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Paths descriptive of urban complexity

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Introduction

In view of current research involving different disciplinary expertise, city represent a fertile field of analysis and experimentation.

The agreement between these two terms, recalls a path, both methodological and operational, oriented on an hand to the interpretation motivated, widespread and therefore sensory, about places, events and phenomena. All issues that characterize the transformations of urban contexts, with the consequent management of its information.

At the same time, this agreement would explore the utilities of the most advanced technologies and digital forms of communication, related to the development of images domain, able to create experiences engaged in a dialogue between real and virtual matters, to generate forms and places available in cyberspace, using resources and existing networks.

The synthetic declination made above completes itself main disciplinary implications and intersections that, in several geographical and cultural contexts, help to build a palette of experiences referred to the identification of a collection of environmental specificities and related procedural records.

Indeed, while research in the issue of virtual modeling recently had slow but steady developments, there is still much to investigate, in my opinion, in the field of urban survey, although much has been said and written as result of important studies, among which include, for example, those conducted in Turin, by Dino Coppo and Pina Novello, or Naples, by Adriana Baculo.

The future work to do comes from the fact that the contemporary city expresses more and more the concept of complexity in both its positive meaning of diversity and stream dynamism and in the negative one about entropy generated by the dissipation of resources, including cultural and inability to manage the multiplicity of relations between spaces of ancient plant and an increasing number of functions and articulate, expressed also by the varied composition of its users / stakeholders.

In the *forma urbis* of contemporary cities there is in fact a sedimentation of physical built structures of the built, joined to a constellation of intangible cultural values and common symbols from which, in a analysis



stage and thanks to a more widespread awareness about this issue, can not be ignored, and that inevitably involves visual science and representation matters.

As though any science, these ones work first of all in order to objectively analyze the physical reality with tangible, quantitatively and qualitatively measurable features defined by technical based images, founded on scientific principles and connotations of established norms.

This approach is essential for the knowledge and understanding of urban space and the development of its models, in order to ensure operational usability and possible, consistent planning actions.

But such graphic or infographic tools and their norms defined to create the immediate correspondence with the real object, undeniably are not adequate to describe the varied configurational and using features of the urban changes that occurred over time, related to the natural and human matters and documented by several informations from diverse, both quantitative and qualitative.

Complexity and Hybridization

The sixties of the last century were impregnated by a clear and fertile amplitude of views in knowledge studies, demonstrated by essays such as those of Gombrich, Ancona, Panofsky, Arnheim. A notional sensitivity was developed, turned to problems of wider cultural parterre, afoot of interesting disciplinary insights. This sensibility directed a series of studies that revisit and actualize more often episodically the image of the city in all its aspects of hybridization, spatially and expressively, linked to the cultural and social evolution. This ones in fact determined a complexity and density of urban places made of signs not always decodeable, innervated in more often conflicting tensions, rich of relational thick, but also not empty of meaning so effectively described by Marc Augé in his studies (Augé M., 2009).

It seems appropriate to briefly consider the meaning of the word hybrid, concerning its connection with such contents, despite having origins in genetics matters, as a result of a join between two different qualities from which they can derive two outcomes: infertility and the so-called vigor ibrido, i.e. a particular propensity for resistance and the strengthening of the characteristics of a species resulting from the hybridize (Fenton J., 1985). So, hybrid urban places acquire the same characteristics attributed to the selection that is consolidated in the outcome of vigor ibrido. These ones have that winning qualities in terms of ability to meet the demands of urban modernity to transform them into specific and integrated formal units in the cultural landscape.

The sense of place perception changes to the way it is projected by the people. It is therefore always historically situated and invested by new meaning, with a continuous cultural stratification. Therefore it derives the possibility, widely practiced today, to influence this value with appropriate communication policies and management infrastructures, including intangible assets.

Borrowing these practises the representation of the city, in its transpositions virtual connotations ever more spectacular, with catchy expressions that create consensus and involvement, arousing desires and aspirations.

For this reason, some studies are interesting in order to analyze the quality of the spaces by their join with sales network, or even some anthropological and sociological studies demonstrating, however, how technologies participate not extend a cognitive, instinctual and emotional potential but to feed the culture of things against a culture of people, promoting the fluctuation of the information in a huge semiotic decontextualized place.

The theme of the image, which undeniably appoints also reflections and experiences about aesthetics, as well as the relationship between art and technology, including technical issues and communication, tends to make less strict the cognitive approach and the declination of a speculative, mutisensoriale and multiresolution path, emphasizing the outcomes as a function of the overall size achieved by the integration between different languages and techniques.

In relation to these aspects, the visual graphics creates a fertile environment for interaction and sharing and, as speculative as meaning, it also becomes a place where relations theory vs transmission of knowledge represent forms that help to describe the space and its transformations with never overlooked

or unspoken ways of communication, exploring the possibilities to coordinate, systematize and manage the different forms of data resulting from the analysis of places.

Surveying over the limit

The urban organism is symbolically and functionally evoked by one of the oldest, synthetic and technically meaningful graphical representations: the map. Map represents the dimensioned transposition by projection on a plane in order to give a fundamental topographic transcription, carried out with a basic level of information, which lends itself to a series of visual processing, diachronic and synchronic, 2D and 3D, thanks to which the urban reality appears more immediately comprehensible in its objective articulation of solids and voids, in the permanence of its planar tissue, explained or just evoked.

The essential topological part of a map not only allows to formalize, in terms strictly structural and consequently comparable, the relations of continuity and spatial and functional contiguity between morphological demonstrations sometimes seemingly very different. Maps could also describe, with appropriate conventions and graphical strategies, signs of urban transformations and its places in historical time and its cyclical rhythms, involving thick material that irrefutably contributes to denote the overall cultural dimension.

Beyond the ontological and epistemological implications that follow reflections about the meaning of map as a tool of representation and form of knowledge, technological development for communication and sharing urges and makes possible a new interpretation and understanding of places. Not only we can see the city by bird's eye view - giving furthermore to the roofs of buildings, a new central aesthetic role - and play with the viewing distance, but even it is now possible to explore specific places or buildings, estrudendoli from their area of site plan.

However, these calculations are often unknown to the everyday use of space, avoiding to the imaginative total expressions of the eye and the mind, or merely evoking what is beyond a limit over the visible.

Those who live daily the city, starting from the threshold of termination of visibility, are at street level, often as pedestrians who fail to get the space as a whole, in its relationship between full and empty of a deducible configuration. People that contribute to write city as a *urban text* without often be able to read and interpret it (De Certeau M., 2001).

The spatial partitions captures the semantic pregnancy and psychological perception of concepts and categories of paths that refer to the characteristics of their existential space organized between a series of focal points connected by memorable paths (Lynch K., 1990).

All about now explained can be understood as description of paradigms of urban complexity, starting point in order to experience research pathways that concretize the cognitive need to create narratives able to preserve multiple interpretations (Papa L.M., 2003). In the underground, we know, history is better preserved, but we can't fully understand it and not be made it as a sharer of this slow, gradual maturity of thought and awareness that, perhaps more than the written history, allow the evolution of a culture.

From this meaning, however, on several occasions declined by the author (Papa L.M., 2005), follows the rethinking of the definition of the concept of practice, which must be consistent and agreed with the meaning of *urban text* and discourse, rich in places of registration, erosion of signs and values, and therefore subject to progressive interpretations and reinterpretations, with a continuous becoming too descriptive outcomes. The tool is the survey, that is procedurally and expressively enriched to know not only the connotations of spatio-temporal artifacts and urban spaces delimited by them, but also to understand the relational qualities, methods of use, accessibility, physical and perceptive use, operating at different scales.

The signs of that instance occurring in our matters, derive from different skills and attitudes, and also, in an immediate and significant way, from artistic practises that are common in public spaces, and they try to delete the different urban surfaces and boundaries for an evocation and involvement of perception, anamorphic, of the underworld.



Figure 1,2: *Anamorphic experiences conducted by Julian Beaver, the "street" artist called Pavement Picasso*

The rejection or ignorance about the layering, consequence of cultures and construction techniques developed over a wide time span, promotes a cyclic segmentation in city's descriptive layers that imperceptibly and often unconsciously, transform tangible bodies of the city and the territory, synthesis of events and established practices, in partitions of facts and processes by which the difficulty / surrender, to give an material and immaterial unified view, carries out.

Thanks to different several images - the sketch done on an urban scale in order to interpret habitats, the photography, the pattern of Mongian section, the virtual model - i can evoke a perceptual and conceptual path that unfolds between upper city and its underground.

In particular, images define some connotative aspects of a strong presence in the city, represented by a sixteenth century Neapolitan street - Via Toledo - that binds the oldest part of the city to areas of urban expansion (Figs. 3-8); these images are able to direct a cognitive and multisensory path.

Along this axis was recently completed subway station designed by Spanish architect Óscar Tusquets. During its construction of this work, which has three discrete exit points with the topsoil, part of the spanish fortification of late fifteenth / beginning of the sixteenth century came to light. This stonewoerk, revealing traces of basements attributable to construction projects promoted by Pedro from Toledo to mark the opening of the road, encompasses structures from the Roman era of tufa blocks with brick bands, probably relevant to a spa building dating from the second century before Christ.

The design scheme of the section is technically and communicatively powerful, , synthesizing the volumetric articulation totally embedded below the road level, from wich an artifact, a sort of periscope, emerges in order to allow the pedestrian to imagine the underground complex volume that manifests itself instead to the user with an explosion of colors and lights, helping to heal atavistic repulsion related to the dark, to the underground, to the unknown.





Figures 3-8: *Visual descriptions of an urban path, including its above and underground layers.*

Atlas of paths, search paths

The study about the path / node, as significant system from the morphological, typological and functional point of view, can then define a concrete research issue on urban transformation.

Presenting significant metric features and rich psychological and behavioral connotations, paths can represent some interpretative paradigms that lead to explore limits and potentialities of the related cognitive analysis, from a quantitative and qualitative point of view, in order to assess the need to establish appropriate models of integration about knowledge and procedures thought to accelerate the transformation from 2D in 3D data. Data that can be used in a web-based form, and then to describe not only outcomes but processes and data management architectures, but also to build a set of comparable practises.

This leads us to operate in a diachronic and synchronic logic, also multi-scalar, about generated, used and perceived spaces, with a progression-acceleration of sensory experiences and stories relating to different conditions of use, in different languages.

Research challenges conducted in the Department of Civil Engineering, Construction and Environment, University of Naples Federico II (Papa L.M., D'Agostino P., 2012) concern about these issues, some of which in operative partnership with the Government Departments involved, Professional associations and local government. All these stakeholders are involved concerning their specific several expertise, sensitivity and needs. But with such stakeholders, researchers have to interface in order to design a constructive way to document and understand the urban space and its multilevel use orienting congruent design choices. In short, in order to give a more extensive, depth, integrated use of the urban survey.

The practice of the survey, as a system of disclosure of generative and relational processes, tries to verify the different layers of an interactive complexity that built city sets with the its historicized side. At the same time, survey allows to evaluate its proactive role, in order to detect, illustrate and verify forms and also to adopt the better models of restitution and communication necessary to, synergistically, overcome atavistic difficulties in perception, in understanding and evocation of the e material depth involved in

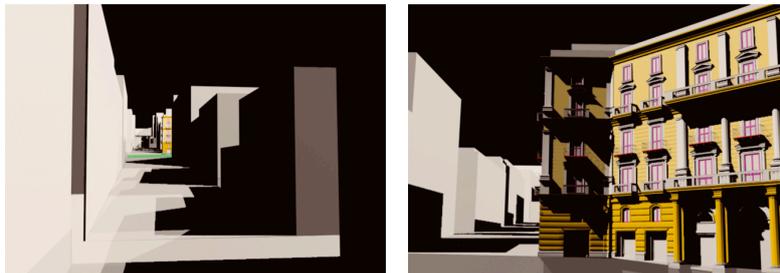
analysis. In his stratum are layered buildings above ground, some utilities, infrastructure and structures in the underground, which should be carried out continuously updating documentary.

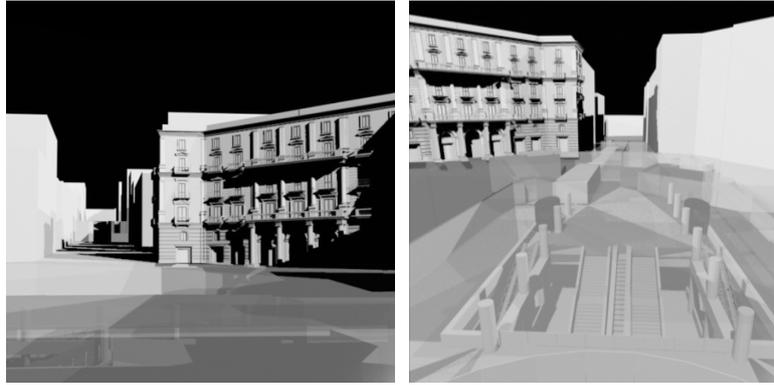
I think that this methodological approach should be able to reinforce a *focus*, based on the analysis of the several thematic and scalars layers. These layers contemplates the relationship between users-actors of the urban scene and the composition of the area, suggesting stages that progressively enrich practical and perceptual qualities. A system able to unfold the *urban tale*, starting from its zenithal representation that integrates the information in order to evoke even the underground architectures and their size.

Everything discussed above represents a field of research still in progress, in which it is appropriate to work with a multidisciplinary methodology, in order to decline cognitive paths, motivated and functional to several cultures and sensitivities of different users.



Figure 9: overhead view of a street in the hilly area of Naples, with the node Piazza Vanvitelli and the metro station referred to it.





Figures 10-13: *Consecutive views with volumetric explorations for the definition of buildings curtain, for the cognitive approach to the underground space.*

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