repellence to oil and grease in critical conditions (high temperature). More in detail, the “Kit Test” is a procedure that rates the repellence of paper and paperboard using 12 kit reagents. Formulated by mixing in varying proportions castor oil, heptane and toluene, the kit reagents are numbered from 1 to 12: the higher is the number, the higher is the chemical solution’s aggressiveness. The most aggressive solution that is not absorbed by the cellulose material indicates its value of resistance to oil and grease. For example, as it could be seen on the table below (Tab. 1), the values registered for four samples of recycled paperboard, non-coated with an oil repellent treatment, are 3, 4, 5, 5. The average value repellency to oil and grease of the paperboard’s sample considered would be 4.

The results of the experiments were very encouraging: natural-based coatings, developed by the CIPACK researchers, exhibited good barrier properties to oil and grease. From the “Kit Test” has emerged that the biopolymers coatings offer superior performance (average grade 12), in terms of oil repellence, if compared to the uncoated and fluorinated recycled paperboard. The second experiment, an empirical test

Samples	Uncoated paperboard	Fluorinated treatment	Natural-based coatings
1	3	7	12
2	4	6	12
3	5	6	11
4	5	5	12
Kit Test average value	4	6	12

Tab. 1. Kit Test results on uncoated paperboard (sx), fluorinated paperboard (c) and natural-based coatings (dx) on recycled paperboard

named “Oil Drop Test”, measured the resistance of the recycled paperboard to the absorption of oil in variable conditions of temperature. The test evaluates the time of absorption of a drop of castor oil on a sample conditioned in oven at 120 °C. This test simulates the conditions at which presumably the cellulosic packaging will operate, especially in the case of foods that could be cooked or heated while in the pack. In the comparison between the different samples were analyzed the diameter of the spot (trace of absorbency), the presence of halos in the support’s back (evidence of the passage of the drop), the confinement of the drop (expansion or spherical shape), etc. The figure below (Fig. 4) shows the results of the “Oil Drop Test”.

In critical conditions (temperature higher than 40°C), the uncoated recycled paperboard samples and the ones treated with fluorinated emulsions showed evident phenomena of absorption, both on the front surface of the specimen and in its back. The samples treated with the natural-based coatings, instead, revealed, only in few cases, punctual absorption: the drops, characterized even after two hours by a spherical shape, remained confined on the surface of the specimen.



Figure 4. Comparison between the level of absorption of uncoated paperboard (sx), fluorinated paperboard (c) and natural-based coatings (dx) on recycled paperboard

5. Conclusions

The encouraging results of the experiments conducted at the Department of Chemistry, Materials and Chemical Engineering “Giulio Natta” (Politecnico di Milano), let believe in the possible application of the biopolymers coatings to the field of food packaging. The treatments developed by the CIPACK researchers, indeed, exhibited good barrier properties to oil and grease, even at high temperatures. Make safe the use of recycled fiber in food packaging is the most important challenge in the paper industry, as it represents the locking ring on the life cycle of the cellulosic packaging. For that reason, the CIPACK is actually testing the coatings’ barrier to vapor to evaluate the resistance of the treatments to mineral oil components. At a first analysis, the tests confirmed a good barrier to vapor of the natural-based coatings.

Future tests will be conducted in order to verify the compostability of the CIPACK’s coatings together with further studies on the environmental impact assessment (LCA) of such packaging solutions. The increase of innovative and sustainable materials in the market demonstrates that materials research represents one of the most concrete and promising ways to achieve a more sustainable and safe production in the food packaging field.

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Product design

Product and Urban Design_Reception

La stampa 3D come Iperartigianato

Utopia tecno | eco | logica

per la configurazione di un mondo migliore

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Abstract

La stampa 3D sta cambiando il mondo. Non si tratta soltanto delle cose che si possono materializzare ovvero stampare con una semplice macchina dal prezzo non più proibitivo (a partire da poche centinaia di euro) – una stampante 3D – e attraverso software, proprio come si fa da tempo con le classiche stampanti 2D. Questa tecnologia consente oggi la realizzazione di oggetti personalizzati depositando materiale plastico dall'alto oppure di lato (processo additivo). Tali progetti – i nuovi prodotti stampati – rappresentano la materializzazione di un sogno domestico; non si tratta di una nuova produzione industriale dettata dall'alto (come nella grande industria), ma di un'azione estemporanea, anzi di tante azioni non orchestrate, per così dire dal basso, una sorta di movimento fattuale animato caoticamente da progettisti, designer, auto-produttori e piccoli imprenditori che potrebbero – e già lo stanno facendo – sovvertire i tradizionali rapporti progettista-produttore-commerciante-utente.

Sempre più spesso, infatti, chi stampa oggetti utilizza e veicola esperienze e conoscenze open-source in una condivisione virtuale che si amplifica al crescere della globalizzazione. Ciò significa, in breve, che sempre più utenti possono impiegare questa tecnologia oggi immediatamente fruibile in termini sia economici sia di know-how e flusso informativo. È il portato della III fase della Rivoluzione industriale, contrassegnata dal digitale, che ci renderà tutti più creativi e liberi? È l'inizio di una sperimentazione sui materiali che parte dalla plastica e arriva chissà dove, passando per l'argilla e per il cemento? È una nuova maniera felicemente democratica per realizzare prodotti a chilometro zero? Con costi relativamente bassi e fonti di energia rinnovabile? La stampa 3D, insomma, sta davvero cambiando il mondo?

Alcune premesse

Nell'Europa orientale e in Russia il disegno industriale si trova, istituzionalmente, spesso legato all'arte (bella), secondo la migliore tradizione delle Avanguardie storiche. Nell'Europa occidentale e negli States, invece, è più spesso legato alla tecnologia¹. Comunque sia, da questa e da quella parte del mondo, resta il fatto che il design – industriale e non – è intimamente legato a tecniche, materiali e processi. Com'è stato giustamente detto, infatti, si tratta di addomesticare la tecnica; il che vuol dire dominarla. In che altro modo, infatti, i designer potrebbero progettare configurazioni e interfacce, rendere cioè la tecnica nuda e cruda a portata dei non addetti ai lavori?

1. In Italia, all'interno dell'Area di Ingegneria Civile e Architettura (08), il settore scientifico-disciplinare del Disegno industriale (ICAR/13) costituisce, con Architettura tecnica (ICAR/10), Produzione edilizia (ICAR/11) e Tecnologia dell'architettura (ICAR/12), il macro-settore Design e progettazione tecnologica dell'architettura (08/C1).

A metà strada tra arte e industria, tra estetica e tecnica, “il design inizia dove finisce la funzione” (pratica) e dunque la tecnica: definizione, questa, solo apparentemente paradossale eppure molto puntuale.

Dire infatti che il design inizia dove finisce il dato funzionale, materiale, economico, tecnico-produttivo... non significa sminuire la parte per così dire hardware del progetto mettendo l'accento su quella software, tra il simbolo e la comunicazione integrata, ma considerare la funzione pratica scontata nel senso di fondamentale e inamovibile, ovvero considerare la tecnica *conditio-sine-qua-non* del design².

Ribadita la centralità della tecnica nei processi produttivi (di qualunque epoca) e dunque nel design, un aspetto che mi preme rilevare circa la nuova tecnica di stampa 3D è poi il rapporto tra progettista e industria o meglio tra progettista e produzione, che non è necessariamente industriale o è industriale nel senso di seriale ma non della grande industria con la sua articolazione complessa e verticale che ha scandito la II fase della Rivoluzione industriale e praticamente tutto il secolo scorso. Nella III fase, a partire dalla stampa 3D, cambia infatti questo rapporto e si (ri)afferma una specie – molto evoluta – di artigianato: un artigianato digitalizzato. Ma a questo punto chiediamoci: artigiano e designer possono essere la stessa cosa o si tratta di figure diametralmente inconciliabili? Secondo i principi postulati da Gillo Dorfles nel 1963, assolutamente no, perché la prima condizione necessaria del design è che «esso sia prodotto attraverso mezzi industriali e meccanici, ossia mediante l'intervento – non fortuito, occasionale o parziale – ma esclusivo della macchina»³.

2. Fin dalla sua stessa fondazione, a partire dalla primigenia definizione di “arte applicata”, il design è stato intimamente legato alla tecnica e alla tecnologia. Si pensi ad esempio ai fantastici interni art nouveau (ottocenteschi) caratterizzati dagli intrecci floreali di ferro e ghisa, materiali in quel momento trattati con nuove tecniche e suscettibili di sorprendenti applicazioni, con vetrate altrettanto mirabolanti fino a qualche anno prima semplicemente impensabili. Passando dall'interior al visual design o alla grafica (per intenderci), uno dei possibili inizi è la *peinture d'affiche* di fine Ottocento realizzata per mezzo della cromolitografia (dal greco: *chroma*, “colore”, *lithos*, “pietra”, e *graphia*, “disegno, scrittura”): una tecnica di stampa, abbondantemente usata per la riproduzione di manifesti pubblicitari, basata sul principio della reciproca repellenza di inchiostro e acqua. Così, alcuni cosiddetti “artisti commerciali” o *affichistes*, come Jules Chèret e Henry de Toulouse-Lautrec, realizzano sorprendenti manifesti, la cui resa cromatica rasenta quella delle pitture a olio. Ma potremmo andare più indietro e rintracciare le origini della grafica nella stampa di Gutenberg, messa a punto nel XV secolo: una tecnica rilievografica che amplifica, oltre ogni immaginazione, la (ri)produzione di testi e libri. Cfr. Renato De Fusco, *Storia del design*, Laterza, Roma-Bari 2005; segnatamente il capitolo “La stampa come design”, pp. 1-16. Sulla stampa gutenberghiana come caso di disegno industriale ante litteram, vedi anche Riccardo Falcinelli, *Critica portatile del visual design*. Da Gutenberg ai social network, Einaudi, Torino 2014, p. 25: «La nostra storia inizia nel Quattrocento: la rivoluzione industriale settecentesca ha in Johannes Gutenberg (1394-1468) un prodromo fondamentale e – in anticipo sulle scarpe da ginnastica e sui cibi in scatola – è il libro stampato il primo oggetto industriale, cioè di design». Per quanto riguarda il prodotto, invece, un esempio illuminante è quello delle *Schools of Design* inglesi istituite da Sir Henry Cole negli anni Trenta. Non a caso l'Inghilterra, dove scoppia la Rivoluzione industriale, è il Paese leader della I fase. Qui, a Londra, si forma Christopher Dresser, definito da Vanni Pasca e Lucia Pietroni, Christopher Dresser. Il primo industrial designer 1834-1904, Lupetti, Milano 2001; e insegnano alcuni eccellenti docenti, progettisti e intellettuali, come Owen Jones, autore e del basilico libro *The Grammar of Ornament*, Messrs Day and Son, London 1856 (nuova edizione 1986); e Gottfried Semper, grande architetto tedesco esperto di materiali e processi produttivi, che fa il punto sul rapporto tra scienza, tecnica e design ovvero *Wissenschaft, Industrie und Kunst. Vorschläge zur Anregung nationalen Kunstgefühles, Druck und Verlag von Friedrich Vieweg und Sohn, Braunschweig 1852*. «La scienza si rivolge più decisamente alla prassi e si erge nel presente a sua tutrice. In tal modo essa assicura a se stessa e alla vita un incessante arricchimento: materie utili e portentose energie naturali di recente scoperta, nuovi metodi della tecnica, nuovi arnesi e macchinari. [...] Le cose più impensabili [la speculazione] riesce ad ottenere giocando con mezzi presi in prestito dalla scienza: il più duro porfido o granito si taglia come gesso e diventa liscio come cera; l'avorio è ammorbidito e pressato in forme; il caucciù e la guttaperca sono sottoposti a vulcanizzazione e usati per avere perfette imitazioni degli intagli in legno, metallo e pietra (e qui sono oltrepassati di gran lunga i confini naturali dei materiali simili). Il metallo non viene più fuso o temperato, ma grazie a forze naturali fino a poco fa sconosciute lo si fa depositare per mezzo della galvanoplastica. Alla dagherrotipia segue la talbotipia, e la prima è presto dimenticata. La macchina cuce, fa la maglia, ricama, intaglia, dipinge, penetra profondamente nella sfera dell'arte umana, mortificando ovunque l'abilità dell'uomo. Non si tratta forse di grandi, magnifiche conquiste?» Così, se – chiosa l'architetto tedesco – «l'eccesso di mezzi è il primo grosso pericolo con cui l'arte deve confrontarsi [...] sono certo [...] che simili conquiste prima o poi si volgeranno ovunque e felicemente a beneficio e lustro della società», Gottfried Semper, cit. in Vanni Pasca, Lucia Pietroni, Christopher Dresser. Il primo industrial designer 1834-1904, Lupetti, Milano 2001, pp. 194-196.

3. Gillo Dorfles, *Introduzione al disegno industriale*, Einaudi, Torino 1972, p. 10; il saggio di Dorfles fu pubblicato per la prima volta nel 1963 da Cappelli (Bologna) col titolo *Il disegno industriale e la sua estetica*.

Ma nel corso della storia le due figure – artigiano e designer – si trovano spesso intrecciate e talvolta addirittura sovrapposte. Ed è Walter Gropius, primo direttore del Bauhaus (mitica scuola di arte applicata, artigianato, design e architettura), a rilanciare, nel Manifesto del 1919, questa auspicata e salvifica convergenza: «Architetti, scultori, pittori, noi tutti dobbiamo tornare all'artigianato! [...] Non c'è differenza sostanziale tra l'artista e l'artigiano. L'artista è un artigiano a un livello superiore»⁴

Nel 1924, Tuttavia, è già possibile preconizzare in Germania importanti prospettive economiche, in virtù dei finanziamenti statunitensi verso i Paesi europei distrutti dalla Grande Guerra (piano Dawes); cosa che determina, nella mente lungimirante di Gropius, un significativo cambio di rotta del Bauhaus da scuola-monastero consacrata alla bellezza e all'artigianato artistico a laboratorio sperimentale per la realizzazione di prototipi pro-industria. Form follows function: “la forma segue la funzione”, si continuerà a ripetere per decenni, in una stagione progettuale (europea e statunitense) scandita dal Funzionalismo e dal Razionalismo in architettura e nel disegno industriale. È per questo che Less is more, altro motto che attraversa il secolo, formulato dal grande architetto Mies van der Rohe, terzo direttore del Bauhaus (Berlino 1930-1933, dopo Hannes Meyer), e tra i più influenti progettisti del Novecento, ovvero “meno è più”: massimo risultato minimo sforzo. D'altra parte, semplicità formale, essenza, geometria (dei solidi platonici), verità dei materiali, purezza, precisione tecnica... sono tutti modi per affermare la stessa cosa: conseguenza di forma e funzione all'interno d'un processo produttivo quanto più possibile impersonale e perfetto. Dai cinque punti dell'architettura di Le Corbusier (visionario ideologo del Movimento moderno) alle rarefazioni in compensato di betulla di Alvar Aalto (incessante sperimentatore di forme e funzioni), dalla cura del dettaglio di Charles Eames (esponente di punta del good design americano) al Less is better di Dieter Rams (project manager della Braun) e alla stringente metodologia della Hochschule für Gestaltung di Ulm (1954-1968), fino alla chiarezza di concetto dei grandi designer (architetti) italiani come Vico Magistretti, design e artigianato, nell'intenzione del progettista, sembrano essere cose ben diverse e, talvolta, perfino antitetiche.

Negli anni Ottanta, tuttavia, Memphis – un turbolento gruppo di progettisti guidato dal grande Ettore Sottsass – “cambia le carte in tavola” rilanciando l'artigianato in prospettiva industriale. Nel 1981, a Milano, alcuni oggetti d'uso piuttosto insoliti irrompono sulla scena: arredi, complementi di arredamento e oggetti per la casa dalle forme atipiche e dai colori sgargianti, ottenuti con vari materiali e gli accostamenti più improbabili (dalla carta al marmo, dalla plastica al lapislazzulo), con tecniche di costruzione diverse, molto evolute e insieme rudimentali, spesso prototipi o prodotti in limited edition e circondati da una sorta di alone artistico. Evidentemente, non stiamo parlando di prodotti industriali comuni, né tanto meno prodotti industriali tout court, ma piuttosto di una forma inedita di artigianato, a opera di progettisti affermati, con mezzi tecnici all'avanguardia all'interno di un processo nel quale il progettista segue il prodotto dalla fase ideativa a quella realizzativa.

«L'artigiano non è colui che non usa la macchina nei suoi processi produttivi – spiega Andrea Branzi (esponente del gruppo) – ma al contrario colui che all'interno di una organizzazione circolare della bottega, usa tutte le macchine, controllando in maniera diretta tutte le fasi della realizzazione»⁵. In questo senso, Memphis propone un nuovo approccio alla produzione, perché l'oggetto artigianale, simbolicamente contrassegnato, vale come prototipo ovvero primo pezzo che dev'essere testato sia in termini antropologici e di consumo, in vista di un'eventuale, più onerosa produzione industriale: un “nuovo artigianato”, non alternativo all'industria ma integrato all'industria quale sperimentazione espressiva, surplus estetico, una sorta di progettazione pre-industriale, una concettualizzazione materiale, insomma⁶.

4. Walter Gropius, *Programma del Bauhaus state di Weimar* (1919), in Hans Maria Wingler, *Il Bauhaus. Weimar Dessau Berlino 1919-1933* (1962), Feltrinelli, Milano 1972 (1987), p. 63.

5. Andrea Branzi, *La casa calda. Esperienze del Nuovo Design italiano*, Idea Books Edizioni, Milano 1999 (1982), p. 137.

6. «Il “nuovo artigianato” [...] possiede alcune caratteristiche molto precise: l'artigianato che viene utilizzato, dato che la produzione è costituita da piccole serie o da pezzi unici, non è costituito dall'uso di tecniche particolari, ma piuttosto da una rapidità costruttiva dei modelli, progettati sempre come non necessariamente ripetibili, che gli artigiani realizzano secondo le tecniche più avanzate della moderna falegnameria. L'aspetto esplicitamente culturale dei modelli non ha origine nella cultura artigiana, ma

Infatti, testimonia Barbara Radice, «tutti i pezzi Memphis [...] sono progettati per la produzione industriale: se sono prodotti in piccola serie è solo perché la richiesta è limitata»⁷. Nondimeno, come afferma Ernesto Gismondi, «Memphis ha scatenato una mania dilagante, influenzando in maniera straordinaria sul modo di progettare mobili per molti anni. Poi si è spenta, nel senso che Sottsass [...] mi disse che voleva produrre in serie i pezzi di maggior successo. Ma io gli risposi che i prodotti in serie nascevano per essere prodotti in serie, e non il contrario; e quelli erano nati per essere artigianato, senza problemi di prezzo o simili, quindi, non ce l'avremmo fatta. A quel punto Sottsass volle uscire»⁸.

Nella III fase della Rivoluzione industriale (che parte convenzionalmente dagli anni Settanta), con l'avvento del personal computer e in particolare del Mac (lanciato da Apple nel 1984), il sistema planetario della produzione comincia a subire alcuni, inizialmente lievi ma presto rilevanti, cambiamenti. Negli anni Ottanta, infatti, i più possono sperimentare una vera e propria produzione industriale "casalinga". Forse non se ne rendono conto e probabilmente non ci facciamo caso neanche noi, uomini del Terzo Millennio, ma la classica e ormai banale stampante 2D sforna fogli tutti uguali, e cioè seriali. In questo caso, il file vale come "disegno tecnico" (che nella produzione della grande industria è elaborato dal designer), mentre la macchina-stampante riassume in sé l'intero processo industriale (con tanto di rullo a mo' di catena di montaggio). Il designer, però, è diventato ognuno di noi, che coincide con la figura dell'autoproduttore-piccolo imprenditore, sempre che questa produzione abbia una portata commerciale.

Negli anni Ottanta, del resto, si sviluppa il fenomeno dell'autoproduzione come strategia di progetto⁹. Alcuni designer, da soli o in gruppo, decidono di realizzare in proprio i loro progetti ovvero di auto-produrli. Così, possono guadagnare immediata visibilità presso le fiere internazionali, per esempio al Salone del Mobile di Milano; ma anche avviare un'impresa personale, se è possibile contenere i costi dell'autopro-

usa piuttosto questa cultura produttiva come luogo sperimentale. Il prototipo e la piccola serie, infatti, non si pongono più come alternativa polemica alla produzione in serie, ma piuttosto la presuppongono come possibile e successiva fase alle esperienze progettuali che il nuovo artigianato permette. [...] In questo senso, e in maniera corretta, il nuovo artigianato si pone a fianco, o prima, della produzione di serie, e non contro di questa, dal momento che la sua esperienza è di natura non tecnica o produttiva, ma fondamentalmente espressiva», Andrea Branzi, La casa calda. Esperienze del Nuovo Design italiano, Idea Books Edizioni, Milano 1999 (1982), p. 141. A questo proposito, è molto interessante la definizione di NUOVO ARTIGIANATO di Alessandro Mendini del 1984: si tratta di un'attività in continuità con le arti applicate praticata da un TELE-ARTIGIANO, che si avvale dell'innovazione tecnologica per «ri-progettare (o [...] de-progettare) ex novo un mio "diverso" problema progettuale», Alessandro Mendini, Lettera al giovane designer, "Domus", 650, maggio 1984, p. 52.

7. Barbara Radice, Memphis: ricerche, esperienze, risultati, fallimenti e successi del nuovo design, Electa, Milano 1984, p. 174.

8. Ernesto Gismondi, cit. in Giulio Castelli, Paola Antonelli, Francesca Picchi (a cura di), La fabbrica del design. Conversazione con i protagonisti del design italiano, Skira, Milano 2007, p. 154.

9. Il tema dell'autoproduzione, in realtà, si pone già negli anni Settanta, parlando di "auto-progettazione", ossia dell'opportunità, per l'utente, di progettare e fabbricare autonomamente le cose di cui ha bisogno. Nel 1974, Enzo Mari lancia la "Proposta per un'Autoprogettazione", una mostra di basici mobili e insieme un piccolo manuale delle istruzioni con cui chi lo desidera (non essendo un designer) può facilmente realizzarli con tavole di legno e chiodi. Ciò, per Mari, rappresenta design autentico, ovvero economico e democratico (vale la pena ricordare che gli anni Settanta sono segnati dalla crisi energetica); ma soprattutto è convinto che, «se le persone si fossero esercitate a costruire con le proprie mani un tavolo, per esempio, avrebbero potuto capirne le ragioni fondanti», Enzo Mari, Autoprogettazione?, Corraini, Mantova 2010 (2002), p. 4. In tal modo, oltre a fornire una maniera economica per risolvere i problemi arredativi, Mari rilancia il design come dispositivo culturale amplificando la capacità critica dell'utente, il quale si appropria di un'idea e la mette in pratica. Ecco perché Argan afferma di apprezzare la posizione di Mari: «Con tutte le sue difficoltà, è uno dei pochi che si ponga il problema di concepire il design per una società che non sia opulenta, di instaurare una metodologia progettuale che non sia necessariamente il superamento continuo di parametri economici dati. Quando Mari propone un design che richiede l'intervento diretto del fruitore, pensa chiaramente a strumenti, pensa chiaramente a strumenti di mediazione per la fruizione estetica dell'ambiente; è un'ipotesi abbastanza improbabile e un po' calvinista, però è una delle pochissime nuove proposte interessanti», Giulio Carlo Argan, Intervista sulla fabbrica dell'arte, Einaudi, Torino, 1980, pp. 136-137. Trent'anni più tardi c'è un interessante epilogo: l'azienda finlandese Artek chiede a Mari di commercializzare la Sedia 1 con libretto delle istruzioni e pezzi che servono al suo facile montaggio (2010), egli accetta di buon grado, perché «come loro credo che il design abbia significato se comunica conoscenza», Enzo Mari, 25 modi per piantare un chiodo. Sessant'anni di idee e progetti per difendere un sogno, Mondadori, Milano 2011, p. 88.

duzione come si cerca di fare spesso e volentieri; o al contrario, puntare sull'aspetto artistico dell'opera-oggetto-d'uso autoprodotta alla stregua di una scultura col suo conseguente surplus estetico che si traduce in valore economico, come spiega acutamente Ron Arad¹⁰. In questo senso, un caso clamoroso è senz'altro quello del gruppo olandese Droog Design, che ottiene grande successo al Salone del Mobile di Milano del 1993 con pezzi autoprodotti tra l'arte e il design. Alcuni nascono da Tesi di Laurea (Eindhoven Design Academy), come la suggestiva Rag Chair progettata da Tejo Remy nel 1991: una poltrona (già) fatta di stracci dal sapore neo-dadaista. Ecco come il gruppo olandese, cavalcando l'onda del successo mediatico e forte di un brand concettualmente denso, arriva ad accordarsi con DMD (Development Manufacturing and Distribution) per la produzione e la distribuzione di prodotti limited edition, «a dimostrazione di come questo suo approccio critico e concettuale, apparentemente anti-industriale e anti-globale, possa entrare a far parte delle strategie produttive più avanzate»¹¹.

Nel terzo Millennio, dopo i personal computer, macchine sempre più intelligenti e flessibili, a controllo numerico, vengono fuori le stampanti 3D. La stampa 3D, senza addentrarci nelle sue specifiche tecniche che cambiano di caso in caso, consiste sostanzialmente nel plasmare materiale in modo controllato, cioè attraverso un software che muove braccia meccaniche in grado di materializzare le informazioni di un file. Si tratta di «un processo di creazione di un oggetto solido tridimensionale di qualsiasi forma da un modello digitale elaborato al calcolatore»¹². Caratteristica di questo processo è la costruzione per livelli sovrapposti (additive manufacturing); cosa ben diversa dalle tecniche di produzione tradizionali per sottrazione o che prevedono l'utilizzo di stampi¹³. Altra caratteristica di queste stampanti è il loro essere, per così dire, organismi autoreplicanti, quasi fossero dotate di vita propria. Le stampanti realizzate con componenti stampati da altre stampanti, cioè implementate con significative parti autoprodotte, si chiamano infatti RepRap (Replicating Rapid Prototyper).

Come suggerisce Adrian Bowyer (ideatore del progetto RepRap), la possibilità di autoprodurre implementando favorisce il libero sviluppo delle idee¹⁴. Ma soprattutto è possibile glissare sulla pressoché totalitaria logica commerciale del prodotto a obsolescenza programmata per cui, dopo un certo numero di operazioni, il prodotto cessa di funzionare a prescindere dalle sue condizioni materiali (fisiche). Ciò, in effetti, accade dappertutto, nel libero commercio, tanto nel capo d'abbigliamento, che passa di moda, invecchia e cessa dunque di funzionare simbolicamente, quanto nell'oggetto tecnico come la stampante 2D che, esaurito il numero programmato di

10. Negli anni Ottanta, Ron Arad fonda lo studio One Off, cioè «uno fuori (serie), pezzo unico». Questo nome ribadisce una felice intuizione che contribuisce a rendere Arad il designer di successo che è: un manufatto dal tenore artistico (come un ready-made) possiede un valore percepito ben superiore di un prodotto industriale o semplicemente d'uso. Argomenta Arad: «Lo sforzo intellettuale e fisico era identico, ma la combinazione di arte e design poteva rappresentare un sentire più soddisfacente da percorrere, piuttosto che cercare di costruirsi un'esistenza ancor più precaria come designer», cit. in Deyan Sudijc, Ron Arad. Cose di cui la gente non ha veramente bisogno (1999), Postmedia Books, Milano 2003, p. 41. Di conseguenza – e paradossalmente – se produrre oggetti realmente utili ed economici era una battaglia persa in partenza (si pensi oggi alla insostenibile concorrenza di Ikea), «One Off si dedicò a quello che si potrebbe definire “fare cose di cui la gente non ha bisogno e venderle a un prezzo che la maggior parte delle persone non può permettersi», Ivi, p. 44.

11. Vanni Pasca, Olanda, in Vanni Pasca e Viviana Trapani (a cura di), Scenari del giovane design. Idee e progetti dall'Europa e dal mondo, Lupetti, Milano 2001, p. 122.

12. Enrique Canessa, Carlo Fonsa, Marco Zennaro (a cura di), Stampa 3D di basso costo per la scienza, l'educazione e lo sviluppo sostenibile, ICTP, Trieste 2013, p. 35, <http://sdu.ictp.it/3D/book.html>.

13. Le tipologie di stampa 3D possono essere suddivise in tre categorie. La stampa FDM (Fused Deposition Material) consiste nell'estrusione di materiale fuso, il più delle volte polimeri termoplastici come PLA e ABS ma anche metalli, argilla o cioccolato. Una seconda tecnica è quella di utilizzare un laser o altra fonte di luce controllata da computer per solidificare materiale liquido (procedura nota come “fotopolimerizzazione”). Altre tecniche come SLS (Selective Laser Sintering) e DMLS (Direct Metal Laser Sintering) utilizzano laser per la fusione selettiva di un materiale granuloso; in questo caso, il pezzo stampato è immerso in un mezzo polveroso che lo sostiene, eliminando il bisogno di supporti stampati per pezzi sporgenti, sospesi o molto sottili.

14. «Patents do inhibit development – it's unquestionably the case. It's in the nature of patents that they give a monopoly to whoever holds them for 20 years», Adrian Bowyer, cit. in Hod Lipson, Melba Kurman, Fabricated. The New World of 3D Printing. The Promise and Peril of a Machine that can Make (almost) Anything, John Wiley & Sons, Indianapolis 2013, p. 230.

fogli, semplicemente si ferma, e cessa dunque di funzionare materialmente.

Si determina così una nuova rivoluzione: III fase 2.0, si potrebbe dire, ossia un cambiamento epocale che viene a riconfigurare l'attuale sistema di produrre le cose, come già sta accadendo. Chiunque, con un computer e una stampante 3D, può, in potenza, diventare azienda o avviare un'impresa personale, in termini sia produttivi sia commerciali (comunicativi), con mezzi sempre più efficaci che spaziano dall'e-commerce ai social network: un'industria molto agile, con componenti immateriali (digitali) molto performanti, ma diciamo pure una forma di artigianato evoluto, che richiede ingegno, capacità di progettazione CAD e domestichezza con la stampa 3D, e soprattutto la conseguente interazione delle tre cose. In altre parole, si tratta ora di pensare e dunque di progettare ciò che, attraverso un file, diventa processo per mezzo di due macchine (computer e stampante 3D) e può essere conseguentemente materializzato: un insieme di operazioni condotte da un progettista-designer che autoproduce ed è dunque un artigiano.

Questo progettista è certo "un artigiano a un livello superiore", per usare le profetiche parole di Gropius, ma distante anni luce dal designer-artigiano del Bauhaus (1919-1933). Anzi, se negli anni Ottanta del Novecento si è parlato in Italia di "nuovo artigianato", indicando la virtuosa convergenza di artigianato e industria, come abbiamo accennato, oggi è possibile apprezzare una sorta di "iperartigianato", un artigianato elevato a un di-più-di-se-stesso, dove il prefisso iper- non allude tanto all'incremento delle tecniche operative e ai software all'interno dei processi produttivi quanto alle possibilità commerciali della rete planetaria¹⁵.

Ci troviamo nell'epoca degli auto-produttori, conosciuti anche come Makers. The New Industrial Revolution, per citare un recente saggio di Chris Anderson (2012): Makers. Il ritorno dei produttori. Per una nuova rivoluzione industriale, come recita il titolo dell'edizione italiana. «Ecco la storia dei vent'anni di innovazione in due frasi: negli ultimi dieci anni abbiamo scoperto nuovi modi per creare, inventare e lavorare insieme sul web.

Nei prossimi dieci anni ciò che abbiamo imparato verrà applicato al mondo reale», si legge all'inizio del secondo capitolo su "La nuova Rivoluzione industriale [per spiegare] che cosa succede quando la generazione del web si affaccia al mondo reale"¹⁶. Ciò che caratterizza il movimento dei Makers, infatti, non è soltanto l'impiego di media digitali e progettazione su schermo: i Makers «sono la generazione web, quindi istintivamente condividono le loro creazioni online. Semplicemente, unendo la cultura e la collaborazione del web al processo del fare stanno realizzando qualcosa su una scala assolutamente nuova del fai-da-te»¹⁷. Si comprende così come la "società dell'informazione" – preconizzata da Daniel Bell ne La società post-industriale nel 1973¹⁸ – abbia oggi assunto un rilievo piuttosto pronunciato, se è vero com'è vero che l'insieme dei flussi delle informazioni supera, per importanza economica, la produzione fisica dei beni. Ecco perché: «Il processo di produrre beni materiali ha iniziato a diventare qualcosa più simile alla creazione di beni digitali»¹⁹.

15. Il termine iperartigianato potrebbe far pensare alla "ipermerce" di cui parlano Fulvio Carmagnola e Maurizio Ferraresi, *Merci di culto. Ipermerce e società mediale*, Castelvecchi, Roma 1999, a proposito della merce «che funge da propellente al cult ipermerce. I cult sono l'ipermerce, la merce più tipica del nostro tempo» (p. 1), ovvero merce (iper)carica di valori simbolici (o pseudo-valori) in grado di suggestionare e di stimolare, irresistibilmente, l'acquisto. Qui, viene anche in mente il saggio di Elisabetta Di Stefano, *Iperestetica. Arte, natura, vita quotidiana e nuove tecnologie*, "Aethetica Preprint", 95, agosto 2012, il cui prefisso iper- ("al di sopra" ma anche "al di là") «viene a esprimere l'esigenza di una ulteriorità, il bisogno, avvertito da tempo e da più parti, di estendere la mappa teorica e metodologica dell'estetica nell'incrocio di altri saperi (ecologia, biologia, sociologia, psicologia, antropologia, gastronomia, neuroscienze)», come pure «l'oltrepassamento del limite, [...] quell'eccesso di bellezza e d'immagini che investe capillarmente la società odierna [...] per abbracciare tutta una serie di pratiche artistiche che [...] si aprono alla cultura popolare e all'esperienza di tutti i giorni» (p. 10).

16. Chris Anderson, *Makers. The New Industrial Revolution* (2012), trad. it. *Makers. Il ritorno dei produttori. Per una nuova rivoluzione industriale*, Rizzoli Etas, Milano 2013, p. 21.

17. Chris Anderson, *Makers*, cit., pp. 25-26

18. La nostra «è una società dell'informazione, così come la società industriale è una società produttrice di beni», Daniel Bell, *La società post-industriale* (1973), Comunità, Milano 1991, p. 467.

19. Chris Anderson, *Makers*, cit., p. 30.

Il termine inglese *maker*, del resto, ribadisce come questa rivoluzione prenda campo nei paesi più industrializzati – o post-industrializzati – come gli Stati Uniti²⁰.

Fino a poco tempo fa era impensabile realizzare in proprio prodotti per la commercializzazione (eccetto, ovviamente, i manufatti tradizionalmente artigianali o artistici per un mercato ristretto). Non era quindi possibile mettere insieme attrezzature produttive e innescare processi “domestici” in grado di competere commercialmente con gli impianti della grande industria. D'altra parte, sarebbe stato improponibile mettere su una strategia di commercializzazione ovvero di comunicazione con investimenti che avrebbero richiesto ingenti risorse economiche per orchestrare una moltitudine di operazioni, che vanno dai luoghi fisici della vendita all'editoria fino alla costruzione di eventi e di tantissime altre cose che hanno storicamente determinato l'importanza del capitale sui processi di commercializzazione della (grande) industria. Adesso, però, la stampante 3D ci dà l'illusione di essere demiurghi platonici, di poter plasmare la materia per dar forma alle cose, come la lampada di Aladino che – strofinata digitalmente – permette di dar forma a sogni e progetti liberando il genio che c'è in noi. Ma è davvero un'illusione? D'altra parte, marxianamente, il potere non sta forse nelle mani di chi detiene i mezzi di produzione? “Maker di tutti i Paesi, unitevi!”, si potrebbe dire parafrasando uno dei più famosi slogan politici.

In un recente articolo, Sergio Pone e Sofia Colabella fanno il punto sulla natura dei Maker: «Dopo la macchina a vapore e dopo il computer – concludono –, la stampante 3d consente di immaginare un orizzonte diverso che, senza costringerci a rinunciare a nulla dei benefici prodotti con i primi due grandi passaggi e proponendo un'ulteriore notevole espansione delle nostre possibilità, potrebbe restituirci, ricorsivamente, qualcosa che abbiamo perso»²¹, e cioè il legame esistente tra il sapere diffuso e il sapere tecnico interrotto dalla Rivoluzione industriale. Infatti, se la tecnica dei Maker è più “limitata” rispetto all'onnipotenza tecnologica dell'industria, ciò che la caratterizza è il fatto di essere condivisa e quindi integrata al processo che va dal progetto all'uso. I Maker vengono dunque a identificarsi culturalmente con i consumers: un nuovo rapporto produzione/uso che assomiglia a quello tipico della cultura pre-industriale, e dà luogo a una comunità virtualmente molto ampia. Come gli artigiani d'un tempo, i Maker tendono oggi a ridurre i passaggi di mano – il che vuol dire semplificare il processo “prodotto, produzione, vendita, consumo”²² – e a minimizzare i costi, prefigurando «un'economia molto adatta ai nostri “tempi di crisi”»²³. Per mezzo di software, come abbiamo accennato, le stampanti 3D materializzano prodotti fisici. Ci troveremo a breve in un'epoca post-virtuale?

Adesso, senza entrare in competizione con futurologi e indovini, ci piace osservare che ciò che sembra effettivamente avveniristico accade davvero nel presente: qui e ora. Accade infatti che uno dei più intraprendenti artefici della stampa 3D a livello internazionale sia italiano e abbia già realizzato traguardi importanti e per certi versi rivoluzionari. Si chiama Massimo Moretti, opera a Massa Lombarda (RA), in contatto con specialisti di tutto il mondo, che si recano in Italia ad apprezzare prodigiose meraviglie. Dal suo ingegno multiforme scaturisce il WASP World Advanced Saving Project, un ambizioso progetto nato nel 2012 dal Centro Sviluppo Progetti (CSP) con «l'obiettivo di sviluppare tecnologie avanzate al servizio del mondo»²⁴.

20. «Riconoscendo la forza di questo movimento, agli inizi del 2012 l'amministrazione Obama ha lanciato un programma per aprire, nei prossimi quattro anni in un migliaio di scuole americane, dei makerplace, completi di strumenti digitali di fabbricazione come le stampanti 3D e i laser cutter. In un certo senso, si tratta del ritorno dei laboratori di classe, ma adattati all'Era del web. E questa volta non sono pensati per formare colletti blu per lavori di basso profilo, ma piuttosto vengono finanziati da un'iniziativa governativa per la manifattura avanzata diretta a creare nuove generazioni di progettisti di sistemi e di innovatori di prodotto», Chris Anderson, *Makers*, cit., p. 23.

21. Sergio Pone, Sofia Colabella, *Maker*, in “Op. cit.”, 149, gennaio 2014, p. 17

22. Per Renato De Fusco, non è possibile dare una definizione univoca di «quell'insieme di esperienze che usiamo chiamare industrial design» perché, per quanto «esiste ormai una ricca e pregevole letteratura, si può dire che non abbia avuto ancora una adeguata teoria e una vera e propria storia». È possibile tuttavia individuare la fenomenologia del design attraverso «quattro il progetto, la produzione, la vendita e il consumo», produzione, vendita, consumo. Il cosiddetto quadriglioglio di De Fusco è quindi l'«artificio storiografico» utile a tracciare la sua Storia del design, cit., p. XI-XII.

23. Sergio Pone, Sofia Colabella, *Maker*, cit., p. 18

24. WasProject alla Camera dei Deputati, 19 maggio 2014, www.wasproject.it.

Qui, si congettura l'idea – democratica e rivoluzionaria – di stampare la casa più economica possibile, con materiali locali e a km 0: massimo risultato minimo sforzo²⁵. Ecco dunque il Design con la “D” maiuscola: il design storico, pensato per la massa, il progetto (sociale, politico) del Movimento moderno, quello di cui parlava Victor Papanek nel 1970: Progettare per il mondo reale ovvero per il 90% di popolazione mondiale²⁶. Così, WASP mira a ridurre l'impronta ecologica abbattendo i costi non solo economici ma anche ecologici (che pesano di più), perché comporta l'utilizzo di materiali locali come l'argilla, che si presta ora alla stampa 3D in termini di pura sperimentazione²⁷.

La bellezza di questo processo – la stampante 3D – è che permette di utilizzare la più nuova delle tecnologie con il più antico dei materiali: la terra bagnata. Inoltre, gli sforzi progettuali del gruppo mirano a utilizzare una forma di energia rinnovabile, come i pannelli solari, che si possa facilmente produrre in loco. Ci siamo dati – dice Moretti – «un obiettivo volutamente utopico, irrealizzabile e provocatorio come dice il nome stesso della società: salvare il mondo. Però è significativo dell'atteggiamento mentale che ci guida: vogliamo fare innovazione, non profitto»²⁸. Si tratta insomma di realizzare un sogno: un sogno piuttosto lucido, aggiungerei. Il progetto, infatti, per quanto utopico, non è certo velleitario, visto che il team WASP, con una BigDelta facilmente trasportabile e a basso consumo di energia, è già in grado di stampare costruzioni alte sei metri²⁹.

Non a caso, la sostenibilità del progetto è dichiarata già nel nome o meglio nell'istinto progettuale della vespa vasaia, da cui il nome WASP. Questa, infatti, per così dire progetta istintivamente: recupera terra bagnata lì dov'è (a Km 0) e la deposita dall'alto in maniera controllata – proprio come una stampante 3D – sfruttando l'energia solare per solidificare la sua casa-nido, perfettamente naturale e dunque ecosostenibile. A partire da questa semplice quanto illuminante osservazione, il team WASP progetta e costruisce stampanti sempre più grandi, la cui vendita assicura un finanziamento continuo e costantemente reinvestito nel progetto-sogno della casa stampata per tutti. Attualmente WASP commercializza diverse stampanti per uso domestico con un ottimo rapporto qualità/prezzo³⁰. Il materiale utilizzato è in genere il PLA (acido polilattico), un polimero termoplastico biodegradabile ovvero una bioplastica ottenuta dall'amido di mais e altri vegetali, che si presta a diventare qualsiasi cosa. Certo, le possibilità di applicazione rilanciano il mito della plastica, mito già di ascendenza barthesiana, con il suo meraviglioso fregolismo³¹. Quale forma prenderà dunque la (futuribile) casa per tutti?

25. «Più di un prodotto: una visione del mondo», Dario Colombo, *La casa in 3D si può fare*, “3D Printing Creative”, 003, 2014, p. 28.

26. Victor Papanek, *Design for the Real World* (1970), trad. it. *Progettare per il mondo reale*, Mondadori, Milano 1973. Si pensi oggi alla drammatica situazione in Africa e alla prospettiva che aprirebbe la concreta possibilità di stampare case di gran lunga più economiche di quelle che tutti conosciamo.

27. Il problema dell'argilla consiste nel fatto che il materiale fluido-denso deve assumere la migliore consistenza per essere abbastanza solido da non crollare durante la stampa e insieme abbastanza fluido da poter venire fuori da un estrusore (anch'esso costruito ovvero stampato ad hoc).

28. Massimo Moretti, cit. in Christian Fossi, *Una volta eravamo “smanettoni”, oggi invece degli innovatori 3D*, “Sette Sere”, 1, gennaio 2015, p. 23.

29. BigDelta 6 metri – scelte, percorsi, evoluzione della stampa 3D, 5 dicembre 2014, www.wasproject.it.

30. La PowerWasp Evo, per esempio, è stata definita la migliore stampante 3D sotto i 2.000 euro dalla redazione di 3D-printers.ireviews.com, CSP POWERWASP EVO, 17 luglio 2014, ireviews.com.

31. «La plastica, i cui prodotti sono stati recentemente concentrati in una esposizione, è essenzialmente una sostanza alchemica. All'ingresso dello stand, il pubblico fa a lungo la coda per veder compiersi l'operazione magica per eccellenza: la conversione della materia [...] più di una sostanza la plastica è l'idea stessa della sua infinita trasformazione, è, come indica il suo nome volgare, l'ubiquità resa visibile; e proprio in questo, d'altra parte, essa è una materia miracolosa: il miracolo è sempre una conversione brusca della natura. La plastica resta tutta impregnata di questa scossa: più che oggetto essa è traccia di un movimento. E poiché questo movimento è press'a poco infinito, trasformando i cristalli originari in una quantità di oggetti sempre più sorprendenti, la plastica è insomma uno spettacolo da decifrare: perfino nei suoi risultati. Davanti ad ogni forma terminale (valigia, spazzola, carrozzeria d'automobile, giocattolo, stoffa, catino o carta) la mente continua a porsi la materia primitiva come un rebus. In realtà il fregolismo della plastica è totale: essa può formare tanto un secchio che un gioiello. Donde uno stupore perpetuo, il sogno dell'uomo davanti alle proliferazioni della materia, davanti ai legami che egli coglie tra il singolare dell'origine e il plurale degli effetti», Roland Barthes, *Mythologies* (1957), *I miti d'oggi*, Einaudi, Torino 1974, p. 169.

Cioè al momento oggetto di dibattito, perché il team WASP non pretende di dettare nuovi standard architettonici, ma tende a coinvolgere progettisti e teorici del progetto, aprendosi anche al mondo universitario per sollecitarne la ricerca. Per tornare ai termini fondamentali sulla forma degli anni Dieci (che hanno poi animato il dibattito novecentesco) a proposito dell'allora innovativa architettura in cemento armato, ha ragione Muthesius quando parla di forme semplici e conseguenti alla meccanica del processo di produzione industriale oppure Van de Velde con i volumi fluidi e avvolgenti del suo teatro (Colonia 1914)? Insomma, ora come allora, la faccenda resta insoluta³².

Un'altra caratteristica di WASP – interessante ai fini del nostro ragionamento sull'iperartigianato – consiste nella duplice composizione del team capitanato da Moretti: una piccola azienda artigiana (professionisti di esperienza con spiccata attitudine pragmatica), da una parte, e un gruppo di designer neo-laureati che hanno gran dimestichezza con le nuove tecnologie (software, rete, social...) e una visione ampia (in grado di re-immaginare il mondo), dall'altra. Lavorando in sinergia, le due categorie di progettisti mantengono le proprie posizioni, ma tendono a interagire con entusiasmo, completandosi. Il dato essenziale, tuttavia, è che questo caso ribadisce la compresenza di due qualità e approcci altrettanto fondamentali: quello del fare, manuale e concreto, e quello del progettare con i bit, riconfigurando processi e prodotti. Del resto, «l'artigiano è un artista» potenziato, dice Gropius nel 1923 e ripete Moretti a distanza di novant'anni: «Bisogna passare dalla ricerca e sviluppo alla scoperta e sviluppo. La ricerca deve passare all'artigianato e alla piccola azienda se vuole dare frutto»³³. Nella III fase della Rivoluzione industriale, insomma, l'artigiano digitale trasforma la materia dando valore a un oggetto; ma è proprio questa tecnologia a

32. Tra la fine dell'Ottocento e l'inizio del Novecento, nella II fase della Rivoluzione industriale, l'esigenza di "addomesticare la tecnica" è la prima preoccupazione del *Deutscher Werkbund*, un'associazione con lo scopo di «nobilitare il lavoro industriale (o professionale o artigianale) in una collaborazione di arte, industria e artigianato tramite l'istruzione, la propaganda e una ferma e compatta presa di posizione di fronte alle questioni relative», Tomás Maldonado, *Disegno industriale: un riesame*, Feltrinelli, Milano 2008 (1976), p. 35. Tale esigenza è talmente cruciale e controversa da scatenare un altrettanto cruciale e controverso dibattito. Da una parte, Hermann Muthesius, fondatore del *Werkbund*, sostiene la *Typisierung* ovvero la "tipizzazione", proponendo uno stile autenticamente industriale; secondo Muthesius, cit. in Maurizio Vitta, *Il progetto della bellezza. Il design fra arte e tecnica*. 1851-2001, Einaudi, Torino 1972, p. 145, bisogna «definire con la massima chiarezza lo scopo di ogni singolo oggetto e [...] derivare logicamente la forma dallo scopo». Dall'altra, Henry Van de Velde, architetto-artista di spicco dell'Art nouveau e paladino del *Kunstwollen* ("volontà d'arte"), rivendica l'autonomia creativa dell'artista quale libero interprete dello *Zeitgeist*: «il gioco potente delle loro braccia di ferro creerà bellezza, purché la bellezza le guidi», Henry Van de Velde, 1901, cit. in Gillo Dorfles, *Introduzione al disegno industriale*, Einaudi, Torino 1972, p. 21. Questa inconciliabilità all'interno del *Werkbund* trova dicotomica materializzazione nelle architetture erette in occasione dell'Esposizione Universale del 1914 a Colonia. In linea con la tesi di Muthesius, Walter Gropius progetta un modello d'industria dai volumi semplici e scatolari, in cemento armato, ribadendo i principi di standardizzazione già applicati nelle celebri *Officine Fagus* del 1911 (una nitida anticipazione del Razionalismo che prenderà campo nei decenni successivi). Van de Velde, invece, disegna un teatro dal carattere espressionista, con forme sinuose e avvolgenti, sempre in cemento armato benché in una configurazione totalmente diversa dal modello scatolare di Gropius; un'architettura sui generis, insomma, ma non per questo incoerente con le valenze plastiche del materiale. Se nei decenni a venire si affermerà la soluzione scatolare indicata da Gropius (basta guardarci intorno), nella direzione di Van de Velde lavorano alcuni esponenti dell'Espressionismo in architettura, come Erich Mendelsohn, progettista della *Einsteinurm* di Potsdam (1918-1924), o Hermann Finsterlin, pittore e ideatore di fantastiche architetture, in anticipo di circa ottant'anni sulle forme fluide del museo Guggenheim a Bilbao ad opera di Frank O. Gehry (1997). Un altro grande architetto visionario è il catalano Antoni Gaudí. Le sue visioni architettoniche non si risolvono in pitture fantastiche come quelle di Finsterlin, ma stanno lì, a Barcellona, quali testimonianze materiali, organismi biomorfici, a declinare le forme tutt'altro che scatolari del cemento armato; un noto esempio è Casa Milà, conosciuta anche come *La Pedrera* (1905-1902), cioè "la cava", per la sua configurazione assolutamente "naturale" (irregolare, fluida) e pure architettonicamente rivoluzionaria. Il museo Guggenheim di Gehry, le cui forme zoomorfe sembrano il massimo dell'innovazione possibile, è invece una specie di bluff: sotto gli scultorei e meravigliosi pannelli di copertura in titanio, insiste una molto tradizionale struttura fatta di altrettanto tradizionali putrelle. È la tecnica, dunque, che – intrecciata all'arte – dà forma alla materia. «Arte e tecnica: una nuova unità!», sentenza Gropius nel 1923, rilanciando il *Bauhaus* di Weimar. «La tecnica non ha bisogno dell'arte, ma l'arte ha molto bisogno della tecnica», Walter Gropius, *Breviario per i membri del Bauhaus* (1924), in Hans Maria Wingler, *Il Bauhaus. Weimar Dessau Berlino 1919-1933* (1962), Feltrinelli, Milano 1972 (1987), p. 137.

33. Massimo Moretti, cit. in Christian Fossi, *Una volta eravamo "smanettoni", oggi invece degli innovatori 3D, "Sette Sere"*, 1, gennaio 2015, p. 23.

proiettare il futuro nelle mani dell'artigiano, in termini materiali di realizzazione e immateriali di condivisione in rete³⁴. Nel mondo della stampa 3D, infatti, si parla di open source, per l'appunto "sorgente aperta": la condivisione (gratuita), in rete, di esperienze e conoscenze, cioè la disponibilità a condividere informazioni (sorgenti, fonti) ma anche i propri progetti, che possono essere liberamente riprodotti e/o implementati. In generale – afferma Geoff Mulgan – la «social innovation refers to new ideas that work in meeting social goals» ; ma la cosa ha anche una ricaduta commerciale, configurandosi come una raffinata strategia: «queste aziende regalano i bit e vendono gli atomi».

Tutti i file di progettazione, i software e gli altri elementi che si possono descrivere in forma digitale – i bit – vengono regalati su Internet, previa sottoscrizione di una licenza che in genere autorizza un uso pressoché illimitato dello strumento, purché continui a rimanere aperto e condiviso. Ma i prodotti fisici – gli atomi – si vendono, perché comportano costi reali che vanno recuperati». Nel mondo della stampa 3D, infatti, si parla di open source, per l'appunto "sorgente aperta": la condivisione (gratuita), in rete, di esperienze e conoscenze, cioè la disponibilità a condividere informazioni (sorgenti, fonti) ma anche i propri progetti, che possono essere liberamente riprodotti e/o implementati. In generale – afferma Geoff Mulgan – la «social innovation refers to new ideas that work in meeting social goals»³⁵; ma la cosa ha anche una ricaduta commerciale, configurandosi come una raffinata strategia: «queste aziende regalano i bit e vendono gli atomi. Tutti i file di progettazione, i software e gli altri elementi che si possono descrivere in forma digitale – i bit – vengono regalati su Internet, previa sottoscrizione di una licenza che in genere autorizza un uso pressoché illimitato dello strumento, purché continui a rimanere aperto e condiviso. Ma i prodotti fisici – gli atomi – si vendono, perché comportano costi reali che vanno recuperati»³⁶.

Ovviamente, nel caso di Moretti, ciò che si vende sono le stampanti 3D, le quali potrebbero anche essere autoprodotte dagli stessi utenti con i quali si condividono (preziose) conoscenze ma che – in quanto WASP – posseggono un'intrinseca garanzia di qualità e quindi vengono preferite alle riproduzioni fai-da-te³⁷. La tentazione però è forte: che succede se si arriva prima di tutti a mettere a fuoco una conoscenza cruciale e dunque potenzialmente remunerativa? Va condivisa gratuitamente, com'è del resto nella logica dell'open source, oppure ci si tutela con un brevetto di utilità da chi potrebbe sfruttare l'invenzione commercialmente? La tentazione è forte, dicevamo, se apre imprevedibili prospettive economiche. Sperimentando senza sosta, infatti, Dennis Patella (membro di spicco del team WASP) sviluppa la funzione Re-

34. Cfr. Stefano Miceli, *Futuro artigiano. L'innovazione nelle mani degli italiani*, Marsilio, Venezia 2014 (2011) (Premio Compasso d'Oro ADI 2014). Lo stretto rapporto programmatore-artigiano, del resto, è già stato abbondantemente rilevato: «Sono in molti a pensare che anche il mondo dei software debba essere visto come uno spazio di espressione della competenza artigiana. È vero che i programmatori non lavorano la materia, ma in un'accezione estensiva di lavoro artigiano anche il software può essere considerato alla stregua di legno, vetro o pietra naturale. L'analogia regge perché, dal punto di vista antropologico e culturale, il programmatore ha molto in comune con gli artigiani [...] Al pari degli artigiani, i programmatori sono sostanzialmente autonomi nel proprio lavoro, sia che operino presso una grande azienda sia che scrivano codici in modalità free lance. Anche i programmatori, come gli artigiani classici, fanno riferimento a comunità professionali con ritualità proprie e specifici riferimenti culturali. Come molti artigiani, i programmatori appassionati del loro mestiere amano la dimensione del gioco e della sfida: non considerano il loro lavoro semplice esecuzione di mansioni, ma sono capaci di sperimentare e innovare in proprio», ivi, pp. 142-143. Sul rapporto artigiano-programmatore e sul futuro artigiano in generale, vedi anche Sennett, *The Craftsman*, Yale University Press, New Haven-London, trad. it. *L'uomo artigiano*, Feltrinelli, Milano 2008.

35. Geoff Mulgan et alii, *Social Silicon Valleys. A manifesto for Social Innovation*, Young Foundation – Basingstoke Press, London 2006, p. 9. Sul concetto di social innovation, cfr. Aleardo Furlani, Francesco Lutman, *Social innovation. Reti sociali: le nuove protagoniste dell'innovazione. Una guida pratica per le aziende italiane*, FrancoAngeli, Milano 2012, pp. 17-18: «Il ruolo delle persone, e conseguentemente delle nuove tecnologie di condivisione e messa in rete, è oggi leva di competitività e strumento per creare valore economico. [...] È un valore nuovo, un valore che associa l'individualità con la collettività e che nasce dalle nuove intersezioni di conoscenza e di relazione tra persone. Un valore che si calcola con parametri di valutazione immateriali, non più facilmente quantificabili, ma non per questo meno "pesanti"».

36. Chris Anderson, *Makers*, cit., pp. 133-134.

37. D'altra parte, «the idea that because you give the intellectual property away you can't run a company that makes a profit is demonstrably nonsense. All you have to do is to add value», Adrian Bowyer, cit. in Hod Lipson, Melba Kurman, *Fabricated. The New World of 3D Printing. The Promise and Peril of a Machine that can Make (almost) Anything*, John Wiley & Sons, Indianapolis 2013, p. 231.

surrection (stop e salva), così chiamata perché permette di riprendere la stampa nel punto esatto in cui si è interrotta (volontariamente o accidentalmente). Questa funzione è importante, perché altrimenti non si potrebbe mai staccare per ricaricare; per non parlare delle interruzioni improvvise³⁸. Perché allora WASP decide di diffondere preziose conoscenze sia pure con una limitazione a uso commerciale? Innanzitutto, non pensiamo che si tratti di «una scelta altruistica: è puramente egoistica», confessa Moretti. «Brevettare ti fa star male come azienda e come persona in quanto entri in un'ottica di chiusura che fa perno sul terrore che questo o quello ti abbia copiato qualcosa. Se inizi a vivere così, cominci a spendere soldi in avvocati e brevetti e il risultato è che non fai più ricerca»³⁹.

Comunque sia, l'open source rappresenta oggi uno strumento decisamente democratico: una forma di accesso dal basso, che sta favorendo la costituzione di Creative Commons sempre più estese Communities. Altro strumento, molto in voga, è il crowdfunding, dove crowd sta per "folla" e funding per "finanziamento", ovvero una condizione virtuosa che porta gente sconosciuta (la folla) a sostenere economicamente, con donazioni libere, i progetti dei Makers che, pubblicati in rete, riscuotono interesse e simpatia; ciò, al di là dell'opportunità economico-commerciale, sottolinea il valore della ricerca e dell'innovazione, oltre che, ovviamente, della capacità di diffusione planetaria della rete⁴⁰.

Tornando a WASP, anche qui si decide di puntare sulla condivisione e il coinvolgimento emotivo; non si usa credito bancario, ma s'inizia a produrre soltanto sul venduto. Infatti, poiché il team WASP non ha grandi capacità produttive e dedica almeno il 50% delle risorse in ricerca e sviluppo, chi acquista una stampante WASP la paga ben sapendo che ci vorranno non meno di quattro settimane prima di riceverla a casa. Perché allora qualcuno decide di comprare una stampante WASP se poi deve aspettare tutto questo tempo? Perché è convinto dell'eccellenza del prodotto, certo, ma soprattutto – ecco dunque – perché crede nel sogno WASP: salvare il mondo o almeno contribuire a renderlo migliore attraverso la casa stampata a basso costo per tutti. Ed è qui che l'innovazione, il cui costo è spesso proibitivo per la piccola-media impresa, si rivela una strategia di finanziamento per sostenere dal basso un progetto etico e condivisibile.

Il progetto WASP dunque attira e galvanizza molti giovani progettisti, soprattutto i più giovani, perché infonde loro la speranza di poter fare. Sono tanti quelli che recano a Massa Lombarda (da Milano, da Faenza e da altre parti d'Italia) per esporre il proprio progetto. L'artigianato digitale, del resto, rappresenta per i giovani progettisti una concreta chance di lavoro, nonché un cambiamento di stato mentale: dal cercare un lavoro al fare un lavoro.

Progettare con la stampante 3D, però, non è facile; più facile è cadere nella tentazione di stampare gadget, piccoli pupazzi e cosette, che alla fine non interessano a nessuno. Bisogna invece avere un'idea chiara, sostanziata da un ragionamento, uno spessore di pensiero tale da fare la differenza, una visione, un'utopia⁴¹ o, se vogliamo, una tesi. Una tesi, sì, e visto che parliamo di giovani progettisti, magari una Tesi di Laurea. Raramente, tuttavia, accade che uno studente in Design abbia oggi una Tesi (di Laurea) convincente. Flavio Gioia, al contrario, ha un'idea, che si risolve in una Tesi: progettare e dunque stampare un mattoncino polidirezionale. Da qui, la

38. *Resurrection System, una rivoluzione nella stampa 3D*, 25 novembre 2014, www.wasproject.it.

39. Massimo Moretti, cit. in Christian Fossi, *Una volta eravamo "smanettoni", oggi invece degli innovatori 3D*, "Sette Sere", 1, gennaio 2015, p. 23; continua Moretti: «Sono convinto che sia meglio l'opposto: tutti i giorni ci arriva un'idea nuova, facciamola e che gli altri ci corrano dietro a copiare... è un problema loro. Noi andiamo avanti con le idee che arrivano. In questo settore è fondamentale la condivisione della conoscenza», *ibidem*.

40. Una definizione più tecnica e ancorché sintetica è quella di Alessandro Brunello, *Manuale del crowdfunding*, LSWR, Milano 2014, p. 26: «Un processo di collaborazione tra più persone che decidono di stanziare il proprio denaro, in linea di massima piccole somme, per sostenere gli sforzi, i progetti e le visioni di altri privati cittadini, ma anche di aziende, enti e organizzazioni». Per ulteriori approfondimenti, cfr. Thomas Elliott, *The Everything Guide to Crowdfunding: Learn how to Use Social Media for Small-Business Funding*, Adams Media, Avon (Mass.) 2013.

41. È interessante notare che il termine "utopia" indica un luogo che non c'è (ou-tópos) ma anche "il regno perfetto della felicità" (eu-tópos), ovvero un luogo ideale verso cui tendere.

condivisione in rete del progetto (open source), che mira a fidelizzare attraverso la condivisione di valori (secondo il virtuoso esempio di WASP), e una strategia di e-commerce per la vendita in rete del mattoncino polidirezionale⁴² o anche soltanto di versioni sofisticate dello stesso e più difficili da autoprodurre.

Ciò che mi sembra più interessante, tuttavia, non è tanto il prodotto – o l'autoprodotto – in sé ma il processo, dato che, come abbiamo detto, il design sta nel processo (che determina la forma). I mattoncini sono dunque stampati e si combinano in più direzioni: dal basso, dall'alto e di lato (mentre i Lego, per esempio, si combinano uno sull'altro). Il nome stesso, Extro, si riferisce a questo: al verbo che indica la sovrapposizione di livelli del processo additivo, estrarre, con una certa assonanza alla forma latina, extruo; ma allude – cosa nient'affatto secondaria – all'estro del progettista-artigiano digitale e alle mille possibilità costruttive della stampa 3D. Gioia, infatti, non si limita a progettare il file e consegnarlo alla stampa. Se si trattasse solo di questo, non sarebbe un designer-artigiano ma un designer che si confronta tradizionalmente con macchine evolute. Egli segue tutto il processo, cominciando a costruirsi da sé la sua stampante fino a implementarla da buon "RepRaper", se così si può dire, alludendo alla sua attività di violentatore (raper) di tecnologie consolidate. Così riesce a dar forma alla sua idea, sperimentandola in fieri. E partendo da una forma basica, una sorta di archetipo simil-Lego, dopo aver esaminato e tratto ispirazione dalle migliori costruzioni di sempre – Kiddikraft, Froebel's gifts, Meccano, Tinkertoys, Togl, Geomag⁴³ –, configura un autoprodotta in stretta relazione al processo (additivo) e alla tecnica di costruzione.

Certo, il riferimento alle costruzioni Lego è inevitabile. Chi non ci ha mai giocato almeno una volta? Ma dove sta scritto che l'incastro del mattoncino autoprodotta dovrebbe riflettere la configurazione – ideale, ormai archetipica o addirittura platonica – del mattoncino Lego? Al contrario, Gioia, ormai immerso nel processo fino al collo, dopo aver realizzato un incastro a forma di quadrato (allineato al corpo del mattoncino), decide poi di ruotarlo di 45 gradi per ragioni squisitamente processuali: in quanto risulta più adeguato al processo additivo di costruzione per livelli (che prima restavano sconvvenientemente sospesi). Quindi, lo stesso incastro (quadrato ruotato di 45 gradi) è poi tagliato verticalmente per migliorarne la performance. Quale forma assumerà insomma, il mattoncino autoprodotta, continuando a sperimentare di questo passo?⁴⁴ Certo, sarà la risultante dei diversi fondamentali fattori del design, materiali (economico, tecnico-costruttivo, funzionale...) e immateriali (simbolico, estetico, semantico...). Come per la casa stampata per tutti WASP, quale sarà la forma è ancora da vedere, progettando il futuro. Work in progress...

42. Flavio Gioia, Extro. Design generativo per un mattoncino polidirezionale, Tesi di Laurea in Disegno industriale, Università degli Studi di Palermo, 2014

43. La ricerca di Gioia abbraccia anche l'allegro metodo didattico di Bruno Munari, per il quale «il gioco o il giocattolo devono essere stimolatori dell'immaginazione, non devono essere conclusi o finiti (come certi modellini perfetti di macchine vere) perché così non permettono la partecipazione del fruitore. Un gioco perfetto solo da ammirare, dimostra la bravura tecnica dell'autore ma poi stanca subito e non è educativo. [...] Il gioco va alla velocità del pensiero, la mente è in continua azione, tutto si fa e si disfa come nella realtà, non c'è niente di importante, quello che conta è la possibilità combinatoria, cambiare sempre, provare e riprovare. La mente diventa elastica, il pensiero dinamico. L'individuo creativo», Bruno Munari, *Da cosa nasce cosa. Appunti per una metodologia progettuale*, Laterza, Roma-Bari 2010 (1981), pp. 248-250. Fondamentale anche il riferimento a Enzo Mari e a *Il gioco dei 16 animali*, un «classico per l'infanzia» progettato per Danese nel 1957: «Parto da una lastra di legno intera, con l'obiettivo che le sagome degli animali si possano separare con una sega. La scatola che li contiene è di circa 30 x 40 cm, lo spessore degli animali 3 cm, così possono stare in piedi, essere disposti in modi divertenti e inaspettati, e diventare attori di una commedia dell'arte, il cui regista è il bambino», Enzo Mari, *25 modi per piantare un chiodo. Sessant'anni di idee e progetti per diffondere un sogno*, Mondadori, Milano 2011, p. 36.

44. Ogni elemento del sistema Lego, tuttavia – sia esso mattoncino, piattaforma, asse, ometto ecc. – viene puntualmente realizzato con la massima precisione per garantire un incastro perfetto; cosa che implica l'utilizzo di particolari impianti di fusione con produzione a quantità limitata e macchine ad alta precisione, mentre gli stampi a iniezione sono equipaggiati con sensori che rilevano le minime variazioni di pressione e temperatura. Una tecnologia ben diversa e onerosa di quanto non sia l'autoproduzione domestica con stampante 3D.

DHM to investigate product ergonomics and visual representation of results

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Abstract

The simulation of human-product interaction belongs to the mega trend of Virtualization, combining virtual products and human modeling. Nowadays, either industrial products or commodities are supposed to be validated in many ways including ergonomic issues. Actually, the interaction with the different people that may have to deal with the product is crucial to provide an efficient and robust outcome. Beside final user actions, maintaining, assembling, installing or performing other activities related to products life cycle require a human intervention and, thus, a proper ergonomic design and check is encouraged.

In this work we show an investigation method based on digital human models to evaluate product usability related to ergonomics. A proper test campaign is defined to reproduce in details the most challenging circumstances taking into account several system variables such as product configuration (e.g., different geometries or dimensions) as well as different human features (e.g., size, posture, position, orientation) beside eventual environmental condition that may influence the way the task is.

The paper shows the implementation of the method through a case study in the domain of commercial refrigeration. A freezer display unit of the kind normally used in supermarkets and groceries is investigated taking into account the case of use of a customer opening the door and picking up a product. Visibility and reachability issues are investigated for any point on a grid on each shelf paying particular attention to interference between the customer and freezer components such as doors and shelves. The results of the test performed are collected in visual maps overlapped each to the referring shelf of the display unit so that the design team can easily manage all data with a few structured pictures.

1. Introduction

Virtual ergonomics tools permit engineers to identify multiple and complex problems involved in human-product interactions in the early stages of design process. This work shows a method allowing to analyze both reachability and visibility on commercial products and to obtain numeric results as well as graphical representation on the product itself. The method relies on a parametric definition of the actor, of the product geometry and of the environment allowing a fast and exhaustive exploration.

The use of a graphical way of showing results is the key factor for the fast identification of any potential problems and boosts-up the communication among designers and with not technical people. This paper presents at first a brief overview of Digital Human Modeling tools, then a description of the method proposed followed by the case studies and the gathered results. At last a critical discussion about results and method concludes the paper.

2. Previous work

DHMs are used in several industrial contexts to address safety issues, to design better products or to improve existing design methods. Ergonomic aspects can be introduced within the method of Design for Assembly or Design for Manufacturing (Regazzoni & Rizzi, 2014). For instance, in case of maintenance activities the use of DHM can provide some indication to reduce work related musculoskeletal disorder normally related to repetitive or uncomfortable tasks. The focus of the present work is to consider customer's interaction with a generic product combining the use of DHM and parametric CAD programs to provide the technicians with an interactive method of evaluating ergonomics in terms of accessibility and visibility of different design variants.

- Concerning human models, various tools of different complexity can be found on the market or in academia and many research activities are under development to fulfill the requirements coming from different industrial sectors to solve specific problems. We have grouped them into four main categories (Figure 1) (Duffy, 2007):
- Virtual human/actors for entertainment, used to populate scenes for movies and videogames production. Virtual crowd simulators (Thalmann Et al., 2009), belonging to this group, can be also adopted to simulate emergency situations and for training purpose.
- Mannequins for Clothing (Volino, Et al., 2008) (S.S.M. Et al., 2011) used to create virtual catwalks, virtual catalogues, and virtual try-on show rooms and to design garments.
- Virtual humans for ergonomic analysis, three-dimensional models of the human body, used to study human-machine interaction that can be used to define complex scenes, analyze postures, simulate tasks and optimize working environments.
- Detailed biomechanical models (Abdel-Malek, Et al. 2009) (www.lifemodeler.com), usually more complex than previous ones, structured into three distinct components: the skeleton with deformable elements and joints, skin and muscle tissues, tendons and ligaments. Applications concern ergonomics analysis, medical equipment, study of safety in transport, and human performance during sports activities, etc.

As said, according to specific needs digital humans and related tools can be used in various applicative domains such as automotive (Colombo Et al., 2005) (Mueller Et al., 2009), aeronautics (Green Et al. 2011) (Dantas Alves Silva, Et al. 2007), bioengineering and medicine (Bucca Et al., 2009) (Xu, 2005), videogames, movies, education and training. In this paper we consider a tool belonging to the Virtual humans for ergonomic category that can be profitably used along the product development process to show and analyze how humans should act in various situations and execute required tasks but also to predict the impact of their actions on musculoskeletal apparatus (Naumanm & Roetting, 2007). In previous works we have experienced the use of Virtual Humans in ergonomic design of supermarket refrigerated display units in loading equipment for commercial refrigerators and in the design for maintenance of compressor units (Colombo, Et al., 2010).

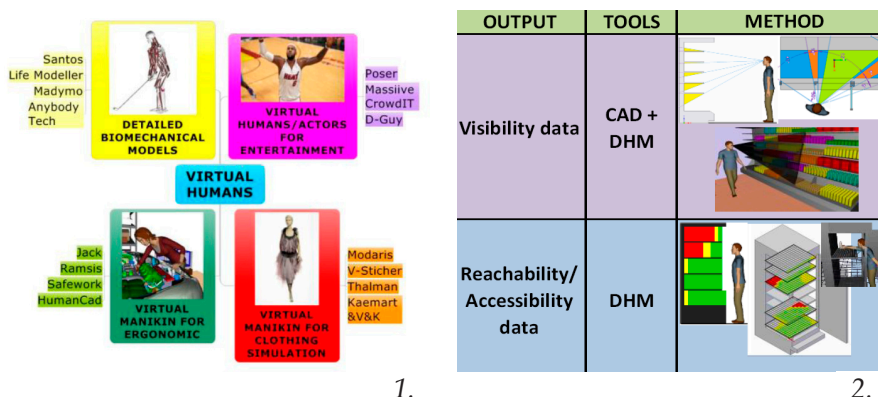


Figure 1 - Digital human classification and tools

Figure 2 - Graphical description of method used.

Also if the product we examined, i.e. the display unit, is not complex there are different challenges to face when considering maintenance workers, shop operators and customers buying products placed on the shelves. Actually, each category has different requirements and performs different tasks with the display unit. For instance when considering the buying phase the common experience is that a customer walk in the supermarket lane, watches the shelves, individuates what s/he need and then grab it and put it in the shopping cart. There are some implications to this sequence of events: the first is that the customer has to clearly see what is available on the shelves and s/he will prefer the better placed products; the second implication is that s/he has to grab it easily otherwise s/he will change product or will be discouraged to buy it.

3. Methods and Tools

We propose a method based on DHM and a parametric CAD software in order to evaluate in details accessibility and visibility of products, generating results that are both numerical and graphical for an easy comprehension and usability. Human modeling tools are used in the traditional way to simulate the person physically interacting with the product and the environment. This allows gathering both numeric and graphical results concerning accessibility and visibility of products.

Besides, the CAD tool permits to manage in a parametric way both product geometry and scene configuration. Thus, the results obtained can be shown directly on the products analyzed by using color maps overlapped to the 3D model (Figure 2).

3.1. Case study

The case studies refer to vertical refrigerated display units being used by customers. To evaluate the design of a display unit three main phases involved in customer-display unit interaction have been defined:

1. Visibility from the middle of the supermarket lane.
2. Visibility standing close to the display unit.
3. Reachability of products on each shelf.

All these aspects are related to the buying experience. Visibility from the center of the supermarket lane is crucial as the first approach of the customer to goods. Visibility standing near is measured in the position that is typical of a person that is going to open the door of the low temperature fridge. Reachability of each shelf gives the indication of the ideal length and position of each shelf to maximize accessibility and of the effort of the customer to grab the goods. All these aspects defined and measured can give significant insights to engineers for a better product design involving aspects such as shelves position, inclination and lighting. Our method will be applied to two specific products:

- Case 1: high temperature (0-4 °C) open display unit (without doors) (3a)
- Case 2: low temperature freezer (-25 °C) closed display unit (with doors) (3b).

Figure 3 – Refrigerated display units under investigation



3a.



3b.

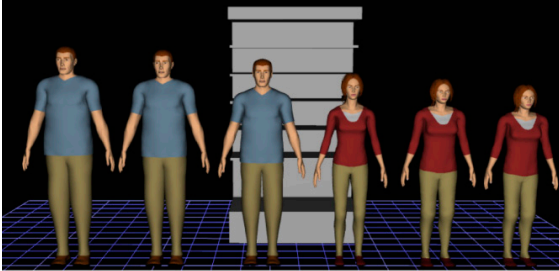
In the first case study we assessed the reachability of each shelf and the visibility from the lane. In the second case study we considered the influence of frames and doors when taking a product out of the shelf and the visibility both from the lane and from a close position.

3.2. Reachability tests

To evaluate reachability and visibility in the first case study and reachability in the second one we used the DHM tool Siemens Jack 7.0.

Each display unit has been tested with six human models sizing from the 5th percentile female to the 95th percentile male, selected with the staff of the display unit manufacturer (Table 1). Different customers' postures have been simulated. To better understand customers' habits we observed a group of them during a normal shopping experience and we defined the most recurrent postures and actions. We record also unacceptable behaviors, such as stepping on the first shelf to reach the highest (upper left image in Figure 2).

SUBJECT	HEIGHT (CM)	WEIGHT (KG)
95° male – M95	187	101
75° male – M75	184	91
50° male – M50	175	79
50° female – M50	163	63
25° female – M25	158	56
5° female – M5	153	51



1.



Reachability has been evaluated measuring the distance from the hand of the human to the bottom of each shelf.

A single indicator for the reachability of each shelf has been defined weighing the results gathered for each virtual model.

For case study 2 we analyzed the accessibility of each shelf verifying the eventual occurrence of interference between customer's hands, arms or head and structure of the display unit. To do this we build a 3D model of the display unit and then defined on each shelf a grid of 50x50 mm and for each point we simulate the position assumed (14x11 on each of 5 shelves) by the customer to grab a product. For any configuration assumed we observed the relative position between body and frame and in case of contact, or distance minor of 50 mm, we record which body parts and structure parts were interested. We overlapped the results on the grid for each shelf using a simple color map (Figure 5) in which:

Red means there is a contact between consumer and display unit.

Yellow means the customer is close ($d < 50$ mm) to the display unit;

Green means there is no contact.

Any red or yellow cell has an annotation describing which body parts and structure parts are involved. As shown in Figure 3 the first letter indicates the body parts (i.e. A is for arm, H is for head) and second letter is for structure parts (i.e. S is for shelf and F is for frame).

For each human size and each shelf considered we defined a set of standard postures: standing, kneeling on one knee (using the same hand of the knee on the ground or the opposite), squat and two knees on the ground. For each of these postures were considered also different orientation relative to display unit (Figure 4).

Table 1 - Human sizes considered.

Figure 2 - Posture assumed for reachability analysis.

A-S	A-S	A-S	A-S	A-S	A-S	5
A-S	A-S	A-S	A-S	A-FS	A-FS	4
				A-F	A-F	3
				A-F	A-F	2
				A-F	A-F	1
6	5	4	3	2	1	

Figure 3 - Fragment of a color map on the accessibility of a shelf.

3.3. Visibility tests

Visibility tests refer to the phase of product searching while the customer is walking on the supermarket lane, and product selection when the customer has found the right display unit. For instance in Figure 5 shows the vision cone of a 50th man walking in the middle of the lane.

In order to evaluate visibility from the lane we used a vertical cross section of the display unit. According to the configuration shown in Figure 6 we used different distances of the human from the open door-less display unit (varying from 1 to 2 meters) and depending on human percentile we changed the vertical position of the viewpoint. The same approach has been used also to evaluate visibility at closer distance (between 150 and 500 mm) occurring when dealing with a display unit with doors. Actually once the door is open the customer is obliged to stand closer. Figure 9 shows a typical position once opened the door of the display unit.

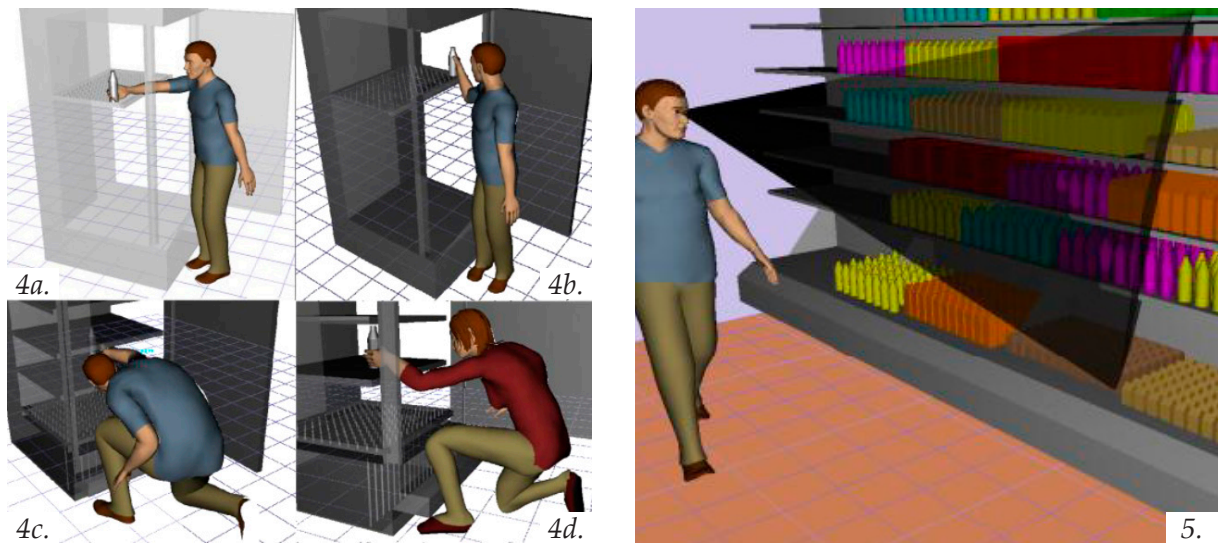


Figure 4 - Sample postures for reachability analysis: (a) standing and 45° rotated on the left; (b) standing and 90° rotated on the left; (c) kneeling on one knee and using opposite hand; (d) kneeling and using homolog hand.

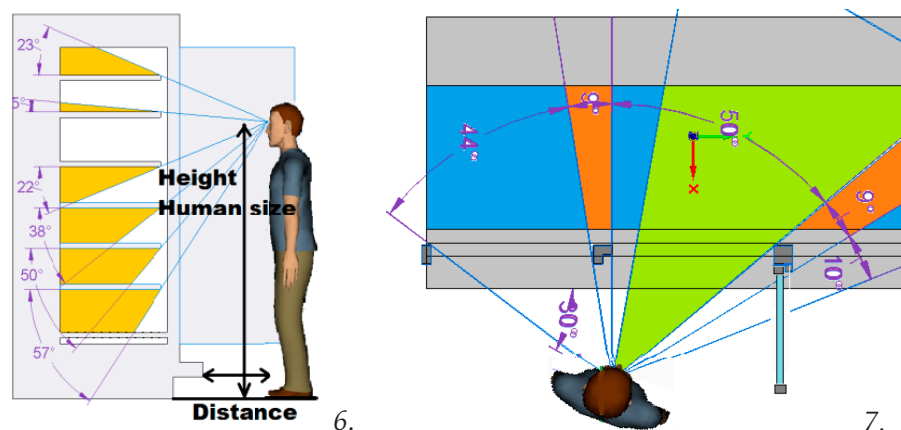
Figure 5 - Visibility when walking through the lane, vision cone highlighted.

Once obtained all data we elaborated them considering that data from M50 and F50 are statistically more relevant. To do this we gave a smaller weight to M95-75 and F25-5. In this way we obtained an average value of visibility for every shelf and position. Display unit configuration, distance between human and display unit can be defined as parametric variables in a CAD and they can be easily changed to gather new results (e.g. blind angles) as shown in Figure 8.

In case study 2 we considered also the influence of the structure on the visibility of the shelves. To do this we defined on a horizontal cross section of the display unit, the different positions and orientations that customer assumes once opened the door. In this configuration we looked for eventual blind angles on the attention cone

Figure 6 - Representation of CAD use in visibility evaluation.

Figure 7 - Use of CAD system to evaluated proximity visibility.



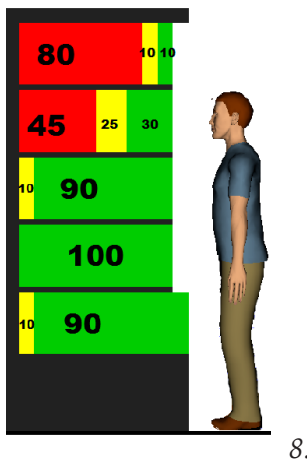
of 40° (Figure 7). Each of the elements described above can be modified in a parametric way so that changes can be measured and visualized quickly and easily both in a numeric and graphical way.

4. Results

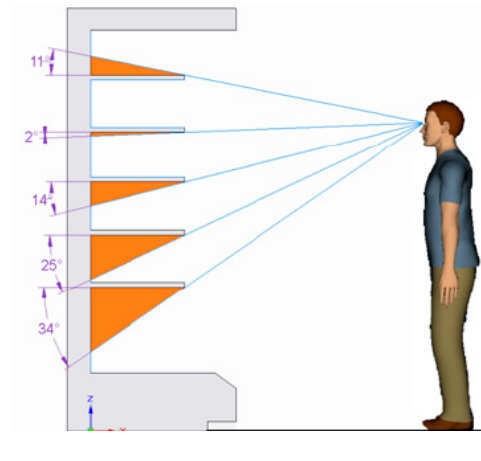
The case studies considered are two refrigerated display units: a high temperature without doors and a low temperature with doors. For each of them a similar analysis of reachability and visibility can be done but they differ for the presence of doors and frames and this imply different approach that drives to different results representation. In the followings some results are presented to show how effective a graphical representation can be.

4.1. Case study 1

Figure 8 shows which are the portion of the shelves that can be accessed by most of the customers (green), the portion hardly reachable by most of the people (yellow) and the portion nobody can reach (red). For each shelf an index is calculated by dividing the length of the shelf that can be reached by the entire length of the shelf.



8.



9.

Figure 8 - Reachability case study 1

Figure 9 - Graphical representation of visibility of M50 from 1,5 m.

4.2. Case study 2

The second display unit mainly differs from the previous one for the presence of doors and frames that create a barrier for the customers. This motivates the simulation for reachability on a horizontal plane.

Figure 10 shows the result obtained for the 1th shelf and M95, green cells means no contact and optimal reachability, yellow cells means proximity to structure of display unit, red cells identify contact with structure and grey cells are not reachable. So, for instance, the cell in row 7 and column 2 tells the designer that the head of the customer is close to the door; the cell in row 2 and column 14 highlight a collision between the arm and the frame. Figure 101 shows a compact graphical representation of contacts for M50 and a low temperature display unit, this representation give evidence to those area that are easily reachable, to those that are reachable but there is a contact between human and structure and those that are not reachable.

Due to the presence of door frame also horizontal visibility is a key parameter to be assessed. Figure 12 shows a graphical representation of visibility of a low temperature display unit with the door open. In this configuration the customer is rotated of 30° toward the open door as this is the most recurrent posture. Colors are used to discriminate different portion of the shelf. The visible portion of the shelf plane insi-

Figure 11 - Compact graphical representation of reachability for M50 using Epta Elephant.

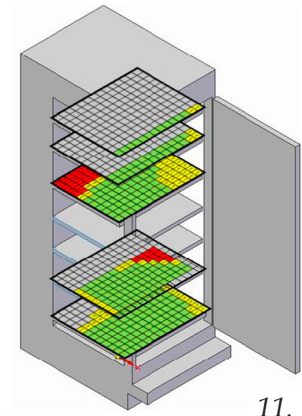


Figure 13 shows the same kind of analysis where the door has been closed and distance of the customer increased up to 1 m.

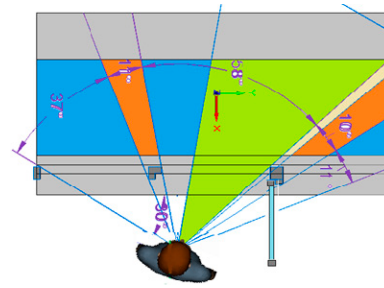
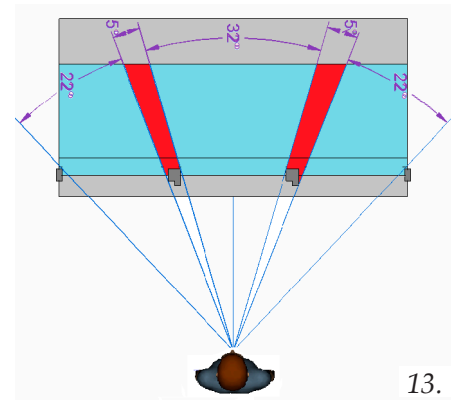


Figure 13 - Top view of visibility analysis from 1 m distance.



DHM can be fruitfully adopted to assess product visibility and accessibility. The shown application highlights an effective way to provide results to technicians in charge of designing the product. In particular, this application suggested several triggers for the re-design of display unit architecture in order to guarantee a better buying experience. This method permit to create a map of possible area where contact happened, identify which are the most probable body parts that could come in contact and with which elements of the structure and, in an indirect way, to evaluate accessibility. Combining results from different human sizes and different postures highlight major problems. A sharp representation of results easily suggests solutions also about design of components as, for example, the doors layout. There are still some issues due to the manual positioning of the human that requires some experience in using the tool to assure a correct result. The results obtained with visibility analysis in case study 1 has been used at the company as guidelines for light positioning to augment visibility and reducing also energy consumption. Visibility analysis on case study 2 has never been conducted on precedent works and represents a novelty since it gives the possibility to the designer to understand which parameters of frame layout can easily and quickly increase or decrease visibility.

The method proposed relies on the use of DHM and a parametric CAD system to extend the capability of analyzing visibility and accessibility of products that imply human interaction both in industrial and commercial environment, obtaining both

a numerical and a graphical representation of results. The method presented not only integrates the traditional use of DHM but permit at the same time to modify geometry of products and environment configuration in order to test many different product variants and obtain in real time important results. Another characteristic is that the results give a graphical indication that fit directly on the products considered putting a strong evidence on possible weakness. In the particular case of display units this work had the aim to analyze step by step the buying experience and for each phase it individuates the proper test to highlight specific aspects. The results of this work permit us to assert that Digital Human Modeling combined with CAD systems are an appropriate tools to evaluate ergonomics of products in the case studies considered of two existing display units and that could be used also to other products design in the early stages of design process itself for an earlier identification of issue. The combined analysis of reachability and visibility together with a graphical representation of results provide the designers with a simple and powerful approach to ergonomic design.

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Narrative Design Objects. Towards a multidimensional society valorizing the “heritage”. “Sealing on a dressbone” project.

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*Thematic line chosen :
Product design*

Abstract

In the actual globalized context in which the cross-fertilization among disciplines and different fields of project mixes together forms, systems and processes, cultural identities can make the difference in the production and in the consumption of the products. “Sealing on a DressBone” is a project developed as a thesis in Fashion Design at Politecnico di Milano. It consists in an experimentation of different knitwear techniques and natural yarns leading to the construction of a garment with the purpose of enhance the tradition of the “Italian tradition know-how”

The starting point has been Ernest Hemingway’s novel of 1952, “The Old Man and the Sea”; the author, tells us about an old unlucky fisherman named Santiago that one night takes off alone for the open sea on his sailing boat, looking for fortune. But Santiago at the end of the story approaches the pier just with a fishbone. This element is the center of Hemingway’s story, and it becomes the winning-defeat symbol of life: this idea leads to the Concept of the project and to the research of the stitches that have been used. In order to find a balance between the “handmade” parts and the “industrialized” ones, the garment has been made both with crochet and with a Brother knitting machine.

For the “handmade” parts, two wood instruments called “forcelle”, made of a central base piece and of two shafts around whom the works develops, were assembled. The result is a series of knots and loops that recall the image of a fishbone. For the machine parts it was created a stitch that could give the same idea using the holding cams.

The main construction of the garment comes from the sailing boats. Looking at the history of navigation and at different types of sails, such as the squared, the gaff and the lateen ones, various modules shaped as them were developed.

Combining them on an ideal woman’s body, gradually the pattern of the dress was decided. The loops of the handmade parts have been joint together in order to recall the shapes of the sails and also the ancient method of interlocking the nooses of the ropes used to stop the sails at the mast and at the yards. In the final garment, there can be recognized different techniques and different modules.

The materials used are all natural. The machine parts have been made with pure boiled hemp and the handmade ones have been made in linen. The choice of this two kind of fibers is strictly related to the project, since those were the materials of which the fishermen’s ropes were made of.

The idea of the project can also be applied to other design fields. The same techniques and fibers could be used to create home furniture chairs, pillows and so on. The final result could be a line of products based on natural yarns and materials, that focus on an ethical philosophy underlining the importance of the environment in which we live.

The paper focuses on the territorial dimension of the project; more and more frequently we are currently seeing the return and a new discovery of traditional

techniques and manufacturing, which have re-appeared in the contemporary world with a new look and a new balance. As it is subject to changes in time, the set has to be interpreted as a variable heritage which should be preserved. Today the object of market and consumption is not only the simple possession of a specific product but it is the experience, the "story" that the customer can live inside the object, according to values of the manufacture that create add value to the existence.

Dress design in the contemporary scenario

Too often the study of dress and fashion has been undertaken with a simple iconic approach, limited to a purely aesthetic discourse between the creator and the user. In this way the analysis and consequent reading result in fashion appearing decontextualized from the mechanisms that induce its ideation, production, and consumption. The common concept of "fashion" is still centred on unrestrained consumption, beauty, luxury, elegance, and distinction: a sort of "magic world", considered by many to be ephemeral, in which "image" is the only fundamental element.

Fashion details today represent speech, a sort of continual "narration" between product and consumer. If it is true that from the 1960s onwards we no longer speak of Fashion in the singular but of Fashions in the plural and since the 80s we no longer speak of style but of styles, always in the plural, then today we can talk about the "style details" that each brand has gradually built up. Fashion products, at least designer products, are today characterized by the ability to express content of a "cultural" kind: this has gradually become the constant characterizing element. Objects become icons that testify each culture's origin; design becomes a necessary interface between tradition and modernity. The role of design to become an engine for innovation through the reinterpretation of the local's cultures and crafts productions.

In the contemporary design scenarios knitting is a really fertile project area. Even if most of the people think about it as an old-fashioned hobby, reserved to old grannies making ugly jumpers, it's clear that today knitting is a very interesting challenge from a designer point of view.

Knit design involves many aspects and allows intervention and experimentation in every part of the production chain. It's a complex project that matches an ancient know-how with design experimentation and technological innovation. Objects become icons that testify each culture's origin. Their power is conveyed through memory. Indeed, its narrative can combine archetypical images and future suggestions within a fascinating present. This new paradigm provokes new experiences and interdisciplinary encounters, like between architecture and medicine, or between fashion and crafts.

Inspiration and methodology for the project

In the contemporary scenery of a globized society where products are easily reachable and cultures cross one other tearing down limits and boundary, there is the need of a new dimension of the product. A product that highlights the past linking it with the future and underlines the importance of the territory-know-how. The project, "Sealing on a Dressbone" is a thesis in Fashion Design at Politecnico di Milano, inspired by Ernest's Hemingway's novel "The Old Man and the Sea" [1]. The main character, Santiago, is an unlucky fisherman that after two days of fight in the open sea with a Marlin approaches the pier just with a fishbone. This is the key-point of the book and the Concept of the project. The research focuses on the idea of experimenting a traditional hand-made knitwear technique with a modern industrialized one, taking something from the old tradition and giving it a new interpretation. Among the many crochet techniques, it was chosen the "forcella" (hairpin crochet), because it allows to obtain a knitwear fabric with a structure similar to a fishbone. Since the inspiration came from a nautical field, the history of the sailboats was inspected, studying their shapes and their scope and the details of the way of securing them to the boat. The single modules of which the dress is made of are inspired by them. Since the sails and the ropes were made of linen and hemp, those are the material that have been chosen for the project. For the construction of the garment's

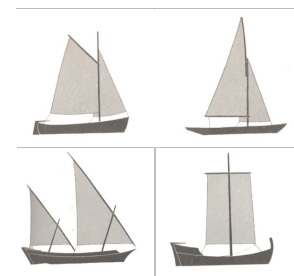


Fig 1. Mainsail, Portuguese sail, Squared and Lateen sail. Retouched illustration of the book "L'artnavale" [2], page 99.



Fig 2. The two forcelle, one with straight shafts and the other with oblique ones, a crochet and a ball of linen yarn.

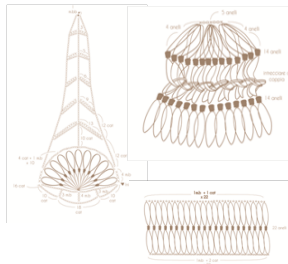


Fig 3. Technical flat of the different method: circular, straight and triangular.

pattern, there were taken into consideration the different types of sails presents in the nautical history such as mainsail, Portuguese sail, squared and lateen used to create the modules that combined through different techniques create the model of the dress (Fig 1).

Those were put together with different methods: crochet, linker and hand sewing. Some modules were developed by hand and the others were knitted on the machine. In both cases, the main purpose was to recall the fishbone and the shapes of the sails. The "handmade" pieces were made with three different methods using a crochet and two "forcella"[3], two instruments made of a central base piece and of two shafts around whom the works develops. These tools were specifically realized for this project, they were made out of wood to underline the idea of natural material. The first forcella has straight shafts while the second one has oblique ones (Fig 2).

When working the yarn with a crochet around the forcelle, the result is a series of central knots from which some loops develop, those have then been worked in three different ways: circular, straight and triangular (Fig 3).

The triangular modules have been assembled by wedging in the loops trough each other, a technique similar to the the ancient method of interlocking the nooses of the ropes when stopping the sails at the mast and at the yards (Fig 4).

In the second part of the project a new stitch, similar to the ones made by hand was created with a Brother knitting machine. This is an instrument, provided with a carriage that brings the yarn from one side to the other of the main board, making the needles move and creating the fabric. For the new stitch the technique used is called "holding cambs" where a button of the carriage is pushed in order to leave some needles out of work (Fig 5).

Along with these parts a simple jersey stitch for the central part of the garment was used. The materials used are all natural. The machine parts have been made with pure boiled hemp and the handmade ones have been made in linen. Hemp and Linen are two of the most ancient material ever used in the textile field. Egyptian used linen to sew their tunic, since it was natural, tough, fresh and a wide quantity was growing along the Nile's shores.

Hemp was widely used in Italy to create fabrics; its bigger diffusion was during the Maritime Republics when it was used to make ropes and sails. In 1975, with the prohibition of the Indian hemp "Cannabis Indica", the plantation was abandoned and just the last decade, thanks to an European law¹, the industrialization of the fiber was reintroduced.

1. The actual reference legislations are the Council Regulation n.1234 of 2007 that came after the Regulation n.1673 of 2000 about the reorganization of common agricultural markets; the Council Regulation n.73 of 2009; the Commissions Regulation n.1122. For Italy the law about the sustainof the plan

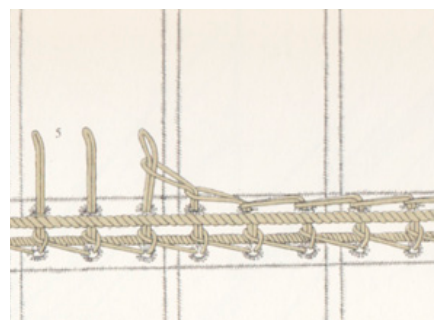
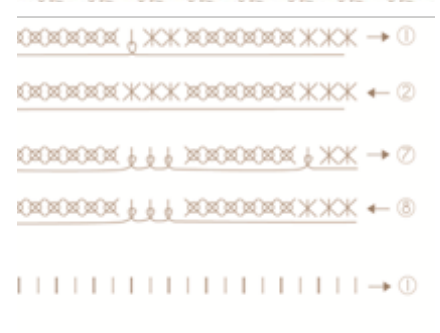
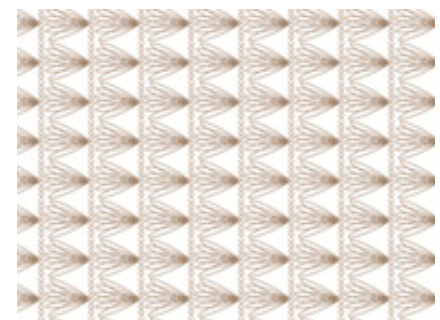


Fig 4. An illustration taken from the book "L'artenavale" and a sample of the result obtained with the forcella inspired by it, page 120.



Fig 5. Technical pattern and explanation of the machine pieces.



This pause in its production had a big impact in the textile and fashion system and just lately hemp is taking back its role as one of the most important natural fiber.

The choice of these materials is strictly related to the project because those were the materials of which the fishermen's ropes were made of and on the other hand it follows the idea of enhancing traditional elements.

Results

Once all the modules have been created and assembled, the result was an elegant light dress where both the handmade and the machine pieces were put together in harmony. A balance between the different types of procedures and the two different yarns. In total there were 9 handmade modules and 8 made with the machine. Even though the materials are known as rough and stiff, thanks to the industrial process applied to them during the production chain and due to the knitwear techniques used, they appeared smooth and incredibly soft. Because the section of the linen of the crocheted parts is wider of the section of the hemp, the handmade modules appear thicker than the machine modules that have a lighter and more delicate look. The harmony of the final product is given by the similarity between the pieces and by the shades of colors used. The garment is elegant and follows the body in its shapes, underlining some details of the figure such as the back that recalls a fishbone (Fig 6 and 7).



Fig 6 and 7. Final dress. Model: Emanuela Marino. Photo by Riccardo Natale.

Discussion

The paper focuses on the interpretation of traditional manufacturing and their bond with the territory; it looks at our heritage, using it as a starting point for new experimentation linking the past with the future. The final product goes from being a simple object created for the final customer to a product that tells a story made of traditions, values and emotions.

The idea of the project can also be applied to other design fields. It places itself in a design trend that favours the application of natural material and elements, answering the need of an ethical and ecological product. In fact, the same approach could be applied to a whole line of home furniture like chairs, pillows and so on. The result will be a line of products based on natural yarns and materials that could go from clothes to interior design objects, that focus on an ethical philosophy underlining the importance of the environment in which we live.

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The effects of outdoor environmental design on children's wellbeing

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Abstract

The significant effect of different environmental settings on all groups of people's wellbeing, emotional life and behaviours has been documented by researchers [1,2]. In the recent years, more attention has been given to studying the influences of outdoor spaces on children [3]. While Unicef believes that a good foundation of basic development in the early years will make difference through adulthood and develop a better and more successful next generation, research shows that outdoor play can highly stimulate children's development experiences [4]. Some play environments are more supportive than others [5]. Children are said to be inheritably attracted to natural environments [6]. Woodlands, as an example, have been known as "relaxing" spaces among people [7]. Being outdoors in the nature doesn't only benefit the physical health but also benefits human's overall well-beings and mental health [8]. As Children spend a considerable part of their lives in schools and are constantly interacting with its physical environment, this paper focuses on this environment for research. This paper aims to compare children's wellbeing and levels of engagement when they are playing in two different outdoor play spaces.

One is a school playground which is facilitated with fixed play structures and play equipment, and the other is a woodland area which is covered in trees, bushes and other natural elements. The sample consists of 15 preschool children who are observed while playing in these environments. Their behaviours are scored based on the Self-evaluation Instrument for Care Settings (SICS) test which is a tool that focuses on two central indicators which are children's 'well-being' and 'involvement'.

The findings from this research show that most of the children were in higher levels of wellbeing and were more engaged in play when they were in the natural environment rather than the manufactured play setting. The author finally counts some of the specific characteristics of the natural environment that resulted to these findings and suggests that there should be more natural elements in designing school outdoor settings in order to improve children's wellbeing and involvement.

1. Introduction

Children nowadays do not have enough play opportunities at home due to the things they interact with, such as video games, computers, and television [9]. These facilities do not develop child's skills like the play that takes place in a school play environment [9]. A research by Perry [10] shows that an hour of "educational" television program doesn't give the same level of learning outcome that an hour of play does. Schools and nurseries are the most important places that children spend

long hours of their day learning in. According to Mirmoradiet al. [11] these are the child's most important and effective days of cognitive development, education and learning. Children spend a considerable part of their lives (around six hours a day and over one thousand hours a year) there and they are constantly interacting with its physical environment [12].

Traci A. Kopp [9] in her PhD thesis titled "Learning Through Play" argues play influences child's social, emotional, physical, cognitive development, and language development, and overall, children learn through play. The centrality of play to the lives of children has been elevated the basic needs of which includes other principles needs such as nutrition, health, shelter and education. James L. Hymes Jr. [13] child development specialists and author explains:

"Play for young children is not recreation activity... It is neither leisure-time activity nor escape activity.... Play is thinking time for young children. It is language time. Problem-solving time. It is memory time, planning time, investigating time. It is organization-of-ideas time, when the young child uses his mind, body, his social skills, and all his powers in response to the stimuli he has met."

There is a strong association between children's learning and their usage of outdoor environments [14]. Natural environments have positive impact on cognitive and psychological well-being. Research shows these environments benefit all groups of people such as prisoners, collage students, hospital patients and children, even if it is only the presence of a tree from a window [2]. In the recent years, there has been more attention given to studying the influences of outdoor spaces on children's education [3]. Children are inheritably attracted to natural environments as it provides them a space of diversity and timelessness ([15]. Schools' outdoor environment can support children to learn more of what they usually gain in their curricula indoors [16]. Outdoor play is said to stimulate children's development experiences highly [4]. These researches have led to more investigation about the relations between playground designs and children's play behaviours, either by studying the various play areas and what they provide for children, or by studying how children play in respond to different playground settings [17,18] The Association for Childhood Education International (ACEI) believes all children from various ages need to engage in play, especially in today's world where the children are experiencing pressure to improve in all various areas [19].

Thus, providing a sufficient playground spaces as the main area for children to engage in play is vital. These spaces, as mentioned in the literature, should support children's well-being and maximise their levels of engagement in play. Therefore, this research aims to compare children's wellbeing and involvement levels in two different outdoor play spaces.

There are different categorizations of playground types. Cosco[20] in her PhD thesis divides playground settings into manufactured playgrounds, natural playgrounds and mixed including both manufactured and natural elements. In this research, a woodland area is chosen to represent the natural environment and the nursery's playground which is equipped with a manufactured climbing frame and some play equipment is chosen.

2. Methodology

2.1 Case Study

The sample consists of 15 nursery aged children including 6 girls and 9 boys who are observed in two different outdoor environments. The first environment is their nursery playground. This area has a timber climbing frame in the centre. The climbing frame includes few steps at the start plus some ropes to climb up with. Then, it goes into an unstable pathway with ropes around it to hang onto, and then to a square wood stage with wooden walls and a circle plastic frame to look out from. The climbing frame ends with a slide on the other side (Fig. 1).



Fig 1. Nursery Playground; Timber Climbing Frame

The nursery has a canteen in one side of the playground which various play equipment are held in. these equipment include traffic games, bikes and some building blocks. For this research, different types of bikes and kid cars were chosen to facilitate children's play with.

The other outdoor setting which represented the natural environment as a space for children's playing is a small woodland area near the nursery. Greenery could be found in parks too, but unlike parks that are designed with clear paths, organised plantings in specific areas, benches and other facilities, woodlands are wild, low density forest-like areas. The woodland that the children were taken to was located few minutes from the nursery's building so it was accessible. Passing through a narrow path into the woodland, the children reached a wider area with no trees in the centre but covered with trees around it which made it a suitable area to gather all the children (fig 2).



Fig. 2, Children going into the woodland near their nursery.

2.2 Data Collection Method

In order to assess children's well-being and engagement in these two outdoor environment settings, The Leuven Well-being and Involvement scales was used [21]. This assessment test is designed under the supervision of Dr.Ferre Leaners by a team at the Research Centre of Experiential Education at Leaven University, Belgium.

This test assesses early year children's 'well-being' and 'involvement' in the activities they are engaged in. In this test, wellbeing refers to "feeling at ease, being spontaneous and free of emotional tensions and is crucial to good 'mental health'." and is associated with self-esteem, confidence and resilience. Involvement refers to "being intensely engaged in activities and is considered to be a necessary condition for deep level learning and development".

Children are observed while playing in each of these environments and their well-being and level of engagement is scored in a 5 point scale based on the bellow indicators (Table 1 and 2):

Level	Well-being	Signals
1	Extremely Low	The child clearly shows signs of discomfort such as crying or screaming. They may look dejected, sad, frightened or angry. The child does not respond to the environment, avoids contact and is withdrawn. The child may behave aggressively, hurting him/herself or others.
2	Low	The posture, facial expression and actions indicate that the child does not feel at ease. However, the signals are less explicit than under level 1 or the sense of discomfort is not expressed the whole time.
3	Moderate	The child has a neutral posture. Facial expression and posture show little or no emotion. There are no signs indicating sadness or pleasure, comfort or discomfort.
4	High	The child shows obvious signs of satisfaction (as listed under level 5). However, these signals are not constantly present with the same intensity.
5	Extremely High	The child looks happy and cheerful, smiles, cries out with pleasure. They may be lively and full of energy. Actions can be spontaneous and expressive. The child may talk to him/herself, play with sounds, hum, sing. The child appears relaxed and does not show any signs of stress or tension. He /she is open and accessible to the environment. The child expresses self-confidence and self-assurance.

Table 1, Well-being signs in five levels: <http://www.kindengezin.be/img/sics-ziko-manual.pdf>.

Level	Involvement	Signals
1	Extremely Low	Activity is simple, repetitive and passive. The child seems absent and displays no energy. They may stare into space or look around to see what others are doing.
2	Low	Frequently interrupted activity. The child will be engaged in the activity for some of the time they are observed, but there will be moments of non-activity when they will stare into space, or be distracted by what is going on around.
3	Moderate	Mainly continuous activity. The child is busy with the activity but at a fairly routine level and there are few signs of real involvement. They make some progress with what they are doing but don't show much energy and concentration and can be easily distracted.
4	High	Continuous activity with intense moments. The child' activity has intense moments and at all times they seem involved. They are not easily distracted.
5	Extremely High	The child shows continuous and intense activity revealing the greatest involvement. They are concentrated, creative, energetic and persistent throughout nearly all the observed period.

Table 2, Involvement signs in five levels: <http://www.kindengezin.be/img/sics-ziko-manual.pdf>

3. Results

3.1 Play Scenario with the Climbing Frame

Taking the children outside to play in the climbing frame playground, firstly they were pretty excited to play on the frame and so they were in a rush on getting on it. This caused some of children to start pushing the others to get on it first. In the first few times that they climbed up, they simply went up the stairs and the ropes and slide down the other side (fig. 3 and 4).



Fig 3 and 4, children excited on the climbing frame

However, after repeating the same process for few times, some of them tried to climb the frame in different ways. They tried hanging on the ropes, bending down and twisting around while getting up. They also started jumping up and down on the unstable path and the timber stage at the end to make the playing more fun. Also, some of them thought of different ways to slide down the slide such as coming with hands, sliding down on their tummy, bending their legs while sliding or even hanging from the slide by holding their hands to the top of the slide (Fig 5, 6 and 7).

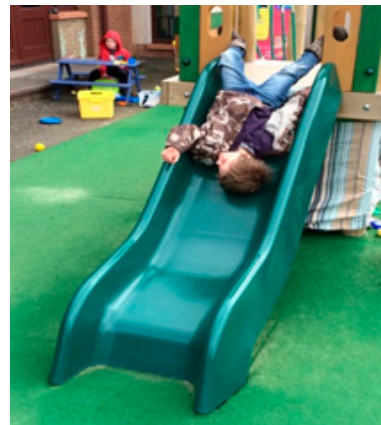


Fig 5, 6 and 7, children trying different ways to slide

After only few minutes, some of the children seemed to get tiered of doing the same sort of activity over and over again. Unlike the beginning of the observation session that they were pushing each other to climb up first or forcing the person in front to go down the slide faster, many of them didn't even seem to enjoy playing on the structure any longer. There was no longer a long row or children waiting to get on the frame. Instead, some of them started walking away and joined the other children who were riding bikes and cars (Fig 8).



Fig 8, Children riding bikes and playing with play equipment in their playground

Accordingly, the results of the wellbeing and engagement levels in the manufactured playground is as followed(table 3):

Child number	Well-being	Involvement
1	4	4
2	2	3
3	3	4
4	3	4
5	4	3
6	1	2
7	4	3
8	1	3
9	4	4
10	3	2
11	3	4
12	3	4
13	4	4
14	2	3
15	2	4
16	4	4
TOTAL AVERAGE	2.93	3.43

Table 3, Children's well-being and engagement scores in the manufactured playground.

3.2 Play Scenario in the Woodlands

In the woodland session, the teacher brought some materials to the woodland such as some strings, ropes, plastic containers, water and other items that could facilitate children to play. In the first stage, the teacher read a story to the children about a "stick-man family". This gave them the idea to make stick mans in the nature, but they were allowed to do any sort of play that they wanted. When they were free, some of them started making a stick man family straight away. They used the clay for the head and the sticks that they found in the nature for the body.



Fig 9, 10 and 11, Children engaged in making stick man and creatures with clay and other materials in the woodland.

A stick-woman was made by one of the children by putting a little feather on the head as her hat that was found on the ground (fig 9, 10, 11). They engaged in playing with the stick-family and pretended they were going for holidays or talking to each other. One of them made an imaginary house on a tree bulk; a horizontal branch was the living room, another part was the room, and a hole in the tree was their kitchen. She used snail shells as pots and cups and planned an evening tea for the family



Fig 12 and 13, children using sticks and water to make things

Another child mixed more water in clay to use it as paint and draw things on the bulks. Some children started picking sticks from the ground and making signs and arrows to show paths in the woodland.

Another group of children preferred physical activities. They used the hilly parts to run over and jump from, or the dead bulks to climb on and jump over. These bulks were even used as seats by the children when they were having their snacks. Some of the children also got highly engaged in investigating in the nature. They used



Fig 14 and 15, children searching for creatures



Fig 16, child digging the ground for treasure. Fig 17, child playing on the rope.

magnifying glasses to look into the soil or bulks to find interesting things, used the pots to catch creatures and worms (Fig. 14 and 15). One of them found a bee stock in a fallen tree root and tried to save it. Some others started digging the soil looking for treasures and pretending they are finding bones while others were collecting wood chunks to experiment the various textures in the nature (Fig 16). The teachers also tied two ropes to two tree bulks horizontally so the children could hold hands on one and walk on the other (Fig 17).

Some of the children enjoyed doing that a few times, but then went back to explore the nature again. Accordingly, children's wellbeing and engagement scores were as followed (table 4):

Child number	Well-being	Involvement
1	4	4
2	4	4
3	4	4
4	4	3
5	5	5
6	4	5
7	5	4
8	3	4
9	4	5
10	4	4
11	4	4
12	4	5
13	5	4
14	5	5
15	3	5
16	4	5
TOTAL AVERAGE	4.12	4.37

Table 4, Children's well-being and engagement scores in the manufactured playground.

4. Discussions and conclusions

Observing the children in the two different settings and scoring their wellbeing and engagement levels, it is clear that the children were in higher levels of both involvement and well-being in the woodlands compared to the manufactured playground. In fact, children scored an overall well-being level of 4.12 in the woodland as a natural environment while this score was only 2.93 which is below moderate when they were playing in their nursery playground with manufactured play elements. Also, their level of engagement in the manufactured play space was less than when they were in the nature, being 3.43 compared to 4.37. From the engagement score of 3.43 in the playground, we understand that children may get in some levels of involvement playing with fixed and manufactured play settings, but their well-being is below moderate and they don't seem very happy as a result. On one hand, in the nursery playground, the children seemed to get bored playing on the climbing frame after a short time as it was not much engaging and motivating after a while.

This seemed to be because they only had the option to repeat the same thing all the time. Also, the play merely involved physical activities. In other words, the children weren't engaged in any thinking processes or happiness so it wasn't that much supportive to children's well-being either. Their activities weren't continuous and many of them kept shifting from one activity to another. In some of the children's faces you could see frustration which was due to having to wait for others to slide down, or feeling bored or the repetition. In some cases there were also arguments going on.

On the other hand, as seen in the involvement score of 4.37 and well-being score of 4.12, in the time period that the children were in the woodland, every one of them was busy doing something in the nature, either with friends or on their own. Most of them were highly engaged and seemed concentrated and energetic in the activities they were involved in. Their activities were continuous most of the times and they developed the game they were playing. They were inspired by the diversity of things they could engage in by being in the nature and none of them seemed to be bored or even wanting to leave the area. Most of them seemed to be quite happy and confident in whatever they were doing, either if they were involved in group activities of playing individually.

The findings from this paper suggest children's playground designers to provide more natural features in designing these spaces. Natural settings and materials not only attract children's involvement more, but also support them to experience higher levels of well-being through play.

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Communication

Multimedia

Communication Design for landscape identity

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Keywords: Communication Design, Place Identity, Landscape, Communicative Access, Aesthetic Experience, Perception, Communication Formats

Abstract

Nowadays we can observe two strong transformations that involve many territorial realities and the peoples who live and/or visit them. On the one hand, inhabitants progressively lose the sense of belonging to places, this because territories are organisms even more dynamic and so their identity constantly changes. On the other hand, tourism industry is registering a deep change in tourism demand, especially if we consider the phenomenon of cultural tourism. This specific sector reveals an increased interest of travellers towards less popular destinations in search of authentic experiences that involve at the same time natural, social and cultural aspects of a place.

Thus, in this scenario the traditional model of tourism promotion needs to change and communication design expertise could support the search of new communication paradigms.

The direction suggested in this paper regards the topic of the 'communicative access', which is here considered as a design tool able to support people in decoding the urban space – that means to make its past, present and future identities clear. From this perspective, communication design becomes the common ground where functional information and different typologies of in-depth contents can meet.

The suggested design approach is aimed at developing communication formats and tools through which give back meaning to places by providing different and unconventional points of view. Thus, the design effort relies mainly both on contents and expressive languages, in search of new interlinks between storytelling and physical spaces.

An overview on place identity

«There seems to be widespread misconceptions about what visual designers think they are doing within design commissions that focussed on the representation of identity of institutions, services and products. Designers of today speak of 'doing the identity of ...', or they 'developed the corporate identity for...'. This is a claim of a task that is even hilarious as fairly impossible». [...] «Visual design doesn't create identity in direct sense. It concerns the visual representation of certain concepts and appeals to collective meaning (memoria) that in its turn facilitates the identification processes of groups and individuals» (Evert Ypma, 2010) with the place where they live.

Identity is the unity of a subject that resists even if its attributes change. It concerns relationships, not the form, and lies in the collective memory of people who experience the place. Collective memory can be described in turn as a common structure of memories, shared by the people who belongs to the same community.

We can discover the identity of a place watching it through its inhabitants viewpoints. From this perspective identity of places is strictly connected to the concept of “home”: the place that reflects the identity path of those who live there and stores all the objects that represent their transactions, interactions, identifications, etc. Till few decades ago, the physical dimension of the inhabited space was consistent to the community of belonging whereas today the way of living is deeply changed causing a consequent transformation in what we consider “home”.

So, currently the identity is built in a completely different way from the past: we have lost the elements that force an individual to identify himself with codified models of a specific community within a given place.

The value of communication design

We assert that communication design expertise and tools are fundamental to make sense of territories, especially in the case of those areas that seem less attractive or popular. Communication design main task consists of launching an “aesthetic change”, that means driving the audience in an exploration able to produce a different perception of places – a perception which arises from both the movement in the space and the perceptual immersion in multimedia contents. We are talking about an aesthetics based on the concept of naive perception – or “first impression” (Griffero, 2010) – which derives from learning. Thus, communication design firstly has to figure out the actual reality of a place and then support the audience in understanding its social, cultural and historical aspects. In this sense travel becomes an exploration aimed to find emotion, not necessarily related to memories but rather by transformations.

To this aim the act of contemplating or observing landscape could work as an hinge between cultures and identities. The design outcome arises from these considerations and tends at the development of a strategic communication aimed to promote traditions, goods and cultural assets by mean of an “aesthetic experience/exploration” of place, landscape and urban environment. In other words, the final goal is to relink identity, culture and territory.

Let's think to the landscape of the European suburbs. It is made by many fragments of identity (layered and not always visible) of which often remain only “traces” or “minimal signs”. The concentration of these traces in the environment helps to understand facts, stories and events of the place's past.

From this perspective, the “place of living” becomes even more similar to the concept of “landscape” as it is defined by the Council of Europe in the article 1 of the European Landscape Convention, that is «an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors» (Council of Europe, 2000, p. 9). So conceived Landscape is the combination of tangible and intangible heritage and then it can be seen as a sort of communicative act. We assert that to give new value to the cultural capital of places (both tangible and intangible) first of all we must make it accessible and visible. In other words, we have to decode the ‘landscape’ and translate it into a narrative. The challenge for communication design consists in finding new paradigms to develop a representation made by elements that are frequently difficult to represent (what we previously define the “minimal signs” of a place), which becomes synonymous of ‘identity’.

We assume that representing the coexistent identities of a place is a theoretical operation before than an aesthetic one. It needs an hard “work of editing” because to make the “emotional landscape” accessible we have to translate contents using different languages and forms of writing that must be keep together on a single basis, for example a cartographic one.

Communication design becomes a “tool of translation” that acts on the levels of “depiction” (within the domain of representation) and “transfiguration” (within the domain of expression). Both of these communication levels concern images. The first provides information about the perceived external reality, whereas the second offers information on the internal reality which arises from feelings, culture and personal impressions about the world (Calabi, 2013).

The phenomenology of communication is not de facto expressed only by the

content transmitted but also (and especially) by what happens “with” the audience. Communication design is the main actor within this double interaction because the representation and expression processes need the ability to develop clear perceptual synthesis which provides an envolving experience.

The suggested solution is focused on the ‘communicative access’, that is concerned not only in functional terms but also as the ground for practices of communication synthesis aimed at the development of design formats and tools for the communicative interfacing with places. Thus, the design effort regards content and languages, in search of new interlinks between storytelling and physical spaces. The main purpose is a ‘re-semanticization’ aimed to enhance and stimulate the experience of places.

It is argued that to represent the identity of landscape the communication design process starts from an esthetic action - the collection, interpretation and the further representation of its different ‘traces’ - and then it proceeds with the poietic process. The traces gathered and then “translated” or decoded, must be represented each time through specific modalities in order to produce relevant and clear contents that truly represent the place and its identity.

To this aim we can exploit the potential of digital technologies which allows us to design experimental formats and develop new methods to represent the place, holding together different texts. The development of communication formats that involve specific contents and storytelling models enables us to produce an ‘augmented’ and immersive perception of the reality of places.

Communicative access

The modern urban environment is involved in social and physical transformations that determine strong mutations in the landscapes. Nowadays, these transformations happen very quickly so it’s even more difficult for people to accept and understand the changes: on the one hand, memory needs continuity and a periodical revival. On the other hand, changes need the development of new attitudes in order to deal with the evolution of complexity. In those places where the sense of belonging starts to vanish, we can observe a progressive refusal by their inhabitants and therefore a consequent degradation of spaces that will be perceived as unfamiliar. In this scenario, the main aim of a design action should be strengthening the identity and the sense of belonging to places.

According to Scaramellini (2012), the decay of the territorial assets and the loss of what is generally considered as “identity of territories” strat with “...the deterioration of existing territorial assets and their subsequent re-composition according with the operational needs and organization models of new economic, social, cultural, urban realities...”

In this context, it is essential to communicate and than make accessible the cultural identities which have shaped the place over time.

If Landscape will be presented through its deep characters, it can meet the need to get in touch with natural, cultural and social aspects of a place which is expressed by both locals and tourists.

Communication design process allows to re-think the way in which we promote territories, from content to formats passing by expressive languages. The development of relevant communication codes can help to deal with the fragmentation and loss of landscape semantics. Thus, communication design can enhance the “aesthetic experience” of the landscape which is considered as a perceptual phenomenon (D’Angelo, 2003).

This issue is related to the “aesthetics of relations” that is a matter of design. The design task is to provide the necessary guidelines to rebuild the set of identities, as far as making visible what is invisible: memory and future.

Communicative access is the research topic of “DXCT: Design for Communication of the Territory”, a research group of the Department of Design at the Politecnico di Milano. The group’s work is focused on the development of formats and tools for cross-media digital publishing. Its research arises from the need to share different typology of documents, which together represent the heritage of memories

of a territory. The main output of the research consists in the development of design communication formats aimed to create a relationship between places, tourists and inhabitants, from different point of view.

Those formats developed for the project of Atlas and tourist guide systems have to satisfy two specific function. On the one hand, they have a “predictive function” therefore they’re aimed to provide an overview of the territory before being there. On the other hand, they have also to guide people on site, satisfying both “informative and directive function” (Giannitrapani, 2010). To this aim, the communication formats we design specifically for web have a map-based interface.

The map is a famous and ancient tool for the communication of a place. The map shows the physical and morphological aspects of an area (zones and institutional boundaries, geographic elements) and is also an instrument for presenting various aspects of a place and of people who lives it. Maps are between representation of spaces and the creation of new ones. We might mention the famous and historical examples of the Situations International - e.g. Debord, *The Naked City* -, examples of “emotional cartography” maps - e.g. Emotional maps of Christian Nold -, datascares - e.g. the maps of SENSEable City Laboratory, Massachusetts Institute of Technology -, sound maps, “multi-layers maps” - e.g. HyperCities (HyperCities, 2009) - and, of course, map-based services as Google Maps and Google Earth. As a first and basic access to territory, the map provides paths on rural or urban areas.

The role of Communication Design is to keep together different multimedia contents. It works as a sophisticated system of interconnected documents and services, and for this reason it can be defined as a “devices” (Agamben, 2006) that allows the “communicative access” to a wider audience. It allows to share content conveyed by means of different media and different languages (audio and video, digital and traditional), connecting them.

The traces of place identity are made by intangible memories, text, video, audio, legends or oral traditions, which are all “footprints” left in the urban space by removed objects.

Obviously there are also more traditional documents about the history of place, which together with traces tell the intangible and tangible memories of the place.

It is clear that there are a lot of historical content about Mediterranean cities which can be collected, described and made visible; what we need are communication formats developed to represent both traces and documents in a coherent way.

The design process is a creative process able to create narratives: the fil rouge through which understand all the elements of place identity.

A Casa study: the Lomellina

Communication Design deals with the design and development of new communication systems and experimental projects in order to make accessible different levels of information by different media, and also to create new modalities of content’s fruition.

An example of application of the research concerning the ‘communicative access’ is a project we are working on, which aims at the communication and valorization of the Lomellina, a rural area near Milan (Italy). It mainly consists in developing immersive communication formats for the promotion of the area.

As Lomellina is a wide and non-touristic area, the ‘communicative access’ has been even more effective. The analysis of the promotional material concerning the place revealed a lack of content able to stimulate the traditional tourist demand, in other word, not attractive to the mass tourism. For this reason, working on minimal traces has been essential. Thus, we started identifying the hidden identities, in order to make them recognizable and visible.

The analysis also revealed that the current communication strategies for the promotion of the sample area, concern almost entirely the traditional publishing production. Currently, are available many travel guides for visiting the area but per sé are not enough to communicate areas poor of strong symbolic relevances because transmit contents in a little memorable way.

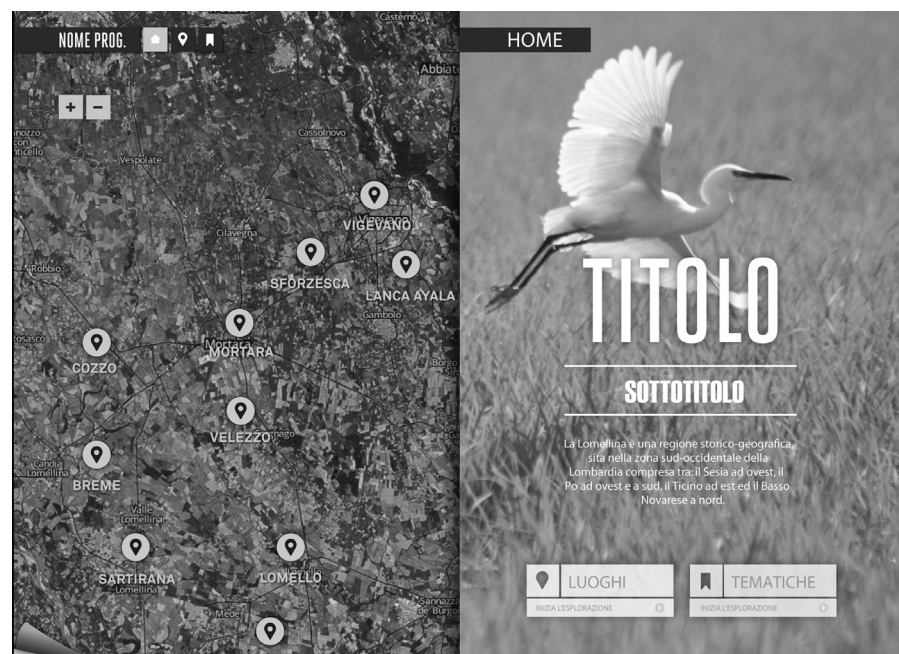
Different design strategies have been experimented in order to make contents “sensible to the places”, to (virtually) localize and anchor them in the environment.

The research result has validated our approach in designing the experience of place and multimedia contents.

The interface is composed by two parts containing two different structural elements of the represented 'space': a map (left side) and several communication formats for the in-depth multimedia contents (in a sidebar on the right). These two elements are parallel narratives, and the user can easily shift from one to the other resulting in a fluent exploration despite the huge amount of information available.

It is argued that the communication design for landscape identity must start from an esthetic process - the collection and interpretation of the different 'traces' - and then proceed with the poietic process, in order to create relevant and understandable contents that truly represent the place and its identity.

Thus, a communicative space of convergence was designed, in which texts, audios, static and kinetic images are mixed. It was a work mainly related to content and languages, searching for new connections between storytelling and physical spaces. In this sense the territory becomes a medium that proposes itself as a cartographic representation but also as a perceived and experienced space.



Conclusion

The deeper identity of a place, the "genius loci" (Norberg Schulz, 2000), is connected to many connotative traits. Those traits often are represented in various documents (text, images, videos, stories, etc.). These documents, as level of information, are able to give different perspectives and impressions, and describing the place through traces and fragments and memories (Abrams & Hall, 2006). We intend as memories both the historic documents both the Intangible Cultural Heritage as defined by UNESCO (traditions or living expressions inherited from our ancestors and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional crafts) (UNESCO, 2003). In fact, if the visitors or citizens consult only the basic information (e.g. historical, tourist, culinary etc.) related to the places explored, a first contact with an unknown urban area often offers only an exterior and superficial point of view.

The intimate character of the area can only be investigated with a keen sense of observation and listening skills. In this scenario, communication design has to develop instruments, which allow the representation of different layers of the place identity, and the interaction modalities more suitable for citizen and travelers needs.

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Environmental and Visual Language: Designing Ludic Spaces

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Abstract

This paper discusses the assumptions for the design of playful spaces, based on theurban design theories, visual literacy and the concept of “ludic”. In addition, the case study of a playful space located on the outskirts of the city of São Paulo is presented, aiming to reflect upon the ludic characteristics of both environmental structure and visual language, specially considering educational and cultural aspects as well. The analysis indicates not only the importance of motor and sensory stimulation offered by such ludic spaces, but also their ability to provoke emotion and the child’s imagination, encouraging its creativity. Moreover, the ludic space stimulates the interaction with both other children and adults, through pleasurable challenges and “only pretending” narratives

Introduction

My interest in the visual language of ludic spaces derives from my professional activity, which was strongly related to children space design. During the creative process for these spaces, I soon realized how important it was to know the children better, to investigate their growth and their needs, as well as the specific traces of the spaces they used, particularly concerning the connection between entertainment and education.

From the various spaces in cities dedicated to children (schools, science and technology centres, playgrounds, fairgrounds etc.), only a few of them are actually built on contemporary and inventive ideas. Their visual identity is also an important aspect to be considered here, as it must transmit the institution’s ideals and proposals (be it educational or not), not just work as a mere wrap-up for the building. In the case of schools, more specifically, they often seek a language that can simultaneously improve their visibility and communication and be stimulating and familiar to children itself. Of course, this includes not just the visual aspects but also the whole amount of sensory, emotional, cultural and social stimuli surrounding children.

That being said, the present paper presents the theoretical and methodological principles used in my doctoral thesis – Ludic Architecture: children, design and language (MAZZILLI, 2003) – to discuss a particular ludic space: Sesc’s Ludic Park (Parque Lúdico do Sesc). It was conceived between the 1990’s and the 2000’s as a complex of ludic spaces located in peripheral boroughs such as Interlagos and Itaquera (south and east São Paulo, respectively), where children from zero to twelve years old could play. The idea was to reinvent the traditional playground structures by introducing the concept of “ludic installation”, an interactive structure that associates both educational and leisure aspects to the equipment’s design and materials. Unlike

a school, whose obligation is to offer a qualified play that stimulates learning, these ludic facilities are only concerned about the playing itself. Its purpose is to instigate curiosity and create imaginary and sensory situations that can be freely explored by children.

Children, space and play

When we talk about a set composed of a physical space, objects, actions, people and nature, we are talking about an environment. In the book *The city and the child* (*A cidade e a criança*), Mayumi Lima (1989, p. 30) discusses the spaces experienced by children in different São Paulo's locations and suggests the combined form "space-environment":

The physical space as an isolated place only exists in the adult's minds in order to measure it, to sell it, to keep it. In the children's minds, however, what exists is the "joy space", the "fear space", the "protection space", the "mystery space", the "discovery space", in other words, spaces of freedom or oppression. The material/concrete/physical space is simply a support for objects, people and nature to build a relation between themselves, thus qualifying the space and assigning it the condition of an environment¹.

Children first sense the spaces around them in the early relations they establish with their surroundings: crawling, walking, grabbing, making a gesture, a movement or taking an action. The many materials and shapes they experiment, as well as the relations with other children or adults, help them build bit by bit their own knowledge about the space-environment. This is a sensory, ludic, symbolic and relational space, and as so, it represents an imperative factor in children's personality (Navir, 1994).

Jean Piaget (1990) is another important author in this field, bringing the constructivist theory of knowing to the discussion. According to him, children are constantly building their knowledge of the spaces as they interact with other people and other objects. Assimilation and accommodation are both concepts he uses to explain the continuous and symbolic relation between playing and learning. "Assimilation" refers to the children's ability to examine and then incorporate the material provided by the environment to her own way of thinking about the world. Accommodation, in the other hand, is related to how children's perception can be transformed by the environment's stimuli.

Studying the environmental perception and cognition, Rapoport (1978) observes there is an ideal range of stimuli to be received from the environment. Neither the excess nor the scarcity are good in this situation, as both of them invalidate stimuli assimilation by the sensory system. At the same time people want to understand rationally their environment, they also wish to notice its sensory abundance. The author points out that complexity is constituted by the play between the cognitive and its overcome. When an environment's perception is too explicit, it does not draw interest to itself; as its explicitness decreases, the complexity soon takes place. But then again, if the environment gets excessively complex and creates many stimuli, it becomes unwanted.

Lynch (1980) also contributes to think about the subject as he links image formation with the cognitive process of visibility or legibility, which determines how easily the environment parts can be recognized and organized in a coherent structure. It involves, for instance, continuity, identifiable parts, good orientation, easiness of movement, singularity, simplicity of forms, visual range, conscious movement, names and meanings. Accordingly, complexity becomes necessary in order to renew information and keep people's interest and curiosity alive; thanks to it, there can be mystery, surprise, symbolism, multiple meanings, visual abundance, varied elements such as textures, shapes and weights, multisensory perceptions, news, incongruence and temporal variety. Thus, legibility and complexity are complementary aspects of the environment perception, revealing themselves as essential tools to discuss ludic spaces.

The cultural dimension is another crucial aspect when talking about the ludic environment. Under a sociologic and anthropologic point of view, Brougère (2002, p. 30) writes about a ludic culture production as "a set of rules and meanings specific

1. Freetranslation

to the play that the player acquires and dominates in the context of the play" (2002, p. 23). In other words, it involves a certain amount of schemes that make it possible to start a game and create different realities from the ones we see in our everyday lives, in which players can gather around structures based on fashion, children's interest and the environment's culture. There is also an adult ludic culture inserted into the children's culture that can be found within books, movies and child's play. Of course, this does not mean the adult is the only one to create the ludic culture, as children themselves react to the environment's stimuli and add their perceptions. The two of them together establish a rich and complex culture that can produce a new range of meanings.

Keeping this in mind, Brougère's thoughts help us understand how visual manifestations take place in the children's universe, especially when we consider media's constant influence on children (such as with toys and television). The idea of a ludic culture leads us, therefore, to a ludic visual culture associated with distinct visual values that vary according to each society. That is how we can investigate the ludic visual language applied to children space considering both the creative process and the space's execution and use. It is the designer's ludic visual culture combined with the client's and the children's culture that will create new visual meanings to the space, the environment and its objects.

In the case of Sesc's Ludic Park, Erivelto Garcia is the one to discuss the concepts of ludic space and interactive structures. He observes that the term "interactivity" was widely used by the informatics to describe a specific play condition in which user and system establish a dialog and interact with each other. That is what happens with the last generation videogames, which lead players to different endings depending on their previous choices and difficulty levels. Transferring this idea to the ludic spaces, we can define them as places in which children can play interactively (Miranda, 2001, p. 29), where the equipment and the toys stimulate children to touch them, handle them, climb on them etc., i. e., spaces where they are invited to play, to participate in an interactive game. And, during this game, everything (the space, the environment and the objects) must be familiar and strange to them at the same time in order to cancel the culture industry clichés and create a stimulating atmosphere filled with pleasant challenges. As a result, the ludic space shall be able to incite curiosity, encourage children to establish relations with each other and with their surroundings and promote imaginary and sensory situations, "far away from the artificiality found in electronic relations".

Play and visual language

Visual language is one of the pillars in the creative process of ludic spaces. Being a means of communication, its components (visual elements, particularly) are often associated to form a wide range of messages in many complexity levels. Therefore, in order to understand what we call ludic visual language, we should first look at the meaning of "ludic" as an attribute of play within the children's universe.

Johan Huizinga sees the play element as a cultural phenomenon. In its primary signification, play builds itself on the idea of handling certain images (some kind of reality "imagination") to understand their meaning and value in the course of the humanity's social development. The play would go, thus, in the opposite direction of seriousness, implying amusement, intensity and a great deal of fascination, all aspects that cannot be interpreted in a logical way. In the author's words, play is, by all means, freedom:

[...] play is a voluntary activity or occupation executed within certain fixed limits of time and place, according to rules freely accepted but absolutely binding, having its aim in itself and accompanied by a feeling of tension, joy, and the consciousness that it is "different" from "ordinary life"
(Huizinga, 1971, p.28).

Huizinga points out some ludic characteristics that are directly related to visual and aesthetic qualities of the language. According to him, the play tends to be beautiful, to create and to be order itself ("[...] play has a tendency to be beautiful [...]. It creates order, is order."). Words such as tension, poise, balance, contrast, variation, solution, resolution are all commonly used to describe play's elements. In addition, the rhythm and the harmony inherent in play are "the noblest qualities we are capa-

ble of perceiving in things". He also insists on play's pretending quality as well as its formal and joyful characteristics. As such, there are many social situations – parties, rituals, myths, dances, poetry – in which this fantasy can take place. In any case, what play represents is nothing more than a materialised appearance: "imagination" in its original meaning. This is the reason why children play: because they can escape their ordinary life and get inside an imaginary and amusing world.

As for the visual language, many authors write about the rules and elements that take part in the visual learning, the development of communication techniques, reading systems and methods of design, all of them applicable to different kinds of communication environments (Arnheim, Munari, Dondis, Gomes Filho). According to them, the visual language derives from various space perceptions that can be received and interpreted in different levels – representative, abstract or symbolic (Dondis, 1997) – and which are always linked to each other.

The first step towards understanding the visual language is to recognize its syntax, that is, the structural elements of the visual language – point, line, form, direction, hue, colour, texture, dimension, scale and movement (Dondis, 1997) – as well as the psycho-physiologic relations (gestalt psychology) – proximity, similarity, continuation, segregation, contrast, figure vs ground, horizontal vs vertical etc. – organized in the visual field. When associated, these elements can create optical illusions and states of rhythm, tension, balance, clarity, disorder, harmony, movement and so on. The synesthetic perception is also important, as the combination of visual, tactile, olfactory and gustatory sensations bring on visual responses: the fixed rhythm of a music transformed into a sequence of visual signs or a certain kind of smell translated into a specific colour, for example.

Ostrower (1983), in her turn, discusses that the relation between visual elements (line, surface, volume, light and colour) and the dynamism of visual movement creates a meaningful content to the set in two main dimensions: space (spatial tensions ruled by contrasts) and time (rhythmic sequences ruled by similarities). If we consider the human being as a whole, we can also add intuition, memories, emotions, feelings and cultures to the visual experiences, which enrich the visual language's quality. Representation is another valuable aspect for this work as it also takes part in play (be it child's or not). Various images can lead to it, depending on sensory stimuli and past experiences, thus creating representations that are either similar to reality or abstract/symbolic.

Putting together the play's aspects and the visual language's attributes, it is logical to think that play is, in fact, a kind of representation: it depends on both a form and a content and has its own order, structure, rhythm, harmony, balance and contrast. In other words, play has its own visual language built on these aspects combined with joy, amusement and tense feelings. All there is to know now is how the ludic aspect of the visual language manifests itself (through points, lines, colours, textures, shapes etc.). We must bear in mind, though, that it only exists as a set of elements and rules that help to create a ludic design. The overall process will always be subjected to the ones hiring (clients), designing (professionals) and making use (users) of the space, all of them bound to their respective socio-cultural environment.

Case study: Sesc's Ludic Park

The idea for a Ludic Park goes back to the 1980's, when Sesc was investing in a series of experimental projects such as the exhibition "*Entreatos para crianças*" (1985), coordinated by Lina Bo Bardi, and the projects "*Casa na árvore*", "*Aldeia lúdica*" and "*Gigante jacaré*" (1), the latter being conceived by Márcia Benevento for the Interlagos' Country Club (Centro Campestre de Interlagos). These experiences were the basis to create a new set of spaces in Itaquera's Country Club (Centro Campestre de Itaquera) dedicated to children: three entertainment areas and a complex called Ludic Park, which was composed of three installations: "*Bichos da mata*" (2), by Márcia Benevento, "*Orquestra mágica*" (3), by Christina Mello and Rita Vaz, and "*Espaço de aventuras*" (4), by J. C. Serroni.

Fig 1. Gigante Jacaré. Unusual scale instigates the adventure..

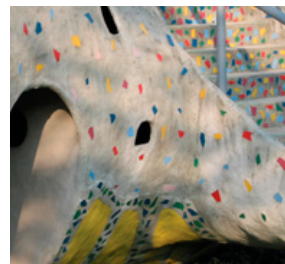


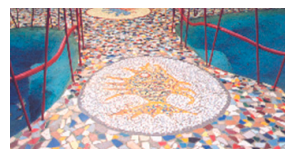
Fig 2. Bichos da Mata. Surprise and mystery take place as children investigate the Brazilian fauna.



Fig 3. Orquestra Mágica. Playing with sound in giant music instruments.



Fig 4. Espaço de aventuras. From the upper left: decks, dragon slide, fountain and hidden figures in mosaics.



Methodology

In order to investigate the Sesc's Ludic Park project, the concepts of complexity and legibility were used in association with the ludic qualities of play. I also worked on building a wide photographic record to observe attentively the visual elements, the syntactic and semantic aspects of language and how the equipment was being used. In a first stage, I came up with the following variables' names and classification:

1. Affective/Emotional: derived from the first encounter with the environment. It can be represented with adjectives/qualities such as surprise, sadness, joy, mystery;
2. Functional: experienced during play's actions and activities (pretending scenes, motor and building activities, ruled games etc.);
3. Visual Syntax: includes information about spatial structures, materials, visual syntax elements and representations (subjects and symbols).

Once the first stage records were properly organized, I looked for associations within the environments that would help identify them and their parts through similarities or contrasts. Therefore, I was able to come by the ludic visual aspects both of the environment structure (as a whole) and the visual language (in particular) (Quadro1).

QUADRO 1- CARACTERÍSTICAS VISUAIS NO DESIGN DE ESPAÇOS LÚDICOS		
		Características
1. Estrutura Ambiental	1.1 Integração X contraponto com a natureza	formas orgânicas / movimento X formas geométricas ou retilíneas cores e texturas do próprio material, contrastes pouco acentuados, tons de saturação média X cores saturadas, contrastes de matizes variados, cores primárias materiais opacos, rugosos, transparentes (madeira, argamassa armada, pedras, água, cabaças, corda, pneus) X materiais com brilho: mosaico, cerâmica, estruturas em ferro, plástico
	1.2 Mudança de ponto de vista / deslocamentos / relações de espaço e tempo	mirantes, cavernas caminhos abertos e fechados interior / exterior tempo de percurso / movimento
	1.3 Elementos do espaço	pisos trabalhados com texturas visuais, figurativas ou abstratas; delimitando áreas. superfícies verticais e horizontais, aberturas e vãos, coberturas padronizadas para abrigo de sombra mobiliário (bancos, abrigos, lixeiras) instalações / brinquedos sinalização
2. Elementos da linguagem	2.1 Temas Figurativos (aproximações do real ou simbólicas) Abstratos	bichos da fauna brasileira (galinhas d'angola, micos, maritacas) e diversos (jacaré, coelho, cobra, capivara, hipopótamo) instrumentos musicais pessoas enquanto personagens
	2.2 Forma	a forma como resultado da integração dos elementos visuais – movimentos orgânicos, ritmos.
	2.3 Cor	contraste orgânico X geométrico – movimento, dinamismo, inusitado harmonia nas composições contrastes: de matizes – alegria, divertimento contrastes de complementares – tensão, dinamismo contrastes claro-escuro – surpresa harmonia nas composições
	2.4 Texturas (visuais ou táteis)	grafismos: pontos, linhas, xadrez, padrões orgânicos, texturas ritmadas formadas por contraste de luz e sombra harmonia nas composições
	2.5 Escala / proporção	gigantismo / miniaturização deformação de figuras

Affective, Functional and of Visual Syntax Aspects

The ludic installations differ from the traditional playgrounds because the spaces are conceived as a whole and the equipment establishes a good relation with everything around it. Things are organized according to thematic aspects, so to speak, taking into account more than just motor activities.

Therefore, in the three mentioned installations, the environment supports a qualified play, stimulating imaginary and representative games in which children find themselves completely involved with the situation. There is even an affective/emotional approach to it, as surprise, mystery, adventure, challenge, fear or pleasure are all sensations that arise during most of the installations' experiences. To venture into the darkness of a cavern, to be astonished by giant animals, to climb the high steps of a mountain, to uncover the ways in the woods and to explore labyrinths, all these situations can figure out on a child's pretending. They can use their imagi-

nation and their muscles at the same time, doing what they most like to do: run, go up and down, slide, poise. The children's body truly interacts with the installation's equipment.

But there is also the possibility to play following rules, such as in the board games of the viewpoint found in "Bichos da mata", in "Amarelinha musical" ("Orquestramágica) or in their own invented symbolic games. The "Espaço de aventuras" area, in its turn, encourages children to handle tyres and start a building game. Play achieves, therefore, its educational purposes, favouring children's growth and learning(5).



Fig 5. From the upper left: board games, "Amarelinha musical", Bicho da Mata's viewpoint and the tyres stage of "Espaço de aventuras".

In some rare cases, there are exceptional design and language solutions that integrate various ludic elements. Play and visual language become indistinguishable as they are both explored in expressive, rich and diverse ways: empty-full and light-shadow contrasts, colour variations, circuits involving wide changes in children's points of view (closed and open areas, stairs, slopes, slides, ropes, bridges), among other things. As they play, children experience space, interact with its elements and have their tactile, visual and sound perceptions stimulated.

The ludic language is also lead by its use and its functions. If one of play's aim is to entertain, to amuse, then the project's functional and security solutions must be amusing and entertaining too, taking advantage of the various possibilities offered by the ludic language. For instance, "Orquestramágica" uses a circle in the floor to limit the safe area in a spinning equipment; funny handrails attract attention and create visual associations in the Space of Adventures.

As for how the installations were set in the environment, opposite solutions were used depending on the case. "Bichos da mata" takes place inside the woods, so the installation elements are integrated with the landscape: organic forms, colours and textures that already belong to the materials, rough and opaque objects and surfaces, the theme itself and the plastic solution conceived by the design. "Orquestramágica", on the other hand, suggests a contrast between the installation and its surroundings, as it is located in an open area: geometric shapes combined with organic forms, saturated colours mostly in primary hues, shiny materials (ceramic mosaic), steel and plastic structures etc. In "Espaço de Aventuras", Serroni uses both kinds of approaches, contrasting colours and placing fantastical creatures.

Conclusion: ludic aspects of the environmental structure and the visual language

The attentive observation of the three ludic spaces brought on some common characteristics between them: they all have reference points (such as the “Bichos da mata”’s viewpoint or the “Espaço de Aventuras”’ weather vane), are divided into different parts and have a wide visual range. This does not mean they are tedious or simplistic, on the contrary: they are discontinuous, encourage discoveries and are all very complex, just as Rapoport points out: the variety of elements, the multisensory perception, the contrasts, the mysteries, surprises and symbolisms, the abundance of spaces and the wide visibility, the thematic characters and landscapes (Brazilian fauna, imaginary/fantastical creatures, musical instruments, mountains, rivers, caverns). Each professional conceives the installation in different ways, according to its own experience and language, as well as referring to other designers’ or artists’ ways of expression. Márcia Benvenuto made a series of drawings from observation to understand the animals better; the works of Gaudí, Niki de Saint Phale and Hundertwasser influence Serroni’s solutions for the “Espaço de Aventuras”; in “Orquestramágica”, the music instruments and their formal and technical aspects are the ones to orient the drawings.

Finally, it is possible to recognize each of the visual language elements in the installations: the line – organic, tense, joyful, geometric, taking part on a net. The forms, sometimes organic, other times geometric, suggest dynamism and unpredictability. The textures – tactile and visual, following amusing and rhythmic graphic patterns – associate with colours to promote one of the most ludic aspect of the equipment. The colours are built on contrasts of primary and complementary hues, vibrating. The rhythm and the movement are both frequent in the elements’ sequences and in the variation of organic and geometric forms. Distortion and scale changes are also an important matter for the installations’ concept, which works with deformed figures, be it gigantic or very small.

Then again, if the sensory and motor stimuli are a key to this project, the adult’s help and participation are needed too, as they create opportunities that will drag more or less interest to the children in exploring the environment. After all, it is from the interaction between child and adult that the educational space arises.

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Co-designed signals. Designing an open wayfinding system

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Abstract

A wayfinding system is a structured system of signs that has the aim to inform and orientate users in specific areas. A site becomes accessible to users through such kind of systems. Wayfinding helps to communicate and make clear functions, paths and becomes a true interface between a place and the users. Signals can have a stronger role in terms of visual language in making evidence to a place's identity. Enhancing it at the same time. Using Christian Norberg-Schulz words, a user is able to orientate him self in a site when the experience of that place is for him comprehensible. Usually a wayfinding system is designed as a closed and forced system, superimposed to a place's surfaces or spaces. But there are places that need a specific design concept to be adaptable to users needs, that change over time. Or to be adaptable to the place's needs, that change physically over time.

Through an experimental project has been possible to set up an open wayfinding system for a parkland particularly used by free-climbers. A climbing area is a site where people can exercise their passion in rock free climbing and spend time outdoor. The site called Falesi di Calusco d'Adda - in the neighbourhood of Milan - is known for have inspired the background view of Leonardo da Vinci masterpiece "Gioconda (Mona Lisa)". The site is visited and used from enthusiastic free climbers, who use to personalize and naming climbing ways all around the site.

This context inspired a design concept for an open system of signs and typography. The concept is based on a set of elements and rules to be downloaded through a web site to implement information and orientation around the site. The specific web site has the aim to make accesible all the useful instructions and downloadable documents. The system is based on a set of pictograms and a personalized stencil font (the Calusco Font), to be reproduced on wood or stone, depending on the users' needs. The all visual design has been inspired by primitive signs and adapted to the need to reproduce it on different kind of surfaces using ecologic paint-spray.

All the design has been conceived to be easy to use from everybody, with a low budget and by making just a restricted numbers of operations. In this way the outdoor site can be enhanced by the community of users, that is engaged and participate himself to the process. The designer is not anymore just the author of a closed visual system, but of an open user-oriented process and accept the possibility that the community uses the elements in a freely way. This responding to an actual trend of engaging communities in the design and in the application of a designed system.

The aim of this paper is to present this experimental project, describing his design process and discuss some of the above mentioned topics.

1. wayfinding as open system

According to Lynch [1] as well as to Arthur & Passini [2], the term “wayfinding” refers literally to the meaning of “find the way” in an unknown place. It is quite obvious to say that wayfinding is the result of rules and habits referred to spatial orientation and that those habits are a base for humankind behaviors. To design a wayfinding system means interpreting those habits in specific places and giving it a proper interface so to help people to “find their way”. The discipline of wayfinding design refers to the particular area of visual communication design called information design. It implies the development of maps, signages and other elements of identification that can help users to orientate themselves in a place. Designing a wayfinding system means to translate visually and in a comprehensible manner information related to an environment. This is why it is also possible to use the expression “environmental design”.

A wayfinding system can be applied to small spaces as well to a large territory. It is not a matter of scale. In it there is a presence of skills related to different disciplines including graphic design, architecture, interior, landscape, industrial design. In particular, designers of visual communication can coordinate specific aspects such as the typography (or the study of typefaces in order to ensure readability in all conditions), colors, graphic organization of information, the drawing of signs and symbols to synthesize functions and actions. As well as to provide a consistent visual interpretation of the identity of a site and its functioning to ensure the correct use by users and to organize an appropriate design process.

A wayfinding system has not a unique task of orientate users. It is also a bearer of information about the space itself in terms of identity and values that can help to determine the look beyond its immediate understanding and to decode its complexity. It is so possible to define a wayfinding system as a system of disposals or as a disposal itself. The term “disposal” is used to mean the evolution of the definition of “artifact” [3]. That seems to fit better to the processes of knowledge sharing, over the provision of information, including “the point of view of those who enjoy, envisioning its outcome, the effects of the reception” [4]. An artifact is the result of a design intentional operation, which gives substance and form to a concept, to information and so to a “personality”, the core of an identity. In the same way, a disposal puts in practice interactive processes able to define a personality. Processes that are themselves design, beyond the mere flow of information or the materiality of artifacts, but that determine a way of designing communication. By using Baule’s words [4] the information content (the information on a place) interacts with the support that conveys them (the signals) and with the context. And “[...] necessarily interacts [...] with the form of writing that expresses it, with the format that contains it: these elements come together in a single device, where the pure piece of information is no longer separable, but becomes one in the device to communicate”.

Usually, a wayfinding system is designed as a closed and forced system, superimposed to a place’s surfaces or spaces. Designers use to set rules and a series of artifacts to be placed around a site, following an often strict hierarchy. Armstrong [5] affirms that design has always been a discipline characterized by a certain degree of control, in terms of forms and shapes to use as well as of results to reach. However, there are places that need a precise design concept to be adaptable to the user’s needs, that change over time. Or to be adaptable to the place’s needs, that change physically over time. This is the reason the designer’s approach has to be different, as well as to reconsider the whole design process. It is not possible to think anymore on a project as a static work, closed and finished over time. It is necessary to think about it considering its potential lives and developments in the coming future. Reconsidering the design process means that designers need to start to think of –using the words of Umberto Eco [6]– “fields of possibilities” instead of finished solutions.

The designer has to act as an expert and at the same time as a participant. He should be a “reflective practitioner” [7] who establishes a relationship with the various actors that enable him to be a mediator and activator of processes. The designer today is a “meta-designer”: its role shifts from ready-made solutions to the

users' problems towards the ability to allow users to take part directly in the process of problem-solving. He "needs users generated content" [5] to complete his work, which has to be open to changes and revisions made by the ones who are usually the final users. Designers can not pretend anymore to control the whole process totally because stress now shifts from "work to progress" [8].

2. A design experimentation

In consideration of all of the above, an experimental project has been conceived to set up an "open wayfinding system" to be applied to a particular site used by a broad community of enthusiastic sport rock climbers.

Observing the contemporary practice, it is also possible to identify some case histories to be assumed as a reference as well as to be part of a small field of design experimentation. The most interesting and based on a similar design concept is the "guerrilla wayfinding" open source project called "Walk [your city]" [9]. It is a user-oriented process of urban signage production specifically dedicated to pedestrians.

The core of the project is a website where users can create their signals, order them to receive the printed matter at home and then install where they have observed a need around a city. It is a platform that encourages citizens to improve their communities by promoting and tracking walkability, collaborating with government to deliver real, physical change and accomplishing the mission of building safe and vital places to live.

The process needs the users, e.g. citizens, to be activated, and the role of the design is in the definition of the process itself. Users complete the cycle by installing the single signs, using the predefined set of formal rules. Citizens who use this platform become part of a participatory community and are involved in a process usually demanded to professionals.

Such kind of a web platform works as a participatory hub which gives an impulse to the motivation of different subjects –citizens, organizations, municipalities, designers– to freely associate with others in a community and finally gives the opportunity to lead initiatives outside a traditional market logic [10].

2.1. The background

Sport rock climbing is an activity in which participants climb up, down or across natural rock formations or artificial rock walls without the aid of artificial means (except for special shoes). It is necessary to equip the wall with nails to which the climber ensures himself to make the ascent safe. To equip climbing walls requires accurate knowledge, time and a reasonable financial commitment; Italian cliffs are equipped by private enthusiastic individuals or in some cases by associations, in any case all volunteers. Rock climbing areas (the cliffs, "Falesia" in Italian) are mainly self-managed. Cliff users manage independently nailing, maintenance, cleaning of the area and the access points and sometimes arrange extemporary forms of signs (fig.1). This lack of support, planning and, at least, of design, makes evidence to the participation of the users' community, strongly motivated in practicing their activity. Usually in such kind of areas provisory signals are used to identify paths, landmarks and rocks to climb.

Fig.1 – Examples of extemporary signs in the site of Calusco d'Adda: an identification sign for a climbing route and a directory showing all climbing routes on a single wall.



All signals are made by users, as a result of their experience in a site and to share finally information on the site with other users.

A design response to the problems and needs above mentioned has been experimented in the Calusco d'Adda cliff area, that lays over the Adda river, not far away from Milan and Bergamo. That of Calusco is a very famous cliff in northern Italy and in use for a long time. It is a true reference point for many climbers due to the ease to reach it, to the huge numbers of the walls to climb, to the openness of the community of attendees. In addition, the site landscape is known for having inspired the background view of Leonardo da Vinci masterpiece "Gioconda (Mona Lisa)".

2.2. The concept

The experimental project has been conceived for the free climbers community and has been developed to enhance both the qualities and the values of the place (the site) and the community of users itself.

The project is based on a six key points concept. 1) DIY (do it yourself): the design it is not imposed as a closed system, but as a set of tools to be managed by the community. 2) Participation is encouraged: everybody interested in offering his own contribution can collaborate to the realization. 3).

Easy to use: all tools do not need any particular expertise except the ones the community already owns. 4) Cheapness: tools are all conceived to have low prices and to be adopted by using cheap materials. 5) Environmentally-friendly: respecting the place's identity tools and materials are mainly eco-friendly and with a low environmental impact. 6) No-logo, all the visual system is conceived by his visual language, without a traditional hierarchy and the identity is determined by the rhythms and the times of his application by the community.

2.3. The process

The selected site and his specific characteristics have been analyzed by on-desk and on-site research. The potential of the community has been deepened by engaging a small group of users and by on-desk research on qualified blogs and websites as well as on social networks. This to understand and verify the effectiveness of the concept and the participation of the community. To develop and enforce the visual and the tools system other cases of signage in other cliff sites have been analyzed, as well as the signage system developed by C.A.I. (the Italian Alpine Club). This is the only one to have been formulated in the course of time to be used as an orientation and identification system on mountains, hiking trails and paths around Italy.

A series of site inspections and surveys has been necessary to test the tools system and his application. To make easy to use the system, it has been implemented by a series of instruction manuals developed caring of methods and approaches most apt to the specific context. Finally, the traditional climbers channels of communication and information have been enforced designing a website prototype to be used as a community platform.

2.4. The final result

The visual identity is based on a set of pictograms and colors. A personalized stencil font (the Calusco Font) has been designed, to be reproduced on wood or stone, depending on the users' needs. All the visual design has been inspired by primitive signs and adapted to the need to reproduce it on different kind of surfaces using

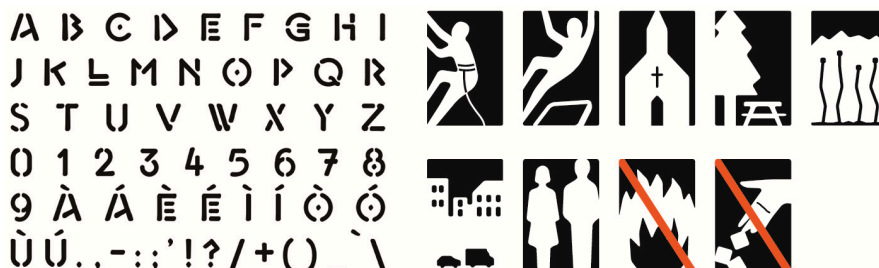


Fig.2 – The stencil Calusco Font and some of the pictograms designed to define a consistent visual identity for the site.

ecologic paint-spray. Consistently pictograms and fonts are designed without right-angles (difficult to achieve by using the stencil technique). All the pictograms' figures are not closed, but worked out to be recognizable, consistent and easy to reproduce.

All colors have been selected to not disturb the context and to be visible: black, white and orange (Pantone 180) are the only colors suggested and of easy availability. Colors can be reproduced by using a marker pen for black (as it is even now by the climbers community) and eco-friendly water based paint-spray for orange and white. The wayfinding system is based on four types of signs (fig.3) conceived to make easier the site's exploration, to identify and inform on the points of climbing and hiking interest. The four types are the followings. Identification signals:



Fig.3 – Three of a series of four types of signs applied during an on-site test session: function identification, directional sign and identification of a single climbing route.

to be used to identify specific functions, like the picnic areas. Directional signals, to orientate users. Directories to organize information referred to the climbing walls. Identification and naming of single climbing routes. All signals can be applied by using the stencil technique except the directories to be printed on a stable support to affix to the climbing rocks.

All instructions downloadable from the web platform (fig. 4) are defined by a simple and narrative visual language to easy explain how to compose and apply the four signage types. On them there is a description of materials and tools needed, techniques to use, and there are suggestions of dimensions and positioning. On the web platform it is possible to download for free the Calusco font (Open Type files), to be used on all operating systems), all pictograms and stencil masks (as pdf files) to customize and print. A social and a sharing area is also provided to be used by the community to implement information on the site and toward the development of the signage system with comments and photos.

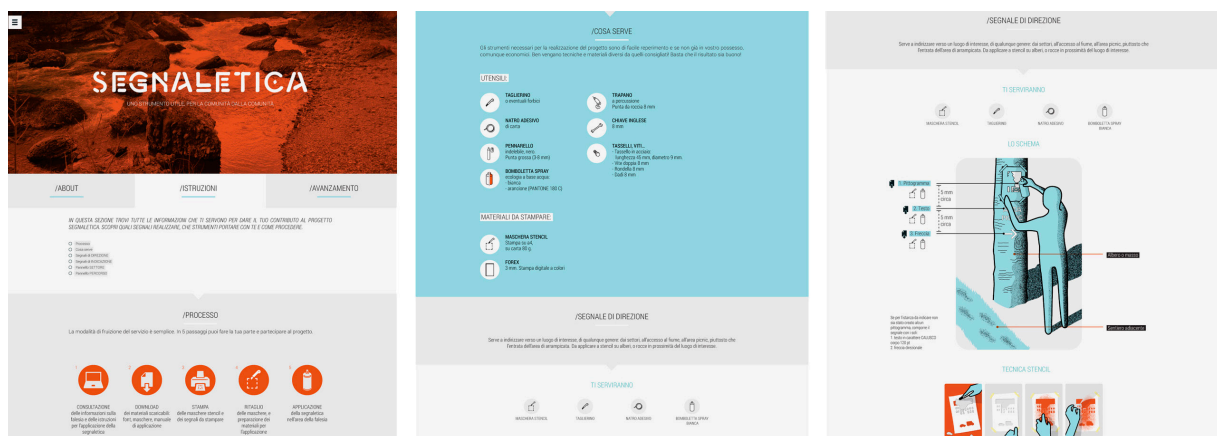


Fig.4 – Screenshots of the website area dedicated to the wayfinding system instructions. In the page, it is possible to download instructions to be printed and the Calusco Font to use on various operating systems.

3. Conclusion

Using Christian Norberg-Schulz words, a user can orientate himself in a site when the experience of that place is for him comprehensible [11]. The aim of the experimental project above discussed has been to develop an appropriate design tool consistent to a particular community needs (the rock climbers) in terms of spatial and functional identification, orientation and accessibility.



Starting from the users' current practice the all tool aims to enhance the site's identity and fruition to make it more comprehensible, by including the community itself in the process of enhancement. The role of the designer is to "enable" this process through his own competencies and knowledge, by supporting it by an appropriately designed tool. However, it is not only a matter of being a "server" or problem-solver, designers are becoming more and more providers of instruments for an autonomous construction of solutions instead of providers of single solutions [12]. Accepting the idea that users can modify the design application over time.

The web platform is not central in engaging the community, which has been involved in the process from the beginning, but the technological support facilitates the sharing of information referred to the tool. Responding to a precise need as already explained.

The community participation is considered not as an add-on or option, but as a necessity. According to Davis [13], participation has been assumed as part of a process to increase the likelihood to add value to the design practice, providing inspiration, insight, and the opportunity to "design in a more empathetic manner".

The obtained design results and feedbacks from tests allow to plan future developments for the experimentation by contacting rock climbing associations to organize direct meetings and involving them in the project dissemination. Next steps should be: publish an online accessible website; share results with the rock climbing communities; collect useful feedbacks and precise the potential application of the tool to other cliff sites around Italy.

Fig.5 – On-site test session photos: identification sign for a single climb route and directional sign along a trail realized by using water based paint-spray and a black pen marker.

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New life in the old town of ala (TN): Figurative and functional approaches

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Keywords: digital representation, environmental survey, multimedia communication, urban design.

Abstract

This paper presents the first results of a collaboration between university researchers and local administrators that started in 2013 in Ala, Trentino. The focus of the research lies in the virtual 3D reconstruction of Via Nuova's urban spaces through the advanced techniques of video-graphic digital representation. The processing of photo-realistic architectural models is the basis on which new communication solutions are developed and several project ideas are simulated with the aim to "interpret the present", to "reconstruct the past" or to "foreshadow the future" using computer images: still pictures, interactive panoramas and/or movies. Digital models offer, defiantly, to revive the ancient town on the basis of new figurative and functional strategies that reconsider first of all the usual dichotomy between public and private spheres. The issues involved are "civic participation", "video graphics for environmental design", "accessibility and universal design", "smart city", "parasite architecture and recycling". All the research's steps have involved the course of Digital Modeling which is held in the third year of the master's course in Architecture and Building Engineering at the University of Trento.

1. Starting point

The research presented in these pages is based on a partnership between the University of Trento DICAM (Department of Civil, Environmental and Mechanical Engineering) and the municipality of Ala (Trentino). It is part of a broader program agreement also involving the Community of Vallagarina, a union of seventeen municipal districts with over 90,000 inhabitants which covers an area of almost 700 square kilometers in the south central part of the Provincia Autonoma of Trento. In 2006 a provincial law identified in the consortium of municipalities the institutional level suitable to fulfill some important administrative functions and gave to local authorities any direct powers in the field of social services, schooling, social housing, urban planning and waste management. The study and design experience carried out in Ala, therefore, may lead not only the strategies for the single urban centre but also general policies to the real revival of an entire area.

The research topics result from opinions that different actors have shared in the early stages of work: scholars, administrators, citizens and casual users, with their own specific look at the city and its historical core, have helped to identify the facts and the dynamics worthy of in-depth knowledge

through which one could justify the assumptions to do for the intervention. The starting point, which then turns into the essence of the experiment, is the admission of the necessary link between analysis and design of architecture and the awareness of the symbiotic relationship that exists between their tools. These tools belong to



Fig. 1 – Views of Via Nuova obtained from digital models. Authors: Alfred Caushi, Arianna Cescatti, Paolo Corti (left); Elena Conte, Aldo Maistri, Andrea Sammartin (right).

different disciplines but they intertwine and overlap due to the common reference to the built space that we have to document, to understand, to transform and shape. In the later stages of the work the representation of what is built and what could it be becomes a powerful medium to express ideas, to communicate proposals, to encourage participation, to induce debate. Ala is located halfway between Verona and Trento, the Brenner motorway and the railroad brush its territory. The village was founded in the Roman period; in the early Middle Ages it was split into an ancient part around the castle and a settlement along the creek. The plant of the old town, with its narrow streets and its irregular squares, dates back to the 14th century; only with the Venetian domination and the flourishing of commercial activities in the late 1400s an architectural transformation of the city takes off that will burst out with the building of several palaces in the 17th and 18th centuries. During this period Ala could enjoy the highest of its economic splendor and cultural ferment, becoming famous throughout Europe for silk weaving and velvet manufacturing. Nowadays if you walk through the old town you can feel a sense of abandonment and isolation due to the gradual reduction of people and activities. The continuous population growth and the strong productive vocation settle elsewhere; in the ancient streets houses and shops close their doors and move to areas more comfortable, greener and better served by public transport. Via Nuova doesn't escape this fate of relentless depopulation of its buildings and impoverishment of its courtyards; the loss of its public, social and economic role corresponds to the loss of an identity linked to centuries-old traditions of community life. Within the projects developed by the academic group that identity is taken as the core generating the formal inventions.



Fig. 2 – Via Nuova tells the urban history with the Street Painting. Authors: Tommaso Dal Farra, Ermes Floretta, Gianmaria Ganz.

2. Methods of analysis

Basically the analysis of the project area uses the procedures of urban and environmental survey, in which we can recognize some specific applications of architectural survey. Therefore the understanding of Via Nuova is based on the study of different sets of data concerning history, geography, culture, construction, society and economy, in order to identify within buildings both the evolutionary lines as the permanent features. In other words it is necessary to think about "how it is done" a place that has many temporal phases, to connect the perceivable characters to the

hidden reasons that produced them, to detect the main aspects to be taken as possible rules for the design and the preservation. Indeed «each project action begins by selecting a specific local character (spatially and temporally) [...]. Materials and their technology, traditions, landscape, manufacturing processes, lines of force of the urban structure, use by citizens... all of this is taken and compared by the designer inside his global knowledge but necessarily in a local way».¹

Better than any other, the objectives of the work done in Ala are precisely summarized by the concept of “character” in the meaning that emerges from Christian Norberg-Schulz’s words. It «denotes both a general inclusive atmosphere both the concrete form and substance of the elements that define space. Each real presence is intimately related to a character. A phenomenology of character must include both a survey of evident signs as an investigation of their actual causes. [...] The character is defined by the matter and the shape of the place. We shall have to ask “how” is the ground on which we walk, “how” is the sky above us, or “how” are usually the boundaries that surround the site. [...] Looking at a building from this point of view, we must consider how it rests on the ground and how it rises towards the sky, and pay special attention to the walls and the sides of the perimeter [...]. Usually the character of the group of buildings representing a place is condensed in recognizable patterns such as particular types of windows, doors and roofs. These elements may become conventional when they are used to transport a character from one place to another».²

Fig. 3 – Via Nuova becomes a protected space exposed to natural light. Authors: Stefano Brunelli, Giulia Spezie, Marco Tomelleri.



Via Nuova’s character is investigated at the two differing scales of the houses and the street by processing existing cartographic and iconographic data, but also through observation, photography, drawing, measurement and interview. The latter two, in particular, are worthy of a special thought. The units of measure are not only chosen for a quantitative and volumetric analysis, to be conducted with technical and scientific methods; they necessarily include the quality assessment’s parameters that belong to other fields of knowledge, which allow you to isolate and observe a finite number of the site’s features. Architecture and cities are measured with the metric survey’s adequacy but above all with the interpretation’s appropriateness compared to a given topic; it is the only way to produce cognitive models that are authentic keys to understanding the anthropic events. The location in the Cartesian space is simply a silent chassis if it isn’t enhanced by the representation of the many dimensions investigated by the humanities: architectural history and civil motivations, myths and ideologies, social and political achievements and more. In this context the use of the interview takes on a precise meaning; in fact every town has a public image that is the layering of many individual images, or perhaps every town has many public images each one owned by a number of citizens.

1. V. Ugo, “Regione e marginalità”, in Y. Bezručka, *Forme e caratteri del regionalismo. Mitteleuropa e oltre*, Luoghi/Edizioni, Trento 1999, pp. 127-128.

2. C. Norberg-Schulz, “Luogo?”, in *Genius Loci. Paesaggio, ambiente, architettura*, Electa, Milano 1979, pp. 13-15.

Anyway, through these images you can include in the interpretation of urban space what the community thinks and you can develop perception models able to encapsulate the values that people attach to manufactures, neighborhoods, routes, urban margins and poles. About it is easy to remind the studies of Kevin Lynch in the 60s and the role that “figurability” assumed at that time as a set of qualities characterizing the visual experience of the city. Today, however, the issue is much wider and it doesn’t invest only the physical elements through which the observer sees environmental strong figures or even weak, structured or even fragmented; now we take on the perceptive sphere as an anthropological experience from which depend the same social and symbolic meanings of an area, as well as its functions, its history and even its name. The architectural survey is not limited, therefore, only to geometric modeling of space, soil and buildings, but it goes even to the figurative representation of materials and technological elements, color and style. The urban survey widens even more analytical issues in order to deal with the complexity due

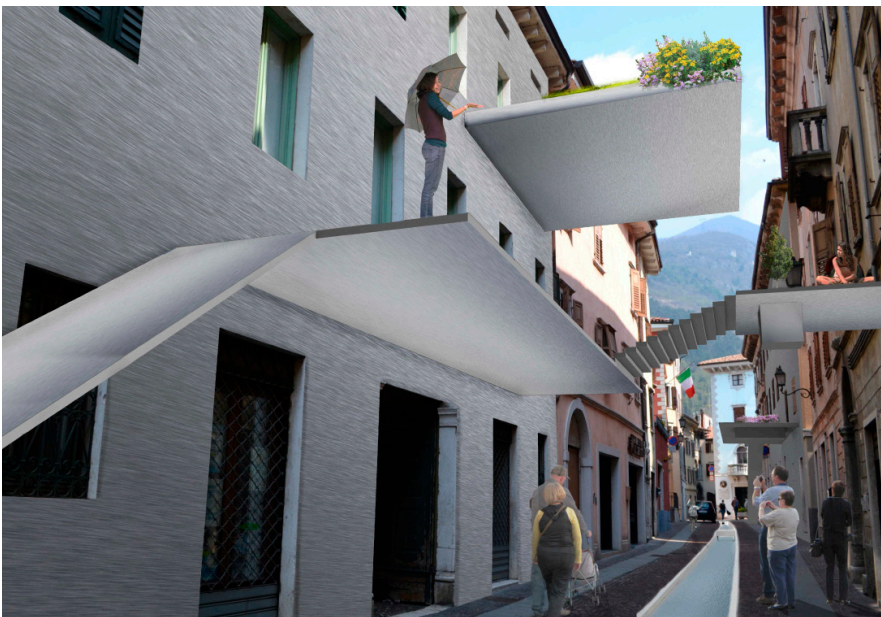


Fig. 4 – Via Nuova multiplies its paths to connect the different levels. Authors: Francesco Baldo, Andrea Bombonati, Gioia Munaretto.

to the change in scale: the morphological study of the built environment dialogues with the perceptive one, the description of the routes refers to that of cultural heritage and urban design, the mapping of inanimate things is completed with the one of fruition’s modes and so on. As written by Vittorio Ugo, a survey on an urban scale must uncover complex parameters and their relationships «by giving qualitative measures and appropriate representations. The problem is to choose the correct scale and the analytical tools to study an organized body», knowing that we must take the idea of scale as a range and not as a numerical ratio, as the «architecture’s inherent ability to cause resonance with more or less wide radius and intensity».³

3. Design tools

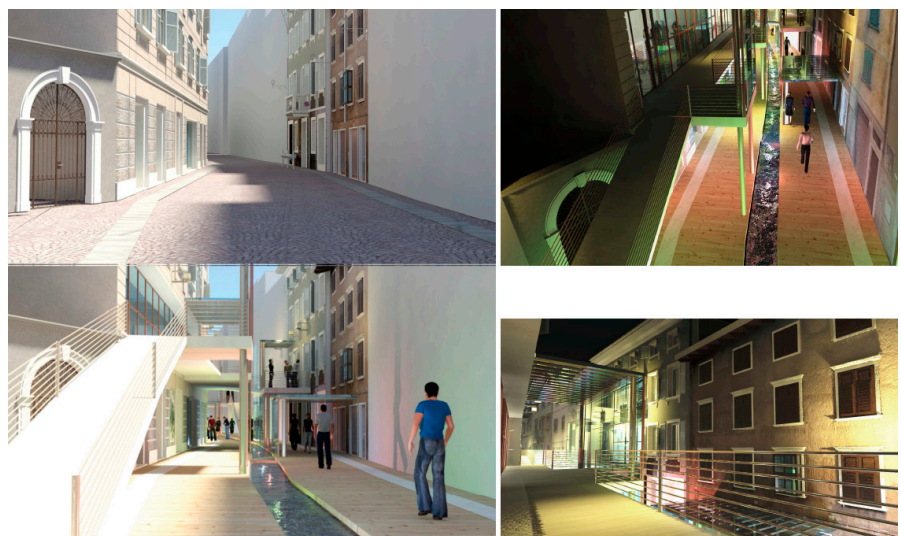
Whereas the urban survey turns around the notion of “character” and manipulates the instruments of measurement and perception, the design thinking focuses on the concept of “geostoria” and the tools of modeling and representation. «The geostoria is the history that the environment imposes on people conditioning them with its laws or with its slight variations, whether and when they are able to exert an influence on humans [...]. But the geostoria is also the history of man struggling with his space, [...] it is the study of a dual relationship that goes from nature to man

3. V. Ugo, “Misura e scala nella conoscenza della morfologia architettonica”, in Aa. Vv., *Informazioni Territoriali e Rischi Ambientali*, ASITA, Napoli 1999, vol. 2, pp. 1209-1210.

and back again, the study of mixed and confused actions and reactions repeated endlessly in every day's reality»⁴. The projects that shine through the figures included in these pages start from here, because they choose to deal with the society in the space or, better, by means of the space. The human environment of Ala is in the spotlight with its historical heritage, its urban and architectural structure that still preserves the memories of the centuries in which crafts, trade, culture and hospitality blossomed. The preservation of all that exists, with its burden of traditions hidden in the stones, is brought into the great stream of contemporary design that is directed towards the research of new figurative and functional solutions. The project may represent the place's identity, so it is rooted in geo-historical meaning, only if it can connect the future scenarios to the heritage of the past by means of the present time's analysis. Advanced techniques of digital modeling and representation allow the creation of this temporal connection in practice, with a visual evidence and a communicative power that are difficult to reach with the traditional tools of design and graphics. The different parts of a unified 3D model shall provide the virtual reconstruction of what is no longer visible today, as well as the critical depiction of what lies in front of our eyes, and finally the photorealistic reproduction of what is not yet visible nowadays. The information model and its subsequent representations work as true "4D incubators of ideas" in which the spatial coordinates are associated with temporal phases and layers. Static and dynamic synthetic images show the transformations through the centuries, the constants survived the changes, the perceptual quality of the places, the architecture's functional aspects and the urban ones; but they also foreshadow some action strategies useful for triggering a new urban quality, resulting from the active attendance of spaces and from the attractiveness of innovative formal proposals.

Models and representations allow you to investigate and communicate the geometric and compositional aspects of reality, the typological and distributive ones and those related to materials and structures, in order to inscribe «what merely is, the pure datum, in the broader horizon of the world that "may be" or "should be"»⁵ or "you want it to be".⁵ It is clear, therefore, that the design practices rely to the model in a conceptual way, rather than operational, and they use the architectural representation as a place of dialogue between theory and building. It is also evident that the landing point of Via Nuova's research is a computational and iconic production that is directly enjoyable by the common user, because it belongs to a similar level to that of empirical experience of reality; the careful study of textures and animations, in relation to physical and lighting condition, is the result of a great skill in the use of procedures, that can be justified compared to the needs of visualization and multimedia communication. If the latter were neglected or deemed irrelevant, the desire to participate in collective processes which is one of the research's reasons would be damaged.

Fig. 5 – Via Nuova breaks down the borders between public and private spaces. Authors: Marco Benedetti, Alessandro Borgo, Edoardo Valentini.



4. F. Braudel, "Geostoria: la società, lo spazio, il tempo", in *Storia, misura del mondo*, Il Mulino, Bologna 1998, p. 100

5. E. Benvenuto, "La questione della verità in architettura", in V. Ugo (cura), *Laugier e la dimensione teorica dell'architettura*, Dedalo, Bari 1990, p. 146

4. Experimental Outcomes

How is it possible to go back to see the Ala's centre peopled and noisy, inhabited by citizens and visited by customers and travelers? Which innovative values and attractive powers may be implemented in order to design an urban quality that is competitive but not indifferent to the historical and local characters? The first results of the research openly have a thought-provoking meaning and purpose, though they remain within the limits of reality; they are geared to encourage the discussion about the city and to expand our thinking about the ways to plan public spaces. All the proposals share the choice of pedestrianize Via Nuova by diverting car traffic on alternative routes; so a lot of assumptions may be practiced to experience the assi-



Fig. 6 – Via Nuova assigns new functions to its buildings. Authors: Riccardo Cappellaro, Giorgia Menardi, Larry Perin (above); Davide Bassetti, Giulia Molinari, Elisa Zaroni (below).

gnment of a new look to the street and to envisage a future full of social, economic and cultural opportunities.

The first idea aims to exhibit the city's past realizing a figured itinerary on Via Nuova's paving using the technique of Street Paint; the images, rich in significance but also entertaining, are intercepted by a system of benches that transforms the road in an open-air museum composed of five areas: the Middle Ages, the Venetian domination, the XVIII century and the age of velvet, the XIX century and the industrialization, the XX century and daily life. A second project develops the idea of an unitary space to offer the community not by means of an exhibition but by building a massive transparent roof that just touches the houses; the steel pillars rise towards the sky with sinuous shapes and are anchored to the ground with large stone benches that adorn the street; Via Nuova becomes an architecture that serves all people and is ready to welcome the small and big events of city life even on rainy days.

A different idea is to exploit Ala's geographical position on the axis between Trento (MUSE) and Rovereto (MART) to settle the third cultural hub of Trentino; urban routes, courtyards, houses and palaces are filled with walkways, ramps, shelters in metal and glass that seem extrusions of facades. An artificial watercourse in the middle of the street, like a tributary of the Adige river, makes the environment charming even at night; above paths are intertwined on many levels and deny the usual linearity of transit and the separation between inside and outside: glass panels in fact are not barriers but filters which invite to the enjoyment of the building's interior spaces. The theme of a renewed vitality generated by the routes' dynamicity is the basis of several experiments. One of these plans to multiply the space of Via Nuova

by creating a labyrinthine plot of not hierarchical and countless connections, using steel platforms tied to the buildings' walls without damaging their integrity: a place rich in perspective views and alternative routes takes form in order to live social relations and promote integration. Another project locates in red cubes the tangible icon of the rebirth: they occupy the urban environment at the pivot points between the horizontal and vertical tours, they penetrate into the inner courts making them accessible by passers, they invade with their modularity also the deserted basements turning them into public places.

Some experiences involve specifically the street's architectural dimension. Palazzo Pizzini, the present museum of the ancient piano, is pierced by new passages that allow visitors to easily walk from the exhibition area to the courtyard; is covered and turned into a multifunctional musical laboratory suitable to host planned and improvised concerts, pageants, festivals on historical music and new forms of sound expression, young artists' trials. On the façade of the palace some big screens inform passers in Via Nuova on what happened in the court, what is happening or will happen. The future citadel of botanical sciences settles instead in the opposite buildings, with shopping areas on the ground floor, educational and exhibition areas for children and young people on the upper floors; the street is paved with green and partially protected by a pergola, the roofs are removed to open terraces suitable to accommodate different and periodical installations. Nearby, a different project distributes along the façades and on the roof-garden some of the functions of public spaces amplifying their effects; it is a further attempt to promote sociality catching at the same time the relationship with environment.

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Fear as a Design Matter

Mapping the reassuring scenarios

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Abstract

This study starts as a PhD research in Design aiming at actively contributing to the debate on “fear and safety in urban environment”. The interest starts from the concept of *city and surveilled space* (Foucault 1975). Foucault draws the relationships between the city, its inhabitants and the authority meant to protect and guarantee the fair development of daily activities within the complex urban system. As M. Surace¹ highlights, the same issue is analysed by G. T. Marx in his article appeared on “The futurist” in the 1985. She talks about “new surveillance”, defining the differences between its nature during the XIX sec and in the contemporary era. In the first case, the data collection was functional to the State in order to administrate the Country; in the second, more than one entity were involved as commercial brands or agencies. They elaborate personal information to control and manipulate social interactions, preferences and opinions. Considering the *knowledge* as the main component of the *paradigm of control* (Revel 2003), it is possible to assume that data is the reason for which control mechanism works. There are two kinds of control. The institutional one, meaningful and believable, it is enduring through time and space and is socially clear. It is a formal and identifiable control with the specific task to verify that people do not trespass normal symbolic boundaries. The informal control instead passes through the social interaction between people and it represents the hidden part of control mechanism, then it resides in the daily activities. One of the preliminary research questions marks the opportunity to inquire the wider concept of “surveillance” as the first and faster answer to a raising safety request. Independently from the ethical implications that establish the topic between practices of control and political manipulation, it lasts to inquire the ecological aspects and their meanings in the urban context.

Fear in the urban context

According to the Shorter Oxford English Dictionary, *fear* is the emotion of pain or uneasiness caused by the sense of impending danger, and as a state of anxiety derived from the concern for the safety of a person or thing. Such feelings are manifest as a state of constant or intermittent anxiety. The nature of fear is highlighted by van der Wurff and Stringer who state that fear is “the perception of a threat to some aspect of wellbeing, concurrent with the feeling of inability to meet the challenge” (Bannister, Fyfe 2001). These definitions were recently evoked by Z. Baumann in

1. Surace, M.; *Dalla sorveglianza moderna alla New Surveillance: il ruolo delle tecnologie informatiche nei nuovi metodi di controllo sociale in Analisi socio-giuridica del rapporto tra sorveglianza e diritto alla riservatezza nell'era di Internet, research available on L'altro diritto – Centro di documentazione su carcere, devianza e marginalità - www.altrodiritto.unifi.it/ricerche/control/surace/index.htm*

Liquid fear (2008), where he gave shapes to the hardship considering the *amount* and the *intensity* of our troubles. Fear is a construct (Bannister, Fyfe 2001), it is the result of different elements that vary from subjectivity and previous experiences to objectivity and real danger around us. It is hard to trace the boundary between the negative sensations nourished inside of us and other emotions outside our soul, recognizable as the *real danger*. Personal safety is a crucial factor of lifestyle options, and crime is considered one of the main problems threatening the quality of urban life (Blobaum 2005). Further, the fear of crime, which received scant attention until the 1980s, is now recognized as a more diffused problem than crime itself (Hale, 1996).

Together, *crime and the fear of crime* are considered as dangerous elements for the urban life, attacking the economic, social and political fabric of cities. Seemingly, crime and the fear of crime have undermined the cities of their vital essence: the celebration of difference. But what is the nature of this fear? Is fear only a product of the criminogenic conditions, which appear to have thrived in urban environment? Or is fear more broadly related to the concept of city-dwelling, a metaphor for the quality of urban life? In general terms, three (overlapping) theoretical positions have been advanced to explain the fear of crime (Bannister, Fyfe 2001). These approaches can be characterized as being concerned with :

1. - Explaining fear as the product of victimization,
2. - As the consequence of a breakdown in social control;
3. - As being mediated by the urban environment.

Building upon this classification, it is possible to discern that an understanding of the city, of its people and their interactions and of its public and private spaces, has much to offer the investigation of fear. The most interesting approach for this research is the third one. It focuses on how fear is commonly known as the environmental thesis.

The key to understanding fear of crime lies not in direct experiences of crime, or with control per se, but rather in how people experience and interpret urban space. Fear is embedded in the physical and social characteristics of place and the familiarity of that space to the individual. People effectively read the environment as a barometer of risk and protective factors. In the end, the environment provides an individual with visual evidence (when other knowledge is limited) of the likelihood of criminal risk and the likelihood that others will intervene on their behalf. Clearly, if this hypothesis carries worth, then fear is allied to urban form and the ways in which urban spaces are utilised and given meaning. As Hale (1996, p. 84) observes is more probable that we are not merely measuring the fear of crime, but rather some other attribute which might be better characterised as 'insecurity with modern living', 'quality of life', 'perception of disorder' or 'urban unease'. A significant part of what we take to be the fear of crime actually represents a 'displaced' urban anxiety. (Bannister, Fyfe 2001).

Why fear is a design matter?

One of the first relevant experiences inquired the relationship between fear, safety and design was the exhibition "Safe. Design Takes on Risk"² curated by P. Antonelli in 2005 at MoMA (NY). Antonelli presents the exhibition with an essential statement: "Pressure is around every corner and *human resilience* necessary for survival can be surprising. Such resilience reminds us how powerful can be. How safe we are depends on our perception of what is at hand and protect us." In this brief, she focuses in her discourse on a new set of elements that became crucial for this work: *resilience, perception and hand*. The design discipline already considered the definition of resilience as the dynamic process of positive adaptation to significant threat or adversity (Luthar, Cicchetti, & Becker, 2000) and the perception theme is not new in the studies about fear (Yi-Fu Tuan 1974) and the daily urban experience (Lynch 1960).

And what about hand? This third element gave to this doctoral research the intuition to explore in depth the potential of the small scale in order to answer to request of safety, nurturing the sense of protection. Another more recent exhibition about re-

2. for an in-dept analysis visit <http://www.moma.org/interactives/exhibitions/2005/safe/safe.html>

lated issues was held in 2012 at Triennale di Milano with the title “Senza Pericolo!”³. The sections “Architecture & surveillance”, “A safe city” and “Landscape of safety” built a scenario that showed how “... our safety is committed to tools and instruments” and “if safety is more, freedom is less”⁴.

The same scenario studied by S. Savić and G. Savičić, authors of “Unpleasant Design” (2013). In their book they describe what Unpleasant Design means: an accumulation of urban phenomena in which social control and its inherent design play a significant role in the way we perceive and engage in public, semi public and semi private space (Savić, Savičić p 4 2013). They reflect about the relationship between space, design and social interactions, aiming to develop a critical perspective on design patterns that surround people in public and private spaces. Savićs look into the “silent agents” (p 6) that take care of behavior in (semi-) public space without the explicit presence of authorities (security, police, etc...). These “agents” are materialized in objects and installations, which ensure that control is implemented in the environment, through design and urban spaces, urban furniture and communication strategies. Unpleasant design has specific target groups (youth, substance misusers and homeless people) and operates primarily at several demographic layers. However, this vision of the city, of its public places and streets providing an arena where experiencing and learning from diversity (Sennett, 1996) is under threat. For this reason, their crucial question is “How to detect and subvert an unpleasant design?” (p 4). The answer they propose resides in the concept of *Pleasant*.

Pleasant is a plateau; it is a state we would hope to achieve for long, stable, self-reinforced periods, describing not just a sudden moment or event of our lives, but a rationale and means for prolonging a wider system or network. “Pleasant” describe the systemic shape of our lives, and the means, which things persist. (Rothstein p 14 2013).

The *Pleasant/Unpleasant* dichotomy is the primary mechanism of our mental assessment of designed environments; as a system by which individuals interpret, design and reify system, is a powerful force. But designed environment is not sealed and concrete: its pattern drifts as technology evolves and subjective assessments vary. This is the nature of designed environments: the feedback loops that constitute the most permanent barriers are fundamentally susceptible to decay (p 22). Images, which depict the city as an unruly, unsettling and disorderly place are increasingly dominant. Difference is now seen as overwhelming and dangerous, to be excluded or segregated where possible, indeed something to be afraid of.

How has the city responded to the challenge posed by widespread anxiety? Is it possible to reconcile the conflicting images of the city as a celebration of difference and as an arena in which difference is to be feared?

The *Pleasant/Unpleasant* concept, which we often reduce in our understanding to “mere” emotion, is a key pattern and it needs the designers’ attention.

This pattern is enriched with another binomial composed by *Hostile and Hospitable*. The term hostile is used to define an enemy, something which is in opposition, as an environment that doesn’t foster health or wellbeing because of its inhospitable features⁵. Its contrary is the term *hospitable* and when is referred to an environment, it means *pleasant and favorable* for living in⁶. This is exactly how Fassi and Giunta (2009) define the “hospitable city”: the capability of a city to be a device able to be open, accessible and sustainable; able to manage people mobility, to regenerate public spaces, to offer an intelligent variety of services.

This definition is taken by L. Crespi (2013) too in his intervention “The hospitable cities” in which he explains that the perceived quality of the urban environment depends more than the hospitable nature of its public spaces than to the eloquence of its monuments. According to the De Carlo’s vision “That’s why cities are ugly or beautiful, depending on the beauty or ugliness of the streets in which they are made of. And in relation to the energy of human activities they contain and which

3. to translate “No Danger!”

4. L. Bossi on Domus WEB - May, 6 2013 - http://www.domusweb.it/it/notizie/2013/05/2/senza_pericolo_.html

5. According to the Shorter Oxford English Dictionary

6. *ibid.*

is in indirect - but recognizable – relationship with the level of balance that exists between built areas and open public spaces”⁷, the DHoC group⁸ introduces beauty in this discourse as a key element to reconcile the previous conflicting images. Beauty as synonym of a kind of quality able to activate a “social-spatial” attention on urban shapes. The already known “urban design” process must become able to create relationships between individuals, communities and global fluxes through shared public spaces: they have a crucial role in connecting experiences⁹.

Practices and projects: elements for a reassuring scenario

The desk phase developed in the last two years brought this research through an in depth analysis of the state-of-the-art about “social safety oriented” best practices and case studies¹⁰. The first strategy considered 12 European best practices classified as “top-down” and “bottom up”. The t/d group counts all the practices funded and developed by authorities in charge to activate programs of control (e.g. Municipalities or Agencies); the b/u group counts all the successful initiatives carried by citizens in order to fill the lack of attention of their needs about surrounding public spaces.

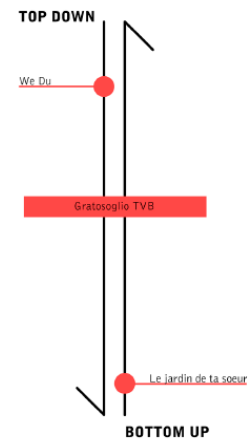
There are here described three interesting practices useful to explain how look at the “safety” issue with different approaches.

As it possible to establish observing the proposed scheme [img 1], two of them represent respectively the two main categories and the third one is an interesting case of “hybrid” practice.

The first one is the network *We du*.¹¹ According to the current models of e-government, the project aim to connect people and Municipalities through an online platform developed around the *decoro urbano* issues. *We du* is an app for smartphone and a website available for each Municipality involved in the “Comuni Attivi” group. Indeed they can enjoy the network for free and they can interact with the inhabitants through the notifications’ map on the website in order to solve quickly unpleasant situations in the city. On the other side, there are some relevant experiences able to show the power of the bottom up approach. In the European context, France stands out thanks to several cooperatives and movements that gave some good examples of reinvented public spaces to the design world.

One of the most interesting is *Le jardin de ta soeur*,¹² born in Bordeaux with a three years long process (2003-06). The goal was to create a community garden in a neighborhood without green areas through two main phases. During the first year and half, the garden was conceived as temporary, like an arena in which experiment through/with arts, debate and design about the future of the place. Following this winning strategy, the group received the approval for transforming the garden from temporary to permanent. Intentionally, it became an unfinished garden, open to the free appropriation, daily designed and re-designed through the citizens’ use.

The third practice, the hybrid one, is the most relevant because it is strictly tied to this research. *Gratosoglio TVB - Active your resources*¹³ is a project developed within



[img 1] Best Practices
Top Down and Bottom Up Clas-
sification | synthetic scheme

7. De Carlo, G, *Nelle città del mondo*, Marsilio, Venezia 1995, p 25

8. *Design for Hospitable City – Interior Design Unit at Politecnico di Milano, School of Design*

9. Castells, M; *La città delle reti*, Marsilio, Venezia 2004, p. 62

10. for a definition of “best practice” and “case study” strategy “*The Handbook of Quality Research*” (2011)

11. Is a tool designed by the Italian startup maioralab in collaboration with the Italian Department of Public Administration, AGCOM and with the support of Wikitaly. To discover more visit www.decorourbano.org

12. Coordinated by Bruit de frigo with the Centre Social Bordeaux Nord and with the supervision of the architect C. Petreau and the artist A. Meurice with the involvement of various associations of citizens - www.jardindetasoeur.org

13. Project developed by Lo Scigno in collaboration with Amapola, Farsi Prossimo and the support of the Council of the 5th district

“Adolescents and safety”¹⁴ in the council neighborhood of Gratosoglio, in the south suburbs of Milan.

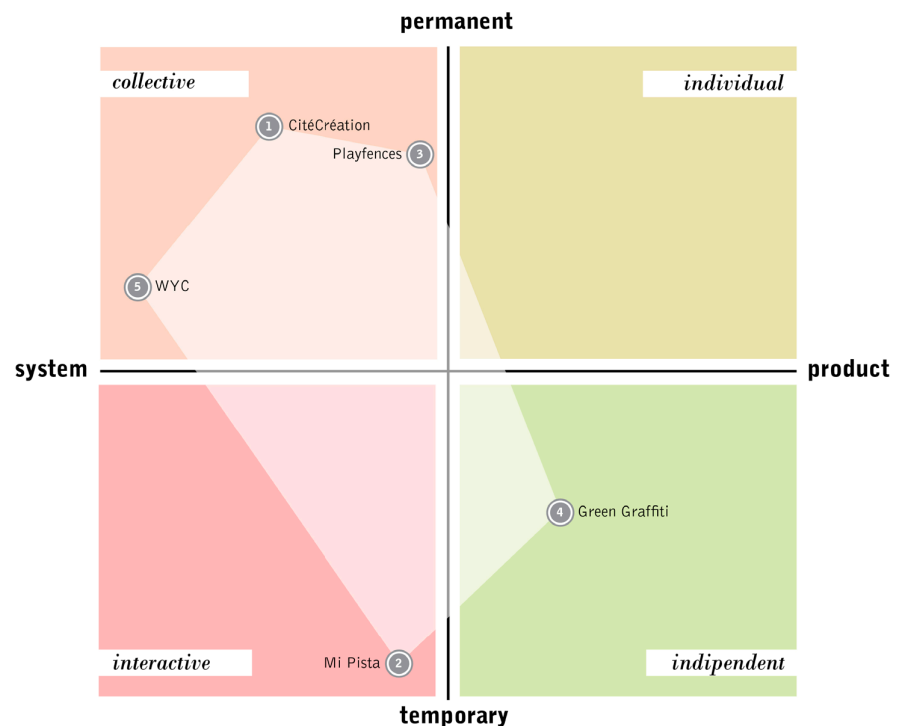
The aim of this integrated project, now at the beginning of its second edition, is to involve the NEET¹⁵ in several activities related to safety able to create awareness about the peculiarities of the neighborhood. Through a research-action process, the kids make surveys, created a map and are now planning some punctual and temporary interventions in the area to improve its livability.

The expected output of this research is inspired to the different elements of these practices (research-action process, online and collaborative platform, artistic intervention, temporary solutions) and in particular will be virtually tested in the neighborhoods of Gratosoglio and San Siro.

Concerning the projects, they were classified through a quartile system [img 2]. The axes represent the two most interesting dimensions for the research purposes: lifetime and scale factor. The measurement related to the scale factor vary from “product” (1:1 scale) to “system” (widespread and intangible) and they are positioned on the X-axis. On the Y-axis is considered the lifetime of the projects, if they are temporary or permanent. This scheme allows us to understand not only which are the design trends about safety issues, since how the expected output will be positioned for its environmental features.

As it was done for the best practices, also for the 20 projects, some meaningful elements connected with the theoretical framework will be identified (Lorenc, Clayton, Neary p 759 2012).

The mixture of these features will establish the system of urban interior design strategies to build the future urban reassuring scenarios. In the following, a possible design strategy is shaped through the mixture of the fundamental design components¹⁶ from 5 different projects.



[img 2] Case Studies
Lifetime and Scale Factor Classification | the scheme show the distribution of five projects that constitute a possible strategy

14. According to the law 285/1997 – promotion of right and opportunity for childhood and adolescence - www.comune.milano.it/portale/wps/portal/CDM?WCM_GLOBAL_CONTEXT=/wps/wcm/connect/ContentLibrary/giornale/giornale/tutte+le+notizie+new/sicurezza+e+coesione+sociale+polizia+locale+protezione+civile+volontariato/disagio_giovanile_adolescenti_sicurezza.

15. Not (engaged) in Education, Employment or Training

16. Polano, S.; Achille Castiglioni 1918-2002 – Electa, Milano, 2006

1. Vertical Surfaces – Façade:

*CitéCréation, France (since 1978)*¹⁷

The slogan of CitéCréation is “walls are the skin of the residents”. Their activities of wall painting are considered as a design intervention because they are the result of a complex process. This path ends with a trompe-l’œil frescos, but it starts with a strong cultural immersion in the local environment. The use of local characteristics such as architecture, history, culture, economics and social phenomena contribute to the creation of suitably adapted mural artwork with which inhabitants, visitors and tourists may feel at ease.

2. Horizontal Surfaces – Empty places:

*Mi pista Campaign by Nike, Madrid (2013)*¹⁸

The slogan of the Spanish campaign was “anytime, anywhere” and it was developed to present the FC247 play - shoes. The concept was brought in the nice (but disappearing) tradition of playing football in the street. The project consist of a laser – projected pop up soccer field accessible through a website in order to schedule the matches in the nighttime (the dark is essential). The campaign provided to manage 7 improvised events in Madrid during one weekend, enhancing the spreading through the YouTube channel.

3. Product – Separating Devices:

*Social Fences by Tejo Remy (2007)*¹⁹

Presented in 2007, the Dutch designer lead us to think about the meaning and the role of “fences” in the urban environment. He manipulated the fence not only creating seats and play areas but, enhancing the interaction between those on either sides of the fence, what is normally built as a barrier becomes an element for connecting and hanging out.

4. Isolated Intervention - Elements of Decay:

*Green graffiti by GG (2008)*²⁰

Starting from the beloved/hated urban graffiti, this method is a sustainable solution that creates temporary or semi permanent images on walls or other surfaces. The GGnetwork is now experimenting different techniques

like Milk Paint or Reverse Graffiti. The latter was invented by the street artist Moose that discovered it at his dishwashing job. Then he started to use a high power washer to remove dirt on a larger scale. Another interesting way of use is the commercial one. Various brand used this technique to advertise their product in the urban context.

5. Spreading Information – Wayfinding:

*Walk your city project by City Fabrics Lab (2012)*²¹

Born with a kickstarter funding, the idea starts from a “guerrilla wayfinding”. The aim is to create a safe and healthy walkable environments through an online platform. By using existing digital resources and the “Google maps” walk tool, the CFL developed a system of classification of wayfinding. Anyone is able to download and customize their own sign, print it and intervening in the urban context to ease its livability making a safer, sociable and healthier way to get around the community.

17. www.cite-creation.com

18. www.cargocollective.com/jesusrevuelta/Nike-FC247-MiPista

19. www.remyveenhuizen.nl/work/public-space/social-fence

20. www.greengraffiti.com

21. www.walkyourcity.org

[img 3] Scenario

The image represents a composition of the elements from the 5 projects classified in scheme 2. It is settled in the area nearest to the tram terminus n. 3 in Gratosoglio.



Conclusion: reassuring beauty

This paper presents a path that starts with the needs of feeling reassured in the daily urban context; then it passes through the reasons why design must focus its attention to the fear and safety issues. Afterward the discourse leads to explore the existing design resources to define new methods and strategies to face the raising safety request. There are some specific concepts referred to the urban scenario that stand out in the work, like pleasant and hospitable. Both of them are inherent to the wider notion of beauty as an essential quality of a good environment.

In 2010 the Commission for Architecture and the Built Environment (UK) carried the research *People and places*²². One of the results suggests that beauty is fundamental to people's lives, independently from their cultural or geographic background. Its consideration cannot be pigeonholed in certain areas of policy: the perception of beauty, or the lack of it, is part of people's everyday lives²³. If policies toward schools, housing, hospitals or transport do not take into account the idea of beauty, then something very important is missing the public realm²⁴.

The lack of beauty is one of the most immediate ways of recognizing poverty and deprivation and, at the same time, experience is the most popular method of accessing beauty – the ability to have an environment in which people can receive the best of what that it has to give.

The practices and the projects presented here with schemes, are a part of the ongoing research "Uninhabited fears: design for urban reassuring scenario". Their aim is to contribute to nurturing imagery (Lambertini 2013), stimulating new cultural vision and awareness because pride in the place can motivate collective actions to protect beautiful assets²⁵. This operation needs, of course, an investment which goes beyond a doctoral research, but after a six months long activity of observation and surveys, a little test will be held in the Gratosoglio neighborhood in February 2015. Through a co-design activity, the ideas of pleasant and hospitable will be explored by the inhabitants to build, with them, a common reassuring scenario.

22. www.webarchive.nationalarchives.gov.uk/20110118095356/http://www.cabe.org.uk/files/people-and-places.pdf

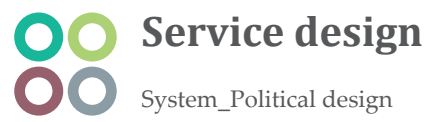
23. Bakhshi, H.; *Beauty: value beyond measure? - People and places: essay seven*, Commission for Architecture and the Built Environment CABA (2010)

24. Bauman, I; *Beauty, deprivation and Richmond Hill in Beauty, localism and deprivation - People and places: essay three*, Commission for Architecture and the Built Environment CABA (2010)

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Environments of self-referential collectivity

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Keywords: Environments, infrastructures, design and politics, city, territory, territorial welfare, political ecology, economy, collectivity.

Abstract

The ports, airports, and greenports of the “Benelux” Delta region, fundamental to the urban conglomerations of not just the Delta, but (at least) all of Europe, are read as outlaw “spatial products”¹. Together with resorts, information technology campuses, retail chains, golf courses, and other hybrid spaces are infact environments that exist outside normal constituencies and jurisdictions –based on familiar commercial formulas of retail, business, and trade - aspire to be worlds unto themselves. Self-referential and “innocent of politics”² they represent an urban horizon of proto-urbanity.

1. Going Back

“Something New Under the Sun” is the title that John McNeill gave to his book on the environmental history of the twentieth century. Extensively footnoted and balanced in its claims, it refers to a period in which the impact of human activities on the lithosphere, hydrosphere, atmosphere, and biosphere of our planet was considerably amplified.

In this situation, for which geologists have coined the paradoxical notion of “anthropocene” a whole revision and revaluation of the roles and interrelations of sciences and technology, philosophy and history, design and politics, economy and art. Activities that have had the greatest impact on the world, particularly in terms of those parts of the world human beings rely upon. As McNeill demonstrates with ample figures and examples, that impact has been dramatic, though not confined to the twentieth century. What has changed most is the rate of change, in almost all environmentally relevant areas.

The drama of some documented changes is incredible. McNeill describes the accidental near-elimination of the American chestnut, the phenomenal global success of rabbits, and the intentional elimination of 99.8% of the world’s blue whales in clear and well-attributed sections. From global atmospheric lead concentrations to the depletion of the Ogallala Aquifer, he also covers a number of huge changes that are not directly biological. I found his discussion of the human modification of the planet’s hydrological systems to be the most interesting, quite probably because it was the least familiar thing he discussed. Also interesting to note is that, published in 2000, this book utterly dismisses nuclear power as a failed technology. In less than three pages it is cast aside as economically non-sensical (forever dependent on subsi-

1. Keller Easterling, *“Enduring Innocence: Global Architecture and its Political Masquerades”* (Cambridge: MIT Press, 2005).

2. *idem*.

dies), inherently hazardous, and without compensating merit. Interesting how quickly things can change. The book looks far more to the past than to the future, making fewer bold predictions about the future consequences of human activity than many volumes of this sort do. Maybe the greatest lesson of this book is that the old dichotomy between the 'human' and the 'natural' world is increasingly nonsensical. The construction of the Aswan High Dam³ has fundamentally altered the chemistry of the Mediterranean at the same time as new crops have altered insect population dynamics worldwide and human health initiatives have changed the biological tableau for bacteria and viruses.

2. Going back to the future

The Southwest Delta region sits between Rotterdam and Antwerp and spans towards the North Sea. Politically and administratively it belongs to the Netherlands, with the De Schelde River that runs through Antwerp flowing into the Sea through the Southwest Delta. This area was disastrously flooded in 1953, putting more than half of the land under sea level.

Only twenty days after this disaster the Dutch government announced the "Deltaplan" that would gradually secure land by building infrastructure to control the sea level inlands. The delta works were completed in 1997 after almost 50 years, opening the land to development. Bordered by Rotterdam and Antwerp, the two main ports of Europe, this territory has a strong potential to be urbanized. Currently it remains an open field of agriculture and scattered rural development. The ports, airports, and greenports of the Delta region, fundamental to the urban conglomerations of not just the Delta, but (at least) all of Europe, define extreme landscape or artificial environments within a fragile environment. With a stable population, but increasing consumption, the port's general rate of growth and its desire for infrastructure will always exceed that of the populated city, itself isolated from zones of production, yet held together by infrastructure systems that cater first to the organization of the port and industrial areas at both a regional and supranational scale.

3. States of exception⁴

The ports, airports, and greenports of the Delta region are near-autonomous zones operating largely outside the bounds of the state, "discrepant territories," as Keller Easterling refers to Free Zones," wherein one is too smart to be right"⁵. Parallel cities without people (save the 'ghosts' of migrant workers and the asylum seekers of the *bajesboten*), but full of the detritus required for civilization they are at once the inverse and the distillation of the same forces shaping the contemporary city.

3. The Aswan Dam is an embankment dam situated across the Nile River in Aswan, Egypt. Since the 1960s, the name commonly refers to the High Dam. Construction of the High Dam became a key objective of the Egyptian Government following the Egyptian Revolution of 1952, as the ability to control floods, provide water for irrigation, and generate hydroelectricity were seen as pivotal to Egypt's industrialization. The High Dam was constructed between 1960 and 1970, and has had a significant impact on the economy and culture of Egypt. Before the dams were built, the Nile River flooded every year during late summer, when water flowed down the valley from its East African drainage basin. These floods brought high water and natural nutrients and minerals that annually enriched the fertile soil along the floodplain and delta; this had made the Nile valley ideal for farming since ancient times. Because floods vary, in high-water years the whole crop might be wiped out, while in low-water years widespread drought and famine occasionally occurred. As Egypt's population grew and conditions changed, both a desire and ability developed to control the floods, and thus both protect and support farmland and the economically important cotton crop. With the reservoir storage provided by the Aswan dams, the floods could be lessened and the water stored for later release. (Wikipedia, http://en.wikipedia.org/wiki/Aswan_Dam)

4. State of Exception" is taken from Giorgio Agamben's interpretation of the term in his book of the same title, in which he argues that the declaration of a state of exception has been replaced by an unprecedented generalization of the paradigm of security as the normal technique of governance. In particular his explanation of military emergency ceding its place to economic emergency after World War One informs the idea that the Free Port Zones are a permanent State of Exception created through governmental abdication of the right to territorial governance in order to ensure state financial security.

5. Easterling, "Zones," in *Urban Transformation*, ed. Ilka/Andreas Ruby (Berlin: Ruby Press, 2008), 45.

Within these zones, land is developed without zoning restrictions and customs procedures are carried out by the import companies themselves. Still marked out as a source of contamination, the sole area where the port must answer to stricter restrictions than the city is in hygiene: all admittances are monitored and regulated. As a networked space without composition, it denies the idea of a center and acts rather as an armature linked by flows.

Increasingly purified of outside activity or even connection, it is structured according only to the principles of increased growth, both in terms of internal capacity and territorial expansion. Both types of expansion are speculative—"the port should await the ship," as the former mayor of Rotterdam demanded. The need for ultimate capacity leads to a space of perpetual transformation: not only through the management and redistribution of goods, but also the constant reassessment and improvement of internal capacity: like the city of Rotterdam,⁶ the port is a site of perpetual transformation. This growth both indexes and presupposes the increase in volume of what a society produces, consumes, and discards - success indexes in a capitalist economy.⁷

4. Parasite city

Though the cities bordering the delta region have liberated their reputations from their port origins, they are dominated by port structures. The rail, canal, highway, and pipeline networks connecting the ports, as documented in the Delta Works map, organize the territory by providing infrastructures that are assets to the civilian areas, but in turn guide regional planning exactly through that provision⁸. With a stable population, but increasing consumption, the port's general rate of growth and its desire for infrastructure will always exceed the city's, and thus it will always guide the development of regional infrastructure simply by requiring it first.

The city is in turn provided with massive connectivity that attracts not just companies tied to the port, but companies seeking the network connectivity that such an infrastructure provides. The creation of beaches and nature preserves in exchange for port expansions of the port and the use of waste materials, like the CO2 from the oil refineries that provides the heat for the greenhouses that allow the Dutch to be 600% self-sufficient in tomatoes are other examples of resources given by the port for use by the city. With no need for image marketing and little need for employees, there is no reciprocity: from the view of the port, the city is a parasite.

In any case, the port has little challenge from the city in terms of organizational influence. The growth of new sub- or ex- urban development in mostly indiscriminate configurations points to the weak gravitational pull of the city centers, as well as a general lack of resistance to shifts in the use of the territory. Perhaps one source of fascination for the port is simply a dissatisfaction with the cities themselves: no one ever muses about Hoboken.

Given the representative pressures on the center of the European city-- which is now expected to be (if there is any opportunity) of well-preserved historical character, civil, pedestrian-friendly, clean, and conducive to shopping - they have been sanitized of the complexity and friction of an urban condition.

Carefully zoned into business districts that empty at 5, shopping districts at 6, and residential areas consisting typically of a single type whether single-family homes or row housing- all are isolated from zones of production, yet held together by infrastructure systems that cater first to the organization of the port and industrial areas at both a regional and supranational scale.

6. Office for Metropolitan Architecture and Nyfer Forus for Economic Research "Maa\$olakte" (Den Haag, 1997).

7. Ronald Wall, "Presentation Title." Paper presented at the Holcim Foundation, location, Date 2007.

8. *idem*.

5. Morphologies and logics

Environments of self-referential collectivity represent a territory in the original sense of the word: a space mastered by corporations and outside the bounds of the state, much like the holdings of the Dutch East India Company. It is not a homogeneous whole, but a series of different tissues that are contiguous, operate for mutual benefit, and are held together and to other archipelagos of industry by infrastructure.

Because of sheer footprint, it is necessary not just to understand that these regions exist but to also attempt a taxonomy of their morphologies and logics. Four main morphologies are codified: static/heavy, light/fleeting, topologies and armatures, and plinths. Static/heavy areas are arranged within the grid of their usually urban context, and as such allow the possibility of pedestrian and vehicular connection from other areas.

Comprised mostly of multi-story warehouse and production facilities with high structural capacity, these areas are considered desirable due to their waterfront location and the transformability of their structures. Light/fleeting areas are cul-de-sacs along an infrastructural armature, operating as self-contained entities tied in a nodal structure to a larger system. The often take the form of an office park, sitting lightly on a nondescript site with dispersed facilities and large areas for staging and parking. Their structures are single-story or low-rise and built as minimum enclosures, likely to be rebuilt as-needed. Topologies and armatures are comprised of an articulated ground plane and a network of machine structures. For storage or production, though they are comprised of a kit of parts, their configuration is specific and produces a complex whole, with the built and the site both designed in total and in concert with one another. Plinths are raised planes, constructed as the rest of the port at least 5m above sea level, upon which constantly shifting landscapes of goods, whether containerized or loose, are handled by automated machine.

The leftover and border areas of the port also constitute a specific species. At their most basic, these are simply areas that have been stranded between infrastructure and the port perimeter, or marooned islands created with a new haven-literally, leftovers. Recent expansions of the port have required far more explicit political bargaining in order to gain governmental and juridical approval, so these areas have grown to include thickened port borders that both disguise the unwelcome presence of the port and provide compensatory habitat areas.

6. A short digression on an architecture of the port

The Maasvlakte Oil Terminal: storage tanks are arranged serially, connected by pipeline to each other, and by underground pipeline to refineries further inland. Each tank has a 1:1 relationship not just between its contents and its envelope- the floating roof means the container is always exactly the size of what it contains- but also between each building and its site, as each tank is enclosed by a square dike that equals the maximum volume of each building. Each a pure cylinder, painted white and repeated in a row of six, it is impossible to perceive the bigness of the 80 meter high structure.

7. A territory for architecture?

The port is post-human, rendering both architecture and the city nearly irrelevant. At the same it, the Urban Horizon produces a set of spaces and resources so fertile they could be considered as engines or catalysts. The city and its citizens should embrace their parasitic state and take fuller advantage of the infrastructures-transit networks, waste materials, information systems, and territories, available to them.

Different school outdoor play spaces and pupil's perception

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Keywords: Outdoor Environments, Environmental Design, Play, Children, School Playgrounds, Natural Environments, Pupil's Perception, Observation, Focus Group.

Abstract

There have been many concerns about the low quality of children's play spaces and this is even more visible in schools' and nurseries' outdoor environments [1, 2]. Even though children spend a lot of their time in these educational outdoor spaces, many school playgrounds are still covered in tarmac with very few facilities. There have been many attempts to improve these outdoor environments, however, studying many of the examples show that many designers merely redevelop the aesthetical look of the play spaces rather than considering what children may really need and desire. In fact, while children are the main users of these outdoor spaces, in many cases their perceptions have been ignored.

This paper attempts to act as a voice for school aged children as potential designers of their own spaces, by representing their opinions about the various outdoor play areas that they could have access to in their playtimes. 26 primary school children from across grades 1 to 7 are randomly chosen from a primary school in Edinburgh. The school is facilitated with a variety of different play spaces which are: 1- a tarmac play space which is facilitated with balls, ropes and similar play equipments, 2- a plain grassy hill space, 3- an enclosed wildlife garden which is covered with trees, bushes and other natural elements and 4- a designed play space which is facilitated with natural elements such as trees, grass and willows, in addition to stages, fountains and other elements.

Children from each grade are initially invited to take part in a 30 minute focus group discussion where they are encouraged to talk about what sort of things they do in each space, what they like or dislike about each play space, and what they like to add to their playgrounds. Secondly, they are taken to each of these spaces and are closely observed to see their play behaviours and engagements in each of the settings. This paper reports children's expressions about the different spaces and a narrative report of the observation sessions. It then counts the main elements that were chosen by the school children in addition to the parameters which supported their play in a positive way. The suggestions can be used by schools and playground designers as a baseline for designing these environments.

1.Introduction

There are many companies [3, 4, 5], organisations [6, 7, 8] and independent designers [9, 10] that work on designing playgrounds and outdoor environment for children considering different aspects. However, studying samples of these cases shows that those designers and architecture who aim to create something original mainly focus on aesthetically appealing forms and structures rather than desirable

forms and functions for children which provide rich quality play opportunities. The main users of playgrounds are children, however they don't usually get the chance to give their opinion about this environment and are forced to act as the space leads them to. This paper aims to give the children the chance to give their own perception on various play environments and designers are suggested to consider these facts through their design process.

2. Research method and case study

This research was undertaken in a Primary school in Edinburgh, United Kingdom. The school had over 200 pupils and apart from a big building, it had access to various outdoor play areas which made it an appropriate case for this study. For this research, two data collection methods were used. Firstly, semi-structured focus group discussions took place with eight groups of children from grade 1 to 7. The Sample consisted of 26 primary school children and each focus group was held with children from one grade. Children were invited to talk about their playground and were asked the following questions (Table 1.):

Focus Group Questions
What sorts of things do you currently do in your playground?
What sorts of things do you do in the Wildlife Garden/ Grassy Hill / Central Garden?
What do you like about the playground/ Wildlife Garden/ Grassy Hill / Central Garden?
What don't you like about your playground/ Wildlife Garden /Grassy Hill /Central Garden?
How could the playground be better/ What would you like to add?
Overall, which part of the playground is your favourite part?

Secondly, observation method was used as the children played in the different parts of the playground in order to understand what the children do in these various settings. The observer recorded children's play as a Recognised Outsider in order to get close to the children's play and capture their acts and talks closely. Also, Narrative recording has been used to get a general idea of their behaviour.

Table 1. Focus group questions

Children were taken to four different play spaces which were already available in their school. The first space which the children spent the majority of their play times playing in was a plain tarmac playground which was facilitated with football goals, a basketball net and some painted games on the tarmac ground. The children brought some play equipment to this space such as balls, ropes and hula-hoops. The second area that the children were taken to was a plain grassy hill space which was attached to one side of the tarmac playground. It only had a small tarmac stage on the top and the rest was covered in grass. Children were not usually allowed to go on this hill in school hours.

The third space was an enclosed wildlife garden which was the most natural environment they had access to having several trees, evergreen bushes, and the ground covered with autumn leaves and some logs in one side. As supervision in this area was more complicated than a tarmac space and all the children couldn't fit in the space, only one class were allowed to use the space at a time, and this was only in case the weather was dry. Finally, the fourth area that the children were observed while playing in was a designed area facilitated with some natural elements such as single standing trees, grassed areas, paths designed with willows, in addition to a stages and fixed logs around it, a small pool and a fountain. Even though this area had a variety of elements and spaces which seemed to support children's play, they were not allowed to access this enclosed area in play times and were only taken with their own teachers for outdoor classroom hours, so it was known as the outdoor classroom area rather than a playground space.

3 Focus groups and observation results

3.1 The Tarmac Playground

The questions about the playground experiences started from this space as all the children knew this area as their playground. When asking questions about their play times in this area, none of the groups seemed to be very excited and simply counted some of the activities they engage in. These included mainly running games together such as tag, piggy in the middle and hide and seek, or playing with the play equipment such as playing with hula hoops, throwing bouncy balls and running after it, skipping ropes, cone and a ball and throwing frisbee to each other. Some children also mentioned using some strings to play cat's cradle (fig 2).

Fig 1. View of the Tarmac Playground



Fig 2. Girls playing Cat's Cradle with string



In addition, many of the children said they engage in sports such as football, basketball and dodge ball. In fact, few of the boys were very happy about having the chance to play football in play times, while some girls from year five mentioned "It's not fair the boys get a football pitch but the girls don't get much".

A more interesting game that two of the girls spoke about was being "ice-girls", where they made ice and the boys slipped over it! However, this seemed to be very occasional and only happened in snowy days. Only few children mentioned playing on the painted games on the tarmac such as hopscotch, which didn't seem to be in their top category (fig3).

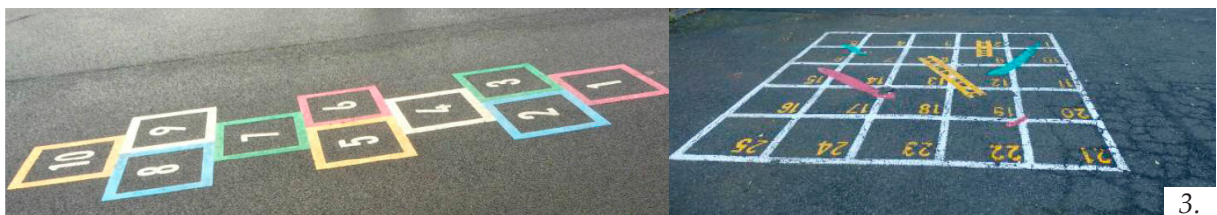


Fig 3. Painted games on the tarmac ground

There were very few more other activities that the children said they engage with in this area which were not related to the facilities in the space. For instance, they brought papers and pencils from their classroom and played notes and crosses, or some girls said they made tattoos by cutting a shape out of stick and then using lipstick to colour the shape. Over all, talking to the children about the tarmac play space, nearly all the children talked about the same sort of activities, which to many seemed to be "very original games and they are boring". Also, some other complaints raised was about the hard surface of the tarmac and that "you fall and hurt yourself".

In the Observation session in the tarmac playground, children were engaged in the same type of play behaviours that they had mentioned. The smaller children spent nearly the whole playtime playing tag together, running around and tagging

each other (fig 4). This sometimes resulted to arguments and upset some of them, which the teachers had to get involved. Some of the older children started playing football from the first minute and they seemed to be happy, just like they had said in the discussions (fig 5).

Other older children who were mainly the girls who didn't like football, started looking into the play equipment basket to find something to engage with, mainly the items they mentioned in the focus groups (fig 6 and 7). However, they only played for few minutes with each play equipment and kept shifting to another item, which showed how these items couldn't really satisfy them to develop on a good quality play. Some of them, just as they had risen earlier, left the play equipment and preferred to walk around the playground talking to their friend.

Over all, similar to how they expressed their opinions about the plain tarmac playground, most of the children couldn't experience much excitement in this area and engaged in repetitive original games every play time. In fact, akin to their voices in the discussions about this space and their play opportunities, their faces didn't show much excitement when they were engaged in play in this environment either.



Fig 4. Children playing Tag

Fig 5. Children playing football



Fig 6 and 7. Children playing with play equipment in the tarmac playgrounds

3.2 The Grassy Hill

Asking the children about their play experience in this area, unfortunately they didn't have that much to say. This was mainly because they weren't allowed to play on this area at all except for dry sunny days. Some of the children also seemed to play on the grassy hill before and after school hours while waiting for their parents to pick them up. Most of the children counted games such as tag, running up the hill and catching each other or "zumbee run" for this space. Some of the girls from grade six said they prefer to sit on the grass, Take papers from indoors and draw things or just relax and talk with friends. A more different experience that two friends had was to make a bird nest in the grass by cutting bunches of grass, placing berries in it and sometimes pieces of bread for them to eat. Some of the complaints about the grassy hill were mentioned by the grade four discussion groups. Firstly they weren't happy that they are not allowed to use this space as it is usually wet, and that their parent's wouldn't be pleased as they will get muddy. Secondly, they mentioned about getting hurt while rolling down due to the rocks hidden in the grass. Finally, one boy from grade four was unhappy about the fallen leaves in this area as it made it look messy.

Fig 8. The Grassy Hill



When the group of children were taken to the grassy hill to be observed, many of them asked to leave and join their peers in the tarmac area. In fact the grassy area didn't seem to be very appealing to them specially without having the chance to play with their classmates. Those who stayed were the older children. As they had risen in the focus groups, they started running and catching each other at first. After some time, the ones that played football in the tarmac space used the tarmac stage up the grassy hill to do gymnastics. Some girls asked if they could bring some play equipment, so they played with the frisbee and hula-hoops for a while. Few other girls, as The observation on the grassy hill showed that it wasn't a very attractive area to the children without their classmates, and it didn't seem to give them much opportunity compared to the tarmac area.

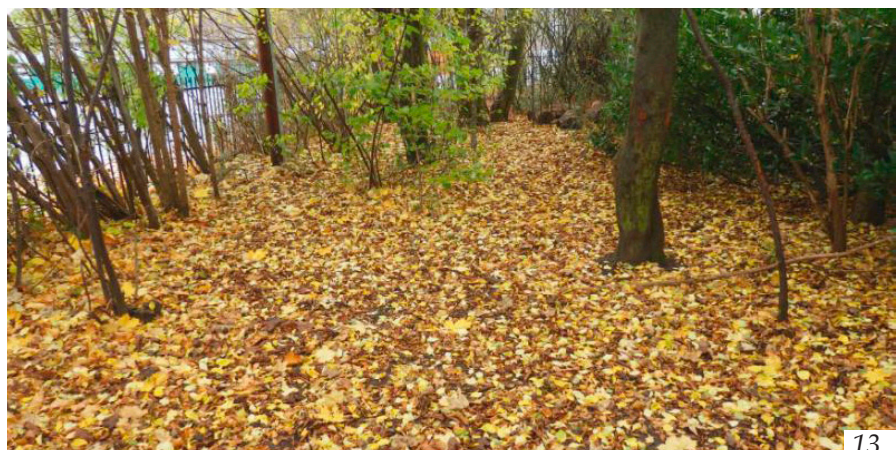


Fig 9,10,11 and 12. Children playing on the grassy hill

3.3 The Wildlife Garden (Woodland)

Starting the discussion regarding the wildlife garden, most of the groups seemed to have lots to say. In fact, they did get excited about the different experiences and they all seemed to enjoy talking about the fun they have had there. The year 1 to 2 children started talking about their experience of the wild life by counting activities such as Catching bugs, finding different leaves and sticks, finding plant seeds and

Fig 13. Wildlife Garden



squashing berries. Another child from year three said he likes the creatures in the wild: "there was a little spider who was a mum and was about to born a baby" (Fig 14). They were also excited about being able to climb up the trees or just running between them. Apart from the wildlife experience, they spoke about more creative play activities that they had had. One child from year two expressed the enjoyment of making a bird house with string and sticks. Another child from the same grade explained how they made a tree by breaking the sticks, sticking them into the ground and attaching a leave on the top of it. Making autumn pictures by taking the leaves and other natural materials into their classroom was another exciting activity the year two's spoke about. Interestingly, as the focus group age increased, the sort of play activities the children spoke about seemed to become even more creative and varied from usual physical based activities.

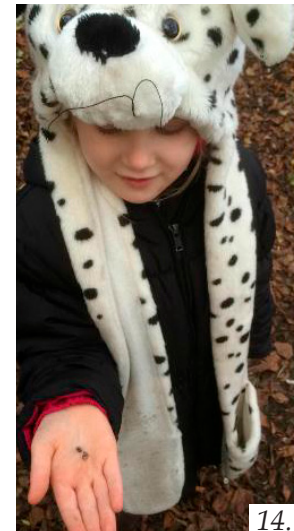
A year three boy said "you can make a limbo bar, pick a long stick and put them on two trees" and another explained a whole scenario of a game they played: "We did a museum and we did it on a big tree and there was like a little hole here and we put honey and berries and there was a big part and we made a bed. We had two leaves we put on the bottom and then we had two cushions and the next day we saw a squirrel inside it". The year four and five's started with expressing some physical activities such as playing hide and seek in the wild life garden or fighting with sticks. They also explained how they enjoyed making a fire place by putting sticks together and rubbing them together to make fire. They also liked the logs as they could sit on them or swing on them. The year sixes seemed to be even more creative about this play spaces. They spoke about making shops in the garden, selling sticks as swards or as brushes. They also made a bed and breakfast and explained the whole game around this idea of having security people as well as cleaners.

They spoke about the parties they had which they used the leaves and other natural materials as decorations. "We make cocktails and put sticks in it and a leave at the top and pretend it's like a fruit cocktail or something" said a year 6 child. In addition, they "made Kingdoms", used specific leaves as "passes" and "money", so the players had to give five leaves as the entrance cost. They also spoke about their "den fight", making dens in two corners between the trees and bushes and "fight over stuff and sticks".

A year six finally said they "just have lots of fun in it". The year sevens had similar exciting stories of what they did in the wildlife garden. They also had the bed and breakfast story: "First me and ... got lots of long sticks and used them as a bed so it was like two branches and a bush and we put it up and it looked like a bed..." or spoke about how they used the logs: "Pick them up and use them as furniture... Turned it into a bed and breakfast...". They also had fights: "There was a war going on in it, we were the dark assassins, and we fight the rubbers" or explained how they designed a penthouse: "We had a Penthouse, we made it out of tree bits and bushes, we added some sticks on...". One other famous game for the year sevens was playing "I'm a Celebrity" were they challenged each other for doing scary or fun things.

Apart from all the excitement that the children had in expressing their experiences in the wildlife garden, some groups also had complaints. These complaints were mainly raise by grade four and five's. They spoke about it being messy, muddy and having so many leaves on the ground they couldn't find the wildlife. Some children were unhappy that they weren't allowed to climb the trees, while younger ones wished they could access the garden more often. A child from year two seemed to have had a bad experience of tripping over a root, while a year 6 was excited about jumping up and down on a root which had come out of the ground. A year five complained about people throwing litter in weekends from outside, while a year four was unhappy that when they make something, the next time they go there it's broken.

The observations were quite similar to what the children had expressed themselves in the focus group discussions. Unlike the grassy hill session, all of the children were very happy to leave their classmates and join the playtime in the wildlife garden. As soon as they came in the garden they all got engaged in playing with each other and the environment. Interestingly, different aged children were



14.



14.

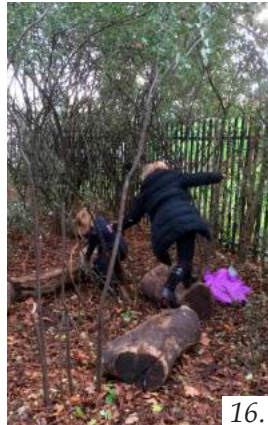
Fig 14. Children finding creatures

playing together and sometimes the older children were helping the smaller ones to enjoy themselves. Many of the younger children were highly excited to climb the trees or jump up the logs (Fig 15 and 16). Some of the children went inside the bushes and pretended they are riding a horse (Fig 17 and 18).

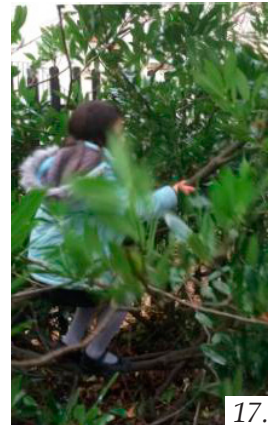
Some of them started finding creatures or small pieces of leaves to feed the bugs. Playing Tag was also something that was going on, but other activities were very famous too. Overall, all the children were very much involved in interesting activities similar to what they described in the focus group discussions.



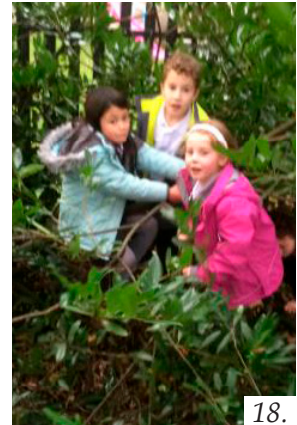
15.



16.



17.



18.

Fig 15 and 16. Children climbing the trees and playing on the logs.

Fig 17 and 18. Children climbing the bushes pretend riding a horse

3.4 The Central garden (Outdoor Classroom)

As mentioned earlier, the designed garden was mainly used as an outdoor classroom space and children weren't allowed to play much often in it (Fig 20). This resulted to them not having that much to say about their activities there, even though they all really liked to have the opportunity to access it as a year six said "I think we should play in the central garden" and another child boy from the same age



19.

Fig 19. The Outdoor Classroom

group said "We only do teachers stuff like gardening, we like doing these though".

Just like all the other pupil, a year two seemed to be really interested in that space too and said "it's got gorgeous stuff", and "I like the flowers, bushes and the green tunnel" said a girl from year four. Another said "When it is autumn you can take leaves of and put them in your basket and make autumn pictures with them". And another child from year two spoke about other creative activities saying "There are apples, you can make autumn pictures with them as well, you can eat them too".



Fig 20. Different parts of the central garden

20.

Even though they hadn't had that much play experience in this area, when they were taken there for observation they were all highly engaged from the very first minutes. Some of the smaller children started running and around the willow tunnel, imagining each part of it is a space of a house and building a family story around it which seemed very interesting and engaging (Fig 21). Some other children went to the messy vegetable gardening corner where they found creatures and au-



Fig 21. Children playing in the willow tunnels.

Fig 22. Children finding leaves and creatures in the vegetable corners.

22.

tumn leaves with different colours (Fig 22).

Some were excited to look into the pool and investigate the different parts of the garden as they ran around. Some of the boys, who usually played football in the usual playtimes in the tarmac playground, were also highly engaged doing gymnastics on the wooden stage while some girls started jumping on the logs around it (Fig 23 and 24). In one corner of the garden, few of the children started picking sticks, and tried to make a house with them by placing them in-between the floorings of the ground. The process was very rich and even though the sticks kept falling, they continued trying. Another girl also started picking different natural materials from the garden with some friends, and started mixing them to make a soup for the wildlife creatures. These activities were very engaging and motivating, and many other children started to join them as it went along (Fig 25).

In fact, this space had been able to provide various play opportunities for all the children with different interests and they didn't even want to go inside for their lunch break.



23.



24.



25.

Fig 23 and 24. Children playing gymnastics and jumping on the logs.

Fig 25. Children using natural materials to build a house and soup for bugs

4 Discussions and Conclusions

Comparing the four environments based on children's perception and desire, it seemed that they least enjoyed the plain grassy hill area. The main reason seemed to be because it wasn't facilitated with different materials or equipment to give them the opportunity to build their games with. This resulted to most of them asking to leave the area and join their friends in the main playground. In the wildlife garden and central garden observation sessions, the 26 children were also separated from their classmates; however these areas provided a variety of activities and excitement that they didn't bother being away from their usual friends. Children from different ages played together and supported each other while they were in the wildlife garden which was very encouraging. In the main playground, the P1 and P2s were mainly playing tag with peers and none of them were seen using the painted games on the ground. In the older children's groups, most of the boys enjoyed playing football while the girls had less play opportunities and didn't seem to enjoy their time much.

Comparing these spaces, the wildlife garden provided a sufficient base for the children to create their own games and be productive. Children found various play opportunities to engage in and the nature gave them the possibility to decide what they want to do. They engaged in high levels of imaginative play and they used their own creativity to perceive materials as they want. There was a lot of building going on, either if it was building a hotel or a game based on it. This was not only observed in the play session but it could also be perceived through the focus group discussions where they were highly excited to just talk about the fun they had experienced.

The Central Garden was also very enjoyable for the children. It provided various areas for them to engage in different activities. Some of the spaces such as the green tunnel which they had more involvement in decision making processes was more supportive to their play. Some of the children used the natural materials in the central garden to create and build things, which again showed how supportive the nature and natural materials could be to children's creative play.

Finally, the tarmac area seemed to merely support children's physical activities such as football or other ball and rope games. As it was obvious in the observation sessions in the tarmac playground, the children showed they were not very happy to be forced to play in this space.

Based on children's words and behaviours they showed in these four play environments, this paper suggests designers and playground builders to consider children's perceptions and needs in providing playgrounds for them. Engaging the children in developing their own spaces seems to support their positive vision about the space; in the environments where they can't do any change and have to follow specific rules they don't seem to be satisfied. Putting the children in decision making positions supports their self believe and gives them more confident to engage in higher quality play. Using natural elements and materials such as trees, bushes and even natural material floor coverings like chips, gives the children the opportunity to come up with different ideas in developing play and thus desire the process throughout. These materials usually provide different shapes and forms, so children can get more involved in thinking processes while playing. Overall, the play elements and spaces that have elaboration and flexibility seem to satisfy children's playing needs more than straight forward play equipment. Thus the diversity in natural spaces seems to be more engaging and motivating to children rather than balls and fixed play structures.

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Design for Smart Cities

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Abstract

In the philosophy of smart city , the eco-district assumes a central role in defining the quality and sustainability of space . The same must be technological and interconnected , but also sustainable , comfortable , attractive , safe , in one word “ intelligent “ : This is the identikit ideal dell'ecoquartiere within the so-called smart cities that are designed to ensure balanced urban development .

1. Eco quarter and smart city

Design, build and live our built environments in harmony with nature can and should be an achievable goal. So that humanity has a future we must learn to live in nature and we have to reduce, to a level balanced and acceptable by the natural system, waste and pollution of our activities. Specifically, contemporary architecture and urban design increasingly need to compare herself with environmental sustainability and the context in which they are inserted. Urban design should be conceived as a study of the integration to redevelop the urban voids with products or socio / economic respecting the environment in which we live. The goal of the design is to create sustainable places, goods and services through a careful planning of environmental issues, thus reducing the use of non-renewable resources and trying to limit the negative effects of industrial production on the environment by reducing pollution and increasing the visual comfort of the urban image of the city, the neighborhoods.

The eco-district then defines a model of sustainable development from a cultural approach where the man is the center of everything and the spaces are tailored to the needs and the needs of the local community. The design of eco-neighborhoods becomes an opportunity to intervene in the urban context by responding to the new demands of environmental protection and respect the land in a sustainable perspective. One can not ignore the size of comfort and quality of life, to better define a planning scenario and project for the creation of spaces and environments capable of telling a model of sustainable development durable intervening on an overall view of the neighborhood that studies the image that the district wants to represent through surfaces hoping for a placement in harmony with the existing urban context.

The neighborhood here becomes an element of sustainable innovation and cross that must be designed and implemented through measurement systems and monitoring at the service of an integrated design that can meet the diverse needs of the construction process and sustainable development. Design, build and live our built environments in harmony with nature can and should be an achievable goal.

The eco-neighborhood is a way of thinking about the territory, a generator of wealth and an effective and self-sufficient to combat the crisis and the need for change. And 'built to facilitate sustainable behavior making them at no cost or even profita-

ble. The payments are used both in new development areas that the rehabilitation of buildings and interiors can be different:

- Urban area in degradation
- The new neighborhood
- The historic district.

In all cases it is essential from the subjectivity of those who live there.

2 Designing with nature

Renew, Retrain and Rethinking the city in view of the zero-impact building

Sustainable design and conscious, obliges us, today, not only to pay attention to environmental issues but also to try to respond to new conditions and disasters that are increasingly affecting our territory. It will, therefore, increasingly important for us designers, able to integrate new technologies that are not only able to respond to the environmental issue but also know how to make us safe and protected in the event of natural disasters and particularly in the case of earthquakes. To do this it is essential to know the whole chain of the project from the environment, the climate, the building traditions to different users and to the economic and social aspects in which it fits. This methodology is developed through the integrated design that goes from the concept of a green house to the creation of eco-districts in urban scale, through the development and regeneration of the built (historical building) and new product architecture Green Building for building eco-compatible new generation.

It is essential to achieve the requirements of sustainability and environmental



Fig.1 – Ecoquarter project in Bergamo - Italy

certification, (ex. LEED, Climate House and others) “design with nature” in a concept of life cycle, project and product where design, architecture, energy and the environment system and the materials used and the dialogue they are not the sum of many small pieces but a unique renewable, flexible, durable and safe.

The message we want to give is to minimize all impacts of sustainable supply chain that must be able not only to reduce consumption, waste and costs, but at the same time to convey strong emotions and enhance the needs and needs of contemporary society.

Next to this need for environmental sustainability, after the seismic events of recent years have taken place in Italy, was born the need to rethink the design, from the point of view of safety, strength and stability of the building, be it new or belonging to ‘immense Italian building. The recent earthquakes in Italy (Abruzzo 2009 and Emilia-Romagna 2012) showed the high level of seismic risk that characterizes our building heritage, highlighting the morphological and structural deficiencies of several buildings, causing ruinous collapse or serious disruptions.

Therefore, the reconstruction can be a stimulus and an opportunity to develop and promote green buildings and technologies to be applied to new construction and renovations with particular sensitivity to the theme “green and social” starting from the needs of the users, especially the most vulnerable, until the design for green housing. In Italy, in this sense, have made great strides in recent years, both in terms of earthquake that environmental sustainability, but few have been projects that have been able to combine both issues in a comprehensive manner. From the technological point of view designers are learning to take account of the anti-seismic already in the concept phase. What seems clear from recent experience is that the new buildings to withstand an earthquake must move towards the isolation of the base of the building to facilitate the dissipation of energy, changing concepts that govern the setting of the seismic design of buildings, proposing new themes for an appropriate design, attentive to environmental issues and structural problems of buildings exposed to earthquakes very violent.

The new concepts for the design must cover new aspects involving substantially compositional conceptions of contemporary architecture and sustainable:

- the movement (facilitating the movement between the parts of the construction counteracts the risk of rupture of the structural elements)
- discontinuity (between the parts of the building, to allow the contrivance of “pads” that allow the swing without the structure is damaged)
- deformability (of the structure as a whole, through the use of materials that are highly flexible but retain a low environmental impact, such as for example wood)
- morphology (the entire building, designed in order to ensure proper weight distribution)
- visibility (devices, through technological and architectural choices that they also have a vocation communicative and user awareness to issues aseismic).

The above objectives require that the architecture gives its irreplaceable contribution to the seismic design. New construction techniques based on isolation at the base and on the energy dissipation suggest new concepts of composition based on the concepts of “movement”, “separation” and “deformability”, generally unrelated to the Architectural Design classic.

For this you will go more and more toward experimentation with new forms and prototypes that will reap the challenge faced by the construction of the houses of the future. What is immediate and clear as of now is that the architecture will have to return to rely on the wisdom of traditional architectures bringing within the story technological innovation and renewing it with wisdom and respect.

Specifically it has started to think about the building such as integration between technological innovation seismic and sustainable architecture to create a building system that is efficient from the point of view of the seismic actions and at the same time that can be considered sustainable both economically and from the point of environmentally.

Great progress is being made at an early stage of the design, trying to exploit the potential that local resources can offer with the use of recycled and environmentally friendly as can be: the cardboard structural, seismic isolation in panels eps or l ‘use of load-bearing structures and wooden panels.

The new architecture will therefore increasingly rich in natural and recyclable materials and will ensure that they become the main structural element of the building itself. It will inevitably towards prefabricated structures with all the trappings of construction and in technical and seismic material, packages and plants to make buildings energy efficient. Projects that aim and ambition to respond to the many issues in the world of contemporary buildings, proving that it is possible to create spaces that embrace the same philosophy of green building and the latest anti-seismic technologies.

The scenery that is emerging is that of architectures Off-grid, that is completely autonomous and efficient: buildings that respond to sunlight to energy needs required for their operation and that, in this way, minimizing the impact on the area in which are inserted. It will be structures with constructive system of fast realization, assembled virtually dry and that minimize the environmental impact, the waste of

the area and the cementizzazione.

The target audience is very broad: it will develop structures capable of responding to the function of public space (kindergarten, school, etc.), space for leisure (associations, leisure etc.), reception area (as a base module for hotels or guesthouses) or residential building, both as a model for the construction of new eco-neighborhoods that as implants extension to existing public buildings that need more space or are unfit or uninhabitable.

The answer then is just the study of a new product architecture and design that has as its slogan evocative the three “R” Renew, Retrain and Rethinking the city.

Summarizing the architecture will move in three priority areas: the sustainability of the life cycle of the project (design innovation, architecture zero impact, short chain component of the product architecture, integration of “component nature” of the case, different uses, retraining / recycling envelope components); Green building systems Building through the modularity and flexibility of the structure and the role of the housing off grid, designed as mobile manufacturer of energy, tailored to different climatic conditions. Smart in terms of speed of realization and assembly and of different types of uses and through the use of space at the free plan view of “architecture renewable”; the quality of the indoor environment: the strong attention to issues seismic and spaces suitable for children and all utilities sensitive, in a perspective of design for all;

Therefore the new sustainable architecture and earthquake must be a model green towards the future, respecting the environment without compromising the parameters of functionality and aesthetics that always belong to the building.



Fig.2 – Green Buildings project

3. Sustainability plan, welfare and life quality

When designing a space you have to pay attention to the concepts of well-being declined in the different conditions of life and work of human living spaces, leisure, hospitality, meeting, work and daily life.

The goal is to rethink the architectural space through new usage models where man is at the center of the project and the size of the space is linked to the perception and the natural elements. Possible applications are: new models of parks, hotels, office space integrated with relaxation areas, new commercial spaces and leisure, qualification of non-places. The “welfare project” must, in short, to be developed taking into account five basic parameters:

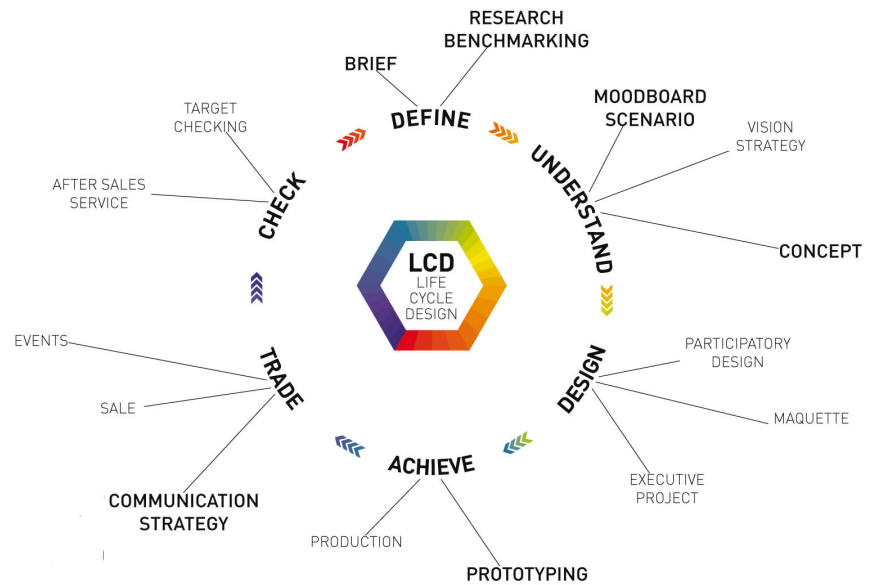


Fig.3 – Green Design Process

3.1 Perceived Quality

The panorama of the materials produced by the industry since the war is for the majority in a world smooth and homogeneous, compact and continuous, the result of a vision hygienist and production logic of standardization.

The coldness tactile metal, clean linear plastics, woods polished by the precision of the machines have to retaliation depleted our sensitivity, creating a landscape in which material normally contrasting materials are reduced or managed with difficulty. Sensory perception in a project must be a key word: we must “design perceptions”, the interaction between man and object.

3.2 Quality of the spaces

There is a possibility to design the spaces in an alternative to the traditional one: looser, softer, more open indeterminacy experience.

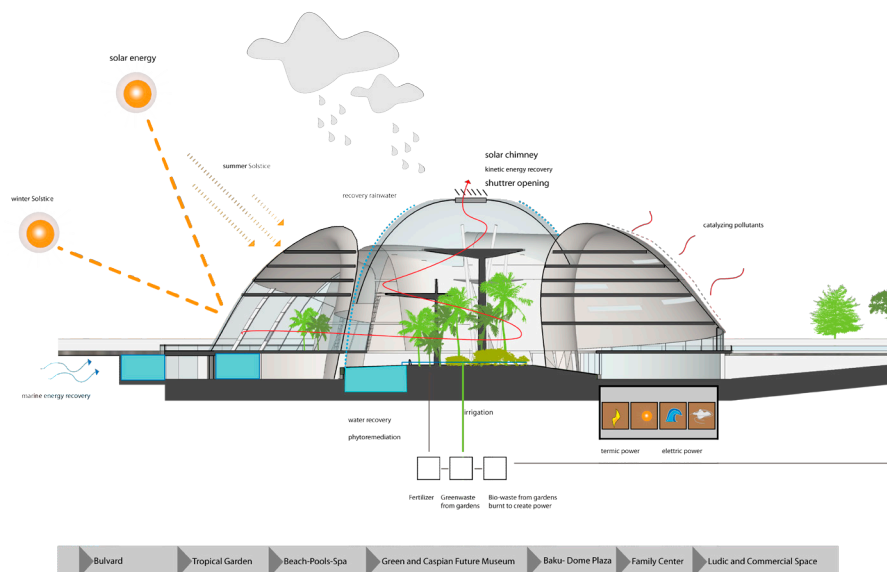


Fig.4 – Green Project in Baku

Is to think about the environment, not as a space phonological, structured according to a formal setting and a functional order, but as a place where they can live more dimensions also opposed to each other, a hybrid environment in which the relationships that establish the damage shape and identity. A space that is constructed so through the selection and simplification of the elements, but by merging distinct polarity (inside and out, formality and flexibility, materiality and immateriality) creating conditions of great richness and complexity.

Space transformable, ductile, able to allow different ways to inhabit and use it during the day and with the passage of time. It is also, however, a space that allows you to be personalized, gentle, willing to get an impression. The space, therefore, as a body, must be able to mutate, evolve according to the cultural project of its inhabitants, maintaining the genetic characteristics of the project.

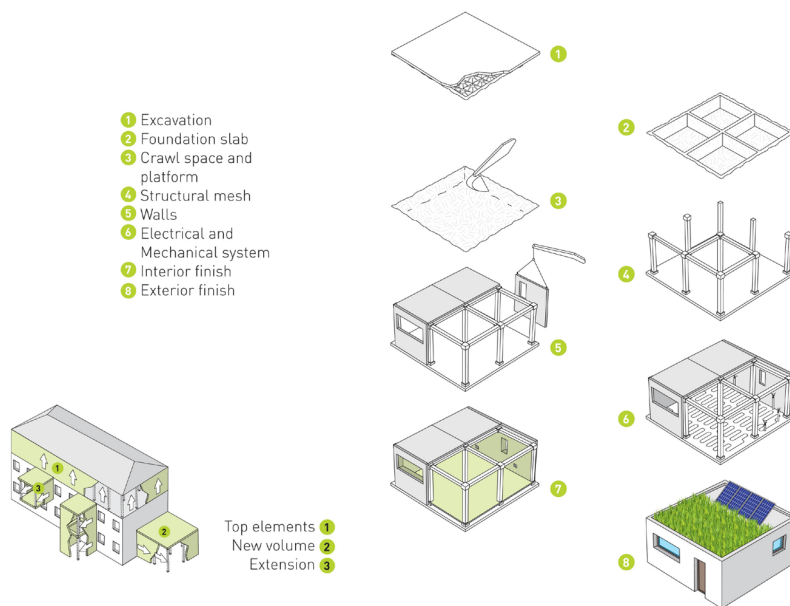


Fig.5 – Tecnology sistem for green buildings

3.3 Quality of materials

The quality of materials is a key element in each project.

To choose the right materials need continuous research and sensitivity to the environment and above all consistency with the objectives of the project. The philosophy behind the choice of the materials must in fact be to reach the meeting point of five key points:

- Sustainability and naturalness: favoring natural materials that are substantially and that even if treated and processed not have a production cycle particularly polluting and damaging to the environment;
- The origin: the materials of the short chain, as well as being the least polluting in terms of transport, are often also the most suitable environment and climate in which they work;
- Durability: assess the strength and consistency of materials used in construction in relation to the features and objectives of the project;
- Recyclability: use materials that can be easily dismantled, recycled and reused once the structure is no longer in operation;
- The local tradition: in some situations the right materials for a project are those who, historically, have always been used for construction (inter alia by the insertion in the surrounding context of the project).

The choice must then start a sensible awareness that buildings and contemporary structures have a date of construction and an expiration date, and then you must

patiently choose the best solution which is a meeting point between respect for the environment, durability over time and opportunity to recycle once the life of the building.

3.4 Energy Resources

Designing sustainable buildings means paying particular attention to the weather conditions where you go to work and be able therefore to choose the materials, techniques, plant systems that involve the least possible energy needs. This concept is of great importance; In fact, the most common mistake is to think that energy saving is simply given by renewable energy sources and from certain plant systems.

The reality is, however, that a building must first have a low energy requirements, obtained through systems of passive income, isolation, natural air circulation, correct choices of materials, construction systems, orientation, etc .. You can, so, get a building with a very low energy requirement (even less than 30 kWh / m²a) and this result we can think of to cover this low demand with renewable energy sources. It is, therefore, essential in architecture design in a conscious and careful and make the right choices and targeted, and then be able to integrate in a more correct renewables and various plant systems.



Fig. 6 – GKH – Green House prototype

3.5 Approach Design for All

The project, developed through the application slavish and uncritical of the legislation, leads to a space suitable for an individual “standard” that in reality does not exist. A “standard” is a formalized model of reference for comparisons and comparisons, it is therefore clear that each individual (for the definition of standards) will differ from the reference model in a micro or macroscopic.

It is for this conceptual mismatch inherent in the definition of a physical reality, we must take into account the different characteristics and physical characteristics of individuals and also cultural to get a final result consistent really usable and focused on the concept of social inclusion.

Farm Cultural Park

Andrea Bartoli, Florinda Saieva

www.farm-culturalpark.com



Farm: Museo delle Persone

Farm Cultural Park non è un museo e non è una galleria d'arte. È un centro culturale di nuova generazione. Qui quello che conta non è la collezione permanente. Non importa il prodotto ma il processo; non il valore delle opere ma quello delle persone. Farm è un museo delle persone. Di quelle che hanno voglia di condividere. Condividere tutto quello che si ha. Risorse economiche, tempo, conoscenze, competenze, network, amicizie. Ogni anno passano dai Sette Cortili centinaia di persone belle che vengono da noi per raccontarci le loro storie, per condividere i loro percorsi per confidarsi i loro sogni e diventare nostri alleati per il raggiungimento dei nostri.

Questa è la cosa più bella di Farm Cultural Park.



Florinda e Andrea

Farm Cultural Park è una Istituzione Culturale privata, impegnata in un progetto di utilità sociale e sviluppo sostenibile: dare alla città di Favara e ai territori limitrofi una nuova identità connessa alla sperimentazione di nuovi modi di pensare, abitare e vivere.

FKP nasce dalla intuizione di Florinda ed Andrea una giovane coppia di professionisti che ha deciso di non trasferirsi all'estero, di restare in Sicilia, di non lamentarsi di quello che non accade, di diventare protagonisti di un piccolo ma significativo cambiamento, di restituire ai loro cuccioli Carla e Viola un piccolo pezzo di mondo migliore di quello che hanno ricevuto.

Recupero di un quartiere

Abbandonato per trasferirsi in banali condomini moderni, questo pezzo del Centro Storico di Favara vive nel gennaio del 2010 una tragedia: il crollo di una palazzina fatiscente che determina la morte di due sorelline.

I Sette Cortili, anche essi dimenticati, trascurati nelle manutenzioni e pulizie sono la sede di piccoli traffici illegali e sembrano destinati per ragioni di sicurezza ad essere spazzati via con qualche settimana di ruspe o ghettizzati con delle mura alte fatte con blocchi di tufo. A resistere nelle loro casette Zia Maria, Zia Rosa e Zia Antonia tre signorine vecchiette nate e cresciute in quel posto e Vito, ragazzone tutto cuore e muscoli con qualche problema con la giustizia.

Nel mese di marzo del 2010, con due anni di anticipo rispetto ai nostri programmi, decidiamo di iniziare i lavori di recupero dei primi due palazzotti dei Sette Cortili. Se non lo facciamo subito c'è il rischio che in pochi mesi di questo piccolo borgo non rimanga traccia.

A giugno del 2010 inauguriamo con una grande festa e con migliaia di persone venute da tutta Italia e da diverse parti del mondo per condividere l'inizio di un sogno; trasformare questo luogo in un Centro Culturale di nuova generazione nel quale la cultura diventa strumento nobile per la rigenerazione di un territorio e per dare ad una città senza passato, un presente ed un futuro. Sono passati quattro anni di duro lavoro; le casette ristrutturate sono tante e i Sette Cortili sono diventati una piccola attrazione turistica, tanti amici si sono uniti a noi in questo progetto ed è nata una prima Cooperativa di Comunità. Si chiama Farmidabile.

Rinascita del centro storico

Non è facile spiegare Farm Cultural Park. Ed è normale che non tutti abbiano capito quale è la sua ragione d'essere. Tutti però si sono accorti, che Favara non è più come prima. Tutti si sono accorti che ogni giorno arrivano turisti e visitatori di tutto il mondo e tutti hanno letto qualche articolo o hanno visto la loro città in televisione.

Non per la mafia, non per l'abusivismo. Ma per l'arte, la cultura, la rigenerazione urbana. Piazza Cavour è la piazza principale di Favara. È una bellissima piazza e ospita diversi palazzi nobiliari, il Castello Chiaramonte, la biblioteca comunale creata dal Barone Mendola, mecenate dimenticato.

Quattro anni fa, di sera, Piazza Cavour diventava un piccolo Maracanà, ospitava i campionati di calcio africani sino alle prime ore della mattina. Era bello anche allora ma in pochissimo si godevano quel bellissimo posto.

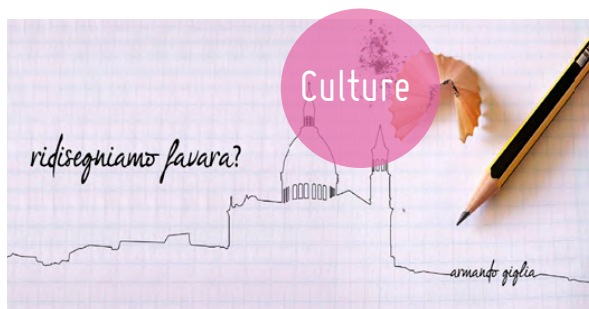
Oggi non è più così. Ci sono alberghetti, pizzerie, bar, osterie e chissà cos'altro sorgerà nei prossimi mesi. I giovani di Favara non vanno più la sera a San Leone. Sono i loro amici di Agrigento che per la prima volta vengono a Favara. A trascorrere le serate in un ambiente accogliente, fresco e pieno di energia. E i giovani di Favara finalmente si sentono orgogliosi.



Costruzione di comunità

In questi pochi anni sono cresciute attorno a Farm Cultural Park diverse Comunità: quella degli Artisti che collaborano tra loro in progetti nazionali ed internazionali ormai a prescindere da Farm, quella dei nuovi residenti, artisti e creativi che hanno deciso di costruire a Favara un pezzo della loro vita personale e professionale, quella dei giovani e dei volontari che partecipano alla nostra proposta culturale e spesso danno una mano per la realizzazione di particolari progetti o eventi ed infine non certo per importanza quella dei nostri amici del web. Oggi i seguaci di Farm Cultural Park su Facebook hanno superato le 24mila unità e partecipano e sostengono il progetto con i loro suggerimenti e le loro osservazioni, condividendo tutte le nostre iniziative con i loro amici.





Obiettivi

Rafforzamento dell'identità di Favara come Città della ricerca e sperimentazione di linguaggi della contemporaneità; di conseguenza crescita dell'attrattività complessiva e dello status dei luoghi, della percezione positiva del *genius loci*; rafforzamento altresì della reputazione territoriale, della visibilità e della promozione su mercati nazionali ed esteri.

1. Economici e occupazionali

Crescita degli investimenti e di conseguenza anche dei redditi; degli standard di vita, dell'economia e della ricchezza locale; delle opportunità di acquisto, della spesa procapite e di quella culturale; miglioramento delle prospettive occupazionali, qualificazione delle risorse umane locali e occasione per fare esperienze.

2. Turistici

Rafforzamento dell'attrattività turistica e dei flussi; consolidamento del rapporto con la Valle dei Templi di Agrigento, qualificazione dei visitatori, creazione di nuovi mercati e nuove modalità di fruizione, allungamento delle ali stagionali e delle permanenze medie. Sperimentazione di modalità innovative di offerta turistica come gli alberghi diffusi e i ristoranti di casa.

3. Politici e Fiscali

Crescita e consolidamento di politiche socio-culturali da parte delle istituzioni, della sensibilità e della interazione con altre politiche attive. Crescita dei gettiti fiscali e conseguente diminuzione delle aliquote locali per i residenti.

4. Culturali

Acquisizione di nuove conoscenze, valorizzazione delle esperienze di scambio e formazione anche e soprattutto attraverso le residenze per artisti; attenzione all'ambiente, al cibo di qualità e alla alimentazione sana.

5. Sociale e Psicologici

Crescita della coesione sociale all'interno della comunità, del senso di identità collettiva, del volontariato e di una maggiore solidarietà; della partecipazione collettiva e del coinvolgimento dei cittadini; del senso di appartenenza, integrazione e tolleranza. Soddisfazione ed orgoglio per il progetto creato nel territorio e del poter diventare Città modello per lo sviluppo di altre realtà.

Cultura come strumento di rigenerazione

È proprio così. L'arte e la cultura qui a Favara non sono fine a se stesse, ma uno strumento nobile per dare identità e futuro a Favara e rigenerare il Centro Storico. Architettura, arte, public design, agricoltura urbana sono il nostro pane quotidiano ma tante altre discipline e tematiche ci interessano ogni giorno sempre di più. In particolar modo tutte quelle questioni che hanno a che fare con l'innovazione sociale e possono partorire delle soluzioni per migliorare e rendere più sostenibile ed etica la vita delle persone del nostro territorio.

Programma Artiscito Culturale

Una programmazione culturale dirompente ha caratterizzato i primi quattro anni di vita di Farm Cultural Park: Mostre temporanee negli spazi interni ed installazioni permanenti nei luoghi pubblici, residenze per artisti, workshop con giovani e bambini, presentazioni di libri, concorsi di Architettura, lettura portfolio di Artisti e numerosissime presentazioni in Italia e all'Estero.

Arte contemporanea

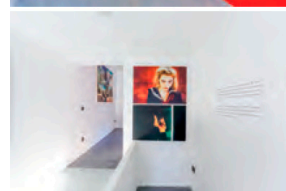
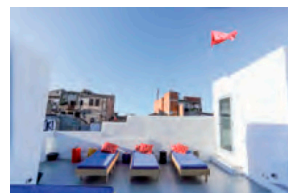
Denuncia, ironia, provocazione intelligente e capovolgimento della realtà sono i tratti comuni delle opere e delle installazioni ospitate ai Sette Cortili, che contribuiscono a fare di Farm Cultural Park una destinazione sorprendente e unica.

Architettura a bassa definizione

In un tempo di contrazione di ogni tipo di risorse: umane, energetiche ed economiche, l'Architettura a bassa definizione ricerca nuovi modelli di definizione di processi di progettazione.

Public Design

Siamo interessati a immaginare, progettare e creare aree urbane non solo funzionali e sostenibili per i cittadini ma anche di grande attrazione turistica. Per connettere persone e luoghi.



Agricoltura Urbana

Coltivare ortaggi, frutta ed erbe medicali e allevare animali all'interno della nostra città. I benefici? Sono innumerevoli e possono essere riassunti in quattro macro categorie: Health con accesso a cibo salutare e attività fisica correlata; Social con la costruzione di piccole Comunità e la loro mobilitazione; Economic con lo stimolo all'economia locale, la crescita dei posti di lavoro e la correlata acquisizione di capacità professionali e l'economicità del cibo; Ecological con il miglioramento del suolo e la valorizzazione della biodiversità, il controllo e la gestione delle grandi piogge e una maggiore consapevolezza ambientale.

Le residenze per Artisti

Ancor prima di aprire Farm Cultural Park e quindi sin dal 2010, lo strumento delle Residenze per Artisti ha avuto ed ha ancora un ruolo cruciale nello sviluppo del nostro progetto.

Gli artisti vengono ospitati per periodi variabili, da un minimo di una settimana a diversi mesi di soggiorno. Chiediamo loro di sviluppare dei progetti culturali che abbiano come presupposto la costruzione di relazioni con gli abitanti del nostro territorio. Bambini, giovani, anziani, creativi. Quello che ci interessa è che i nostri creativi possano entrare in contatto con la nostra

Comunità ed interagire con loro. Attualmente disponiamo di sei posti letto in due appartamenti: il primo all'interno dei Sette Cortili ed il secondo vicino a Palazzo Miccichè, ma stiamo ristrutturando un altro grande immobile che ci consentirà di ospitare contemporaneamente altri 14 creativi.

Gemellaggi

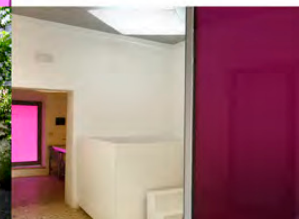
Quanto è importante confrontarsi con altri amici che in altri territori stanno facendo un lavoro analogo? Tantissimo. I rapporti di scambio che si sono generati con alcune organizzazioni nazionali ed internazionali sono fonte di costante valutazione e crescita del progetto Farm Cultural Park.

Tra le relazioni più stabili ed importanti quelle con:

- Ex Fadda. Il più importante caso di aggregazione sociale oggi attivo sul territorio nazionale, a San Vito dei Normanni in Puglia.
- Esterni. Collettivo con quartier generale a Milano a Cascina Cuccagna, da sempre impegnata in attività di rigenerazione e valorizzazione di spazi pubblici.
- Casa Mauaad a Città del Messico impegnata nella promozione di giovani artisti contemporanei.



Farm Pink Garden Apartment





E' il principale luogo di contagio che abbiamo in Sicilia per tutto quanto riguarda innovazione ed arte

Peppe Sirchia, Meedori



Farmidabile

Il Cerchio magico degli amici di Farm ha formalizzato il proprio impegno per Favara creando Farmidabile, la prima Cooperativa di Comunità che affianca Farm Cultural Park nella visione strategica di sviluppo del Centro Storico di Favara.

Sette Cortili

I Sette Cortili sono una sorta di Kasba Siciliana. Sette piccole corti collegate tra loro ospitano una serie di piccoli palazzotti e nascondono alcuni piccoli ma meravigliosi giardini di matrice araba.

Il Blog britannico Purple Travel ha collocato Favara e Farm Cultural Park al sesto posto al mondo come meta turistica per gli amanti dell'arte contemporanea preceduta da Firenze, Parigi, Bilbao, le isole della Grecia e New York. In questo contesto suggestivo, gli spazi culturali sono confinanti con le case delle zie. Antonia, Rosa e Maria sono tre delle ziette che abitano i Sette Cortili insieme a Vito e ad altri pochi residenti. Tutti i visitatori ogni giorno ci chiedono come l'anno presa e cosa ne pensano di Farm. Provate a chiederlo a loro.

Vi risponderanno che sono contente, c'è tanta compagnia e che ricevono ogni giorno telefonate dai loro parenti all'estero che sentono parlare bene dei Sette Cortili.

Farm XL just a place

Non è un museo ma neanche una galleria per la vendita delle opere d'arte. È uno spazio espositivo, uno spazio dedicato alla cultura. Inaugurato a giugno 2014 Farm XL è un corpo di circa cinquecento metri quadri su tre livelli più uno splendido roof garden sui tetti della città di Favara, con una piccola Happiness Kitchen, ideale per organizzare un piccolo evento privato in un'occasione speciale.

Al piano terra, l'ingresso con la biglietteria è sede di un piccolo bookshop con multipli d'artista, oggettistica di design, le divertenti invenzioni Seletti e Toilette Paper in collaborazione con Maurizio Cattelan, il più famoso artista italiano al mondo ed infine i divertenti capi di abbigliamento e accessori Made in Sicilia degli amici di Siculamente. Quattro esibizioni in tutto. Una mostra permanente, con le opere della collezione Farm, al primo piano dal titolo "I'd never ask anyone to do anything I wouldn't do myself" dedicata al famoso fotografo americano Terry Richardson.

Una mostra principale semestrale, la prima dedicata al fotografo americano di origini turche Akif Hakan e due Project Room che cambiano ogni tre mesi dedicate nell'opening a Uwe Jaentsch, famoso artista austriaco da quindici anni ospite a Palermo e al duo messicano, ospite in residenza a Farm Cultural Park, Miguel Angel Salazar e Josuè Eber Morales.





Farm Cultural Park

Accampamento Culturale Mobile è l'Ambasciata itinerante di Farm Cultural Park in giro per il mondo. Un progetto pensato per portare fuori dalla Sicilia i valori e i contenuti di Farm Cultural Park. Farm Cultural Park nell'ambito del suo programma di residenze per creativi intende selezionare progetti di residenza itineranti di Artisti, Architetti, Fotografi, Designer, Musicisti, Chef, Grafici, Videomaker o creativi in genere. Tali progetti possono avere come ambito di sviluppo territoriale qualsiasi parte del mondo ed avere come finalità non solo la partecipazione attiva della gente comune, ma anche la maggiore diffusione, conoscenza e comprensione del progetto Farm Cultural Park

Palazzo Giglia

Parola d'ordine: Sperimentazione. In questo palazzo nobiliare si intende realizzare un progetto di Architettura a bassa definizione con la seguente destinazione:

- Spazio per Eventi esterno: concerti live, proiezioni, cineforum, performance, mercati
- Spazio per Eventi interno: Talk, Musica dal vivo...
- Agricoltura urbana
- Coworking
- Ostello

Children museum

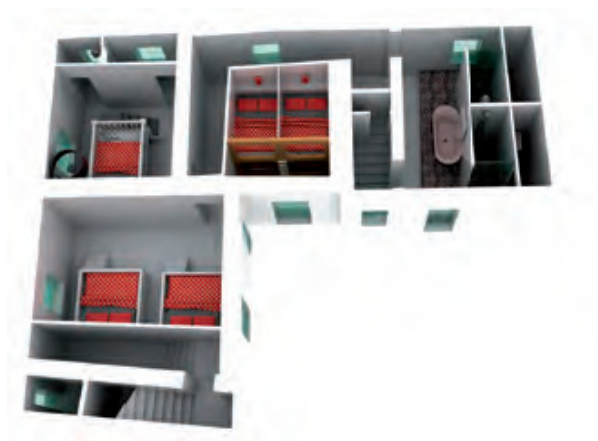
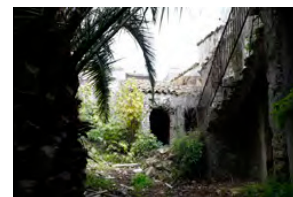
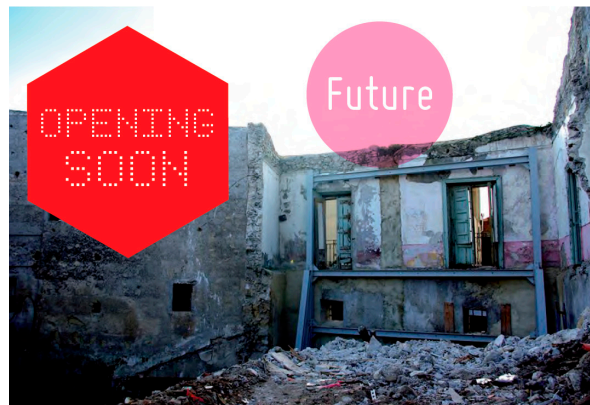
È il luogo del futuro. Dove i bambini potranno giocare, imparare a avere consapevolezza globale. Una sorta di accademia delle arti dove bambini, i giovani e i loro genitori potranno accostarsi a tutte le forme di espressione della Cultura.

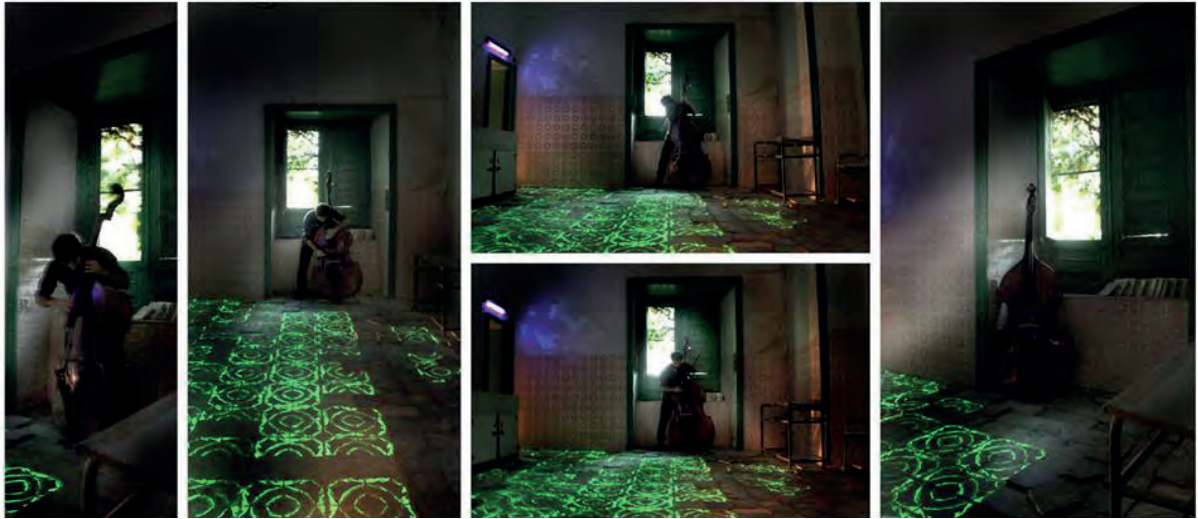
Educational Space

Uno spazio dedicato alla formazione. Due deliziose sale didattiche, uno spazio meeting e tutte le tecnologie necessarie per imparare a fare le cose.

Ostello Residenza

Altri sedici posti letto si aggiungeranno ai sei già esistenti per ospitare creativi, artisti, musicisti, designers, architetti, filosofi, giornalisti e amici che avranno voglia di stare con noi. E tu sei pronto?





Palazzo Cafisi

A ridosso della Piazza Cavour la piazza principale di Favara questo splendido palazzo sta per risorgere grazie ad una serie di amici professionisti che hanno deciso di diventare protagonisti del rilancio culturale sociale ed economico di questa città attraverso la rigenerazione di porzioni importanti di Centro Storico. Si chiamano Linda e Filippo, Katia e Nicola e fanno parte di Farmidabile; se avete voglia di conoscerli e di vedere Palazzo Cafisi basta un messaggio e saranno felici di accogliervi e ascoltare i vostri consigli per le imminenti ristrutturazioni.

Vicolo Luna

Lui è un giovane architetto. Il suo nome è Calogero ma tutti lo chiamiamo Lillo, Lillo Giglia. Dall'apertura di Farm ha sempre partecipato e contribuito con il suo impegno a dare una mano a questo grande sogno. Non contento, ha iniziato la ristrutturazione di un piccolo quartiere a 5 minuti a piedi dai Sette Cortili. Un altro progetto enorme, una grande sfida, un altro grande tassello.

Palazzo Piscopo

Antonio, Salvatore e Giulia li avrete sicuramente già conosciuti. Sono i proprietari del Belmonte Hotel il delizioso alberghetto dietro Piazza Cavour, gestito magistralmente in famiglia. Hanno deciso di ampliare, aumentare l'ospitalità di qualità e per fare questo hanno anche coinvolto uno degli studi di architettura più prestigiosi in Sicilia.



Progettare con la luce

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Keywords: involucro, luce, trame, comfort ambientale.

Abstract

L'obiettivo della ricerca è quello di indagare le possibili forme della luce, quando questa colpisce, attraversa, oltrepassa l'involucro di un'opera d'architettura. Nel momento in cui è spessore murario, la luce diviene introversa, lo oltrepassa lungo la sua profondità per giungere finalmente all'interno dello spazio celato, segreto e la forma della luce diventa un taglio; se l'involucro è ridotto a trame, la luce è filtrata, oltrepassa gradualmente lo spazio, una mediazione osmotica tra dentro e fuori; infine quando la separazione tra interno ed esterno è negata, attraverso la piena trasparenza la luce apre lo spazio e diventa piena manifestazione.

Ciò che queste hanno in comune è la creazione di uno spazio metafisico, spirituale, di uno spazio fatto di sensazioni, per mezzo della materia della luce. La ricerca è stata condotta approfondendo e confrontando sia architetture paradigmatiche di un più remoto passato che quelle contemporanee. Inoltre si è voluto coniugare il tema della luce naturale come materia d'architettura a quello del comfort ambientale.

1. Velux day light challenge

L'iniziativa di Velux Italia, VELUX DAY LIGHT CHALLENGE, parte dalla luce mediterranea, dalla Sicilia per analizzare il binomio che storicamente si determina fra architettura e luce naturale e sollecitare la progettazione con la luce naturale nella contemporaneità nelle diverse condizioni di progetto (architettura di nuova edificazione, recupero degli edifici etc.).

Un tema sfidante "Riportare la luce naturale e il comfort visivo al centro del progetto". "Day light Challenge" è anche un team di progettisti che si prefigge di promuovere l'uso della luce naturale sul territorio siciliano Ma non solo! Rappresenta anche un nuovo modo comprensibile a tutti, dai progettisti agli utenti finali, di raccontare la luce.

Temi affrontati

- Luce e colore
- Luce e città
- Luce e matematica
- Luce e spiritualità
- Luce e tempo
- Luce e persone



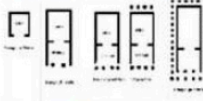



Memoria

rupestre

Pietre scavate
Pozzo di luce
Antico rifugio rubato

La caverna utero dello spirito arcaico femminile




greca

Colonne ambinate
Spigoli vivi di luce
Dentro un naos segreto

L'ordine dello spirito patriarcale del politeismo



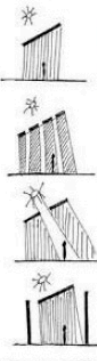

islamica

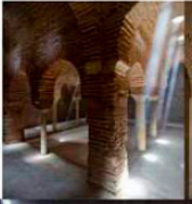
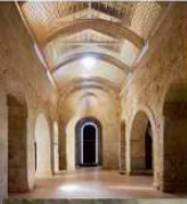
Ricami di legno bucati dal vento
Luce riflessa nell'acqua

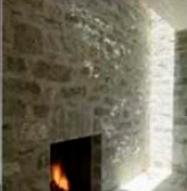
Il filtro, trama e gelosia per una luce introversa, come elemento di mediazione tra l'infinito-Dio e il finito-uomo

« In quel momento, dice Agostino, fu come una luce di sicurezza che si riversò nel mio cuore e tutte le tenebre delle esitazioni si dissiparono ». Sant'Agostino

«Guardare l'ordinario con l'occhio straordinario dell'intensificazione divina ». Plotino





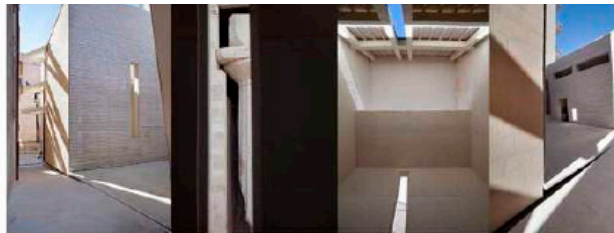
Luce nel Sacro e nello spazio domestico

Captazione



ipogea

Nido di pietra,
memoria visiva di
morbida luce
di carne



a corte

Recinti di Prometeo,
rimbalzi di luce
Dentro le mura abitate



In linea

Flussi porosi,
ritmi di luce e di sguardi
ridondanze di forme bucate



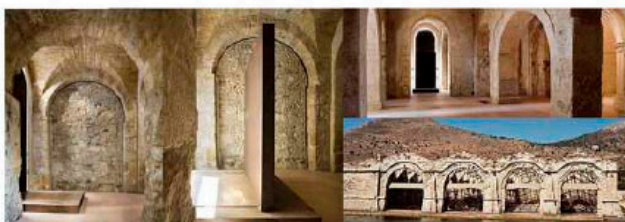
isolata

Torre del deserto,
rosa dei venti e
stella di luce
confine di un giardino
segreto



Basilicale

Nave traforata
da Dio,
ruscelli di luce
inondano le pieghe



2. Pratiche

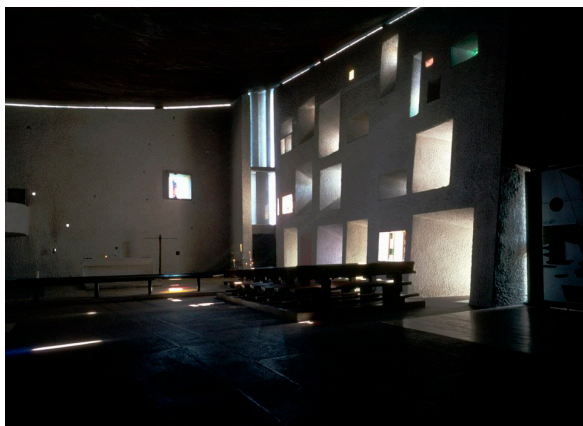
2.1 Luce introversa

Nel momento in cui l'involucro diventa esso stesso architettura, perché possiede uno spessore, perché racchiude lo spazio cavo di un'architettura, per far giungere all'interno di un tale spazio la luce, è necessario che questa sia captata. Sia che provenga dall'alto, sia che provenga dall'orizzonte, anche la luce, come lo spazio diviene introversa, oltrepassa lo spessore murario lungo la sua profondità per giungere finalmente all'interno dello spazio celato, segreto e la forma della luce diventa un taglio, una feritoia.

Quando la luce oltrepassa il muro della cattedrale di Ronchamp, fasci luminosi, giochi di colore, feritoie creano una percezione di intensità differente. La luce diventa materia, trasfigura lo spazio interno, è visibile, si può quasi toccare. La parete non è solo involucro, palpita, si fa custode della luce, la trasforma, la plasma, la avvolge, la rinfange, la dilata.

"Una piccola camera sotterranea: sarà stata 3 metri per 3. Davvero un buco, ma con un pozzo da cui pioveva la luce naturale, resa verdognola dalla presenza di muschi e di piante pendule". Questa è l'idea progettuale per l'allestimento della mostra etrusca a Palazzo Grassi raccontata da Francesco Venezia. La stanza è lo scavo della materia, la captazione della luce attraverso iltholos è un riferimento all'architettura della civiltà etrusca.

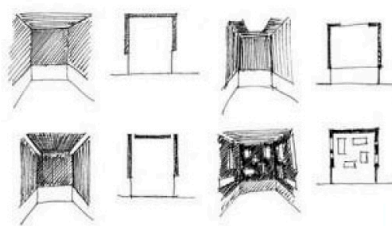
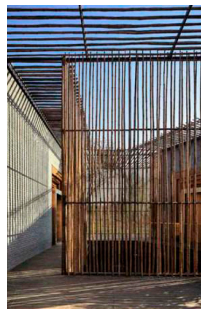
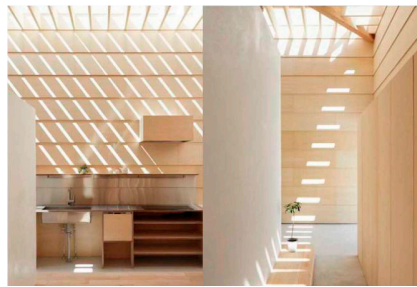
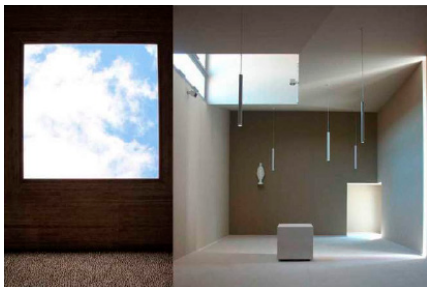
Tadao Ando realizza la croce della Chiesa di Osaka, non attraverso la giustapposizione di una finestra cruciforme ma per sottrazione della materia, la luce penetra dove non c'è il cemento. Citando le parole dello stesso architetto, "Nella profonda oscurità "galleggia una croce di luce isolata e non vi è altro".



2.2 Luce mediata e filtrata

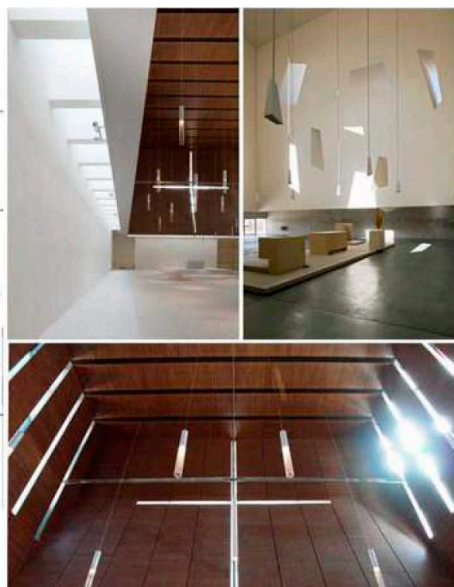
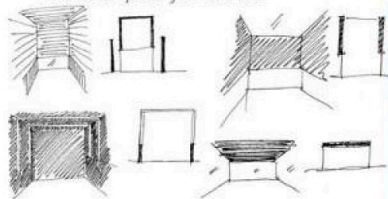
Trame organiche, membrane, tessuti, texture geometriche che creano nello spazio interno intarsi di luce. Le ombre, per contrasto diventano texture su pavimento, sulle pareti. Le forme della luce che riguardano queste tipologie di architettura nascono dalla volontà di proteggersi, di schermarsi, di controllare la quantità di luce da far passare. Non a caso caratteristiche dell'area mediterranea, tali architetture riducono l'involucro a trame, la luce è filtrata, oltrepassa gradualmente lo spazio, una mediazione osmotica tra dentro e fuori.

Tessuto metallico che diviene quasi traslucido, nel rivestimento delle Folies di Lille, canne di bambù servono da filtro nella Bamboo House di Kengo Kuma, cassette di pietra a secco e rete metallica nell'azienda vinicola Dominus a Yountville in California di Herzog & De Meuron. Jean Nouvel afferma, quando vince il concorso per il progetto dell'Istituto del Mondo Arabo "Il tema della luce è riflesso nella parete meridionale, che consiste interamente di diaframmi come quelli di una fotocamera, e così come nella sovrapposizione delle scale, la sfocatura dei contorni, le sovrapposizioni in riverberi, riflessi e ombre."



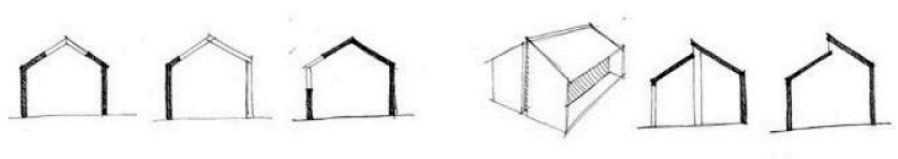
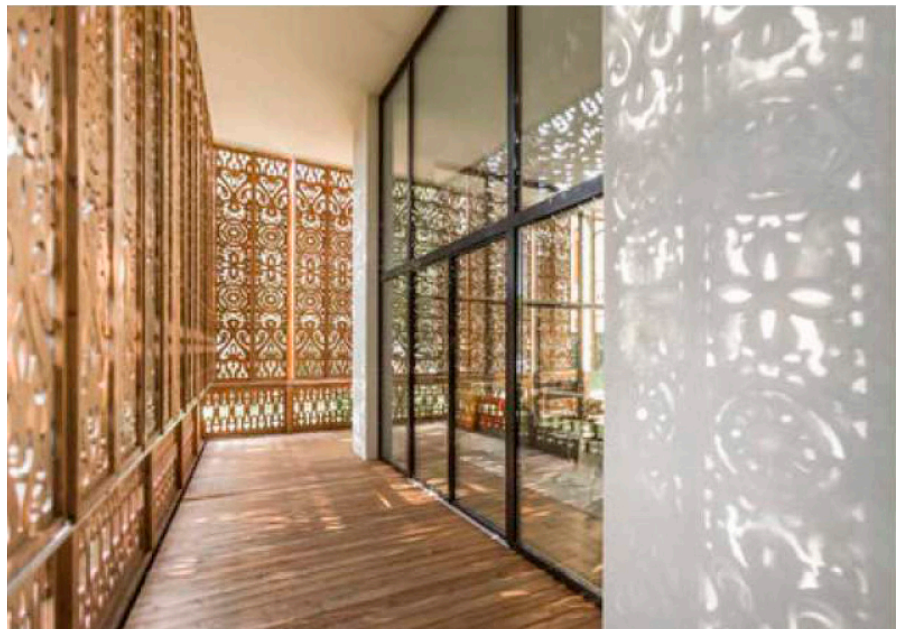
Su un semplice volume

La luce può far tanto



2.3 Luce estroversa

Quando la separazione tra interno ed esterno è negata, attraverso la trasparenza la luce apre lo spazio e diventa piena manifestazione. La luce che si crea all'interno dello spazio è una luce in parte o totalmente diffusa. «La Gravità costruisce lo Spazio, la Luce costruisce il Tempo, dà ragione del Tempo. Ecco le questioni centrali dell'Architettura: il controllo della Gravità e il dialogo con la Luce. Il futuro dell'Architettura dipenderà da una nuova possibile comprensione di questi due fenomeni» Alberto Campo Baeza.



Luce e Città

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Tema

La ricerca, della quale si propongono oggi i risultati intermedi, quelli relativi cioè alla sola fase di analisi e di studio, cui seguirà una fase progettuale, nasce dall'osservazione di un approccio alla progettazione della luce naturale di tipo normativo e quantitativo nell'architettura recente e da un'esigenza mossa da una serie di professionisti siciliani di scoprire una via qualitativa all'argomento nell'ipotesi che la mancanza, nell'attuale approccio, di attenzione a parametri di comfort e di benessere, comunque li si voglia misurare, renda i risultati architettonici molto migliorabili.

La luce naturale viene a essere dunque elemento base della progettazione architettonica, per ogni tipologia e per ogni uso dell'architettura. Un uso consapevole della luce che attraverso la ricerca dei parametri che entrano in gioco nella valutazione della luce di un ambiente e un tentativo di misurazione degli stessi che tenga conto della difficoltà di misurazione di fattori difficilmente misurabili come il grado di soddisfazione, benessere, comfort visivo, piacevolezza, emozione. Fattori tutti che prevedono un riorientamento antropocentrico da parte dei tecnici coinvolti e la disponibilità a una progettazione condivisa con gli utenti. Gli anni '20 del XX secolo hanno visto il fiorire di una grande attenzione nei confronti degli standard in architettura e, tra gli altri, anche l'argomento luce è stato a fondo indagato. Gli obiettivi di quegli studi erano la ricerca dell'optimum, degli standard da poter fornire ai tecnici per progettare correttamente, nell'ottica di una perfetta sicurezza ed efficienza nei luoghi di lavoro. I risultati della maggior parte di essi erano talmente rigidi da tradursi in quantità di lux necessari per ogni attività, e dunque la luce naturale, costantemente mutevole e non del tutto prevedibile mal si sposava con quell'approccio, che si tradusse con il disinteresse dalla fonte luminosa (naturale o artificiale) e l'attenzione esclusiva verso il parametro illuminamento (misurato in lux). Nell'indagine di quale sia l'importanza dei fattori emozionali della luce naturale basti pensare alla rilevanza della luce della Luna nelle arti, dal "Chiaro di Luna" di Beethoven a "Effetto notte" di Truffaut, passando per il celebre proclama di Marinetti "Uccidiamo il chiaro di Luna!" Oggettivare fattori soggettivi dunque, l'eterno scoglio dell'ergonomia, con l'ulteriore difficoltà di progettare spazi per attività non specifiche, come sono quasi tutti quelli dell'ambiente domestico, e con la presenza simultanea di più attori con esigenze e percezioni, ovviamente, diverse.

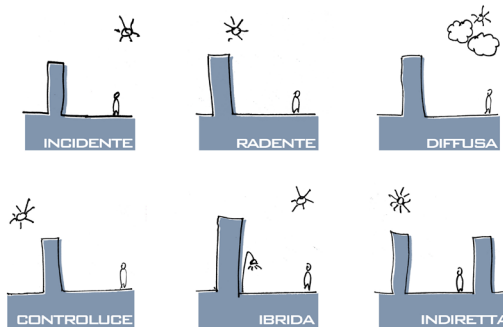
Team

Il gruppo di ricerca è stato selezionato dall'azienda promotrice dell'iniziativa (Velux) attraverso i suoi tecnici sul territorio, che da anni compiono un lavoro di intermediazione e tramite fra le esigenze del progetto, della realizzazione e della fruizione. Il brief fornito ai tecnici invitati a far parte del progetto non prevede in

alcun modo l'uso dei loro prodotti e lo spettro di indagine va ben oltre il campo di intervento dell'azienda stessa. Ipotesi del gruppo di ricerca Velux era che la Sicilia ponesse da sempre un'attenzione diversa al tema della luce naturale motivata dal fatto che, a differenza delle zone d'Europa continentale in cui l'unico criterio nel progetto della captazione della luce è una ricerca della maggior superficie possibile, qui l'esigenza è, per buona parte dell'anno, ribaltata. Le fasi preliminari di brainstorming collettivo hanno prodotto l'esigenza di validare le ipotesi iniziali attraverso uno screening sugli archetipi e sui captatori di luce naturale, identificando una serie di caratteristiche della luce:

tipi di luce:

- diretta/ indiretta
- zenitale/ laterale
- incidente/ radente
- diffusa
- controluce



forme di luce:

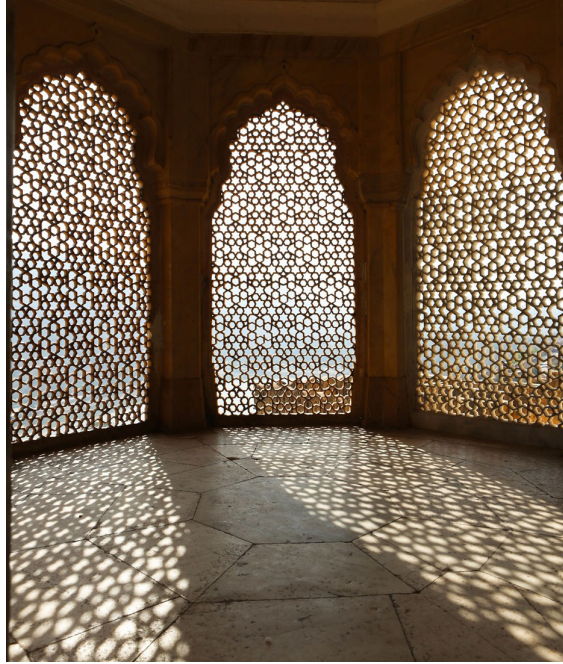
- buchi
- tagli

Attraverso questa fase si è diversificato il campo di indagine di ogni parte del team, che ha condotto autonomamente la propria ricerca, condividendone i risultati intermedi trimestralmente. La presente ricerca presenta l'aspetto identificato con il nome di "luce e città".



Le considerazioni climatiche, che avevano fatto eleggere la Sicilia come luogo ideale per condurre la ricerca, hanno trovato conferma nelle conseguenze che il clima ha portato nell'architettura e nelle dinamiche sociali dei siciliani, che unite alle vicende politiche della storia siciliana hanno prodotto un uso promiscuo della casa e della città, rendendone labili per alcuni versi i confini fisici, ma amplificandone, per altri, le barriere sociali e prossemiche. La temperatura mite per gran parte dell'anno permette di vivere gli spazi pubblici all'aperto maggiormente che nel resto d'Europa, e di conseguenza i corsi principali delle nostre città e i tavolini dei bar sui marciapiedi sono da sempre stati i luoghi deputati all'incontro.

L'impianto planimetrico di derivazione araba di molti quartieri storici della Sicilia trova poi una naturale conseguenza nell'uso degli spazi esterni alla casa come se fossero il prolungamento di essa, e così i cortili che disimpegnano più abitazioni diventano come dei soggiorni condivisi. Analogamente i vicoli che portano a detti cortili sono riconducibili, fatto il debito cambio di scala, ai corridoi interni ai quali si

**posizione di luce:**

- centrale
- laterale
- asimmetrica

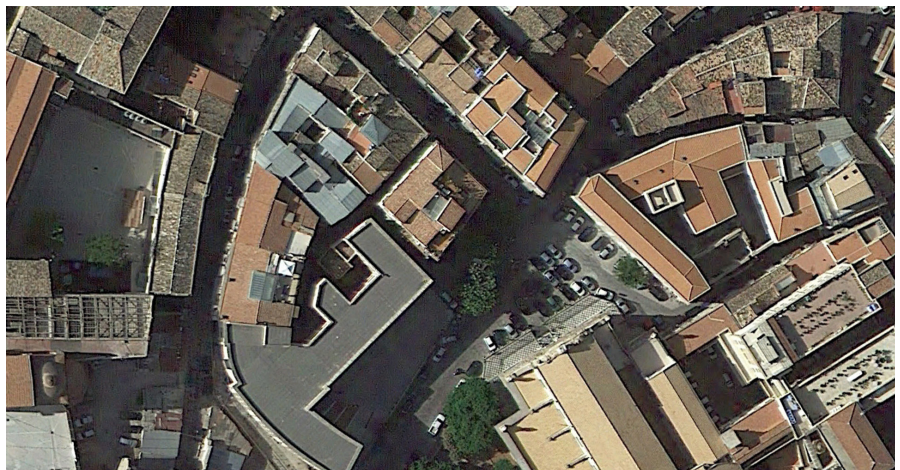
altre caratteristiche:

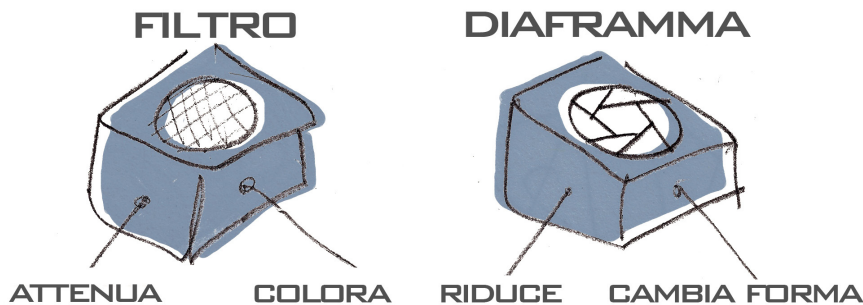
- dimensione
- trame (ritmi)

affacciano le camere. Questo cambiamento di scala porta a leggere l'abitazione come una città e viceversa, in un gioco che si presta a interessanti speculazioni progettuali, che saranno oggetto della seconda parte della ricerca.

Le questioni prossemiche, ovvero quelle relative alle bolle spaziali all'interno delle quali gestire le relazioni con gli altri, nella condivisione e nella sovrapposizione di spazi pubblici e privati, pongono interessanti spunti sull'argomento della gestione della privacy. Tendaggi e moucharabie sono filtri e diaframmi che modulano i confini di questi spazi prossemici. Elementi tecnici che possono frapporsi fra l'interno e l'esterno di un muro (o soffitto), posto che il muro abbia una discontinuità (generalmente identificabile come finestra, ma anche come porta, lucernario, squarcio, taglio, parete o soffitto mancanti). Li abbiamo mutuati dal campo della fotografia e li abbiamo così ridefiniti: Filtro: qualunque elemento si inserisca tra la luce naturale esterna e il buio interno, lasciandone passare una parte e, ovviamente, modificandola (nella direzione, nella frequenza, nella lunghezza d'onda). Diaframma: qualunque elemento opaco si inserisca tra la luce naturale esterna e il buio interno, la cui forma può coincidere con l'apertura (la discontinuità di cui sopra) e avremo così una "porta" o uno "scuro"; oppure no, e chiuderne dunque solo una parte, modificando la forma e la dimensione dell'apertura.

Sia filtri che diaframmi possono essere modulabili ovvero se ne può regolare la posizione e la dimensione. Due filtri possono essere sovrapposti ottenendo l'effetto di un terzo filtro; il diaframma annulla l'effetto del filtro (non sull'intera apertura, ma





laddove non lascia passare la luce questa non può essere filtrata). Argomento basilare per un approccio antropocentrico alla progettazione è la continua verifica sul campo, con i reali destinatari del proprio lavoro o immaginando un target e costruendo un campione. Motivo per cui gli strumenti più consueti al mestiere dell'architetto poco si addicono a una lettura da parte di un'utenza non tecnica. Tavole contenenti disegni tecnici, schemi, parole e fotografie, per quanto accattivanti, abbiamo ritenuto non essere l'ideale per rappresentare i risultati che man mano venivano dalla ricerca. Nel tentativo di identificare un mezzo di comunicazione idoneo alla sintesi delle complessità da rappresentare si è identificato nel mezzo "cinematografico" quello capace di sintetizzare parole e immagini con un linguaggio comprensibile da qualunque pubblico, che coniugasse arte e scienza attraverso la poesia. L'aspetto poetico è un'ambizione da non sottovalutare, poiché la poesia pur non avendo l'universalità del segno grafico, è quella che riesce più di ogni altra forma di espressione a condensare l'emozione, a sintetizzarla. Atto necessario per riuscire nel nostro intento di internalizzare al progetto emozioni come benessere, o piacevolezza.

Oltre l'aspetto poetico, il cinema ci è di insegnamento come industria, per la sua capacità di far pervenire ad un risultato armonico il lavoro di tanti tecnici specializzati, sotto la guida sapiente di un coordinatore generale che prende il nome di regista. La gestione di un progetto complesso come quello architettonico ha bisogno di professionalità che difficilmente possono essere racchiuse in una sola persona, il progetto non è l'acuto di un tenore. Da qui la necessità di trasformare l'architetto in regista.

La meta

Lungi dall'aver finora perseguito risultati tangibili in merito all'ambizioso proposito di fornire metodi progettuali che pongano la luce naturale al centro del progetto in architettura, queste fasi intermedie della ricerca ci vedono ancora coinvolti nello studio del rapporto fra la luce, la città e la casa (intendendo con casa l'insieme dei pieni in una città, ovvero il costruito).

Il medium della parola scritta non si sposa adeguatamente con i propositi di rappresentazione e comunicazione scelti per descrivere i risultati, ma tenteremo una sintesi tramite un'elencazione e una breve descrizione degli argomenti individuati come esempi da porre alla base delle analisi mirate al progetto. Il confronto delle analisi finora condotte con il progetto architettonico reale costituirà il prossimo passo della ricerca. In calce è riportato il tentativo di sintesi poetica che riassume il lavoro svolto.

Cambio di scala

Esterni che diventano interni, il dentro e il fuori si confondono, la città diventa casa. Luoghi storicamente deputati alla vendita, i mercati, o i negozi nelle vie della città, si sono ritrovati all'interno di mercati coperti già nel primo ottocento, o nei centri commerciali alla fine del novecento. In maniera del tutto analoga certi cortili di edifici storici hanno visto modificare la loro funzione e fruizione con la costruzione di coperture e conseguente trasformazione in piazze coperte, è il caso del British Museum di Londra o del cortile della ex Cassa di Risparmio di Piazza Borsa a Palermo. La chiusura degli spazi della città non avviene esclusivamente tramite la costruzio-

ne di un tetto, a volte la conclusione di una prospettiva è frutto di una curva nella strada, che fa percepire una chiusura dello spazio dove non c'è, o di un elemento "transitorio" come avviene col passaggio delle navi in prossimità dei porti. Tra gli esterni che si fanno interni vi è poi a Palermo la piazza Vigliena, proprio nel centro geometrico della città antica, una piazza barocca che malgrado sia aperta sui quattro lati fa percepire lo spazio come fosse un salotto.

Felix infortunium

Interni che diventano esterni, capita a volte che gli interni diventino, loro malgrado, degli esterni. Eventi bellici, terremoti, degrado e abbandono le cause principali. Il più delle volte rimangono soltanto come case cadute a monito di quel che le ha fatte cadere, è il caso della piazza Garraffello alla Vucciria. Alcune volte invece questi eventi involontari donano un nuovo destino agli spazi, e non è detto che non possano servire d'insegnamento per nuovi progetti. La storia del progetto è costellata di eventi casuali che hanno segnato direzioni inattese. Se Santa Maria dello Spasimo fosse l'ennesima chiesa della città di Palermo non avrebbe certo quel primato di unicità dovuto all'assenza del tetto e i comportamenti al suo interno sarebbero probabilmente condizionati dal ricordo del luogo di culto che fu, e invece oggi è un teatro con il palcoscenico coperto (la ex zona dell'altare e l'abside) e la platea all'aperto (la navata centrale). Così EXPA, galleria di architettura che utilizza le scuderie e i magazzini al piano terra come spazio espositivo e gode di un piano nobile "cabriolet" in cui, a differenza di una comune terrazza, l'impianto planimetrico della divisione muraria è conservato, manca solo il tetto. Questo basta a rendere estremamente suggestivi quegli spazi. Come uno dei più collaudati meccanismi di comunicazione, è l'inatteso che ci colpisce, che ci stupisce e che ci rimane impresso.

Annotazioni

Da questa prima fase sono emerse anche delle altre note sparse ad uso del progetto. Considerazioni sulla luce naturale in città, sul suo rapporto con la luce artificiale, raggi di luce inattesi o sguardi non convenzionali sull'argomento, che rimarranno sul tavolo come spunti possibili per la prosecuzione dei lavori.

Li elenco così come su un quaderno di appunti, con la loro vaga incomprensibilità, che lascia adito a prospettive aperte, come si conviene a riflessioni non mature:

- doppia funzione delle tende da mercato (di giorno filtrano i raggi solari, di sera riflettono e diffondono le luci artificiali);
- momenti di luce mista al tramonto;
- inquinamento luminoso (il cielo notturno bianco delle città);
- sguardi in su e in giù (dalla strada e dal balcone);
- città di mare d'alba e di tramonto (Istanbul entrambe);
- edifici contigui fanno la strada, edifici isolati danno luce intermittente (ombre);
- gli alberi in città (la natura costruita) (ombre).

Sintesi poetica

Creando la città l'uomo si confronta con dio nel tentativo di realizzare un luogo ideale dove vivere felice insieme agli altri uomini.

Case e strade, questo è la città;
e persone per strada, sovrastate dalle case.
Il sole disegna la città sulla strada con gli spigoli delle case.
Questa è la luce della città

Lampioni, insegne, fari d'auto, semafori, vetrine di negozi,
la mia città non brilla di luce artificiale,
Palermo è la città del sole,
e il sole regna
clemente e misericordioso,
ma severo
Puoi dosarlo, domarlo
ma è feroce,
schiaccia tutto, brucia, acceca
spacca le pietre, il sole...
Ergiamo muri per ripararci
stringiamo vicoli per non farci trovare,
la città è un nascondiglio dal sole,
è un grande ombrello per pelli delicate
ma non c'è scampo, ci trova dappertutto.
L'ombra delle case è l'unico diaframma,
e da quell'ombra stiamo a guardare, ammirati...

Spazi urbani diventano case,
usi domestici en plen air.
Le attività convivono,
si mescolano sotto la luce.
Dentro e fuori,
dentro è fuori

I confini dell'ombra disegnano gli spazi:
spazi irregolari e sfumati dati dall'ombra delle fronde al vento;
netti e continui dagli spigoli della strada vecchia;
intermittenti dalle case isolate che si alternano ai vuoti sulla strada
nuova.

La luce naturale vive con i luoghi e li trasforma
Il sole muove la città a ogni momento.
La luce e il buio danzano sulle onde del continuo.
La luce artificiale è sempre uguale,
immobilizza tutto.
Eutanasia discreta a questa danza.
E fu sera e fu mattina.

Natural light + Mathematics in architecture

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1. Light

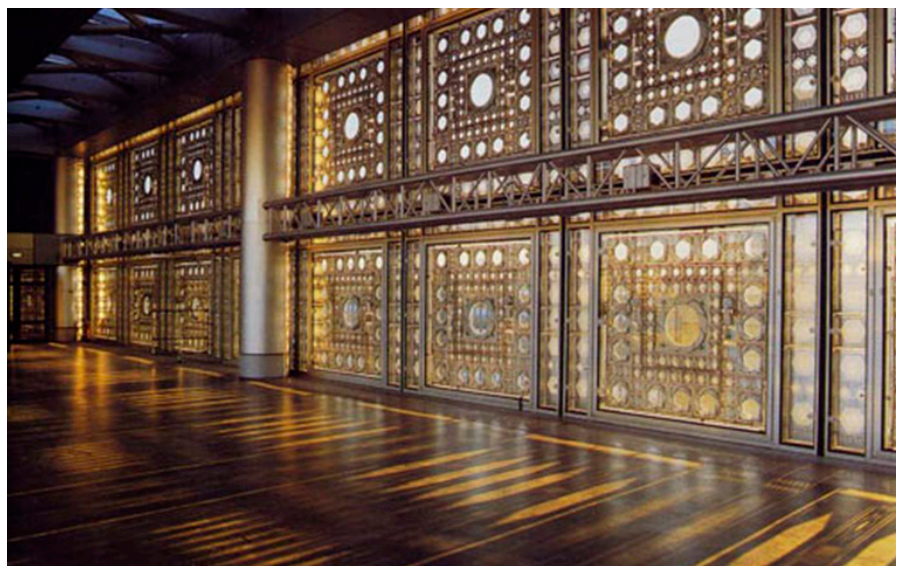
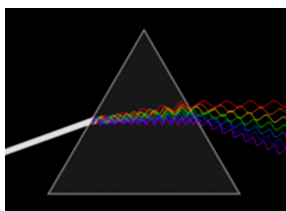
The term light (from the Latin lux) refers to the portion of the electromagnetic spectrum visible to the human eye, approximately between 400 and 700 nanometers wavelength. This period coincides with the center of the spectral region of the light emitted by the Sun that makes it to the ground through the atmosphere. The simultaneous presence of all the visible wavelengths, in amounts proportional to those of sunlight, form white light

2. Optical dispersion and color

In optics dispersion is a physical phenomenon that causes the separation of a wave into spectral components with different wavelengths, due to the dependence of the wave velocity from the wavelength of the crossed object.

The refracted ray is deflected towards the perpendicular because the index of refraction of the glass is greater than that of air. When the beam of light comes out from the right face of the prism, the refracted ray moves away from perpendicular, because the refractive index of air is smaller than that of the glass.

The overall effect of the prism is to change the direction of the beam, causing it to deviate down both when it enters the prism that when it comes out.



3. Mathematical models used in architectural complexity

In parametric design or algorithmic, traditional values of the pursuit of architectural metaphor, the recognition of sign and design coherence remain unchanged but at the same time have evolved and strengthened.



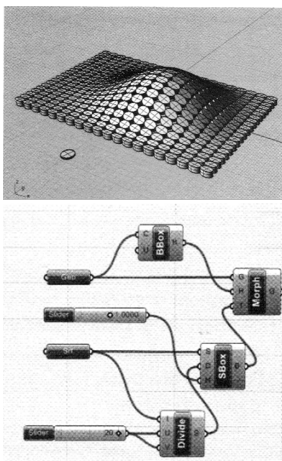
The instinct to hybridization with the art and the physical sciences or mathematics that has always pervaded the minds of architects, become generative foundation of architectural space. What distinguishes a parametric architecture from a classic one is that feeling of complexity that is not generated by a mechanism assembly or juxtaposition of the parties, but by the use of laws that regulate the generation and diversification. This approach has some limitations related to the flexibility of the basic shapes for particular formal requirements and the difficulty of getting quick edits and associative complex models.



The ability to overcome these limitations is provided by RhinoScript, programming language executable in Rhino able to generate three-dimensional models in a flexible manner.

In conclusion, the advantages are:

- Automate procedures
- Definition of geometries using mathematical functions
- Generation of parametric models that allow rapid and profound changes in the initial geometry
- Opportunity to quickly obtain forms of great complexity through repeated geometric elements



The result is a complex order where the one and the whole are continuously related and the project reaches a state of self-referenziality in which it is possible to govern the transformation while maintaining the consistency of the whole. The software itself does not guarantee this consistency, it needs to be supported by a strong logical process that remains and always will remain the domain of the human mind and, therefore, of the designer.

Light and Color

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To design a building properly means above all to ensure adequate natural light inside the confined space. This goal is not easy to reach, as it is obtainable only by placing the openings, capable of receiving external light, correctly compared to the total volume, the specific internal structure of the spaces, to the architectural aspects and the composite characteristics of the facades.

Designing with natural light therefore presents very complex challenges, primarily because, unlike the artificial one, its availability cannot be controlled and set by the designer, but it is a function of the season, the latitude considered, the orientation of the building and of everything that surrounds it.

From these considerations arises the project called "Daylight Challenge" promoted by VELUX. The first step of this complex path was to choose a land – Sicily – which, because of its geographical location and the abundance of natural light that characterizes it, offers incredible opportunities for architectural planning. The second was to involve a group of architects particularly sensitive to these issues and strongly aware of the central role that natural light and visual comfort assume in architectural design. The purpose of this complex work is to develop a new way of telling natural light, understandable to everyone from designers to end users, to make them understand, in a clear and simple way, the architectural, emotional, functional and economical value of natural light.

An accurate phase of initial research that has analyzed, among others, the inseparable relationship between light and color, has obviously been necessary.

Through information that in eighty percent of the cases derives from sensory input of visual nature, man uses more than a third of his cerebral cortex to become aware of the reality that surrounds him. The brain interprets the information from visual stirring comparing it with elements of memory related to experiences, people and historical and cultural reality to which it belongs.

The perception of the visual stirrings is due to the light and the objects that reflect it. The light that enters the eye is converted in the retina into nerve signals that are sent to the brain via the optic nerve.

Any body present in the world, when illuminated, re-emits in the space surrounding it, a portion of the received light that appears to be less intense, with a different propagation direction and generally with a different spectral composition than the one emitted by the light source. The latter phenomenon is the basis of color generation.

The light is, in fact, a type of electromagnetic wave and its characteristics change continuously. The light visible to the human eye is a very limited portion of the entire electromagnetic spectrum with wavelengths, as announced by the CIE (Commission Internationale de l'Éclairage), between 380 and 780 nm (nanometers), from violet to red. The wavelengths of 400-500 nm are perceived as blue, those of 500-600 nm as green and those of 600-700 nm as red. These are known as the three primary RGB colors.

In architectural design, the color has always assumed primary importance as it contributes to the characterization of the space resulting thus useful both in facilitating the orientation as well as in the statement of internal elements and of facade.

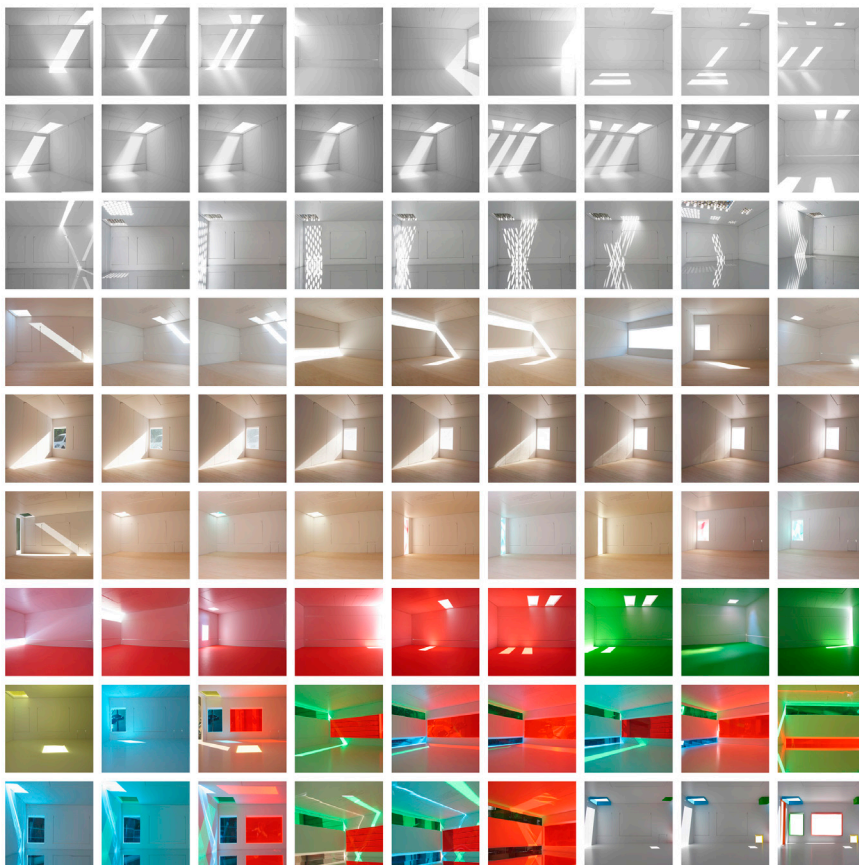
Designing with light and color makes it obviously necessary to consider many aspects that influence this procedure, not only related to architectural areas; but especially to complementary disciplines such as history, psychology, sociology, aesthetics and anthropology. The color, in fact, influences the behavior of people who interact with it, our perception of the environment that surrounds us and our own behavior.

The working group has decided to tackle this issue through an empirical method based on the study of a plastic (image 1) sent to the team in the first phase of the project VELUX Daylight Challenge. This verification tool has proved of great importance as it has allowed reading and understanding the incidence of light within an architectural space in relation to different types of openings, material and colors used. The result of this work is summarized in a video and in a study of the methodology of approach to this issue of the great masters of modern architecture (image 2) and of some contemporary designers (image 3).

The architecture is a fact of art, a phenomenon that arouses emotion, aside the problems of construction, beyond them.

The construction must withstand: the architecture is to move.

Le Corbusier



01. Carlo Scarpa | Tomba Brion | Altivole (TV), Italia

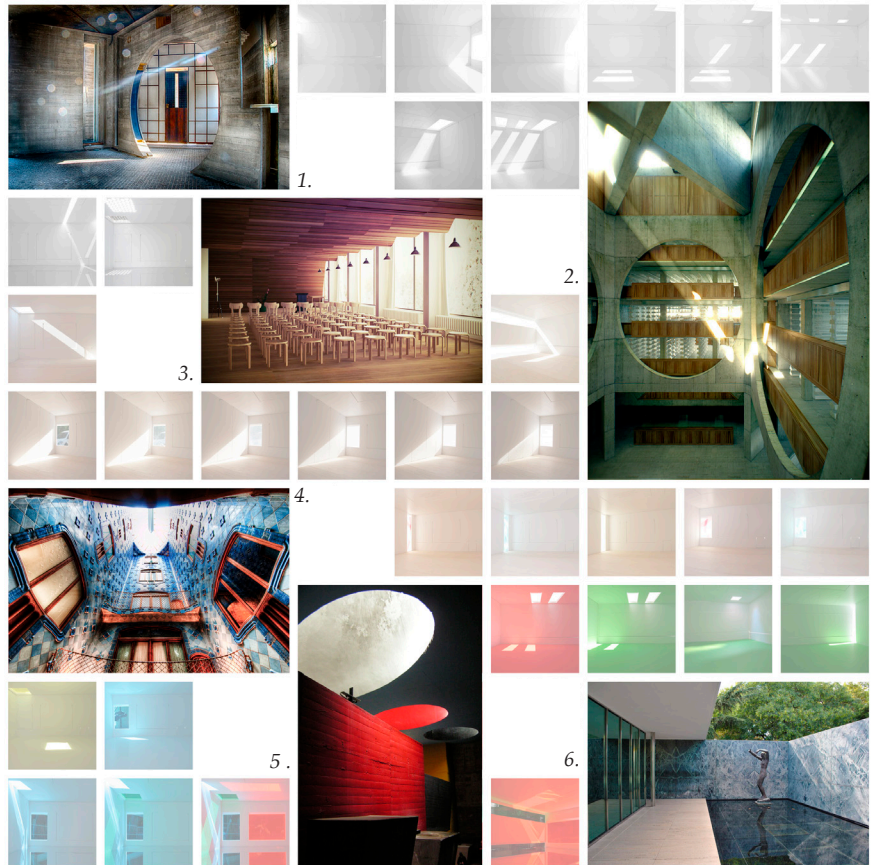
02. Louis Khan | Exeter Academy Library | New Hampshire, USA

03. Alvar Aalto | Auditorium | Vyborg, Russia

04. Antoni Gaudí | Casa Batlló | Barcelona, Spagna

05. Le Corbusier | Convento de la Tourette | Evèux, Francia

06. Ludwig Mies Van Der Rohe | Padiglione Tedesco | Barcellona, Spagna



01. Peter Zumthor | Terme di Vals | Vals, Svizzera

02. Hironaka Ogawa & Associates | Chiyodanomori Dental Clinic | Gunma, Giappone

03. Antonio Giummarra | Edificio plurifamiliare CCC | Reagusa, Italia

04. Richard Rogers, Antonio Lamela | Terminal 4 Aeroporto | Madrid, Spagna

05. Andrea Caporali, Studio Omphalos | Casa di Costa | Enna, Italia

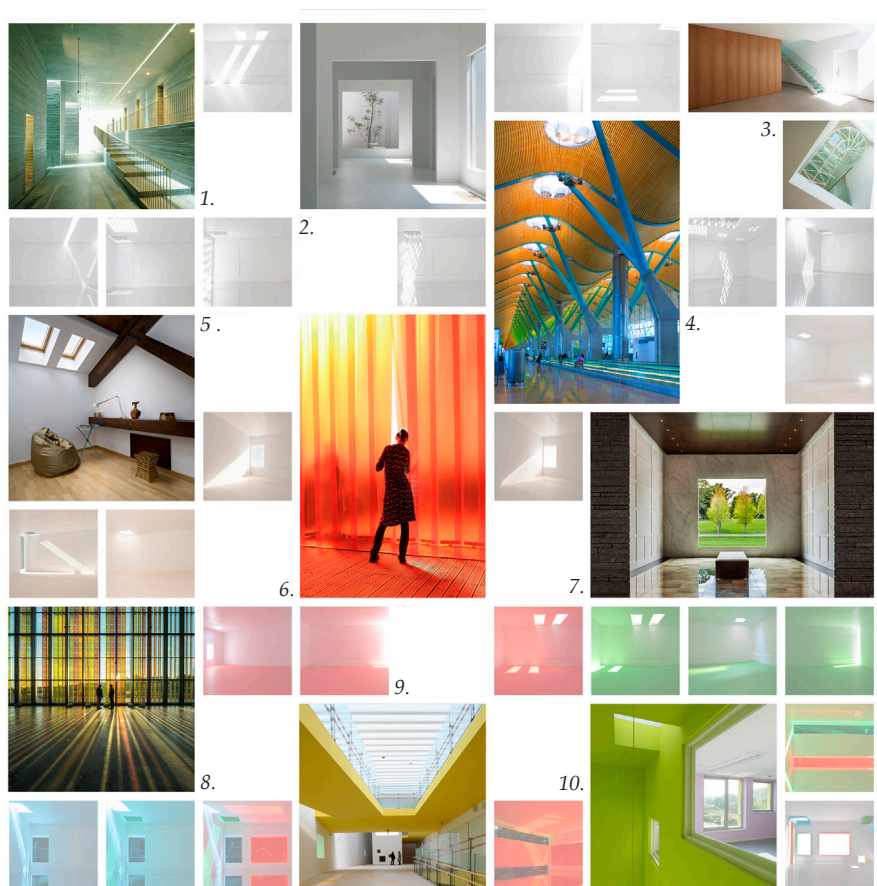
06. OSA Architectes | LPL Building | Liverpool, Gran Bretagna

07. HGA Architectes | Garden Mausoleum | Minneapolis, USA

08. Dahl Rocha, Associés architectes | Swiss Tech Convention Center | Losanna, Svizzera

09. Atelier Deshaus | Kindergarten | Shanghai, Cina

10. ARJM Architectes | Nursery | Lessines, Belgio



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