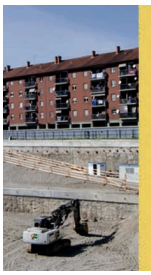

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The retro-active effect of the cyberspace on physical space: the iper-dense city

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The discovering of cyberspace, "spatial vision of the available information in global systems of processing data" (S. Tagliagambe), extends the possibilities of the design project not only in terms of instruments and methods, that is the capacity to produce images and "shape" of something that doesn't exist yet, but also for the retro-active action on "effectual reality" which interacts and that is able to modify and enrich the real one. The progressive de-materialization of the inhabited places into liquid spaces doesn't exclude, but supports the increase of density in physical spaces. The traditional urban forms, typical of the dense and compact cities of the past, don't work anymore but establish the material and cultural structure for the regeneration of the inhabited spaces of the future city, an iper-dense system of places, of gathering, of movement and simultaneity.

Keywords: ciber-space, interaction, iper-dense city, open process, mutation

1. Introduction

Plus les télescopes seront perfectionnés et plus il y aura d'étoiles.
Gustave Flaubert.

New media and technologies have changed our perception of space. Crisis of traditional reality doesn't correspond to death of space but open a domain of new possibilities and opportunities to transform inhabited spaces. This paper, by proposing a series of questions, has not the ambition to give decisive responses, but aims to explore, facing new scientific and epistemological context, the possibilities of architecture, to create new contemporary places in existing cities, working in the interference between physical and virtual spaces and to respond to urgent and crucial issues globalization and recent phenomena have produced.

2. Space as a cultural construction. Physical space vs ciber-space.

Grid and alphabet. Net and code. Two different ways of thinking space correspond to two different languages. The conception of space is strictly connected to the capability of men of "being able to see" that is "being able to read" (Tagliagambe S.,2005), so to communicate and to imagine, to represent and to invent. Space and language are products of human intelligence that generate structures to know, to transform, to inhabit world. Alphabet, as code, are technologies used to de-codify the complexity of phenomena, we call reality.

Derrick de Kerckhove gives an interesting interpretation of the evolution of the idea of space, enlightening a direct relation between alphabet and space. He recognizes in Ippodamo da Mileto the first who introduces a principle of rationality into the sign and informal space of ante-alphabet culture: the grid. It's not a case that the conception of a rational and ordered space appeared in conjunction with the Greek literacy diffusion. This phenomena marks the passage from non-conscious processes to conscious processes[2] of giving form to inhabited spaces, we call city. Roman castrum found its reason in a determined rational principle of occupying territories by imposing universal order and control. We can assert urban design originated from an alphabetic mind. A mind well exercised in the practice of reading, as action of de-codification, is disposed to activate the same process approaching the context, beyond the mere registration of data by physiological instruments of visions. Reading increases use of imagination because the reader has to translate words into images constructing its own reality in a space that we can call "mental space". "A mind stimulated to analyse space could be inclined to organize it and to impose a rational grid in designing process. We can assert Ippodamo was an avid reader" (De Kerckhove D., 2001 p.10). Principles of architecture in "De re aedificatoria" reflect Vitruvius alphabetic mind as the Renaissance perspective can be defined as "the result of the analysis of the space in time, that is by distance" (Ibidem). Frontal relation with world characterizes the perception of space. Building is "read" by the façade, plaza is constructed as a sort of theatre "scene". Distance separates subject from object. Point of view, the position in space of the observer, is crucial in the meaning of space and in its physical dimensions. It fixes ontological, physical and psychological position of man. Human eye becomes a sort of lens that separates the exterior world from the internal space of human mind. "Occidental mind works producing a sort of "upset perspective" (Ivi, p.16). The distinction between interior/exterior, object/subject, finds epistemological reasons in the philosophy of Plato and Aristotle that reflect on this topic constructing the basis of occidental culture.

Ciber-space upsets traditional idea of space[3]. The term, firstly used by William Gibson in Neuromance (1984), indicates a new kind of reality, an "iper-reality", which pictures a "fantastic and artificial" world (in the meaning of out-of-reality) produced by new technologies. However in those years, all critical approach to ciber-space, while affirming an escape from reality, constantly refer their descriptions to precise urban context that are recognisable in their specific characters[4]. But the word "ciber", whose etymon refers to the verb "to direct", "to rule", was used originally in English language to define a new cibernetic science, that is "the study of the control and the communication among living organisms and machines with the

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[2] See part one of Alexander C. (1967), Notes on the Synthesis of Form,; it. ed. (edited by Sergio Los) Note sulla sintesi della forma, Edizioni Il Saggiatore, Milano.

[3] Ciber-space has produced a great epistemological upset. The distance between object and subject is reduced to zero. Point of view and point of state overlap. Subject is not outside but in the vision. Interaction is tactile much more than visual. In fact if screen can be considered the new medium between mind and virtual world, it doesn't separate, instead it captures human mind and inserts it in a new world assisted by computer. Mouse works as a kind of "hand of the mind" (de Kerckhove, D., op. cit., p.38). As Derrick de Kerckhove asserts, the literary introversion of book is reversed into the interactive extroversion of the computer.

[4] Edward W. Soja highlights all critical approach to ciber-space, while affirming an escape from reality, constantly refer their descriptions to precise urban context that are recognisable in their specific characters. "In the main critical approach to ciber-space the utopic, literal and metaphoric assertion are literally and metaphorically contrasted by a persistent reference to an environment that is specifically urban: Los Angeles and Bay Area, New York, Washington D.C., Miami, Chicago, Vancouver, London, Tokyo, Paris, etc.". in in Soja E. W. (2001), Digital Communities, simcities and the hyperreality of everyday life, in -Lotus 110 -, Milano, p. 76.

"theory of information" (Ivi, p. 75). Later, the union of "ciber" to "space" inaugurates the space dimension of cibernetic.
The choice to use the prefix "ciber" instead of "virtual" reveals the conscious attempt to recover the original meaning of ciber-space as a controlled (computer assisted) and virtual (but not mental) space, strictly referred to an urban context
Ciber-space is the space dimension of information[5]. It "overturns the relation between man and information, putting man into information" (Novak M.,1993, p. 234). As "space" it is the result of a cognitive process. As mental space it is a virtual space. As physical space it has its own rules that are expressed by codes. Implosion is one of its main characters[6]. Its "clearly a de-materialized architecture" is " an architecture that is not satisfied by space, shape and light and other character of real world. It is an architecture of unpredictable relations among intangible elements. (…). The liquid architecture is an architecture that breathes and pulsates. The liquid architecture is an architecture whose form is contingent to spectator interests" (Novak M., op. cit. p.234).

3. Nowadays crisis of "unsuitable reality".

New media and technologies have wreaked a breakdown in human thinking upsetting the traditional idea of a homogeneous and isotropic space and a notion of time strictly linked with a positivist sense of progress.
Considering reality a cultural construction stimulates a deep reflection on the way new instruments are changing our "production" of reality. We are experiencing a dramatic cultural adaptation that marks the passage from a conception of reality (the solid structure of traditional reality based on a specific idea of material, space and time[7], to another that unnecessarily will erase the previous one. Instead they will coexist together. The affected nature of the crisis consists in the drastic cultural and epistemological change this process requires. History, as we have seen, is characterized by "crisis of unsuitable reality" (Manzini E.,1993), by transformations from one idea of space to another. But this process was almost unconscious because it happens during a large period of time. Today cultural adaptation imposes a conscious interrogation on reality in a short time frame.
In the past, idea of reality was founded on material consistence and duration. Reiteration of experiences assured the conservation and improvement of principles. Time permitted construction of senses, what is called semiotics of things. Architecture lied on the idea of permanence and firmness of significance, stability and consistence (Ibidem).
The information technology processes break the solid structure of traditional reality based on a specific idea of material, space and time. Despite that in history breakdown soils always open a new world of experiences and possibilities. The prophetic Frollo assertion "ceci tuerà cela" should be turn into "ceci deviendra cela"[8].
In the next section we will try to clarify the nature of contemporary "places of mutation".

4. Contemporary places of mutation: new inter-cities geographies.

Globalization and explosion of technologies (TIC) has changed geography of inhabited places. However, despite to past prevision, cities are not collapsed. Concentration and dispersion coexist in the territories of

[5] Ciber-space is definitely the "space visualisation of information, available in global system of elaboration of the same, though communication nets". Tagliagambe S., op. cit., p.101
[6] "As a mind that emerges from a neurological activity, clearly physiological" (de Kerckhove, D., op. cit., p.21), ciber-space needs of a material support that is electricity. Electricity, as the main ciber-space technology, has introduced a new relation with space, as well as press and alphabet did in the past. But if press extends space (by pushing an explosive and fragmented tendency), electricity concentrates space in a specific point. If press diffuses information in an extended space, electricity converges information in a node.
[7] The traditional idea of a homogeneous and isotropic space and a notion of time strictly linked with a positivist sense of progress.
[8] Essays "architecture and media" in - Lotus 75-, Milano, 1993, pp. 113-131.

global economy. A thick network of nodes and connections fixes the structure of "high specialized interactive geographies of inter-cities" [17]. Nodes represent new centralities, "inhabited infrastructures" (I Ivi, p.28) of contemporary territories. They are places of concentration, information, diversity, and simultaneity. Nodes are cities.
The reason of the phenomenon stands in the structure and in the "potential" of city. Form of the city seems to respond to the necessities, to the dynamic structure of global economy. "Density and centrality assume a new strategic meaning: physical density is the urban form that received an increasing complex number of activities to the management, to the maintenance, to the design, implementation and coordination of global company and trades" (Ibidem).
Density as diversity, as concentration is the substance of historical cities. Nevertheless, nowadays those structures don't work anymore. It's not a question of dimension. The problem is that cities of history are not efficient, cannot support global economy that, it is important to understand, needs of material, physical places. "Density of central places, gives the social connectivity that permit to a company or a trade to maximize the advantages of its own technological connectivity". [20],
In the world of fluxes and interactions, cities should be conceived as "inhabited infrastructures", thick nodes of global economy, dense places of connections, of interferences, of activities that are merged in a synergic and efficient way. The complexity of past cities has to be re-interpreted and converted into a new type of complexity, that one of global economy. This raises an architectural problem that involves the conception of project as transformation process and its capability to activate a mutation, to generate new inhabited places, interfaces between physical and ciber-spaces, but that necessarily have to do with physical space that is the place where men breath, live, work, "the boundary of the containing body at which it is in contact with the contained body." [21].

5. Model as instrument of comprehension and transformation

To introduce the problem of contemporary architectural design project, it is necessary to clarify the relation between reality and representation, that finds in the project itself, a moment of synthesis.
Scientific revolution of the last decades plays an important role by introducing a new approach to context, to the interference between object and subject, by studying the unconscious and conscious process of adaptability and comprehension, and the interference between living organisms and environment. As quantum mechanics introduces the concept of phenomena, of "potentia", enlighten the importance of context (hic et nunc) and the observer (culture) in the process of knowledge, neurosciences give evidence to the strict relation of interaction between "reality of the other" and subject. Irreversibility and individuality of scientific measurement contrast with the reversibility of real phenomena. What we experience is the "potentia", or the possibility/inclination something happens. The space and temporal Galilean homogeneity collapses. Observer projects on reality its own thinking categories. The interference between context and subject generates our representation of world that transforms reality itself in a mutual symbiotic exchange. In accordance with this scientific approach the discovering of neuron mirrors demonstrates that the direct vision of an action provokes in the observer the activation of the same neural circuit responsible to control the execution of the same action. Observation activates the automatic simulation of the action and its consequent comprehension. Therefore perception is not a simply physiological registration of data but a simulated and projective action. Body is the medium.
As Italo Calvino affirms "to know is to insert something in real realm; it, therefore, to deform reality" (Calvino I., 2004). To represent is not just to produce image. It doesn't mean to copy. "To represent" means to produce an image, that we call "map", of something that in a certain sense, has some similarities with an object of the "real world", but not coincides with it. Maps represent the structure of things that is the form, the organisation of elements produced by intellect[9].

[9] In this sense landscape assumes an interactive and constructive conception. It is a place, a system of elements selected by the observer.

This operation implicates the capability "to read", that signifies to recognize an object as functional, or usable in a determined context for a purpose, in accordance with Heidegger meaning of "being in the world", "inhabiting". Therefore representation requires invention. It is project. It transforms reality. Human intelligence activates an operation of knowledge that requires selection and that depends on the capacities of observer to "read", "to comprehend", so to select from complexity some elements and put them together in a new system making that complexity tangible[10]. This capability is given by experience and by shared culture that gather together all human experiences.
"Being able to read" and "being able to see" become the start point of a designing process. "The distance permit to re-construct context oriented to a specific necessity and to recognize it the possibility of transformation. This is the ontological sense of our possibility to comprehend world " (Tagliagambe S., op. cit., p.30).
Italo Calvino says "The city are made by the eyes that look at them".
To comprehend, reveal and transform complexity of city human intelligence generates models. Models as "products of intelligence" and "instruments of reduction of complexity", construct relations among selected elements recognized as significant to a specific purpose and captured from reality, to form the structure of the model, built on an analogical principle.
Silvano Tagliagambe offers an interesting explanation of the concept of model, useful to sustain this argument, by making a list of its main characters. First he stands that "model re-constructs new modality to visualize reality". "It is capable to produce innovative perceptive styles". Model gives shape to a sensible phenomenon that is not comprehensible. It is the representation of the form, that is the structure of a phenomenon, not the effectual phenomenon in itself. It is a map that works on the principle of analogy. It is a sort of weave, a coherent system of relations among points. Analogy is not similarity; instead it is based on a sort of structural isomorphism that refers just to position. It is topological and relational. A semiotic and conceptual construction gives it content and sense. It is not a copy but it refers indirectly to physical phenomena through its rational principles and categories. (Renovation of Kant's lesson). The construction of a model is conditioned to the presence of a necessity, of a problem of knowledge, of comprehension that can be solved only through a simplification of reality, through the model. If model is complex as reality, it is not useful.

6. Architecture of intelligence as space of possibilities

If space as "cultural construction" and place as "extension of human body", permit to get the current crisis as a "soil of possibilities" and to give a new "virtual" dimension to ciber-space, as "artefact of intelligence", it is in the interfaces between physical and virtual space that architecture reveals its capacities to generate mutation in the contemporary places of inter-cities. Ciber-space extends physical and virtual (mental) space, offering the opportunities to enrich the domain of possibilities generated by human mind. Its retro-active effect on effectual reality works in the field of representation, of design and of construction. Architecture, as we have seen, constructs models to reveal, comprehend and transform reality adapting to cultural changes. Again, nowadays architecture needs of models. But these models cannot be the same of those of the past. They should be flexible, adaptable, opened to mutation, capable to respond to different inputs, social, economic and environmental.
In the field of representation new media and technology permit to give shape to mutation and to construct scenarios in the dominion of ciber-space. This means an opportunity not just to translate a product of imagination into something of sensible, "reading by eyes", but especially because it permits to communicate an idea that become collective. To design complexity requires a connected effort of a collective subject, constituted by different individuals with their own identity but supported by a shared

[10] This kind of vision is called by S. Tagliagambe "gestaltic vision", a vision that represents the "non –verbalized component of perceptive capacity and its relative knowledge. The specific object of this vision is the structure of the figure, or the complex relations that connect elements and parts that compose it". Tagliagambe S., op. cit., p.101

culture. Possibility and capability to communicate ideas are the first step for a shared management of resources.
New descriptive model are able to construct new maps that reveal global inter-cities geographies by gathering, elaborating and interpreting the multiplicity and heterogeneity of data selected from physical space.
It is in the domain of designing process that ciber-space reveals its own role of "potentia". Working as an "extension of imagination" by giving the possibility to shape a virtual image produced by human mind, it increases human imagination, generating new images and activating a process that is the same, in a certain sense, that is activated in the reading of a book.
However project is not a collection of data "the natural result of accumulation of data, of the information, of the knowledge, according to (…) a tendency that Calvino call 'rational and geometrical or algebraic tendency of intellect', that in 'Le città invisibili' is personified by KubaiKan". However it is not the direct result of a sudden inspiration ((Tagliagambe S., op. cit., p.30).
Project is developed through models that from an original and resistant nucleus, by a process of trial and error, are shaped to respond to a series of requests, with criteria of efficiency, flexibility and adaptability. Strategy gives continuity to the process. Ciber-space constitutes the virtual realm where process can be controlled, verify, developed, by fixing a resistant structure and working on flexible and variable elements in the continuous interferences between physical reality and ciber-reality.
[1] In the thickness of interfaces, "architecture of intelligence" (De Kerckhove D. , op. cit. as "the architecture of connectivity" (Ivi, p. 7) generates possibilities, dense places of connections and shared intelligence.

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