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SYSTEMIC CONTINUITIES AND INTERACTIONS BETWEEN ARCHITECTURE AND SOCIAL SYSTEMS
Knowledge for the future of the knowledge society

CONTINUITÉS SYSTÉMIQUES ET INTERACTIONS ENTRE L'ARCHITECTURE ET LES SYSTÈMES SOCIAUX
Connaissances pour l'avenir de la société de la connaissance

UES-EUS / Groupe de contact F.R.S.-FNRS 'Architecture & complexité' joined Seminar octobre 2015

ABOUT THE JOURNAL / À PROPOS DE LA REVUE

Aims & Scope / Objectifs et périmètre

Created in 2011 by the European Union for Systemics (EUS), *Acta Europeana Systemica* is an Open Access Journal without publication fees, publishing review papers on topics in all areas of systems thinking. The main objective of the journal AES is to promote systems thinking by providing keys to understanding the complexity of reality. Its mission is to promote the emergence, communication and deepening of systemic thinking. The existence of the journal AES is necessitated by the realization that the complexity of the society in which we live exacerbates the need to find the tools, methods, an epistemology that allows to understand the functioning of the phenomena around us and and able to act. The journal AES is a place of reflection and exchange that confronts multiple practices, training and systems research. It supports in particular the approaches inter/pluri/multi/trans-disciplinary, openings to cultural diversity, field experiences and references to theoretical work.

Créée en 2011 par l'Union Européenne de Systémique (UES), *Acta Europeana Systemica* est une revue en accès libre et sans frais de publication, publiant des articles relus sur des sujets dans tous les domaines de la pensée systémique. L'objectif principal de la revue AES est la promotion de la pensée systémique en fournissant des clés de lecture de la complexité du réel. Elle a pour mission de favoriser l'émergence, la communication et l'approfondissement de la pensée systémique. L'existence de la revue AES est rendue nécessaire par la prise de conscience que la complexité de la société dans lequel nous vivons exacerbe le besoin de trouver des outils, des méthodes, une épistémologie qui permette de comprendre le fonctionnement des phénomènes qui nous entoure et ainsi pouvoir agir. La revue AES est un lieu de réflexion et d'échanges qui confronte de multiples pratiques, formations et recherches systémiques. Elle soutient notamment les approches inter/pluri/multi/trans-disciplinaires, les ouvertures à la diversité culturelle, les expériences de terrain et les références à des travaux théoriques.

A journal from the EUS / Une revue de l'UES

Founded in 1988, the European Union for Systemics (EUS) aims at promoting European research and practice of systemics. The EUS is a community of national scientific societies. The EUS seeks to establish, through its network of companies, a favourable environment to the evolution of systemics (including its theoretical foundations, its methods and its implementation) and its diffusion, in particular by promoting transdisciplinary exchanges.

Fondée en 1988, l'Union Européenne de Systémique (UES) vise à promouvoir au niveau européen les recherches en matière de systémique et de ses applications. L'UES est une union de sociétés savantes nationales. L'UES s'efforce de constituer, avec son réseau de sociétés, un contexte propice aux progrès de la systémique (qu'il s'agisse de ses fondements théoriques, de ses méthodologies ou de ses applications) et à sa diffusion, notamment en favorisant les échanges transdisciplinaires.

The general editorial line of the journal AES is defined by two members of the EUS and the presidents of the member societies of the EUS.

La ligne éditoriale de la revue est définie par deux membres de l'UES et par les président·e·s des sociétés membres de l'UES.

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LE JEU DES (DIS)CONTINUITÉS ENTRE ARCHITECTURE ET SYSTÈMES SOCIAUX PEUT-IL NOUS SORTIR DE L'ANTHROPOCÈNE ?

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La relation *générale* entre les systèmes sociaux et l'environnement – au sens large – a favorisé l'émergence de l'ère de l'anthropocène. Pour un nombre croissant de scientifiques, l'émergence de la période la plus récente des temps géologiques – l'anthropocène – est clairement liée au développement des activités humaines qui contribuent à la destruction irréversible des ressources nécessaires à la survie de nombreuses espèces, dont l'espèce humaine. Cette hypothèse scientifique est confirmée par un nombre croissant de preuves indiquant que les processus atmosphériques, géologiques, hydrologiques et biosphériques du système terrestre sont aujourd'hui altérés par les humains.

La relation *particulière* entre les systèmes sociaux et l'environnement – cette fois *construit* – participe également à l'émergence de l'anthropocène. La somme des édifices construits (l'architecture), des chantiers d'envergure (l'ingénierie) et des villes (l'urbanisme) représente un poids non négligeable sur le système terrestre. La compréhension des relations entre systèmes sociaux et environnements construits est un enjeu contemporain important qui nécessite des méthodes pour penser et des outils pour agir innovants !

Une boucle de rétroaction est à l'oeuvre entre les systèmes sociaux et l'architecture : les systèmes sociaux produisent des établissements humains matérialisés par des artefacts architecturaux et, à leur tour, ces édifices structurent les membres de la société qui les habitent, ces derniers proposant alors de nouveaux types d'édifices et ainsi de suite… Ces influencent réciproques ne viennent pas d'actes isolés mais résultent d'un grand nombre d'actes conscients et inconscients s'enchaînant et interagissant. Ce fonctionnement *complexe* implique l'hypothèse de l'existence *potentielle* de (dis)continuités entre les structures sous-jacentes de cet environnement construit et des systèmes sociaux qu'il abrite, c'est à dire l'apparition *potentielle* de facteurs de cohérence communs aux systèmes sociaux et à leurs manifestations matérielles.

Sur base de cette hypothèse, s'ils connaissent les leviers de ces facteurs de cohérence communs, les concepteurs de l'environnement construit, décident implicitement de prolonger ou de transformer les propriétés des systèmes sociaux actuels, par les édifices qu'ils projettent et les réponses architecturales qu'ils proposent aux questions de société actuelles. Ils partagent donc indirectement la *responsabilité* de l'état d'épuisement du système terrestre qui affecte l'anthropocène.

Les systèmes sociaux sont en mutation constante : la population augmente et les acteurs sont multipliés, les ressources s'épuisent et la soutenabilité est nécessaire, les connaissances s'accumulent et les mémoires externes sont croisées, les idées circulent et la noosphère se développe, les règles se confondent, les clés de lecture et les codes culturels sont multiples, la ville intelligente se fragmente, la *smartcity* est diffuse, l'économie se dédouble et le capitalisme engendre l'ubérisation, la science se perd parce que les incertitudes s'accumulent à très grande et à très petite échelle. En Occident, la diffusion généralisée des technologies numériques amène les acteurs à perdre en partie leurs capacités mentales de mémorisation et de traitement de l'information. Par contre, ils gagnent la possibilité de

vivre des mises en relation autrefois inédites et également une faculté décuplée d'invention et de création (Serres, 2013).

Parallèlement à ces évolutions, l'environnement construit est également en mutation constante, avec l'émergence de villes intelligentes, d'éco quartiers, de changements d'activités… Deux positions sont prise par enrayer le phénomène de l'anthropocène :

1. d'un côté, ceux qui *s'opposent* aux effets négatifs de la *grande accélération* entamée après la Seconde Guerre mondiale et qui proposent une *slow* architecture imprégnée de régionalisme critique, de *low* technologie et de ré-enchantement du monde,

2. de l'autre, ceux qui *surfent* sur les effets positifs de cette *grande accélération* et qui proposent une *smart* architecture encombrée de fonctionnalisme, de technologies, de capteurs et de régulations multiples. Malheureusement, les premiers réalisent des parenthèses (très) couteuses appréciables par des initiés dans des implantations uniques, alors que les seconds réalisent des interventions de grande ampleur (très) couteuses adressée uniquement à de jeunes cadres dynamiques et connectés.

Ces deux voies mènent à terme à une impasse. Une alternative est nécessaire !

Ces modifications touchent également le domaine de l'architecture, en tant que système particulier de mise en ordre de la réalité. L'accumulation et la complication des pratiques et des savoirs extériorisés, l'accroissement du nombre des acteurs et des facteurs pris en considération dans la conception, les contradictions liées à la construction d'une réalité contingente… sont autant d'influences de la société sur la discipline.

Pour l'architecture, l'un des défis majeurs de notre époque est d'appréhender et surtout de gérer la complexité inhérente à ces constats. À la tradition épistémologique occidentale héritée du cartésianisme correspond une conception réductrice du monde. Notre vision de la réalité doit être *complétée* de cadres de pensée fondés sur d'autres représentations qui visent sa complexité. Il est dorénavant possible d'éclairer le domaine de l'architecture par des concepts et des méthodologies qui permettent de bien penser dans l'action, avec lucidité et en pleine conscience de l'interdépendance des phénomènes.

À l'occasion du cinq-centième anniversaire de la parution de l'*Utopie* (1516) de Thomas More, le concept d'utopie est largement remis à l'honneur. Le concept d'utopie est terriblement stimulant pour les concepteurs de projets d'architecture puisqu'il désigne au départ un lieu inexistant tout en étant imaginable. En questionnant les modalités d'organisation spatiale de l'environnement construit, il confronte inévitablement l'architecture aux systèmes sociaux des cités qu'elle génère indirectement, mais qu'elle sert également. Dans le monde entier, les problèmes actuels que posent les villes (la pauvreté, la barbarie, la pollution…) démontrent l'actualité de la question de l'utopie.

Jusqu'à preuve du contraire, l'espèce humaine n'a actuellement pas encore disparu ! Espérons que l'usage de l'utopie critique combinée à la puissance holistique de la pensée systémique soit à l'oeuvre aujourd'hui !

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ARCHITECTURE AND SYSTEMICS – AN OUTLINE AND AN OUTLOOK

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1. THE POWER OF METAPHORS

Systemic thought has often crossed the path of architectural culture along the XX Century.

A significant part of architectural thought is about the connection between people and places. For this reason, the complex nature of architectural phenomena, which shape the built environment where people live, has frequently appealed to architecture theorists.

In 1968, American designers Roy and Charles Eames produced a film for IBM: *Powers of Ten: A Film Dealing with the Relative Size of Things in the Universe and the Effect of Adding Another Zero.* The film begins showing a couple picnicking at the Chicago lakefront, framed inside a one- square-meter field. Then the viewpoint zooms out to a view encompassing a square field with a ten-meter side, then it continues zooming out at a rate of one power of ten every 10 seconds, reaching a field of 1024 meters, that is, the size of the observable universe. The camera then zooms back in to the picnic couple, and then it "plunges" into the man's body showing views of negative powers of ten down to 10^{-16} meter, that is the shortest measurable distance inside the proton of a carbon atom. This representation of the human scale and its interconnections to the greater and the smaller environment was the work of architects and designers, as the Eames were.

In the last 50 years, research improved the understanding of how complex settlements work (Batty, 2005), and relevant advances in systemic thought about the built environment have been made. Recently, a very interesting line of thought has emerged: *Complexity Theories of Cities (CTC)* (Portugali, 2011). Overviews took place in Delft in 2009 and 2013 (Potugali *et al*., 2011). CTC is based on the ideas of self-organization and synergetic, entailing questions about pattern configuration and order parameters.

I will start tracing the path of systemic thought in architecture following the fruitful idea of *metaphor*.

Architectural thought is very fond of metaphors: actually, in many fields in science as in culture, we often use metaphors. A metaphor is a figure of speech in which a word or phrase, literally denoting one kind of object or idea, is used in place of another to suggest a likeness, an analogy between them – in this way making a clearer idea of something that is particularly difficult to describe and to define.

Since the late XIX Century, when the traditional architectural theories proved inadequate to the increasing complexity and the new challenges of mass-production, architectural thought has often looked for inspiration at sciences adequate to research into complex fields – such as physics and biology – and, more recently, to human sciences such as psychology, anthropology, sociology (Broadbent, 1973 ; Zeisel, 1981).

I would rather say "looked for *inspiration*" than *for methods or tools*, because the power of metaphors lies in giving light to new and dark fields, in helping to recognize paths. Along such paths, the quest for methods and tools remains a difficult challenge anyway, especially in those fields where quantitative validation methods are not customary, and speculative assumptions prevail.

At the beginning of the XX Century, and even more after WWI, industrialization turned the mass production of housing into a widely renowned architectural question, something that had never occurred before, and challenged the architectural thought in a radical way.

So, when *mechanization took command,* at the height of the Machine Age, the mechanic metaphor became popular. It conceptualized the idea of a building – as well as of a city – as an artifact with a primary functional character. A machine, a machinery, whose component parts and overall arrangements had to be specifically designed to maximize functionality. The house could be seen as *La Machine à habiter*, according to Le Corbusier's famous statement. Such metaphor strengthened between the two World Wars, and thrived well into the 1970's.

In *Vers une Architecture* (1923), Le Corbusier, again, famously claimed, "All men have the same organism and the same functions. All men have the same needs." Thus prompting the rationalist idea of *standard*. Standards, established by "logic controlled by analysis and experiment", are based upon the idea of users being a homogeneous public, with homogeneous needs, desires, ways of life and so on.

Many years later, in the second half of the XX Century, such functionalist theories were considered responsible for many dysfunctional outputs of city design and construction. Apart from their practical results, they also suggest a mechanical idea of human life and human needs, which greatly helped making contemporary architecture *ideology* quite unpopular among the public opinion[1].

During and after WW2, driven by the military industry in the USA and UK, much research focused on problem-solving activities, which could account for the increasing complexity of industrial production and the need to increase speed and reduce uncertainty in the production process. The aim was to establish a rational sequence going from the problem definition to its solution. Research developed techniques of analysis, prevision and control, and defined processes for activities, and for each process phase, in terms of *plan, program, design, production*.

Design theories assumed a specific "industrial systemic outlook", generating "tools" for problem solving, which resorted to the mathematics of probability. Such were the Operational Research (O.R.) methods, developed during wartime with the aim of tracking down enemy submarines.

The main goal of Operational Research was to establish a decision sequence, in order to obtain an improvement both in the performance of a process and in the performance of the final product of the process itself. Thus, it is possible to synthesize the solution – that is, the decision sequence itself – by means of a mathematical model.

After WW2, in industrial countries the building industry developed prefabricated reinforced concrete techniques, which required increasing mechanization in the building process – both in factories and on the construction site. The building industry soon adopted P.E.R.T. (Project Evaluation and Review Technique), a well-known Operational Research technique, which is still widely used to establish activities in the building process. P.E.R.T. was mostly developed in the 1950's by the USA and British Navies to design nuclear powered submarines armed with Polaris missiles (Broadbent, 1973). The first step in P.E.R.T. design is to define a sequence of activities, which allows the underpinning of critical paths: that is, the time path connecting each activity, which must not exceed their allowed time, not to affect the completion date for the project.

In 1965, RIBA – the Royal Institution of British Architect – defined and published, in its "Handbook for Architects", the sequence of activities involved in building a house. It allowed professionals to draw a complete network diagram and timeline for each design phase (Broadbent, 1973).

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[1] One for all, in general literature, see: T. Wolfe, From Bauhaus to Our House, 1981.

In those days, many authors worked along this line of thought, developing rational design theories and methodologies: Asimow, Jones, Gregory, Archers, to name just the most famous. Their works deeply influenced a large part of the design culture, both in Europe and in the USA (Asimow, 1962 ; Jones, 1963 ; Jones, 1970 ; Gregory, 1964 ; Archer, 1965).

In Morris Asimow's seminal work *Introduction to design* (1962), the author defines the 7 phases of Design Morphology:

1. Feasibility Study;
2. Preliminary Design;
3. Detailed Design;
4. Planning the Production Process;
5. Planning for Distribution;
6. Planning for Consumption;
7. Planning for the Retirement of the Product.

Each phase in the Design Morphology contains the same sequence of events, which represent the Design Process: 1. Analysis; 2. Synthesis; 3. Evaluation and Decision; 4. Optimization; 5. Revision; 6. Implementation.

Such systemic analysis of the building construction process draws inspiration from the industrial production ratio, referring mainly to functional criteria to describe its internal relationships. Its main objective is to provide the building sector with a systematic tool, devised to achieve the best quality of a building and of its parts.

The question asks how can architects define *quality*. The answer lies in defining and stating the characteristics that each element and space in the building must possess. Thus, quality can be defined in terms of the requirements which meet the needs expressed by the user, who shall be satisfied by the actual performance of the building systems and of its elements.

Optimization was the main keyword in this need/performance-based design idea.

All along the 1950s, 1970s and 1970s, the quest for optimization in architecture led, quite often, from Utopia to dystopia, as represented by such famous cases as:

- The Corviale, at the outskirts of Rome. A council housing project built in 1972, it was conceived, and also saluted at the time, as a successful manifesto of rational design. During time, it proved quite uncomfortable and unpopular among its tenants, and underwent a series of disputable refurbishing attempts.
- The Pruitt Igoe Housing Estate, St. Louis, 1951-1955. Designed by Architect Minoru Yamasaki, it won the American Institute of Architects Award in 1951. It was demolished in 1971, after proving absolutely dysfunctional, and having been heavily damaged, beyond any possible rehabilitation, by generations of unhappy inhabitants. The demolition of Pruitt-Igoe features in the opening sequence of the American environmental movie "Koyaanisqatsi" (1982); the event was labelled *an icon of post-industrialization* by geographer and anthropologist David Harvey (1989).

The mechanic metaphor generated the idea of a DESIGN METHOD, that is: the idea that design can be treated like a process, divided into phases, all of them aimed at controlling a stated quality of the output. The contributions of operational research, the increasing development of computing devices and the contemporary development of disciplines dealing with complexity in production, were well available to design theorist in the early 1960's. Rational design methods represented the architectural output as a flow, which proceeds from plan to program to design to production.

The ideas of *input*, *output*, *feedback*, as well as flowcharts, became familiar to architects.

In the words of one of these authors, Welsh designer John Chris Jones, "The method is primarily a means of resolving a conflict that exists between logical analysis and creative thought" (Broadbent, 1973, p.257). As Broadbent noted, "In his method, Jones suggested that the designer should separate

imaginative ideas and designs from logical statements of information and requirements during the design process, trying to put them together again at some point 'along the way'" (p.257).

The ideas of feedback and feedback loops comes, of course, from *Cybernetics*: the science that studies the structure of regulatory systems.

Basically, Cybernetics deal with the structure of language-based systems: a set of signals connecting a system with its environment. All changes in the system cause some change in the environment; such change is conveyed to the system via information, or *feedback.* Feedback is, a flux, a flow of signals that cause the system to adapt to new conditions: feedback allows the system to change its behavior to meet the new environmental situation. Thus, Cybernetics provide powerful tools to study both informational and social systems, as both of them are based on *language*: that is, the exchange of signals which can change the behavior of a system.

Cybernetics and Information sciences bring in another metaphor, which relates to computer science, Artificial Intelligence and the regulatory systems in complex structures.

2. BETWEEN ART AND SCIENCE, UNDERSTANDING NATURE

In the 1970s, The Architects' Journal British cartoonist Louis Hellman depicted an architect engaged in the difficult task of "taming" two wild horses: Art and Science, trying to make them work together. A telling metaphor, once more.

Without any doubt, architecture *is* an art in many ways: it is the art of representing civilization and power, as well as the art of according people, their needs and aspirations, to the "mineral substance" of the material world.

Now, let's take a step back and track down another path in systemic references, that runs into the architectural thought.

Christopher Alexander (1964), in his *Notes on the Synthesis of Form*, wrote that "[…] every design problem begins with an effort to achieve fitness between two entities: the form in question and its context. The form is the solution to the problem; the context defines the problem.

In other words, when we speak of design, the real object of discussion is not the form alone, but the ensemble comprising the form and its context. […] The ultimate object of design is form. The reason that iron filings placed in a magnetic field exhibit a pattern - or have form, as we say - is that the field they are in is not homogeneous. If the world were totally regular and homogeneous, there would be no forces, and no forms. Everything would be amorphous. But an irregular world tries to compensate for its own irregularities by fitting itself to them, and thereby takes on form."

At the beginning of the 1960s, Alexander was committed to the scientific approach to architectural form, going back to the studies of Scottish biologist and mathematician D'Arcy Wentworth Thompson. Thompson (1917), in his capital work *On Growth and Form*, stated that the form and structure of living organisms depend mainly from physical laws and mechanics. Cities had often been compared to living organisms in the XIX Century. Victorian poets and writers, such as Wordsworth and Dickens, often recurred to an organic metaphor in describing London as an ant-hill, or a "monster-city" with a will of its own (Johnson, 2001). A peer and compatriot of Thompson's, geographer and biologist Patrick Geddes, further developed the organic metaphor. In his book *City in Evolution* (1915), he introduced the idea of "evolutionary planning", in order to better describe and understand the way human settlements behave and grow during time, and properly approach planning tasks. As Michael Batty and Stephen Marshall write, "In planning terms, this meant that a town was not a purely manufactured artefact that could be arbitrarily imposed on a particular location, like the design of a building, but was a product of its environment, to be studied as part of that environment, and to be planned in sympathy with it" (Batty & Marshall, 2009).

Through metaphor, we approach the ecological paradigm of our days.

In fact, as many other animal species do, humans shape their own settlements through artifacts. The buildings and other artifacts, deposited on the earth surface during time, form what we call the built environment. The human species has a powerful capacity of modifying its own environment. We can

define architecture, "the set of human artefacts and signs that establish and denote mankind's settlements", following what William Morris wrote almost 150 years ago[2]. Thus, the built environment and architecture represent a complex social product as well as the peculiar, artificial main part of the eco-system where the human species lives and develops.

The organic metaphor helps in establishing an ecological paradigm in architecture and urban design: "Cities are emergent and adaptive […] we cannot expect them to exist in a state of equilibrium, as they are intrinsically unstable, always in flux and thus far from equilibrium" (Batty & Marshall, 2009).

Stephen Marshall further introduces the idea of co-evolution in the process of the built environment growth: "In the evolutionary paradigm, the city is not a designed object (or a series of created objects); nor it is a developing organism composed of parts that are functionally interlinked, supporting and subordinate to the whole. Instead, the city is a collective entity like a forest or an eco-system, a population of coevolving things, partly in cooperation, partly in competition. It is the very interactions of the cooperating and competing parts that gives rise to to the complex collective product. In the evolutionary paradigm, above all, there is no optimal target form. It may be possible to identify potential improvements as immediate targets, but there is unlikely to be a single optimal target form and certainly no long-term knowable optimal form" (Marshall, 2009).

As we can see, references to Systemics have travelled a long way from the early, industrial stage of performance-based design.

Like any other living species, humans are organisms that adjust to a dynamic, ever-changing environment shaping it according to their own purposes. The very nature of the relationships between organisms and their environment is systemic.

The systemic approach to environmental research focuses on the impact of human actions on the physical environment, both built and natural, and entails the idea of a regulatory system: homeostasis. Homeostasis is a self-regulating process which allows living systems to find their own right balance in a changing environment and to reach an equilibrium point despite unpredictable and external conditions.

From the the ecological realm, we draw another fruitful concept: affordance.

According to environmental psychologist J.J. Gibson, affordance is a property of the environment relative to an animal, allowing a certain kind of mutual relationship between them. Affordance represent a property of the environment which allows a specific kind of animal to afford a specific behavior. In Gibson's words (1979), "affordances are facts of the environments and do not depend on the needs of the observer". If we translate the notion of affordance into the realm of architecture and urban design, we find that it could help updating the old, worn-out rationalist notion of performance, without losing the necessary link to the centre of design process: people. "Affordance" is a concept far more open than "performance", which is strictly based upon the users' needs. It is more about a range of offered possibilities than of specific satisfied needs. It allows more opportunities for change in time, thus it is more helpful in the strive for harmonizing our design behaviour to the definition of sustainability given by the Bruntland Report: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). It represents a fascinating field for research.

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[2] According to William Morris (1881), the idea of Architecture could not be restricted to the realm of the Arts, because "*Architecture regards all the signs that mankind leaves on Earth, except pure desert*".

3. LANDSCAPE: SYSTEMICS MADE VISIBLE

The European Landscape Convention defines landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and human factors"[3].

The definition puts the inhabitants' perception at the core of any protection and planning action, and people's partecipation becomes a fundamental issue.

In Ambrogio Lorenzetti's "Allegoria del buon governo" (1338 – 1339) in the Palazzo pubblico at Siena, we can see the effects of good, moral government resulting in the ordered behaviour of citizens and peasants, and in the flow of thriving activities between the lively, peaceful city and the quiet, productive country. Centuries of such activities shaped the productive Tuscan landscape, giving it the character that the whole world knows and perceives in terms of *delight.*

"Delight" is one of the three Vitruvian precepts for good architecture, together with soundness and function. In Latin, the word for delight is *venustas*, the main attribute of Venus, goddess of physical pleasure. Delight is for sure one of the characters that should be preserved, though preservation seems to be a difficult goal in an ever-changing environment, where valuable site resources are in constant danger of being swept away by careless exploitation.

Inhabitants have great responsibilities; local communities often find it difficult to make decisions and to balance between useful development and careful protection of landscape resources. In fact, both big and small decisions give the environment its shape. The construction of a highway promotes great change, as well as a body of planning regulations or the poor maintenance of country lanes. Such activities all rely upon the culture of populations and communities: both the high, institutional culture generating planning regulations and the widespread, commonplace culture defining how people keep their own garden fence.

Christopher Alexander (1964), again, wrote: "Architects are responsible for no more than perhaps 5 percent of all the buildings in the world. Most buildings [...] which give the world its form [...] come from the work of thousands of housewives, the officials in the building department, local bankers, carpenters, public works departments, gardeners, painters, city councils, families...".

In 1974, Eugenio Turri, a great Italian geographer, wrote: "As a biological eco-system breaks down when its utilization by the inhabiting organism destroys the conditions for the survival of the organism itself, so its anthropological equivalent – the built environment – breaks down when the balance between its natural and human resources and the requirements of its inhabitants has been upset. [...] In this case, culture fails to play its role in mediating between society and environment, not being able to direct social behaviours as well as the actions of the political and administrative institutions" (Turri, 1974).

Indeed, *culture* should be considered the main systemic regulator.

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THE EMERGENT CITY. INTERACTIVE RELATIONAL SYSTEMS BETWEEN PUBLIC ADMINISTRATION AND CITIZEN TO FOSTER SUSTAINABLE PROCESSES OF URBAN DEVELOPMENT

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Abstract / Résumé :

The widespread of Information and Communication Technologies and the consequently redefinition of roles in the usage and management of the city brought along new systems of relationships and interactions that produce an auto-organisation of territories or communities, showed also through temporary transformation of the environment. In effect, cities are continuously redefined by emergent properties that may, both be originated and then impact on social, political, cultural, and economical people practices. On the other hand, through the arrangement of its patterns the city shapes the social and connective relations occurring among people. So, the city can be regarded as a complex system, that in the last years has been expanded by the widespread of communication devices and sensors connected to the Internet. In this context, the design of new patterns of interactions that focuses on the new relationship opportunities, in part offered by the Information and Communication Technologies, but not limited to them, may significantly affect sustainable processes of urban development. This paper focuses on the civic aspect of the so-called smart cities, and, in details, on the relation between citizens and Public Administration. Some existing interaction patterns are illustrated in order to support the visualisation of the dynamic relationships between citizens and Public Administration, while new possible relations derived by the interaction with the urban space are supposed.

Keywords / Mots-clés :

interaction patterns, Public Administration, citizen, relational system, smart city, information and communication technologies, meta-design, complexity

INTRODUCTION

The urban space has been highly influenced and transformed by the evolution of Information and Communication Technologies (hereafter ICTs). On the one hand, technologies have been integrated into much traditional street furniture, such as streetlamps, traffic lights, bus stops, even memorials, or have became themselves street furniture, such as public screens and totems, changing the overall look of the city. On the other hand, technologies have induced new habits and behaviours, changing the relations and the interaction modes occurring into the city. For example, the development of transport sharing services generally based on online platforms accessible via desktop or mobile devices, affected the interaction modes between the city users and the urban transportation system. At the same time these practices of shared mobility (such as other practices based on sharing and participation

belonging to other sectors) have been made possible by the widespread use of ICTs, and Internet over all, that fostered information reuse and user engagement.

In effect, the widespread adoption of ICTs and digital media changed the cognitive models and generated several processes of emergence that re-define the relational systems occurred in the city. For example, de Kerckhove (de Kerckhove, 2010) uses the term "augmented mind" to refer to the common concept of mind "inside our heads, but externalized, shared, multiplied, accelerated, randomly accessed and generally processed in a connective way outside our heads". The augmented mind is the consequence of the invention and use of the new electronic media, which support and export language augmenting the mind outside our heads. This augmentation and acceleration of the user's mind is also "the spontaneous formation and aggregation of minds, performing different collaborative functions to achieve a myriad of individual or group aims and initiatives". It is a "connective mind" (de Kerckhove, 2010).

This does not have to lead to a techno-centric vision of the city. On the contrary, it led to reflect on how the relations between people and city are changing into a highly interconnected system, in order to identifying new interaction patterns fostering sustainable processes of urban development. According to Conlon (Conlon, 2008), the Interaction Design should examine "how the user appropriates technology as needed to shape personalized relationship and relationship opportunities with other users". In the last years the appropriation of technologies by the users for the achievement of civic and common interests gained more and more importance into the decision-making and planning processes of the city. For this reason, it should be interest of the Public Administration looks at Interaction Design as the key to the development of a formative and fertile relationship with the citizens. The focus on relation rather than on functionalities opens to a wider field of research able to foster the development processes of the city and the intrinsic qualities of urban life.

Nowadays technologies aimed to collect and manage large and various amount of data and information in order to capture emotions and needs of city users seem to greatly affect the currently urbanization processes and the activities of the city users. This information flow, managed through complex calculation systems, is regarded as a "smart" attitude in the city, which appears able to sustain the development processes. But, in effect it represents a source of fragmentation and information overload for the common citizen. On the contrary, thinking to the city in a qualitative way, as a system of relational opportunities, gives larger importance to the consistencies of the system.

In this paper we focus on the relational systems between citizen and Public Administration. So, first of all, we define and discuss the context and the main topics of the research, i.e. the city, regarded as a system continuously transforming itself and observed through the smart city paradigm, and the redefinition of relations and roles between citizen and Public Administration. Then, we illustrate as patterns of interaction some dynamic relations currently occurring between citizens and Public Administration. Finally, we supposed which would be a possible approach looking at new relational opportunities between citizen and Public Administration derived by the interaction with physical and virtual elements of the urban space.

THE EMERGENT PATTERNS OF THE "SMART" CITY

The city is the physical and equally ideal place where the relational systems between citizens and Public Administration occurred. It can be regarded as a complex system, where different urban structures, susceptible to change in respect of the effective use made of them, emerge from the different combination of architectural and social elements. In effect, the evolution of the city over time sees the creation, the demolition, and the re-creation of different emergent patterns through the actualization of repeated actions, in order to find a balance among the different forces that compose the system. Along with Minati (Minati, 2008), all these forces forge the identity of the city as an emergent property continuously acquired, rather than possessed. In detail, the city is constantly redefined by emergent properties that produce an auto-organisation of a territory or a community showed also through temporary transformation of the environment. People are one of the main sources of changeable emergent properties that affected the city. At the same time, the arrangement of the city

patterns (Alexander, 1977) shapes the social and connective relations among the city users, included the Public Administration. So, the city can be regarded as a complex system of information. The widespread of communication devices and sensors connected to the Internet expands this system. This let citizens have a deeper acknowledgment of the city, but may cause, at the same time, negative effects leading to great inequality (Moser, 2001), such as information fragmentation and overload, that people has to manage every time he/she uses a service or "lives" a city. For example, an uncontrolled and unmanageable use of technologies may foster the only advance of strong communities or organized groups and act as a sounding board for complaints and demagogic attitudes.

Anyway, technologies are a significant force that continues to change the organization of cities and communities. In effect, the concept of "smart communities" originated from the wider range of opportunities for government and commerce offered by the realization of citizens' networks collaborating through ICTs in order to foster local economy (Moser, 2001). The relations among people, sustained by technologies, created value and competitive advantage for the territories, that inevitably changed them.

In the course of time, the city has been characterised by stressing many of its attributes or a combination of them. "Smart" is one of its labels (Hollands, 2008), largely used to vehicle some "city patterns" derived or expected from the current urban development phenomena. In detail, "Smart city" is a term that refers to a concept assuming many aspects and meanings on the basis of the different context or of the different scientific and professional point of view of the observer. A different connotation may be given to this concept by replacing the word "smart" with other adjectives. Anyway, it may refer to the general attitude of the city to capture opportunities and to adapt itself to emerging needs and contingencies by effectively and efficiently using the available resources. In such a way, the different kind of smartness to apply varies with the city and with the field of application. In general, as it results from the study of Caragliu (Caragliu 2011), the smartness does not depend only on the ICTs infrastructure, but also on "the availability and quality of knowledge communication and social infrastructure". Anyway, according to Chourabi (Chourabi, 2012), "technology may be considered as a meta-factor in smart city initiatives", since in some way it influences the other factors.

In concluding, smart city should assure an organic connection between its different components, including technologies (Nam, 2011), which, in effect, can stimulate civic engagement in the processes of public interest. Smart city is not a static entity. It continuously changes and adapts itself in accordance to the elements and processes that emerge within the smart city system.

THE "OPEN" INTERACTION BETWEEN CITIZEN AND PA

As a consequence of the widespread of Internet and digital media, in the last years citizens have acquired different roles and responsibilities taking them to the centre of the decision-making processes of the Public Administration, as sources of innovation bringing value into the system. Beyond being voters and taxpayers, citizens have gained new roles that potentially let emerge new types of relation with the Public Administration, for example as city users and sources of innovation for the whole system (Koch, 2013; Schuurman, 2012).

The network of relations originated in such a way affected the economic, cultural, political, and social practices of territories, increasing the value of concepts such as sharing economy and social innovation, that in effect can be seen as a condition verifiable only if a specific process of development impacts in a sustainable way on economic, social, and environmental sectors at the same time.

By adopting an Open Government approach (founded on transparency, participation, and collaboration), the Public Administration has facilitated these processes. But at the same time the new attitudes and emerging needs of citizens, originated from the transformation of practices led by Internet and the digital media, gave no choice (thanks to their strength) to the Public Administration, that had to move from be a closed system, to be an open one.

The system of relations occurring between citizens and Public Administration is only one of the systems composing the city and that are connected in an organic way to the processes until now described in this paper.

The complex interdependence among the numerous interactions taking place in a city and the widespread of the sense of a civic-mindedness based on sharing leads Public Administration to the need of building a solid relationship with citizens. In detail, because of its public and administrative role, the actions of the Public Administration should be oriented to find solutions improving the relationship between city and society and, consequently, between citizens and Public Administration itself. Moreover, a more collaborative and open Public Administration can respond more appropriately to the needs of a territory or community with effective and efficient services, facilitating the processes of land development. It is responsibility of the Public Administration to lead citizens through a really formative participation and, in turn, becomes really responsive to demands and emerging needs from the society, since not all citizens are engaged in the same way, but they all are subject as city users to the sphere of interest of the Public Administration. According to De Toffol, (De Toffol, 2012) "cities are schools and laboratories to pass from *government* to *governance*; but this implies an increasing in capabilities (individual, collective, institutional) and a radical change in languages, procedures, and government tools". Although, Public Administration tends to focus first of all on legal and regulative aspects regarding the new role of the citizen (because of its institutional role), the radical change needed in languages, procedures, and government tools has to concern others types of disciplines as well, since they are all aspect of the same complex system of interactions. So, the architectural patterns of the city may support or encourage interaction patterns and contribute to form the relation between citizen and Public Administration. And, also design can contribute to the process of social change in a sustainable way, by identifying new interaction paradigms from a systemic perspective.

Moreover, besides marking the direct relations between citizens and Public Administration, that often bring conflicts that block the processes of change, it is needed to look at indirect relations, less visible and recognizable, that may let the process proceed by producing the favourable situation for change to happen. In this sense, Interaction Design allows to explore possibilities about the patterns of interaction, in order to stimulate and explore future city's configurations.

In this regard, the use of ICTs allows very flexible and scattered interactions between citizens and Public Administration introducing open processes of inclusion and exclusion in the system. That is to say that citizens are not forced on a fixed type of interaction, but they can both accept or not the intervention of the Public Administration at different times. In such a way, a dynamic process of participation originates from the relation between citizen and Public Administration. It takes different forms, but it remains consistent with the whole system. For example, the intervention of the Public Administration on a certain territory could bring to a gradual (by stages and extended over time) involvement of the citizen within a process more and more aimed at achieving a common goal, as for co-design processes. Here the process of participation is likely to assume the shape of a spiral direct towards the centre, but in a different moment or towards a different goal the adoption of a more pervasive interaction pattern could be more appropriate. So, information or services without a specific address could be widespread as drops of rain all around, such as in the case of the platform for the creation and use of open data. In Figure 1 some other examples are reported.

→	↑	↓
DIRECT RELATION	**DIRECT RELATION**	**DIRECT RELATION**
(on the same level)	**(top-down)**	**(bottom-up)**
Unidirectional relation between peers, linear *(e.g. citizen sourcing for*	Top-down unidirectional relation, linear *(e.g. collecting citizen's data for open*	Bottom-up unidirectional relation, linear *(e.g. e-government services).*
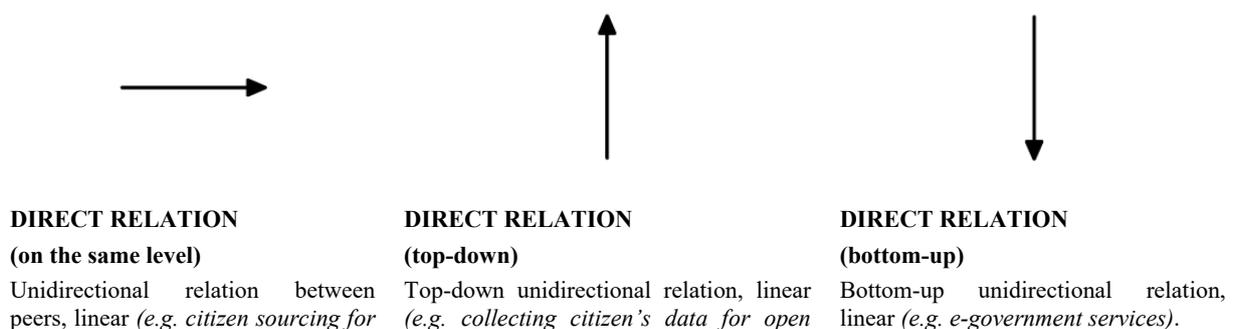
communities services)   *government services)*
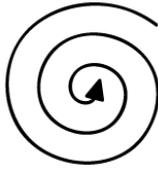
SPIRAL RELATION

(towards the centre)

Gradual engagement, step by step, within a long period process, more and more oriented to the achievement of a common aim *(e.g. co-design)*
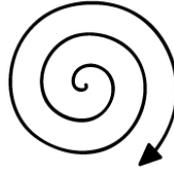
SPIRAL RELATION

(from the centre)

Gradual enlargement of the relation, that, with the passage of time, engage an increasing amount of resources *(e.g. local development processes)*

RAIN DROPS RELATION

Scattered widespread of information and services *(e.g. open data platform)*
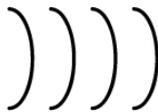
WAVES RELATION

Propagation of services or information on the basis of a repeated scheme aiming to collect, intercept, or hit similar resources *(e.g. word-of-mouth-based services or shared services, as car sharing e bike sharing)*
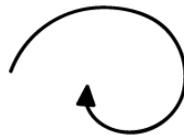
ENVELOPING RELATION

Objective achievement through apparently informal routes, lowly predictable, but immediately engaging *(e.g. gamification or participatory maps)*
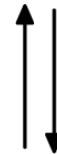
BIDIRECTIONAL RELATION

(top-down or bottom-up)

Direct and linear exchange of information and services based on a lowly engaging hierarchical relation *(e.g. public consultation or transaction)*
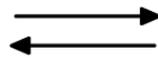
BIDIRECTIONAL RELATION

(among peers)

Direct and linear exchange of information and services based on a lowly engaging peer-to-peer relation *(e.g. swapping platforms)*
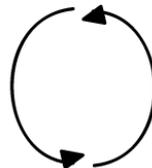
CIRCULAR RELATION

(top-down or bottom-up)

Circular exchange of information and services based on a middle engaging hierarchical relation *(e.g. call for ideas)*
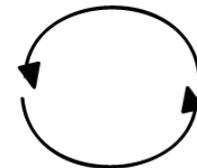
CIRCULAR RELATION

(among peers)

Circular exchange of information and services based on a middle engaging peer-to-peer relation *(e.g. car pooling)*

Figure 1. Some patterns of interactions between citizen and Public Administration

These and more interaction patterns that could be applied to the process of participation are the result of the correlation of different variables of the observed system, such as technology, motivation, level of engagement, etc. They try to represent the "urban complexity" (Guida, 2013) by showing a possible relational and communicational system likely traceable on the territory, so that they can be put in relation to the urban space as meta-design tools supporting the visualisation of the dynamic relationships between citizens and Public Administration. The Public Administration may use them as schemes interpreting the processes occurring in the physical and virtual space of the city, in order to elaborate strategies and better relational approaches.

BUILDING THE RELATION BETWEEN CITIZEN AND PA

Assumed the city as a system continuously transforming itself, because of emergent elements, we considered the interactions occurring in it as part of continuous processes involving its different parts.

Nonetheless, we observed that the analytical approach, largely used to define if a city is "smart" or not and to satisfy its needs, aims to reduce the complexity of the interactions and relations that occurred into the city, focusing on its parts rather than on the whole. The result is standardization and clinical monitoring of the city processes. Moreover, the analysis of criticalities and needs of the smart city and its users, based on classifying and measuring the initiatives of the city or tracing and collecting information and data from people, objects, and almost "everything", contribute to produce information fragmentation and overload.

Clearly, the analytical approach has not to be excluded from the theoretical tools used for studying and managing the city, but, next to it, we need to put an "oriented-to-process" approach, in order to more appropriately manage the continuous transformation of the system.

So we borrowed some key concept from the oriental philosophy and practice (Chieng, 2007), founded on the process concept, and we applied them to the relation between citizen and Public Administration in order to explore the possible interaction patterns. In detail, the main key concept we take into account are: 1) relation as basis for definition of things; 2) ineffectiveness of fixed models; 3) reasoning geared towards the deployment of a possible route consisting of several connected phases, where the identification of a main path does not exclude other paths that intersect and temporarily border on it; 4) dynamic relations (continuous change); 5) holistic approach; 6) process not aimed to a perfect solution (from one well-defined point straight to an other well-defined as well), but to a continuous transformation open to various possibilities; 7) indirect and subtle effect (gradual and not forced change, evolving with the whole process and influenced by strategies).

So, in order to build a solid and effective relation between citizen and Public Administration (essential condition for foster sustainable processes of urban development), the latter should operate in the direction of gradually transforming a specific situation by encourage the favourable elements derived from the situation itself, without pointing directly to an effect by imposing its own plan of action. The Public Administration should prepare the background for the final result, when a transformation becomes clear and established.

Along with the role of administrator, Public Administration should assume the role of facilitator of the city's (unavoidable) changes, which derive from citizens needs and, in general, from the emerging processes affecting the city. In this way the Public Administration could influence specific situations towards a sustainable urban development by offering citizens new relationship opportunities with other citizens. Again, Interaction Design can help to do this in a non-invasive and non-disfiguring way.

Nowadays, digital places are the faster and most visible way to put in connection citizen and Public Administration. Online institutional sites, participation or services platforms, social networks, etc. put into direct contact citizen and Public Administration. They trace a direct line between them. Although they contribute to open the interaction between citizen and Public Administration, these tools of communication and interaction are mostly suited for active users and are mostly oriented to action and efficient problem solving. On the other hand, they require the consumption of large quantity of resources, such as time and information. Moreover, these tools, that can be called "civic technologies" (i.e. technologies aimed to promote civic and social engagement in the processes of common interest, making national or local policies more effective), risk to add fragmentation and disorientation into the citizen life, besides to standardize some participation processes (e.g. adding markers on a map to report some problems). Thinking about the kind of relation established, the risk is that the citizen awaits for an effective and quick response from the Public Administration, a real and immediately clear act of change, as direct consequence of its active participation. If this can be considered as needed and licit in the dialog between citizen and Public Administration, it represents only one (or more) part of the whole process of urban development.

So, besides the use of online platform, properly designed for enhancing worthwhile participation, the relation between citizen and Public Administration has to be enriched of interaction patterns not adapted to rigid models, but emerged from the interaction process itself.

In this sense, the Public Administration should not force people to participate, only rewarding the active behaviour, or impose where, when and how do it (at least not always). Public Administration should instead be perceived as a fair presence both in the virtual and the physical world. If the city is the physical space of interaction between citizen and Public Administration, nowadays this physical place has to be considered as permeated of digital places; and all these places enter as experiences into the citizen life.

In this sense Bratton (Bratton, 2008) talk about the "convergence of architecture and interface design as the chain of successive interactions extends all the way down into global and local networks of systemic interconnectivity, including and dependent upon concrete, tangibly embedded interfaces like buildings, cables, and cities". Moreover we notice that, in considering architecture and interaction design as interested in the same problem of "program" human-related interfaces, although with different tools, Bratton adopted a holistic concern. "Information technologies and social systems of spatial formation, interaction, signification, emergence, and complexity always commingle and codetermine each other" (Bratton, 2008).

So, the relation between citizen and Public Administration should not only be perceived as virtual. It should have effect on the territory. Of course it may start in the digital world, by the action of an online community, and then coming into the real world with a high impact transformation, such as the realization of a shared garden or place to co-work.

For this reason, it is important to put in relation citizen and Public Administration, and the two with the physical places that they shared. In detail, the research of interaction patterns between citizen and Public Administration may focus on the identification of one or more systems of attraction in the city that mark their interactive relational systems. The "attractor", recognised as a system connected to Public Administration, should aim to multiply the relational opportunities among citizens. For example, it can be a public bench offering the opportunity, thanks to technologies, to experience the city from several points of view by connecting with a network of other benches (or better, citizens) diffused within the city. Since the bench is strictly linked to a place and can inspire reflection, as it imposes to stop in a specific place, it can create a relation with that place and, by extending, with the whole city. By acquiring new meanings as a consequence of new patterns of interaction, the object is no more in a closed relation with the system, but it is open to new interactive relational modes influenced by context and people intervention. In this way, the interaction design of a possible system of attraction aspires to be strategic, projective, and innovative, as in general architecture and design are.

CONCLUSIONS AND FUTURE WORK

The debate about smart city usually puts a strong emphasis on technology and city performance monitoring as a source of intelligence. Anyway, in the last years a more organic vision of the city as a system connecting people, technology, and governance as interacting parts gained attention. In this context, interaction design may help to explore new interactive relational systems that foster sustainable urban development processes. In the paper, great attention is paid to the relation between citizen and Public Administration and some conditions are put in order to find new possible interactive relational systems. In detail, we concentrate on the correlation between physical and digital interactions within the city through systems of attraction putting the citizen in relation with other citizens and Public Administration. Future work will explore in depth the design of systems of attraction recoding known objects and elements of the city by combining functionality and poetic, and giving them new features that affect social practices.

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MIMESIS & C[IE] – THE (UN)WALLED MAN

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ABSTRACT / INTRODUCTION :

From the Borromean knotting of concepts world, scene and obscene which represent the material, symbolic and mythological dimensions of our environment, the article explains the process of civilization at work in our societies. In our view, this process characterized itself by the *obscene placing* – to put behind the scene, in French *mise obscène* – of an important part of our environment. It is specific to the social animal that is the human being. When he stands on the scene, he always hides a part of his condition. The one he is ashamed because it places him in front of the ontological void that constitutes him.

The modern movement radicalized this process by elevating the *obscene placing* up to a principle. This principle constitutes, in our opinion, a denial of together : the complexity of the human being, the fragility of his environment and the specificity of his condition. However, it was the way, followed by the moderns, to hide themselves the ontological void which they were nevertheless constituted. As a result appears a new man, a *man without condition* which, surrounded by the comforting decor of the scene, has lost the consciousness of both, its constitutive frailty (body and environment) and the destructive nature of its own way of life. If one refers to scientific forecasts, he now runs blindly towards an imminent ecological drama that could end with nothing other than the inhabitability of his own planet.

This opens a double urgency: first, to identify and understand the devices at work in the process of *obscene placing* and subsequently, to reflect on how to change them. It being understood that human awareness would impact its behavior and, thus, would influence the catastrophic projections of our scientists.

According to our interpretation of the Lacanian definition of primitive architecture, it can be considered as one of those devices because it allows the man to isolate the obscene from the scene (Jungers 2015). Hence, we hypothesize, to open what follows, that the plausibility of the mimesis is related to the mimetic power of architecture. Mimesis and mimetic would, therefore, be two sides of the same coin. Mimesis is ideational. It traditionally regulates the imitative arts in the way nature has to be represented. Mimetic is material. It allows some animals to survive in this nature by using, according to Roger Caillois, three strategies: intimidation, transvestism and camouflage.

To clarify the links between mimesis and mimetic, we will draw hereafter, the contours of this particular animal that is the man, at the same time, talking, symbolic and social animal. On the way we will approach the issues of mimesis and mimetic which will allow us to conclude by pointing three devices used by architecture to hide the obscene: the wall (hiding), the type (meaning) and the parergon (sublimation). These three devices enable the human being not only to hide from himself the obscene, but more than that, to hide from himself that architecture which itself hides.

HOMO SAPIENS

Why would the human animal be different from the other animals? How could we consider that he is not, he would reply, him who became the first geological force of the planet (Anthropocene)? How to explain this unique rise in the animal kingdom, him yet that nothing originally predestined, to the hegemony of the living, considering his constitutive fragility compared with other animal species?

Talking animal

We will respond first, that the human being is a talking animal. He is able, like many other animal species, to produce signs understandable by someone else. Excepting one difference : only the human language allows to bring to the consciousness of each other, things that do not exist (Harari 2015). Only the man is able to point a phenomenon or to invoke a transcendental idea and thereby able to mobilize a group in the name of that idea. Values, beliefs, symbols, ... constitute the "mythical glue" (Harari 2015) which allows the multitude to act as one man, offsetting the weakness that originally characterized the human animal.

Symbolic animal

We answer, then, that man is a symbolic animal. From this ability to deal with the non-existent appears in the head of the human animal, the consciousness of the indetermination of his own existence and, with it, the perception of a void. This essential void or *ontological void* generates a lacking, that of meaning. For Sartre, the real particularity of the human being is that he feels the need to define his own essence, i.e. his place in the light of the "Great Whole". Therefore, the human animal searches, by necessity, a transcendental logic, a "world" because, on the representation of it, will depend the definition of his essence, his function, his role. This role in whose name he will transform his environment to accommodate the scene. Von Uexküll, whom we mentioned above, does not escape the rule when he concludes his book "a foray into the worlds of animals and humans" by introducing us to the idea of the "One". "If one wanted to sum up [the] objective characteristics [of the different environments, he said], only chaos would result. And yet, all these different environments are fostered and borne along by the One that is inaccessible to all environments forever" (von Uexküll 1956). Despite its inaccessibility, von Uexküll thus poses that a transcendental coherence does exist just like the tree around which many animals and insects live without being aware of its existence. This transcendental coherence, he calls it *welt,* literally "world".

The symbolic animal which is man finds himself driven by the lack of meaning. So much that he can be seen as the prisoner of "meaning". Originally it was even "very difficult [for him] to distinguish between the two spheres of the being and the meaning" (Cassirer 1975). This is, for example, the case with the Hopi, an indian animist society of Arizona. The snake because of its formal analogy with lightning plays a central role in their traditional secret ceremonies. By the strict observance of these ceremonies, the snake allows them to control the rain. According to Aby Warburg,

> [...] The creation of a symbol, for example, the "snake" for the lightning, should be seen as an act of intellectual emancipation. Frightened, the Indian seeks to understand the fleeting phenomenon of lightning by comparing it to a snake, that he is capable of handling concretely. Better: the two entities merge - and what is remarkable is that, in his thoughts, he omits the "like" that maintains separate the two elements of his comparison: for him is the lightning snake. [...] If the flash is uncontrollable, we can take control of the snake, although it inspires dread. He can make it part of his body (Fritz Saxl in Warburg, 2011).

In our region, advertisers have long understood our primitive inclination to the lack of distinction between signifier and signified by loading with world any object they wish to make desirable. Thus, everything is done to make us believe that Michael Jordan, a well-known basketball player, jumps so high thanks to the magic shoes he wears and not because of a long and repeated training. Just like the snake and the lightning for the Hopi, a symbol can be defined as a three-dimensional object: spatial, temporal and social (Debray 2001).

But if this inclination to the indistinction is, as we said, the prison of the human animal, it is also his opportunity since knowledge builds itself through symbolization. It begins, in fact, through the establishment of a first connection between a meaning and a thing. Over time, this link will be questioned if the man makes the observation of its inadequacy. It continues with the research and the definition of a new link which, over time, will himself be questioned. According to Elias, the civilizing process would go in the direction of an increasing congruence between meaning and materiality. The use of the symbol "sun", for example, is "more congruent with reality [today] that it was the case a hundred or even thousand years ago when we believed that the sun god traveled the sky in his fiery chariot" (Elias 2015). Ernst Cassirer explains the emergence of religion to the detriment of magic in the same way:

> It is the insufficiency and the failure of the magic that opened the way to religion. It was necessary the decline of the magic that gives birth to the religion. The man saw that he had taken for causes what was not, and that all these efforts to act all these imaginary causes were unsuccessful. His sentence was sterile his curious ingenuity had remained unproductive. He had pulled strings to which nothing was attached (Cassirer 1975).

Gradually, the human animal has risen from the practice of magic to the practice of religion, science, etc. Some troubled periods of history contradict this trend although it seems that the long term confirms it. They are there to remind us that this virtuous movement is not guaranteed.

In art, this quest for knowledge has led to what we name the mimesis. Like the man who, at a young age, learns through imitation, humanity through art has started to produce a representation of his environment. "Like all other symbolic forms, art is not the simple reproduction of a given reality, ready-made. This is one of the paths to an objective view of things and human life. This is not an imitation but a discovery of reality" (Cassirer 1975).

In the book X of the Republic, Plato warns against the so-called imitative arts. He disqualifies them through the painter that he relegates to the rank of an imitator in the third position behind the artisan (who knows practically how to make a bed) and God (who is at the origin of the concept) (Platon 1993). Therefore, Plato in the name of a beautiful, good and true world, will throw out of the scene the imitative arts in order to deliver the human animal from the false and the deceit.

Aristotle has a different opinion on the question. He divides human knowledges into three main areas; the theoretical (physics, mathematics and metaphysics), practical (ethics and politics) and poetic sciences (productions). In the latter, he further distinguishes disciplines who complete nature in performing what it is unable to perform (such as, for example, architecture, medicine, shoemaking, agriculture, etc.) of those which merely imitate it (as it is the case of sculpture, painting, music, poetry, etc.). Although distinct in their end, they join, however, both through the protocol that governs their production. By enacting rules, as it was the case for example with the "Beaux Arts", the human animal equally defines the right way to imitate and to complete nature, binding thereby architecture and the imitative arts. Moreover, for Aristotle, unlike Plato, the imitative arts product should not be seen from the theoretical angle but under the very specific angle of the poetic sciences. This one does not reside in a quest for objectivity, but rather for universality. It is precisely there that they educate us on ourselves. Moreover, it is because the act of imitating is a source of knowledge, that it is also a source of pleasure. Consequently, this source constitutes the first engine of poetry, the consideration of the viewer being the second. His satisfaction derives from the representation based simultaneously on the feelings and the intelligence required to understand the causal links that constitute the fiction. These multiple movements from which emerge a tension in the spectator's head lead, in the end, to a liberating outcome. It relieves the spectator from the tensions generated by the story and, in the same movement, from a part of the tensions of his own life. Fiction has, therefore, a power of purgation called Catharsis (L'Atelier d'Esthétique 2002). The imitative arts are a source of knowledge and balance. There is, therefore, no reason for Aristotle to reject them outside of the city.

The mimesis is not a copy but rather an imitation. It is more a free reproduction of the nature that does not oblige to the accuracy. It departs from the model where it is not appropriate (Littré 1874). Thus, Alberti in his treatise on painting writes: "consider always in nature what we want to paint and always retain what is the finest and most decent" (L'Atelier d'Esthétique 2002). Like the idealists for whom "the painter work for a single purpose: to restore his true nature to nature. The term mimesis is, therefore, paradoxical, since more than nature itself, the artist mimics the theoretical principle of this nature" (L'Atelier d'Esthétique 2002). This was also the case for the builder of the scene. Like the mimesis for painting, the man in the name of ideational representation of our environment, the world, determines what is worthy to stand on scene and what is not. "To 'locate' himself in a place, to organize it, to inhabit it, many actions which presuppose an existential choice: the choice of the universe that we are prepared to assume in 'creating' it. But this 'universe' is always a replica of the exemplary universe, created and inhabited by the gods: it, therefore, contributes to the holiness of the work of the gods" (Eliade 1957). So begins the battle between the world and the earth as reflected in the temple of Göbekli Tepe. Recent discoveries make it possible to believe that progresses in agriculture appeared "[…] to support the construction […] of a temple. According to the conventional scheme, pioneers began by building a village. From prosperity, they built a temple in the center. However, Göbekli Tepe suggests that the temple could have been built first and that afterward a village was formed around" (Harari 2015). The hunter-gatherers passed gradually to agriculture during the building of the temple which confirms the thesis of Jacques Cauvin : the anteriority of the symbolic on the economic.

Social animal

Finally, we will answer that man is a social animal. Within a society, he plays a role on scene in the name of the great Whole, the world. From the mismatch between the *imago mundi* that legitimizes his role and our environment arises a residue that needs to be concealed. This fact, Edgar Morin calls it the principle of exclusion (Morin 1994). Any model excludes not only the ideas that do not conform to it, but also the problems that it does not recognize. The scene and the obscene appears therefore with the appearance of the concept of *welt*, world, and its definition. From the scene, the human animal will thus extract everything that would prevent him to be what his vision of the world imposes him to be. This *obscene placing* doesn't always stem from a conscious choice. It imposes itself on the individual taken that he is in the bonds of mutual dependencies that attached himself to the others. (Elias 1969). In the process of civilization, repression evolves towards a form of auto control in favor of a prospective attitude. This phenomenon first appeared among the elites who see it as a means of distinction (Elias 1969). It then spreads into the lower classes which are attracted by the desire to belong to the upper classes. Thus, in history, nothing indicates that the degree of sensitivity has changed for rational reasons. "A lot of taboos that men use in their social relations have [...] not the slightest relation to hygiene: they draw their justification in the 'painful feeling' that results from their breach" (Elias 1969).

These "painful sensations" induced embarrassment which characterizes the man facing the object that brings him in front of the ontological void which constitutes him, precisely what he "refuses to be but is nevertheless condemned to be" (Anders 1956) a mortal animal who, without world, wanders. According to Elias, the civilizing process is directed towards "privatization" of every bodily function, to their rejection in specialized enclosures, out of the sight of the society.

> All bodily functions are invested gradually with a feeling of shame and unwell from a social origin so that at the end even the words that evoke the subject are submitted by a set of rules and restrictions; men mutually hide these functions and avoid anything that could awaken the memory of those. When this is not possible - we think of the wedding - it uses sophisticated social ritual and verbal formulas that respect the norms of modesty, which help to overcome the shame, embarrassment, fear and other emotions aroused by these driving forces of human life (Elias 1969).

The moral and hygienic motivations are only, in the eyes of Elias, a means used to obtain a specific behavior from an individual, leaving him the illusion that it is his own choice. This manner of imposing behavior on individuals without their knowledge is the object of modern psychological theories, especially psychoanalytic. They deal with "conflicts between socially unfeasible instinctual forces on the one hand and the model of social requirements anchored in the individual on the other hand" (L'Atelier d'Esthétique 2002).

In a synthetic way, let us remember that the human animal together talking, symbolic and social animal, appropriates a part of its environment by arranging a scene on it which is rid of the obscene in the name of an ideational world.

ARCHITECTURE

From our environment defined by our physiological faculties, we position the scene. It is bounded at its edge by a place where the natural meets the supernatural and drilled in many places by special locations that are termed sacred. As this is, for example, the case with the scene of the Hopi. It is defined, on one hand, by a natural border formed by the shores of the Great Canyon, the snowy mountains of Flagstaff, etc beyond which lies the realm of the mistress of the snakes, the Kachina spirits, etc. (Perez 2004). And on the other hand, it is drilled in several points by different places that enable the communication with "the dead and those who are not born yet". In the Hopi tradition, these points can be a source, a cliff, a mountain, etc. They are fractures "in the homogeneity of space [...] symbolized by an 'opening', through which it is made possible to pass from a cosmic region to another." (Eliade 1957). More generally, the metaphor used to name some of them is unambiguous, the navel, a gap that connects men to their nourishing mother, the earth. This is true for the Greek Omphalos (Greek temple), the Roman Ombilicus (Roman city) and the Sipaapu of the Hopi. The latter is a hole on the floor of the Kiva, the Hopi's "temple", which is mostly blocked by a piece of wood that is removed during ceremonies to allow spirits to incarnate. For that reason, these openings are called sacred. They cannot, as revealed by its etymology, be touched without being defiled and without soiling back because it contains a force that is always ready

> to escape to the outside as a liquid, to discharge like electricity. So it is necessary to protect the sacred from the profane [...] It is an active nothingness that debases, degrades, ruins the fullness towards which it is defined. It is, therefore, appropriate to ensure a perfect isolation of the sacred and the profane : any contact is fatal to the one as to the other (Caillois 1950).

Hence, it comes the double meaning of the word, that of "sacred" and "cursed" (TLFI 2013). During the reconstruction of a Greek temple, for example, irrecoverable pieces could not be evacuated from the sanctuary because over time they have been contaminated and became sacred and should, therefore, be buried under the new temple. In the same order of idea, the Greek architect stated in their specifications, the need to evacuate from the site, within five days, all new stones considered unacceptable because of damage (Hellmann 1998). The relationship between the scene and the sacred is thus very sensitive. We now understand better why the sacred is kept out of the scene, obscene. Approaching one of these special places cannot, therefore, be done without severity and without observing codified behaviors. Some, as in the case of the Sipaapu, will require a particular arrangement at their edges in order to ensure the right distance between the profane and the sacred, between the scene and the obscene. This arrangement is called architecture, a prosthetic surround which enables the man to isolate the obscene from the scene by the establishment of an elaborate hardware device. This discipline articulates to do so the wall, the figure, and the parergon. These can create a distance that preserves the man of an overly abrupt relationship with the obscene. Thus offering the religious man "[...] two complementary areas : one where he can act without fear or trembling, but where its action uses only his superficial person, the other where a sense of personal dependency holds, contains, directs each of his impulses and where he sees himself unconditionally

compromise" (Caillois 1950). The "profane" man belongs the first environment. He must be preserved from the second. Only the priests and the Pythia had the right (and the power) to tread the adyton of the Greek temple. "The pilgrim does not enter the classical Greek temples, which is designed for an outdoor vision. It is a Doric peripteros around which we turn." (Hellmann 1998). The primitive architecture may well be, from this point of view, considered like something that is organized around a gap. In the Republic, Plato allows us to measure the symbolic charge of this word in reporting us the testimony of a person that came back to life:

> ... in a certain prodigious place, wherein there are two gaps in the earth next to each other, and also in the heights, two other gaps of heaven, right in front [Souls] were telling stories to each other, some moaning and weeping at the memory of all they had seen and experienced during their journey under the earth [...] on the contrary, those who came from the sky told the happiness she had known and visions of unimaginable beauty (Platon 1993).

The temple would, for that reason, be this surround in the same time container and ultra signifying membrane that lines a gap (in Greek a chaos) enabling man to communicate with the dead's and the gods that are held obscene (hidden or inaccessible). The temple has, therefore, the dual task to prevent the mix between the living and the dead and to compensate or even to sublimate the drama being played within it by an excess of significance and order. The cave is its natural expression, the lifted stone its condensation, the cairn its development, the temple its improvement: a surround of an extravagant signifying power that borders a gap (a chaos) from which could gush the dead. Here stands, we believe, the mimetic origin of architecture, to contain and to dissolve the drama that is being played within it.

Let's turn now to the mimetics categories proposed by Roger Caillois in his book *Medusa and Cie*:

> [...] (1) The transvestite, each time the animal appears to be trying to impersonate the representative of another species; (2) the camouflage, [...] thanks to which the animal is able to merge with the environment; (3) intimidation finally, when the animal paralyzes or terrifies his attacker or his prey, without that the fear is justified by a corresponding risk " (Caillois 1960).

It appears that these three categories can be transposed in architecture: intimidation and wall, transvestism and figure, camouflage and parergon. In a mimetic perspective, these three devices give very concretely to the human animal the ability to hide himself the obscene, but more than that, to hide himself that architecture itself hides.

Wall (ergon)

The wall, as the artwork, does not hide that it hides. It confines and conceals the obscene while assuming its presence as the expression of a limit, a ban, a power and, thereby specifically, the trouble or the intimidation that it may cause. Asia Minor in the Hellenistic period was distinguished, for example, "by the quality […] and complexity of its fortifications, [These seem ...] to respond more to the desire to assert power and independence than to a strict defensive concern" (Hellmann 1998). The wall is the symptom of the *obscene placing*, the ergon, the artwork. It referred to the *firmitas* in the sense that it represents the ideals of the "*homo faber*, fabricator of the world : permanence, stability, duration". (Arendt 1958). The work can be the support or the protection, vertical and horizontal (roof, wall, floor).

Figure

The figure, for its part, loads the ergon with world. It is travestite by symbolization. It turns it into a signifying from which the signified becomes inextricable for a group or a society. The figure masks the wall with the meaning to which it refers. "I do not see a series of walls, but a home" and thus the expression of a use (*utilitas*) that makes sense. This meaning that stops the decryption for Lacan.

Parergon

The parergon finally adorns the ergon that supports it. Like the camouflage, it dissolves the artwork, the *ergon*, taking in his volatilization what it hides. If the wall is no longer perceptible, what it contains is no longer either. The obscene surrounded by the charms of architecture, the *venustas*, finds

itself sublimated as if by magic. The wall, shall we say, separates, is adorned and disappears. The parergon (frame, column or clothing) has no technical or structural function. It fills a gap of another order. "Without this lack, the ergon would not need a parergon. The lack of the ergon is the lack of a parergon, a clothing or a column which nevertheless remains outside of it "(Derrida 1978).

The concept of parergon uncovers the special relationship between ergon and parergon. Would it have something to do with the trouble that we mentioned concerning the ergon? It is in all cases due to the ergon that appears the parergon. As it was perhaps the case for the Cairns of Clava (Inverness, Scotland), for example, that have been equipped with raised stone circles several years after it was finished or the Greek temples of which "[...] the outer peristyle once adopted for the chief's house, reappeared [...] to magnify the temple isolating it, since it is not technically necessary to support a heavy roof." (Hellmann 1998) So, the parergon, fills the lack of the ergon which itself contains the obscene. Therefore, it allows us to highlight the double cause of the primitive architecture : the obscene is the cause of the ergon which itself is the cause of the parergon.

CONCLUSION

The double cause of primitive architecture allows us to emphasize the two meanings of the word void : the first meaning puts the human animal in front of the obscene (what exceeds him). The second immersed him in the meaning (what corresponds to his dimension). In this light, the Greek temple appears as a symbol of the human constitution. It is simultaneously the admission of the existence of an uncontrollable power that must be contained and the opposite, namely, the staging of an "absolute" knowledge materialized through architecture. Ultimately, the Greek temple seems to be the expression of an order based on the repressed consciousness (by the man through the parergon) of the existence of a power or a chaos that is beyond human understanding (gods, complexity, …). This collective repression forms the "mythical glue" that we mentioned above. From this point of view, building a temple is an inaugural gesture since it freezes in the stone a worldview and defines what will be worthy of being on the scene and what will not be. We understand therefore why the representation of a world, in art the mimesis, is inextricably linked to the dissolving power of architecture, the mimetic.

It follows from the above, that our *man without condition*, like our ancestors, illusioned by the architectural charms, is finally a *man without wall* (which nevertheless immures himself). For him, the issue of architecture stands consequently less on the wall as a perceptible element, than on its dissolution.

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HAUNTING RHETORIC, HAUNTED EPISTEMOLOGY:
AN ANTHROPOLOGICAL CRITIQUE OF SYSTEMICS
IN ARCHITECTURE AND URBAN STUDIES

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Although the need for a more complex, interdisciplinary approach to architecture, urban and social systems is well recognized, there are still huge efforts to be made in order to go beyond a mere juxtaposition of different research fields. Systemic studies can rightfully appear at the forefront of this interdisciplinary trend, but we believe that if we want to effectively bolster it, we need to be much more critical of the conceptual framework that will act as the bridge between the different fields.

Our main contention for this paper is that systemic approaches developed in/for architecture and urban studies generate a *haunting rhetoric* based upon a *haunted epistemology*. After having explained what we mean by these, we will conclude with a series of fundamental *dis*continuities that should be at the centre of architectural and urban research. But before we get there, we would like to mention that our goal is not to be provocative (even though we certainly are to some extent) and we would feel rather embarrassed if our proposal was to be seen either as an attack or a condescending rejection of systemic approaches in general. So let us clear the air by saying that in our mind, systemic approaches have played for years an vital role in fostering interdisciplinary research at the crossroads of cognitive sciences, social sciences, architecture and urban studies (among plenty of other fields), and that is why we feel the need to show some tough love by questioning the merits of seeing feedback loops and emergent organization at every street corner – notwithstanding the fact that some "streets" (i.e. places) and some "corners" (i.e. scales) are more taken into consideration than others in urban and architecture studies.

HAUNTED EPISTEMOLOGY

There are several issues to address, among which is the constructivist perspective that allows systems and systemic features to be applied to any abstracted entity, which in turn paradoxically generates a false sense of objectivity and universality: a model of reality is all the more easily taken as reality itself when it is not bounded by any scale nor confined within any particular realm. Inscribing systemics in an "observer-dependent" constructivism does not prevent the subsequent epistemology to be afflicted by biases and essentialism, what we call a *haunted epistemology*. Again, we do not dispute that systemic models have some *instrumental efficacy* across a wide range of scales or contexts; however we would argue that systemic models are *very poor descriptors* outside the realm of mathematics and physics, and that their epistemological status is at the very least questionable. Universality of concepts like "homeostasis", "emergence", "equilibrium", "autonomy", etc. may very

well be the corollary of their emptiness. Lexical similarities and formal conflations tend to be mystifying and cannot therefore provide a pathway to interdisciplinary research. So if certain emergent properties of a human crowd can effectively be abstracted by a systemic model that originated from physics, here's the problem: social interactions cannot be described as sophisticated collisions because people *are not particles*. The fact that a formal conflation is *effective* does not prove its validity as a scientific concept. But what if proponents of systemics argue that the only goal set for their approach is precisely to be effective, to offer a hold on the world, and nothing more? Well, that leads us to our second set of critical remarks.

HAUNTING RHETORIC

As we've just said, there's no denying that systemic models can be very powerful in terms of projection, decision-making and justification. However, we don't think that systemic models are convincing solely because they are efficient. There is also the rhetoric, i.e. the convincing nature of the systemic discourse, propped up by a formal aesthetics that displays a sense of universality, openness and complexity, all values that can appeal to contemporary designers and policy-makers alike. That is precisely the reason why systemics is a haunting rhetoric: it promises a universal way to govern any kind of phenomena by formalizing some properties, from superconductivity to urban design. And while its appearance remains non-political, thanks to the common representation of its origin (hard sciences like thermodynamics) and its formalization (mathematics), this rhetoric keeps being used as an ideology (Boltanski & Bourdieu, 1976) to support policies, to define quality, to rebrand discourses of good governance, to foster dominant interests, etc.

Exorcised architecture: from complexity to messiness

So where do these considerations lead us in terms of urban and architectural practices and research? First it allows us to reconsider critically the idea of a systemic continuity between architectural/urban design, the built environment and social entities like norms, behaviours, institutions, etc. What strikes us the most as social scientists are the *dis*continuities between these contiguous entities: policies and urban planning are imposed even when some participatory initiatives are put in place; urban spaces are at the same time homogenized and fragmented to maximize the circulation of capital and strategies of accumulation (Harvey, 2013; Lefebvre, 1974); "extended' cognitive and systemic models of innovation in architecture and urban design often fail to seriously take into account the embodiment of habits (Turner, 1994; Turner, 2014; Bourdieu, 1972) which are not only mental representations (Dreyfus, 2002), therefore reinforcing an external/internal cleavage that is damaging for the understanding of living organisms. To posit a formal systemic continuity between material configurations and social processes (or vice-versa) is of little help to tackle these challenges. We want to advocate a shift from an aesthetical complexity appealing for policy-makers to the contingent and diverse empirical messiness that is neither systemic nor non-systemic. What we lose in efficient formalizations and decision-making, we regain in thick descriptions and deeper understanding achieved through empathy and participant observation that put matters of life, death and politics at the centre of architecture and urban design. We can dwell on models and mediums of representation for hours within the comfort of our labs, but that will not help us to understand or decide *what is or has to be represented*, *who has the power to do so* and *why*. As Godlewski (2010) wrote in his critique of the work done by Koolhaas for the Harvard Project on the City (see also Crysler, 2012), we shouldn't think about complexity and rapidly changing environments from the height of a helicopter circling over a city if we want to avoid the pitfalls of cybernetic orientalism.

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THE OKU CONCEPT AND THE SEQUENTIAL DEPTH

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In the field of architecture, the Japanese spatial concept *oku*, may be approximated by the Westerners as a "depth strategy". This meets the *ma* concept which may be approximated as a "negative space." If these two concepts refer to time, their relationship to the dynamics of perception is characterized by a static subject for the concept of *ma*, and by a motion subject for the concept of *oku*.

Architecture acquires its reality when perceived and used by human beings. Therefore, issues of a preliminary research on the perceptions and uses of space are the knowledge of the modalities of the perceptions and uses that shape mental spatial constructions, which in turn make our relation to the built environment. Acquiring such a knowledge assumes that we agree to focus – at least at a first step – on the analysis of spatio-temporal instantaneous rooted in the *hic et nunc* dimension, implicit to any action.

This approach requires to develop specific tools to address the issue of the relationship that links human beings to the built environment. Here, the concept of system is a conceptual tool, which aims to highlight the interactions between the elements of a complex whole. In such a context, a systemic approach is a tool that offers many opportunities.

Since the relationships between the components of a system are not unidirectional but bidirectional, a representation based on communication theory may be used to represent information in a form-oriented

vector. This vector is characterized by its points of origin and destination, as well as the amount of information transmitted or received. As some information lead to actions and re-actions, time sequencing factors would be added to the main features of the analysed relationships. Thus, these actions can also be considered as vectors characterized in a manner similar to information, but without being their reciprocal.

As the degree of organization in a system depends on the qualitative and quantitative information available. And as the human being perceives the built environment by means of sensory receptors and sociocultural filters, ... one can state that the built environment system is thus perceived by an external system. Therefore, the amount of perceived organization depends on the occurrences between the "observer" and the "observed". The information exchange process from one system to another can be considered as the transfer of an organization. And the nature of the information may be considered as a pattern.

The interface between humans and the built environment is carried out by systems of interactions between the activity of the human being and the constraints of the built environment. The systems

discussed here are open and non-homogeneous. Open in that they are permeable to the environment external to the system and not homogeneous in that the elements which are interrelated are of different natures.

To do this, the concept of micro-system has been developed to make possible the integration of interfaces, with a significant physio-psychological impact on user behaviour. The definition of a microsystem

requires isolating components, endogenous and exogenous, as well as the subsystems and

their relationships. In architecture, the identification of a micro-system can be made on the basis of factors such as the built environment stimuli, or perceptual and cognitive modalities via which the human being builds a mental picture that helps to interact with the surroundings and induces behaviour.

Such methodological tools help to characterize the "sequential depth" associated with the concept of *oku* which lead the journey to the "inner space". A spatial concatenation in which one enters, actually or

virtually, according to a ritual journey through the spatial structure that binds the various places in the respect of the specificity of use. Performing the two spatio-temporal mechanisms – not only by extending space, but also by generating a sense of depth –, suggesting a relationship with an inaccessible space that refers to "the impression of distance".

PAYSAGE: PERCEPTION ET PROJET

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Keywords / Mots-clés :
architecture, paysage, perception, projet

La présente homologation des interventions d'architecture, d'importants complexes, mais aussi des bidonvilles, est fondamentalement égale partout dans le monde (en Chine comme à Dubaï, comme à Rio, etc.) et elle propose la crise de la relation entre les lieux et beaucoup de nos constructions.

Nous avons hérité de la "modernité" la répétitivité du produit. Cela, dans des systèmes d'établissements, dans les villes et les territoires, en rejetant la relation avec l'histoire et le caractère des lieux et a réduit les interactions qui sont indispensables pour la vie des hommes, (comme pour tous les animaux) et des identités qui sont nécessaires pour nous reconnaitre.

Pour surmonter cette crise, il n'y a plus assez de réflexions stylistiques d'architecture, qui sont maintenant facilement subjuguées par l'uniformité des techniques disponibles, des tendances et des processus, des projets et des cycles d'existence de périodes toujours plus courtes. Constatant aussi une approche et des solutions très superficielles dans l'interprétation des caractéristiques stylistiques locales.

C'est une crise culturelle qui regarde notre habitat. Une possibilité pour surmonter cette condition peut uniquement avoir lieu en changeant radicalement le point de vue.

Un besoin de changer est probablement une des raisons du succès que le thème du paysage a dans la culture contemporaine[1], en particulier avec beaucoup de définitions de la Convention Européenne du Paysage (Firenze, 2000), avec les Recommandations suivantes adoptées par le Comité des Ministres du Conseil de l'Europe (2008) et par celles qui regardent toute formation (Culture du paysage: éducation primaire et secondaire. Recommandation CM/Rec(2014)8 du Comité des Ministres aux Etats membres sur la promotion de la sensibilisation au paysage par l'éducation).

Conceptions qui commencent a trouver des applications dans les plus récents plans de territoires en Europe[2].

Le paysage nécessite toujours d'envisager tout un système de signes et de significations. La "Convention s'applique à toutes les Parties et porte sur les espaces naturels, ruraux, urbains et périurbains. Elle inclut les espaces terrestres, les eaux intérieures et maritimes. Elle concerne, tant les paysages remarquables, que les paysages du quotidien et les paysages dégradés" (C.E.P. Art. 2).

Cela veut dire que tout le monde est paysage et requiert également une conception nécessairement diachronique qui perçoit l'actualité comme une suite de processus lointains et comme une condition du futur. Et, pour les architectes, cela peut rappeler la définition d'architecture qu'avait donné William Morris en 1881: "L'architecture est l'ensemble des modifications et des altérations sur la surface de la terre, en raison de besoins humains, avec l'exception seulement du désert".

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[1] Voir bibliographie.

[2] Voir Planification du paysage et des régions: Puglia, Toscana e Catalogna.

Cette conception du paysage comme système complexe de signes et de significations qui inévitablement dénotent tous les écosystèmes naturels (abiotiques et biotiques) et tous ceux des artifices qui dérivent des actions humaines, elle doit surmonter, comme c'est le cas en sciences médicales, la conception dualiste entre l'esprit et le corps. Ce qui signifie dans le paysage surmonter le dualisme naturel - humain et aussi la séparation entre intentionnel et spontané. C'est à dire, pour l'architecture, unifier les approches artistiques et utilitaires, sociales et individuelles, scientifiques et poétiques, dans toutes les différentes échelles. Enfin concevoir l'unité d'un système d'établissement ou les interactions matérielles de sa structure physique (nouvelle et ancienne) ne sont pas séparables des interactions culturelles concernant la population.

Le paradigme du paysage déplace le problème d'une architecture qui se mélange (pour un mimétisme ou contraste) à l'environnement existant et au paysage. Elle devient simplement paysage, partie d'un système de choses qui se modifient toutes, mais avec des temps différents. Elle peut toujours mettre en évidence des intentions individuelles, mais elle peut aussi être concernée par des actions de modifications, et d'interactions spontanées. Cela signifie que c'est le paysage, par sa perception, qui doit motiver et accepter ou refuser toute nouvelle action d'architecture et non l'inverse.

Cela signifie également que le système ne peut pas gouverner toutes les actions individuelles et que par conséquent il va changer grâce à une variété d'intentions qui découlent de raisons différentes et qui se développent avec des moyens et avec des intensités différents. Donc il est configuré comme un résultat chaotique, indéterminé, ouvert et continuel qui accompagne (mais aussi avec des inerties et des conflits) les mêmes processus de changement qui se produisent dans les structures sociales, les activités, les exigences et les comportements de la population.

Le résultat est une coïncidence qui, dans l'analyse et la conception de nos plans, projets, et programmes de gestion, va unifier systèmes observés et systèmes des observateurs. Une coïncidence qui, dans le même système des signes, regarde les résultats qui dérivent simultanément de processus intentionnels ou spontanés. De tout cela dérive d'un schéma chaotique qui va au-delà de toute possibilité de relation déterminante entre la cause et l'effet (la relation usuelle du projet).

La découverte de cette difficulté qui se pose chaque fois que nous pouvons observer ou penser à intervenir dans les systèmes d'établissements et dans leur processus complexes, nécessité l'exploration de nouveaux concepts. La première étape a dépassé les conceptions du projet moderne. Elle s'ouvre de deux façons: l'une a trouvé la liberté créatrice pour concevoir l'architecture comme une grande sculpture, l'autre a redécouvert les problèmes d'interagir avec l'existant. Les deux sont présents aujourd'hui, la première, avec un grand succès médiatique, ouvre la voie à des nouveaux langages, la deuxième, qui concerne les bâtiments, les districts urbains et enfin tout paysage existant, ouvre la voie à de nouvelles méthodes.

Ces méthodes exigent une connaissance et une évaluation approfondie des conditions de l'objet où intervenir avant de définir n'importe quel projet dans le contexte d'une meilleure utilisation des ressources existantes en offrant des économies qui permettent une meilleure distribution et disponibilité.

Ce diagnostic en particulier doit mettre en évidence le potentiel et les valeurs qu'il faudrait confirmer et les problèmes à résoudre. Il remet au projet la tâche de choisir les processus plus efficaces. L'extension de ces principes par les bâtiments et les complexes urbains a commencé à mettre en évidence la présence de nombreux sujets et la réalité des différents processus, qui interagissent les uns avec les autres de façon et à des moments différents.

La considération des problèmes d'environnement (*cf.* Capra & Luisi, 2014) met en évidence les interactions entre les systèmes et les processus, à la fois naturels et anthropiques. Mais elle considère les processus anthropiques principalement du point de vue de leurs rétroactions sur les systèmes écologiques (animaux et plantes) et sur les conditions de la sécurité et du bien-être (hygiène et santé) des établissements humains.

En même temps beaucoup de sciences naturelles (en particulier les études de la biologie) et de nombreuses sciences humaines (en particulier les sciences anthropologiques, neurologiques et

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psychologiques) (Bonnes & Secchiaroli, 2005 ; Mallgrave, 2013, p.17) élaborent des approches qui étendent, de plus en plus, le cadre d'interactions connecté à notre comportement.

Le concept de paysage assumé par le C. E. P.: " 'Paysage' désigne une partie de territoire telle que perçue par les populations, dont le caractère résulte de l'action de facteurs naturels et/ou humains et de leurs interrelations" (C.E.P. Cap. 1, Art.1, A)

"L'objectif de qualité paysagère désigne la formulation par les autorités publiques compétentes, pour un paysage donné, des aspirations des populations en ce qui concerne les caractéristiques paysagères de leur cadre de vie" (C.E.P. Cap. 1, Art.1, C) propose entièrement les conceptions de l'interaction systémique. Il ouvre de nouveaux problèmes et possibilités pour la lecture et les interventions dans les systèmes d'établissements humains (toujours interconnectés à tous les facteurs abiotiques et biotiques de la planète).

Dans cette conception, il est nécessaire d'admettre que la distinction entre les observateurs et les utilisateurs n'existe plus.

En réalité, nous sommes tous des observateurs et tous des utilisateurs. Peut-être, à des moments différents, et, dans les deux cas, avec l'ensemble des bagages de nos motifs et de nos différentes expériences, mais peut-être aussi avec certaines structures organisationnelles de nos pensées et de nos émotions en commun.

Cette hypothèse modifie le sens de nos réflexions vers une méthode qui sait comment se rapprocher de ce cadre complexe d'interactions et de modifications. Elle change nos projets vers des modèles qui se déplacent aussi dans les approches culturelles plus engagées que dans le "goût" de la culture généralisée.

Ce renversement de l'horizon, ce nouveau paradigme que le paysage peut aussi offrir à l'architecture, n'est possible que dans une culture qui est fortement structurée par une vision systémique de notre unité (individuelle et sociale) entre des aspects matériels et immatériels des choses existantes.

L'attention au paysage explicite la nécessité d'examiner les concepts complexes, disponibles aujourd'hui, les systèmes des facteurs abiotiques et biotiques et d'introduire de nouveaux concepts: celui de la variété et de la diversité des acteurs, le rôle des actions involontaires qui dérivent d'interactions aléatoires des actes intentionnels, des organisations structurées et/ou spontanées, enfin des processus instables avec la possibilité qu'"émergent" des nouvelles formes d'auto-organisation[3].

On peut distinguer les sujets actifs de deux grands groupes: celui qui joue de haut en bas (tous les niveaux et plans et programmes institutionnels: tous les experts et les opérateurs du projet) et celui qui joue de bas en haut (toutes les populations à la fois dans des activités productives sur les sols et comme utilisateurs actifs d'espaces). Ces deux sujets offrent des lectures et des évaluations intentionnelles et spontanées avec différents niveaux de conscience et de cohérence. Ces évaluations peuvent motiver des activités qui produisent des résultats de conservation (inaction ou entretien) et des divers résultats de la transformation.

Le paysage dérive de l'ensemble chaotique et aléatoire de ces activités. Toutefois, il met en évidence des formes d'auto-organisation (partielles et locales) de signes et de significations.

Nous avons défini "inintentionnel" le résultat de ces processus, ce terme signifie que les résultats, quelles que soient les intentions, dérivent enfin des additions et des interactions de toutes les activités et les comportements de tous les sujets qui agissent dans nos paysages.

L'inertie et les permanences des oeuvres et en parallèle les changements dans les besoins et dans les activités humaines génèrent des processus ouverts et continus avec différents niveaux d'instabilité.

Il peut être considéré que les réponses à ces instabilités (qui reflètent également les conditions culturelles, économiques et sociales) vont de lancer et de promouvoir l'émergence de niveaux de cohérence entre les signes et les significations.

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[3] On peut penser qu'au temps passé dans les cultures préindustrielles les architectures et les paysages spontanés montrent des cohérences qui dérivent des cultures matérielles auto-organisées.

Il semble évident, si c'est vrai, que la complexité de nos systèmes d'établissements puisse survenir plus facilement dans les sous-systèmes de paysage sur une échelle locale et non, par exemple, dans les grands paysages des grandes régions.

Cette considération pourrait conduire à confirmer la possibilité de reprendre le problème et le projet de paysage de sa "cellule" constitutive de petite échelle et parvenir, par agrégation, à des configurations, des signes et des significations à des échelles progressivement plus grandes.

Cette hypothèse, en plus de réaffirmer le rôle ascendant des lectures et des gestions à petite échelle, semble faire remarquer un rôle différent pour les niveaux de planification à plus grande échelle (top down).

C'est un rôle qui fournit aux opérateurs les connaissances, et qui facilite les lectures et la prise de décisions locales (participation) en assumant les indications à partir des systèmes d'établissements mineurs qui peuvent, par agrégations successives et itératives, faire prendre des décisions qui pourraient pouvoir offrir des auto-organisations avec cohérence même à plus grande échelle.

Le développement de ces possibilités exige toutefois des conditions convergentes aujourd'hui pas faciles. D'une part le développement, par le biais du processus de formation, d'un raffinement de sensibilité généralisée (et déjà cela exige des modèles culturels progressivement différents de l'actuel) (Morin, 1977); d'autre part le développement et l'essai de conceptions du projet plus articulés et toujours disponibles à différentes formes d'ouverture (back-action) qui permettent des ajustements continus (même avec des fréquences différentes) dans les cycles de vie des diverses présences anthropiques et dans leurs interactions avec les durées très différentes de procédés sur les processus abiotiques et biotiques.

Comme on peut voir la conception C.E.P. du paysage peut impliquer des rôles et des processus très différents de ceux présents. Probablement parce qu'elle pourrait produire, en temps nécessaire, des transformations, des acceptations et des diffusions de ces paradigmes culturels qui ne sont pas évidents.

Les expériences menées aujourd'hui sur les processus de récupération: dans l'éducation, dans la pratique du projet, dans le processus législatif sur les problèmes du paysage à diverses échelles, mettent en évidence l'insuffisance de bon nombre d'outils et de méthodes disponibles aujourd'hui, mais également la grande difficulté de les surmonter, et de ce fait l'exigence d'expérimenter des nouvelles méthodes.

Toutefois, nous sommes convaincus, qu'en surmontant le modèle culturel actuel (ce qui semble être nécessaire par les crises économiques, sociales, productives, écologiques), le paysage, comme structure conceptuelle fortement systémique et avec une forte valence également comme symbole d'utilisation matérielle, puisse donner, même à titre de compensation pour l'extension progressive des symboles virtuels, une possibilité pour améliorer la qualité de nos milieux de vie.

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THE TIME OF THE METROPOLIS:
UNDERSTANDING URBAN AND SYSTEMIC DYNAMICS

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Abstract / Résumé :

How come that some EU cities are often presented as examples and monopolize the best positions in various rankings? They act not according to models, but according to a method which is mostly similar to Edgar Morin's concept of auto-eco-organization. Theirs actions are based on values: they are agile creative, supportive, sustainable. So how do they implement those guidelines ?

Keywords / Mots-clés :

metropolization in EU Cities, method and values, agile,creative, solidair, sustainable, skills for systemic development

The time of the metropolis.
Understanding urban and systemic dynamics

The method
Why do some European cities reach the podium of model cities ? Among them are Copenhagen, Barcelona or Bilbao, Nantes, Toulouse, Hamburg, Friburg, Amsterdam, Eindhoven, Rome or Turin. This presentation is based on multiple visits and meetings with the stakeholders in about forty cities for almost twenty years ([1]). This long investigation shows that no model can be transposed or exported, as local situations always require tailored solutions.

The analysis is broadly based on the systemic approach, and in particular on Edgar Morin's works; through his concept of « self-eco-organisation », he insists on the method, as opposed to models. The method of self-organisation is based on values, some of which underpin the « metropolitan » method highlighted in this presentation.

On the one hand, the systemic analysis appears indeed to be the most appropriate method to monitor the dynamics, coincidences and needs of urban areas. For a few decades it has led many authors to analyse the polymorphous interactions on a territorial scale ([2]), whether between man and his environment or between the environment and the resources, and to take into account the flows between the outside and the inside, whose shapes have in fact become widely porous. On the other hand, ecosystems offer us the most useful paradigms to capture the urban dynamics and interact upon them; living resources are taken into account in order to promote both their conservation their sustainable use, in their multiple interactions with individuals.

The four values of metropolitan dynamics: agility, creativity…
The big European cities, long hindered by nation-states, have proved to be for a few decades the actual drivers of development. Their influence zones are expanding as they exercise power through the stocks they receive as much as through the flows that intertwine on their territories; these constantly growing flows entail interactions with increasingly distant territories. The best practices revealed by the investigation show that the cities have developed a unique expertise to articulate their actions with

those of other entities (regions, medium-sized towns nearby or regions and towns that can be far away). Moreover, these agile metropolises establish cooperations of a multi-scale type (through articulation or interpenetration) across their systemic areas (e.g. the network of German urban areas, the urban area of Stuttgart, Øresund transnational area, the metropolitan community of Brussels under construction, etc.). Eventually, these agile cities maintain or renew their functional equilibrium (homeostasis) despite unstable constraints (e.g. Lille, Barcelona). In the end, the resilience capacities of the metropolitan system are thus boosted (Eindhoven, Vienna, Antwerp).

Economically speaking, the domestic product of the big European cities is generally at 140 to 180% of the European States, which demonstrate their strength. Moreover, these cities massively attract technological and non-technological innovation. But these model cities perceive the dead ends resulting from technological innovation alone (in terms of employment, of territorial anchoring deficit, etc.) ; they focus very much today on mobilising « creativity everywhere ».

Without giving up technological breakthroughs, they try to revitalise other potentials for prosperity, through cross-fertilisation and injection of creativity ; these attempts often turn to the so-called strategies of the « blue ocean » (thanks to creativity, goods and services are not subject to competition due their novelty). In view of a production where goods and services are more intertwined, these cities stimulate creativity at intersections of activities linked to residencial, social or public bases. Thus, the inhabitants' new requests and needs are more likely to be met. On the side of social capital, training and employment are closely articulated with these new bases for wealth, thus enhancing the expertise available (e.g. Copenhagen, Hamburg, Munich, Brussels), and not only « talents » (^{3}).

In the end, creativity and social capital are on board to help « keep the metropolitan pot boiling ». This reflects the notion of « equifinality » : each of these creative metropolises initially moves on to its path thanks to its excellence and expertise panel (Munich, Toulouse, Grenoble). Then the panel is reinforced through agile cooperations (cf. supra ; e.g. *Kompetenznetze* in Germany, cooperations between Nantes and Rennes, Guéret and Limoges, Hambourg and Øresund).

…solidarity, sustainability

The crisis is certainly hitting cities hard, and social urban crisis is noticeable every day. However, against the increasing powerlessness of the nets provided by welfare states and based on procedural solidarity (according to categories, requirements, etc.), some cities have taken over more than others. The investigation reveals that supportive cities are constantly inventing new ways of action, using the effects of proximity, to the point where they become *de facto* a « second pillar » of solidarity. They are active in redefining their territorial boundaries, the stake being to organize solidarity, particularly on tax (e.g. Eindhoven, Stockholm), or in reshaping their actual labour pool (Vienna, Amsterdam, Bordeaux). While considering at first the multiple causes of exclusion, they focus on (re)vitalising the « warm solidarities », through policies aiming at social and civic cohesion (Brussels, Hamburg, Birmingham). They tear down the walls surrounding inner cities or new neglected territories, sometimes located on the fringe of their area (Rome, Turin, Dublin, Lille).

For that purpose, supportive cities activate new « societal combinations » between stakeholders, including to better promote their social capital or integrate their social outcasts (Hamburg, Turin, Sofia). These new alliances aim in particular at « re-monetising» tasks of societal interest linked to emerging requests and needs, for example population ageing (Eindhoven, Birmingham, Guéret-Limoges).

Cities have become major players in sustainable development because of the functions they fulfill (mobility, waste management, etc.). Model cities mobilise a large number of ecosystemic pools : generating new relations with nature, including economically upgrading their fringes through farming organised in short cycle ; recycling buildings and integrating their time dimension (conversion of buildings, restoration) ; opening to the new prospects of circular economy, of energy or waste to make consumers come together (e.g. Lille, Rouen, Besançon, Antwerp, Aachen, Vienna, Güssing, Friburg). In many cases these consumers have paradoxically partly become energy, goods or service producers. Seeking for new balances -homeostasia as a dynamic balance that maintain or regenerate life- is

always present, and the paradigm of the « circular » economy illustrates the new relationships between man and nature.

Tools of systemic action applied to the city

In order to comply with those values, the modes of action are changing. This brief presentation illustrates the driving force of verbs. Taking advantage of malleability to open to new interdisciplinary fields. Irrigating the seeds of creativity, in the proliferating way of the rhizome, to expand new interactive fields. Merging practices to create new modes of action. Ensuring porosity between fields of action, between borders, whether institutional, physical or mental. Consolidating and encouraging restoration rather than being fascinated by « large-scale projects » designed by the brains of some lone « geniuses». These modes of « lateral thinking » make it possible to look beyond « silos », to juggle with factors influencing the evolution of systems.

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THE SOCIAL *FIELD* DESIGNED BY ARCHITECTURE

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Abstract/résumé :

In the literature disciplinary researches, e.g., physics, studied the behaviour of elements, such as particles, in a context provided with properties, e.g., electromagnetic and gravitational. This context is classically considered as field, i.e., a physical quantity associated to each point of space-time. Social sciences and psychology use the concept of Force Field introduced by the social psychologist Kurt Lewin (1890-1947) The Force Field or life space was assumed to be -in any individual or social group- changing with experience and intended as representation of the environment, personal values, emotions and goals. We may say the cognitive system combined with representations and stimuli of the environment. This short essay focuses on Architecture as design of structures able to represent and induce properties of the cognitive systems possessed by inhabitants as well their transformation processes relating to social processes in progress. The subject is studied by Environmental Psychology, in the conceptual framework of Space Syntax. On one hand, the structure of space created through Architecture both represents and induces the social field within which inhabitants behave. On the other hand, inhabitants behave by using such a social field. Within this conceptual framework we may hypothesise the existence of a process of self-architecture by social systems. We explore the coherence, in such social fields, between different aspects such as architecture, design, fashion, music and painting.

Keywords / Mots-clés :

autonomous agent, coherence, environment, field, properties, social field

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THE CONCEPT OF *FIELD*

In the literature disciplinary researches, e.g., physics, studied the behaviour of elements, such as particles, in a context provided with properties, e.g., electromagnetic and gravitational. This context is classically considered as *field*, i.e., a physical quantity associated to each point of space-time, see, for instance, Landau and Lifshitz (1971).

This area of research had subsequent important evolution over time by considering, for instance, the hypothesis of the *unified field theory* which aimed to write fundamental forces and elementary particles in terms of a single field, the three body problem, collective behaviours, and to introduce the Quantum Field Theory (QFT), see, for instance, Peskin and Schroeder (1995).

NON AUTONOMOUS AGENTS

The approaches and ideas come by considering *non autonomous* elements like particles and planets. The term *non-autonomous*, in contrast with *autonomous elements* introduced later, refers to the fact that they do possess properties, such as mass, magnetic and gravitational characteristics, and their behaviour is due to forces produced by 1) interaction between elements (e.g. due to collisions and magnetism), 2) properties (such as gravitational and magnetic properties,) associated to each point of space-time, specified by a *field*.

PROPERTIES OF THE CONTEXT

When exploring the behaviour of certain elements, not only their properties and the field should be taken into account, but also the context in which these elements interact.

The Properties of contexts may *interfere* with forces establishing the elements' behaviour by altering intensity or by adding vectorial components due, for instance, to high, low or non-uniform, temperature, e.g., magnetisation and Bénard Rolls, and perturbations such as radiations.

Other properties of the context such as the *geometrical* features and topological location of a container setting the degrees of freedom to the behaviour assumed by elements, might be considered as well.

An example is given by the shape of pipelines where the movement acquired by elements thanks to a suitable field is converted into a flux having the dimension of the pipeline, e.g., grains of sand falling into a funnel.

AUTONOMOUS ELEMENTS OR AGENTS

Another related conceptual problem arises when we consider *autonomous elements* or *autonomous agents*. Their behaviour is established not only by considering the combination of their properties (the field in which they are immersed and the ones of the context as in the case of non-autonomous elements, i.e., their behaviour can be *computed)*, but by the *processing performed by* their cognitive system since single formal models are not sufficient to represent their whole behaviour.

Autonomous systems are provided by a cognitive system intended as a system of cognitive abilities meant, for instance, to make logical inferences, memorise, make representations, hypothesise, use language and semantics, process emotions, learn, evolve, and take decisions.

Cognitive models are ways to process, for instance, information, representations and memories in order to perform an action. Cognitive systems are typical of complex living systems. Artificial cognitive systems able to perform partial activities have also been introduced, such as playing games, learning, allowing visual and voice recognition, and simulation. This is represented in the field of Artificial Intelligence by using the so-called sub-symbolic computing for instance in Neural Networks (NNs), Cellular Automata (CAs) and Genetic Algorithms (GAs). In the later cases cognitive models are intended as software programs. We highlight how the behaviour of autonomous agents results from combining properties of non-autonomous agents and cognitive processing. For instance, living beings all behave in the gravitational field combined with environmental factors such as temperature. However their behaviour is not the linear *resultant* of this combination since cognitively processed.

SOCIAL FIELDS

Social sciences and psychology use the concept of *Force Field* introduced by the social psychologist Kurt Lewin (1890-1947)(see, for instance, Lewin, 1935; 1936; 1951) in the framework of the Gestalt Psychology founded by Max Wertheimer, Wolfgang Köhler and Kurt Koffka (Koffka, 1935). The *Force Field* or life space was assumed to be -in any individual or social group- changing with experience and intended as representation of the environment, personal values, emotions and goals. We may say the cognitive system combined with representations and stimuli of the environment.

ARCHITECTURE AND SOCIAL FIELDS

Several studies and approaches introduced in the last years, see for instance, Batty (2005), Diappi (2004), Marshall (2008), Hensel *et al.* (2004) and Weinstock (2010), explore the social impact and significance of Architecture. This short essay focuses on Architecture as design of structures able to *represent* and *induce* properties of the cognitive systems possessed by inhabitants as well their transformation processes relating to social processes in progress; see, for instance, Minati and Collen (2009).

In this conceptual framework functionalities and rational aspects (e.g., economical, environmental, military and political) are of 'secondary' importance in the long range compared to architectural properties representing social cognitive properties such as attention to details; beauty; induction to

meet; sense of hierarchy; multiplicity vs. standardisation; *openness due to opening doors rather lack of concrete boundaries*; topologies with labelled areas corresponding to values; usage of building material indicative of the social status of inhabitants; use of the territory in a *non-optimised* way, i.e., dedicated to green areas, playground and artistic exhibitions; usage of city lights, traffic lights and opening hours of shops to set social rhythms; systems of garbage collection as information; colour of the façade and their state being indicative of maintenance and attention to harmony with the architectural style of the neighbourhood etc., see, for instance, Collen (2009), Di Battista (2009), Fontana (2010) and Giallocosta (2010). The subject is studied by *Environmental Psychology*, researching topics such as the connection between *broken windows* and the study of crime prevention through environmental design in the conceptual framework of Space Syntax such as to the *Space Syntax Laboratory*, see web resource at the references, and, for instance, Cozens *et al.* (2005).

COHERENCE

On one hand, the structure of space created through Architecture both represents and induces the social field within which inhabitants behave. On the other hand, inhabitants behave by *using* such a social field. Within this conceptual framework we may hypothesise the existence of a process of *self-architecture* by social systems. We explore the *coherence*, in such social fields, between different aspects such as architecture, design, fashion, music and painting.

Metaphorically speaking we could say that Architecture provides the *words* by which social systems *formulate sentences* about their identity, about how they are changing and what kind of evolution they are aiming for.

The aim of this short contribution is to study and model, using an interdisciplinary approach, the coherence of the social field represented and created by architecture using suitable research methods, educational and professional activities, always baring in mind this complex network of interdependences.

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THE GAME AS THE CENTRAL ELEMENT OF INTERACTIVE AND SOCIAL SYSTEMS FOR THE TRANSFORMATION OF THE URBAN ENVIRONMENT

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Abstract :

The "game" can be considered as a meta-design element useful for the emergence of collaborative processes and of new properties in the urban environment. These elements cause a transformation of the urban environment. In addition to the verbal languages, also the non-verbal languages can be used by citizens/players as performative "utterances" that allow both to communicate with the others and to create, to build, and to renovate. In this context, a systemic continuity among game, social systems, and architectural elements can be identified.

Keywords :

architecture, collaboration, game theory, meta-design, non-verbal languages, processes of emergence, relations, self-design, social systems, systemic continuity, urban transformation

INTRODUCTION

In this paper we firstly focus on the different processes of transformation of the urban environment. Although these processes are in most cases top-down, that is to say that they are imposed by Public Administrations without considering the specific people needs and desires, in some cases they can emerge directly through the action of people living the territory (they are called "city users").

Secondly, we focus on the characteristics of the "game", emphasizing how different authors, belonging to different disciplinary areas, have applied its characteristic elements in order to improve some human processes. We point the attention on how it is applied in the urban environment and the outcomes of this action. For example, we note that the application of the game in a territory causes first of all an interruption of the systemic continuity of the same territory, since it leads people to stop, to interact with specific elements of the urban environment and with other people, and also to change their mood. Considering the social item of the game, we argue that it can be used as a metaphor of the decision-making processes, by referring to the mathematical Game Theory, and on this basis, it can be applied to the processes of interaction among city users aiming to the *moulding* of the territory, in other words to the transformation of the urban environment.

Then, we investigate the languages used for the interaction among city users, focusing not so much on the verbal languages, but on the non-verbal languages (for example: the kinesic system, the proxemic, etc.) since they represent some tools of "relation" among people which structure in different ways the spaces. For this reason they can be considered as "performative utterances". Since also the game is based on different non-verbal languages, it can be seen as a framework useful to structure the relationship and the environment.

In this sense, the game can be considered as a meta-design framework that allows to use verbal and non-verbal languages in order to co-create architectural elements, to transform the urban environment and to build relationships among city users. Indeed, the game is composed of different elements (e.g.: experience points, badges, missions, levels, awards, progression bar, gifts, etc.) that can be used individually or in combination in order to co-create and/or bring people. An analysis of four examples follows: 1) a square that becomes a game table in which the different players, carriers of different instances, collaborate in order to find the organization of the space that satisfies everyone; 2) a neighbourhood that becomes a role playing game where all their inhabitants and merchants play a role and complete the assigned "missions", dealing with the territory; 3) the whole city that becomes a drawing board, where people can imagine a new urban environment; 4) a bus stop that becomes a recreation ground that allows to build a relationship among people.

At the end, we emphasize how the application of the game elements in the urban environment brings out the systemic continuity among game, social systems, and architectural elements.

THE PROCESSES OF TRANSFORMATION OF THE URBAN ENVIRONMENT

The Top-Down Environmental Transformation Process

The process of transformation of the urban environment can be firstly intended as a top-down process, since the Public Administrations implement independently specific solutions within the territory. An example of this process is the construction of specific architectural elements in the urban environment only on the basis of technical needs and requirements of the territory. Although the role of the Public Administrations is carrying out public works for the advantage of the community, the whole community or a part of it may have different interests. This element may cause a real conflict. In most cases, the Public Administrations can only note that, without changing their plans, according to the technical and strategic requirements of the territory. However, in other situations, it would be possible to have a greater involvement of city users in the process of urban transformation.

The "Self-Design" of The Urban Environment

In most cases the process of the transformation of the environment can take place directly through the action of people. Indeed, according to Minati, 2001, the new properties of a system emerge from the interaction among the different elements of the same system. If one considers a city as a system and all the different people living in the territory as their basic elements, the interaction among them can be seen as an opportunity for the continuous emergence of new systemic properties of the city. In this way, the interaction allows to create a network which re-organizes the system. This process leads to a transformation of the space. In details, the exchanges among people who have different needs and intentions and their use of the territory, according to their different characteristics, cause the creation of new or renovated architectural elements in the urban environment. This act can be conscious, for example if there is a more or less structured decision making process, involving also the Public Administrations, or unconsious, for example if the daily *use* of a territory leads to its slow transformation over the time. A simple example of the latter are the "desire lines" emerged from the study of Throgmorton & Eckstein, 2000, which describe the journeys across the city from people which do not take into account the official routes established. About that, De Certeau (2001) emphasizes the difference between "place" and "space": the first term concerns instantaneous

configurations where everything is in its place, while the second term concerns the place practiced and used by people.

According to Minati, 2008, the outcome of this process can be considered as an act of "self-design". Indeed, the people build the territory in which they live, adapting it to the different needs. In this way the city build people's lives. This idea is consistent with the concept of "autopoiesis" of Maturana and Valera, 1980. According to these authors, such a system continually redefines, sustains, and reproduces itself. The process at the basis of these systems creates, processes and destroys it. It allows to maintain its proper organization and to produce its basic elements that recursively produce these elements. In the urban environment, the single elements, that are within the system, are: people, their relations, their needs, and their objectives.

In this process of *self-design*, where the Public Administrations are always present, the city users assume a *mesoscopic* point of view, because they are neither too close the territory (since they design it, they do not use it), nor too far from the territory (that is the point of view of the Public Administrations, which do not really "use" the territory). On the contrary, this process may bring city users and Public Administrations, giving the first the opportunity to design the territory in accordance with their needs and desires, and the second to let emerge the individuality and the specific nature of the territory.

THE GAME AND THE TRANSFORMATION OF THE URBAN ENVIRONMENT

The "game" is the basis of the work of different authors, belonging to different disciplinary sectors, who considered it as an element with specific characteristic enabling or improving some human processes. For example, Huizinga, 1971 considers the game as a central element in the human culture since it represents a requirement in the processes of civilization and knowledge. Moreover, Turner, 1982 focuses on the game as a useful tool for the world representation and invention. Finally, Mead, 1934 and Winnicott, 1971 consider the game as a key element in the self-perception of the single person, since it makes people aware of the presence of the *Other*. Concerning the urban environment, Alexander et al., 1977, in defining the patterns of interaction between the people and the territory, consider the game as a basic elements of the environments, focusing on the importance of urban spaces dedicated to playful activities.

In these examples, the game is commonly considered as an opportunity that reveals new attributes of a subject. In this paragraph we focus on the game as a central element in the urban environment, both since it allows to identify the systemic discontinuity of the spaces, and since it can be placed at the basis of the processes of interaction among people living in a specific territory.

The Game as the Element Interrupting the Systemic Continuity of the Territory

The game can be intended as an element interrupting the systemic continuity of the territory. Indeed, the different playful activities in the territory break the *texture* of the city, since it leads people to stop, to interact with specific elements of the urban environment and with other people, and also to change their mood. In this way, the place and the specific elements of the urban environments, take on new meaning. Above all, we refer to the punctual and almost *unconscious acts of game*, not to the conscious ones. Indeed, if the latter are represented by the spaces explicitly dedicated to the game (for example: a playground, an amusement park, a football pitch, etc.), some processes are on the contrary less explicit. Some examples are: the hopscotch game, where the traditional urban elements are used with other purposes; the parkour, where the movement of players surpasses the traditional urban physical elements; the buskers, who perform only if the viewer donates a coin. These examples reinvigorate and enrich the urban space, conducting the city users to a *meta-reflection* on the city.

The Figure 1 refers to the fountains of Piazza Gae Aulenti in Milan. They represent a tool of interaction with the people and in particular an *affordance* that drives people to touch the water and get wet, breaking in this way the linearity of the people paths.

Figure 1. Fountains in Piazza Gae Aulenti, Milan. Source: personal photo

The Game as the Basis of the Decision-Making Processes: the Game Theory

However, the game can be intended also as an element that represents the process of interaction among people living in a specific territory. For example, the mathematical Game Theory of von Neumann and Morgenstern, 1944 describes the processes of interaction that aim to an individual and/or collective decision.

The focus of this theory is the study of the outcomes of the different people behaviours, by identifying the methods and the models which describe all the possible situations created by the interaction among people and the related behavioral strategies. So, in this theory, the "game" represents an effective metaphor referring to the process of interaction among people (the "players"), who, starting from their preferences and using the acquired information, do actions in order to reach a result, that is a benefit. Generally they need to solve a problem. The models which describe all the possible situations concerning the interaction among different people, can be applied in many areas (e.g.: biology, economy, political science, etc.) and they can be classified in many typologies.

For example, the "cooperative game" is applied when all the players work together in order to reach a common goal and when the collaboration among all the different players is more convenient than playing individually and/or forming an alliance with only a part of the players. In this way, all the participants receive an high value from the collaboration. On the contrary, the "non-cooperative game" is applied when the different players play individually and they intend to reach personal outcomes.

Considering these elements, it is possible to apply the "game" metaphor during the interactions among people aspiring to transform the urban environment. The latter can be considered as the "game context" of this work and the people living in the territory can be intended as the players of this game. They make choices consistent with the possible resources and strategies in a well defined moment. In this sense, the goal of the game can be identified in achieving a higher level of livability in the territory, so the decision making process at the basis of the game involves all the people living in the territory and it aims to that. The outcome is the creation of areas (but, more in general, urban services) on a human scale. It means, for example, that all the architectural elements of the territories are *mould*, making them more "usable". This process describes in a more simple and direct way the processes of emergence of needs, intentions, and then new properties, belonging to the urban environment.

According to the Game Theory, in the urban environment the game could be considered as a "cooperative game", since the players share spaces and services, and for this reason they have a shared interest. Moreover, they have a shared information, that represents an important tool in the decision making process. This game could also be considered as a "non-zero-sum game", since the achievement of the interest shared among the players, an element that declares the end of the game, leads to an increase of the value. Indeed, at the end of the game, the resources employed will be optimized and they will produce a value greater than their sum. However, the players have different characteristics, since everyone plays a role with specific, private, and sectoral needs, intentions, and objectives, and in most cases they differ from needs, intentions, and objectives of the other players. For this reason, this game could be considered as an "asymmetric game", because the specific "role" of the single player represents an important variable in the game process and it influences the related strategies.

NON-VERBAL LANGUAGES AS PERFORMATIVE "UTTERANCES" IN URBAN ENVIRONMENT

In the urban environment, the processes of interaction among people come both from the verbal language, that leads to specific actions (for example: a typical co-design session in which different people come together with the purpose of transforming the urban environment), and from non-verbal languages. Indeed, the different forms of the non-verbal communication, that are the paralinguistic system, the kinesic system, the proxemics, and the haptic, play an important role in transforming the environment: they represent some tools of "relation" among people which structure the spaces. According to Watzlawick et al., 1971 every act of communication has both a content and a relationship aspect: the first focuses on the meaning, the second focuses on the relationship among the interlocutors. In this sense, the non-verbal languages are important carriers of the significance of these relationships.

The gestures among people who share the spaces for transport and mobility within the urban environment are an example of these concepts. The different "users" of the roads, indeed, communicate primarily through non-verbal languages, which are used in order to organize the movement of pedestrians, motorists, drivers, cyclists, etc. Another example is the proxemics, which concerns the distance that a person puts between himself and the others. So, a high distance between people who share a place denotes a low social interaction, which in turn influences the mode of organization of the urban space.

These examples have not only immediate effects on the architectural elements of the urban space. Indeed, in the first case the road users simply understand the movements of the other people, in the second case they communicate a larger or smaller openness to the people who share the same environment. However, they contribute in structuring the environment and the presence of people inside.

Moreover, the organization of the space is intended as a mirror of the social structure, according to the power relations of the territory (for example, see: Ibrahim et al., 2010).

So, we sustain that also the self-organization of the social relationships and the relations of interaction among people living in a territory can mould the places and their architectural elements. For this reason, we can affirm that these interaction processes are based on *performative functions*.

Indeed, as defined by Austin, 1962 and Searle, 1970, the performative function of a sentence creates something. In the same way, the social interactions create or re-create the architectural elements of the urban space. The latter is transformed in this way. As we said, these performative elements can be based not only on the verbal language, but also on non-verbal languages (first of all the proxemics and the kinesics). Indeed, they are direct, quick, punctual, and conventionally recognized, and for this reason they are more effective than oral or written languages in producing real and visible outcomes and in identifying people needs and desires. A basic example of these processes is the use of formal architectural elements with an aim different from the motivation for which it was created. For

example, in our urban environments the use of a staircase as seats can mean that people want to structure their proxemics in a way different from those that the architecture allows.

GAME-BASED INTERACTIVE SYSTEMS FOR THE URBAN TRANSFORMATION

As the non-verbal languages are an important element for the interaction among people living the same urban environment, so they are one of the tools for the interaction and communication within different typologies of games. Some examples are: game applications based on gesture recognition technologies that allow the users to have a direct interface with the systems; the eye contact and facial expressions among the members of the same team that represent an important communication tool in card games; the "hide-and-seek" game that is entirely based on the entry and exit from the intimate space (according to the different areas defined by Halls, 1966 in his "proxemics diagram"); more in general, during a game the paralinguistic system of a player (for example: frequency and tone of voice, rhythm and silence, etc.) reveals important contents concerning the information not shared among the other players.

Considering the meeting points between the languages used in the urban environment, the tools and the methodologies used in game applications, and the centrality of the game in the processes of emergence in the city environment, it is possible to define interactive systems (through both verbal and non-verbal languages) as a tool for designing, realizing, and transforming the architectural elements. Indeed, the game brings people, allowing processes of social interaction (based on verbal and non-verbal languages). In this way, it gives the people the opportunity to make decisions concerning the urban environment, designing, creating and transforming the physichal environment according to their needs and desires. The Figure 2 resumes these relations.

Game ⟶ Social interactions (based on verbal and non verbal languages) ⟶ Decision making ⟶ Self-design ⟶Transformation of the city
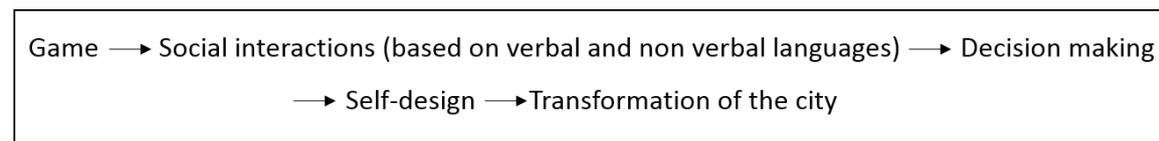
Figure 2. The process that describes how the game can transform the city.

THE GAME AS A META-DESIGN ELEMENT

In this way, the game becomes a paradigm for designing the architectural elements, that is to say a framework that allows citizens to collaborate in order to adapt the environment to the needs of all the "users" of the city.

This carachteristic refers to the *meta-design* environment. According to Fischer et al., 2004, the meta-design approach allows to really include the new emergent properties within the system, transforming it. It can be considered as an adaptive process during which the characteristics of the system meet the people needs. It is important to consider the system as an *open system*, so that it is ready to adopt people demands.

In this sense, it is possible to use the game elements not only to improve the participatory design techniques, but also to strengthen the interaction among people belonging to the community of the territory. In the first case, the game allows users to collaborate in order to mould the spaces of the city, while in the second case it is a tool useful to bring people. Indeed, the game is composed by different elements that can be used individually or in combination in order to co-create and/or bring people. (e.g. experience points, badges, missions, levels, awards, progression bar, gifts, etc.).

In this way, the territory or specific architectural elements of the territory become a metaphor that uses a semantic field belonging to the game environment. This procedure is useful to observe specific city elements under a different point of view. Some examples can be: a square becomes a game table in which the different players, carriers of different instances, collaborate in order to find the organization of the space that satisfies everyone; a neighbourhood becomes a role playing game where all their inhabitants and merchants play a role and complete the assigned "missions", dealing with the territory;

the whole city becomes a drawing board, where people can imagine a new urban environment; a bus stop becomes a recreation ground that allows to build a relationship among people; etc. Below, these examples will be explained and focused.

A Square Can Become a Game Table

We can imagine that a Public Administration planned that in a given territory a square will be built, but it hasn't yet been designed nor implemented. This process could be committed to the city users of the territory, who can identify the solutions to implement in line with their needs and desires. The technical feasibility of the identified solutions is ensured by the continuous presence of the PA and the designers. They ask people not simply gather around a table in order to co-design a space, but play and organize the space they live. In details, it is possible to create a *collaborative game* in which the square is a game table on which different gamers play. They must interact with each other to achieve a common goal. The objective is the design of the square consistently with the needs and demands of all the players. The satisfaction of needs and desires of the players will define the end of the game.

Without considering the specific technical solutions, we can imagine that players have specific "cards", each of which represents specific architectural elements that they would like to see implemented within that space (for example: benches, plants, bicycle racks, etc.). Individual players propose, through these "cards", the elements they desire and they need to meet the favour of the other players, convincing them to accept their proposal. The construction of a story that tells the scenario in which people can use the specific architectural element in the future is fundamental. These meta-design process can be applied not only in designing a square, but also in designing individual architectural elements of the city.

The objective is to obtain a shared vision of the square, to see the future square in the same way. A continuous *fixing* of the different points of view is the action to do.

The Figure 3 represents a session of the "Planning for Real" technique, where the citizens, considered as players of a game, design together the city they want. This is also a basic example where the game brings people in doing something for their city, but it is possible to think different solutions, that affect the city environment itself and that involve citizens in original ways.

Figure 3. Planning for Real technique. Source: www.planningforreal.org

A Neighborhood Can Become a Role Playing Game

In this case, we can imagine a street or a neighbourhood, already built and used, which are the city users themselves to deal with. The actions related to this employment can concern all the aspects of the territorial care or only some of these. Also in this case the presence of the Public Administration is important, since it allows to define the boundaries of possibilities offered to the city users and to check the development process. Considering that the management and the organization of this territory are completely or partly entrusted to the care of people, they always have a territory in line with their own needs and which is useful for those who live there. In this second example, the city users, who are the players of this game, after identifying the objectives to be achieved (a process that could be carried out for example through a process similar to that described in the previous paragraph) in accordance with the Public Administration, can define the specific tasks to be assigned to the single players.

For example, each of these will do actions, which can be defined "missions", consistent with his/her defined "role" in the game. Some possible roles are: the responsible of green spaces, the road manager, the responsible for pollution and waste, the responsible for security, the responsible for public infrastructures, and the budget manager. A possible scenario: the responsible of green spaces will decide the trees to be planted in a park, he/she will clean the green areas, etc., and in doing so he/she will face with the budget manager. It is possible not only to identify single players for single areas, but also a team of players responsible of single areas. The result will be obtained if each player (or each team) will reach individual goals (if he/she will carry out his/her missions) so, if all the players perform them, the outcome is achieved.

As already noted, in this context the presence of the Public Administration is central, so that the solutions are realistic and they respect the technical and structural needs of the territory. Indeed, in this example the specific game elements concern the *role playing game*, since citizens/players play specific roles and this dimension is the central one. In this sense, the Public Administration can be intended as a "master" or a "narrator", who will answer questions of players and will ensure the players make decisions consistent with specific conditions. Moreover, this framework can represent a good opportunity for the involvement of the Public Administration in the processes of *self-organization* of the citizens. Indeed, these processes are nowadays already existing but they are still unstructured. On the contrary this process can take a real advantage for the entire territory; just think the need of street artists to have spaces of expression and the need of Public Administrations to regenerate public places.

The Whole City Becomes a Drawing Board

This solution can be implemented if the players have to identify specific needs and/or problems of the territory, inciting them to imagine a new urban environment in which they can "delete" the element or the characterstics really present and "add" new elements or characterstics. In this way, the city can be intended as a drawing and the single player as a draftsman who can create new things. So, it will be possible to identify the difference between the real and the "pictured" situation.

The Figure 4 represents an example of this process. The "Gulliver Table" can be considered as a "wide sheet to fill". It changes its use and its relation with users; for example it can be a bench or a table, but it can also become a shelter, a playround, etc.
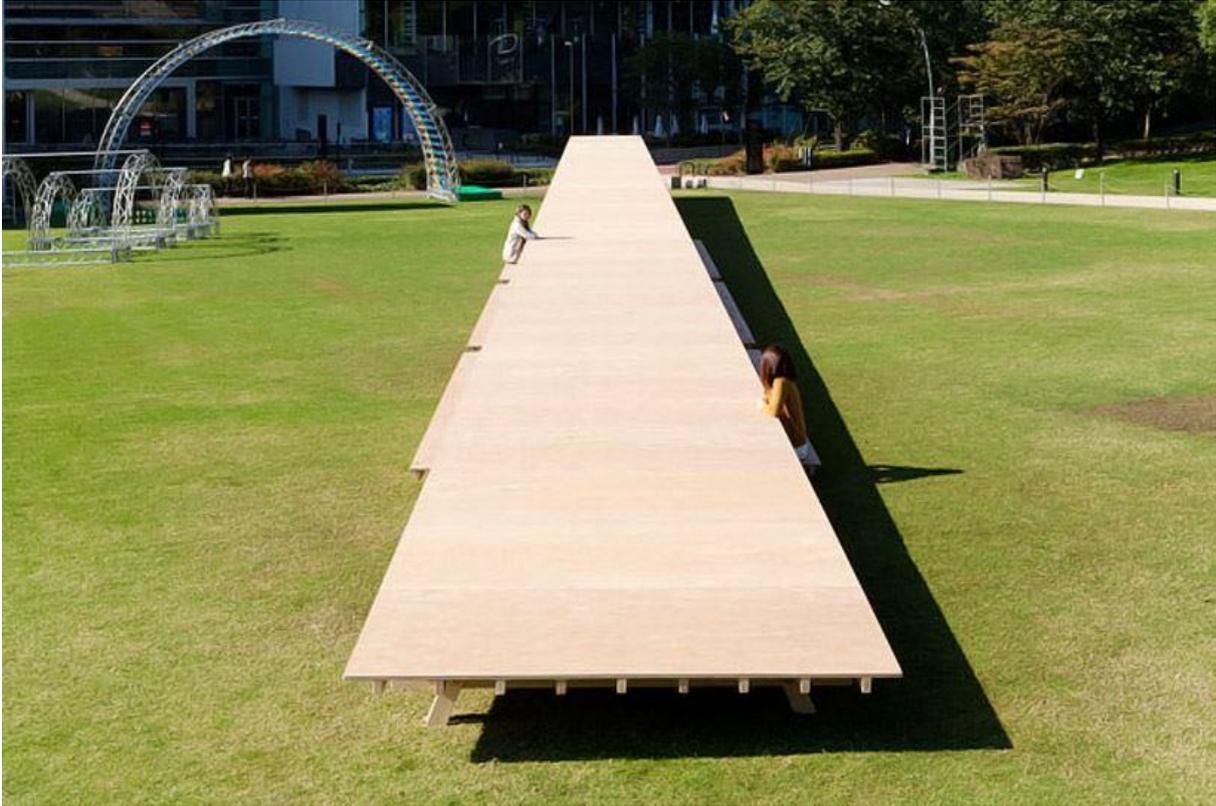
Figure 4. The Gulliver Table, Tokyo. Source: www.designboom.com

A Bus Stop Becomes a Recreation Ground

In this example, the focus is not on designing city elements, but on creating a relationship among city users. Indeed, the game is a highly sociable activity that allows players also to *meta-communicate*, that is to say to focus on their relationship rather than on the content of this relationship. During the "use" of the territory, it is possible to occupy the *interstices of time and spaces* of people in order to strengthen the sense of belonging to a community, the first step for their engagement in building the territory in which they live. These occasions have the aim to focus the attention of people on the same topic, leading them to interact. For this reason, the importance is not so much on reaching a specific goal of the game, but on the relational setting. In this context, the non-verbal languages are the most effective means of communication, since they represent the relation among people more than verbal languages. They represent a possibility, declined in different ways, that leads to activate all the processes for the creation and the regeneration of the city elements.

The Figure 5 represents a good example of this process. In Piazza Gae Aulenti, Milan, there are some tubes that connect different spaces and people. Therefore, passersby can get in touch with other people, where the value of the established relation is more important than the conveyed content.

Figure 5. Tubes connecting spaces and people in Piazza Gae Aulenti, Milan. Translation of the second photo: "*These tubes connect different places and spaces of the building. This work is dedicated to those who, passing through this place, will think the voices and sounds of the city*". Source: personal photo.

In these examples, the game is considered as a meta-design framework that allows to use verbal and non-verbal languages in order to co-create architectural elements, to transform the urban environment and to build a relationship. Bateson, 1972 defines this element a *meta-structure*. It means that the game does not define the specific elements of the design process, but it provides a possible *path* that can be traveled. It is a framework of design options to be defined.

For example, the game as a meta-structure does not define the typology of solutions to be adopted. However, it might be possible to create indicatively two typologies of solutions, which can focus on the contents (it is possible to produce something) or relation (it is possible to bring people): the physical solutions, that concern the installation of elements for co-creation, transformation and interaction in the real environment and the digital solutions that concern the creation of digital applications that have the same objective. In both cases, these solutions have to allow citizens to play in the real and/or digital urban environment, simultaneously or not with other players, so that they leave more or less visible traces, that, related to the others, design or create new spaces of the city.

In our future work we are going to focus on some of these solutions. So, we are going on the second step of the process. Indeed, if in this work we have defined a framework for the design in the next one we will focus on the application of game elements in defining a solution that people can use in order to communicate each other, to create and re-create the environment (the third level of the process).

CONCLUSIONS: THE SYSTEMIC CONTINUITY AMONG GAME, SOCIAL SYSTEMS AND ARCHITECTURAL ELEMENTS

In the described situation, it is possible to identify a systemic continuity (*non-separability*) among game, social systems, and architectural elements. Indeed, the real organization of the social system is the basis of the specific game organization, that is to say that the resources available in the game and the possible actions to perform need to be realistic. At the same time, on the basis of this organization, resources, and needs all the architectural elements are realized and they predispose people to specific usages, that can influence the social systems.

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DEFINING A META-DESIGN FRAMEWORK FOR KNITTING THE EMERGENT CITY ELEMENTS

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SOME EXAMPLES OF EMERGENT PROPERTIES IN THE URBAN ENVIRONMENT

The environmental transformations of the city are the expression of processes of emergence in social systems that continuously redefine the city as a system (Minati, 2001).

In detail, in a previous study, we identified and illustrated three examples to show how the city evolves on the basis of the emergent properties: the re-semantization of specific city elements; the

boundary conditions as source of system change; the social behaviours and interactions as soft protests (Volpi et al., 2015).

The first consists in the attribution of a new meaning to urban ecosystem elements (Martinelli, 2004) as the result of the wear process of the relations between subjects and objects that make up the city. Social or individual actions produce new meanings, by redefining and re-establishing relationships, or altering old ones. An example is the use of elements of the urban furniture for a function other than which they were designed for.

The second is about the "boundary" as both a barrier to the change of the system (so a disabling element for it), and a bridge to it (so an enabling element for its development). This allows to overcome the vision of the "center" as the core of the system in contrast to the suburb areas as a fringe of the system, referring not only to the spatial conditions, but to the topics of political and media agendas, too. The new proprieties of the boundary reach the center, originating fusion, contamination, innovation, and opportunities. This process is the outcome of individual or collective actions that aim to add these new properties to the system identity. An example of these observations are the French riots occurred in 2005 in the *banlieu*, when the discontent of the Arab, North African, and black French second generation immigrants suddenly exploded.

The third focuses on some social behaviors and relationships among the city users that indicate a dysfunction of the city. These attitudes represent a collective intelligence applied to the city to resolve common criticalities, assuming the form of a soft protest. Their aim is to show an alternative solution for better living the city. Some of these collective actions redefine the social interaction on the basis of mutual support and sharing "philosophy". An example is the practice of ticket crossing, that spread from Nord Europe to Italy as early as 2011.

These occurrences are "traces" only apparently separated. Indeed, since these single elements are part of a more complex system, they can be reciprocally linked into "knitted" patterns.

THE EMERGENT PROPERTIES AS "IMAGES" OF THE CITY BORROWED FROM CALVINO'S WORK

As a progression of our study, in this paper we intend to systematize the process of interpretation of the city illustrated above, making a further step forward in the "knitting of the traces". In detail, starting from the acknowledgment of the complexity of the city as a system, we try to categorize the processes of emergence previously identified on the basis of the attributes sprang from the study of the process itself. We sustain this step through the correlation of the emergent properties of each identified process with the representations of the different cities coming from the work "Le città invisibili" by Italo Calvino (Calvino, 1996).

In this novel, Calvino defines some general attributes of the cities (e.g.: tradings, eyes, thin, etc.) and for each of them he identifies some specific declensions, inventing about sixty imaginary cities.

The three examples of processes of emergence discussed above can be the expression of three different cities of Calvino's novel. In details, the process of re-semantization of city elements can be intended as an element belonging to a "city of memory" called Zaira, that consists of "[...] relationships between the measurements of its space and the events of its past. [...] A description of Zaira as it is today should contain all of Zaira's past. The city, however, does not tell its past, but

contains it like the lines of a hand, written in the corners of the streets, the gratings of the windows [...]".

The boundary conditions can be intended as a process belonging to a "hidden city" called Olinda, in which "the old walls expand bearing the old quarters with them, enlarged but maintaining their proportions an a broader horizon at the edges of the city; they surround the slightly newer quarters, which also grew up on the margins and became thinner to make room for still more recent ones pressing from inside". In Olinda the center conceals the new that develops in concentric circles from the inside to the outside, overtaking the traditional meaning of boundary.

The social behaviours and interactions as soft protests can be intended as processes of a "trading city" called Ersilia, in which "[...] to establish the relationships that sustain the city's life, the inhabitants stretch strings from the corners of the houses, white or black or gray or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency. [...] Ersilia's refugees look at the labyrinth of taut strings and poles that rise in the plain. That is the city of Ersilia still, and they are nothing".

Then, we went further in the abstraction and simplification of the identified attributes by choosing a single image exemplifying a single attribute. In these three cities, a specific image is provided: Zaira is an *hand*, with its line of the memory; Olinda is a set of *concentric circles* in which the boundary is a bridge to the change; and Ersilia is a set of *twisted wires* of the relationship between citizen.

IDENTIFYING INTERACTION PATTERNS AMONG EMERGENT PROPERTIES

In a real context, a single city is not defined by one single attribute (or one of its declensions), but by a large set of them. As well as the Calvino's invisible cities are an (extreme) expression of a single attribute even if they are essentially part of one city.

So, we need to analyse the complexity of a city considering the interactions among this large set of attributes and then of more processes of emergence at the same time. Indeed, by putting in relation one or more specific images of the city attributes (or declensions) and then exploring their possible interaction patterns, we provide a way to recompose the complexity of the city by knitting the traces.

If the identified processes of emergence were part of a single city regarded as a system, the hand, the concentric circles, and the twisted wires have to interact. In effect, according to Minati (Minati, 2011), the interaction among elements is a necessary condition to qualify them as a system. Considering that, it is necessary to find one (or more) representation that describe the possible patterns of interaction between two or more images. In our case: how an hand can interact with concentric circles or twisted wires?

According to the Generative Design approach[1] and thanks to an open source 3D graphics and animation software, we have built an animation to simulate how these three attributes, as expressed through images, could interact.

Then we can *see* the interaction: the hand, with its past memories (showed through the re-semantization of the urban elements), links to the other hands creating the twisted wires, actually the

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[1] "Generative Design is a morphogenetic process using algorithms structured as not-linear systems for endless unique and un-repeatable results performed by an idea-code" (Soddu, 1992).

relationships. And through this network of relationships the processes of emergence can spread their action through concentric circles.

By the interaction of these three images, we noticed that every image can be related to the others and it can express different emergence processes. Moreover, to this level of observation, the hand may represent the action (e.g. the change), the twisted wires the channels on which it moves, and the concentric circles the mode of diffusion. The Figure 1 shows an example of this interaction process.
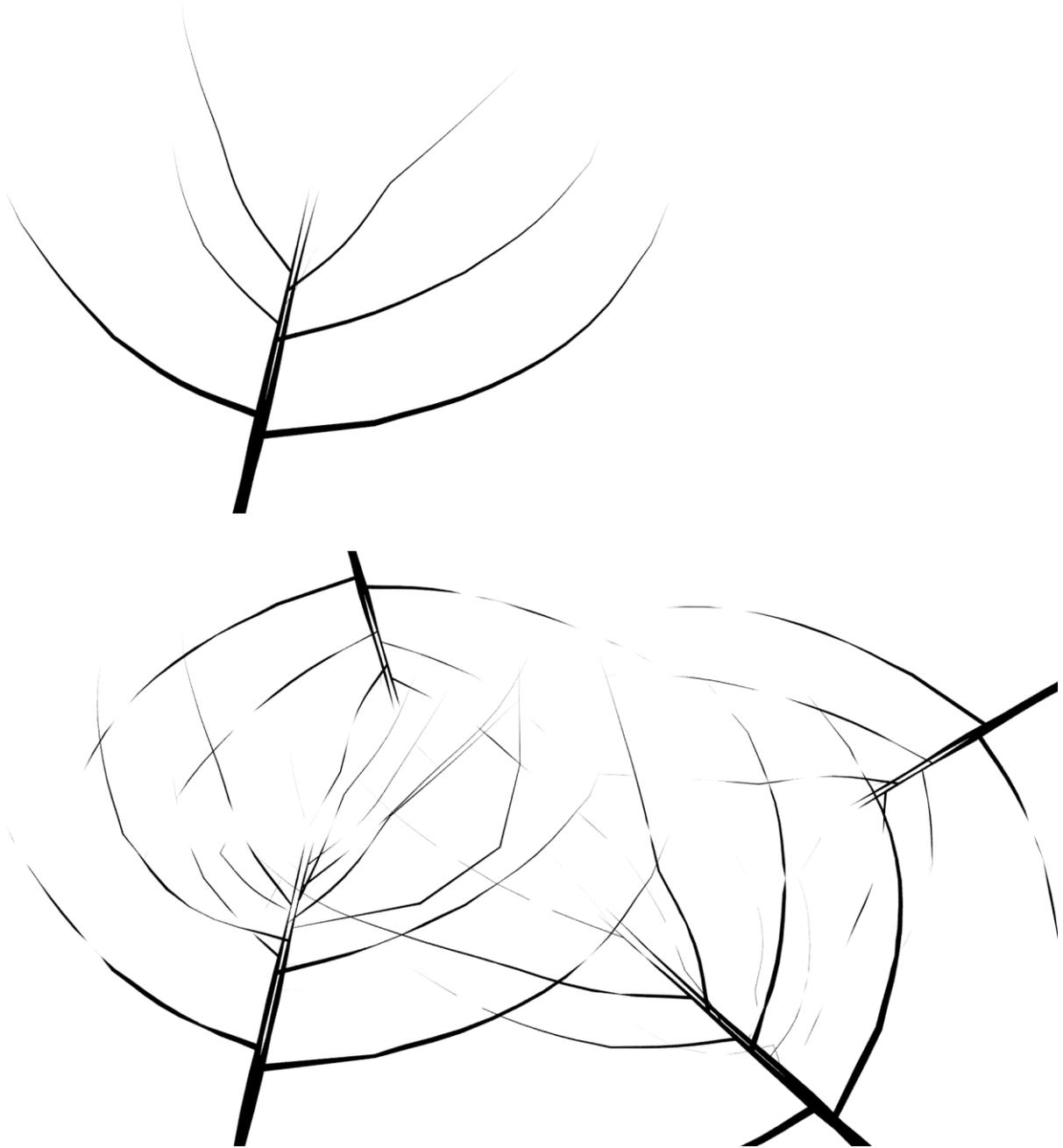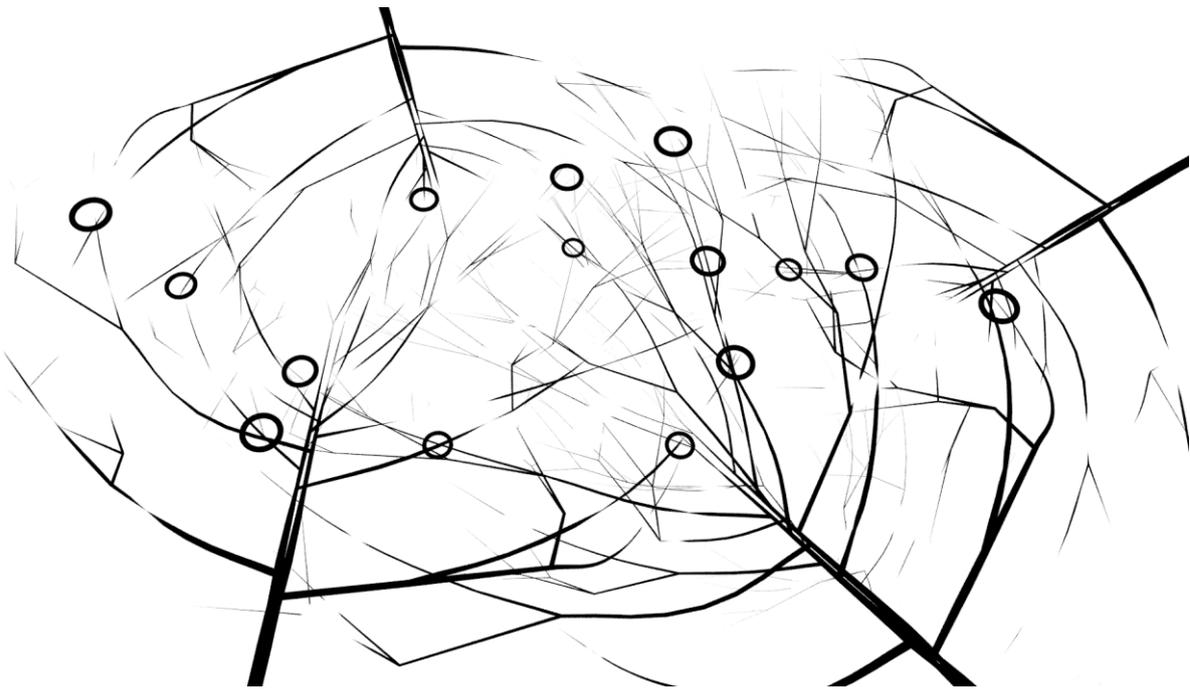
Figure 1. At the beginning of the process there are the hand lines that traces the past memories of the city. Then, by linking different hand lines, the twisted wires emerge. From the intersections of the emerged network of relationships some local actions spread and they expand themselves through concentric circles, overcoming local boundaries and showing the whole complex system.

A META-DESIGN FRAMEWORK AS APPROACH TO COMPLEXITY

Extended to other interactions patterns and images, this exercise at knitting the traces can offer a flexible meta-design framework for managing the complexity of the city regarded as a system. We do not produce a model. We prefigured a tool not directly applicable, but that gives an approach to complexity. Through this approach we figure out the interactions among emergent elements of the city.

In detail, after synthesizing the identified emergent processes of the city through the visualization of an image containing the main features of the processes related to the city aspects, we recompose them into a storytelling describing how the processes could interact together and affect the city development dynamics.

Schematically the approach we suggest has 5 different levels of thinking (Figure 2):

1. Reality Level: at this stage the designers observe the complexity of reality, the processes of emergence and their expression modes. In our example we have focused on emerging identity elements expressed through environmental transformation of the city.

2. Emergent Process Level: this stage consists of the formalization of the identified processes. In our case we had three emergent properties: the re-semantization of specific city elements; the boundary conditions as source of system change; the social behaviours and interactions as soft protests.

3. Deconstructing Level: at this stage the designers analyse and characterize the identified emergent processes. As described above, we focused on three aspects, i.e. past memories, boundary, and relationship.

4. Visualization Level: at this stage the designers figure out the attributes just identified. In our case we have found in three of the imaginary cities of Calvino a perfect correspondence with the attributes.

5. Interaction Storytelling Level: this level aims to knitting the traces making to interact the chosen images. This level allows to identify the categories of the elements, in order to design solutions that take advantage of these specific interactions. In our example this stage was made possible thanks to a 3D animation software and an underlying approach of Generative Design. It should be considered as a simple tool for the interaction storytelling level. Designers can choose the most suitable tool for this level, according to their skills and to the characteristics of the processes identified. The focus at this stage is the resulting storytelling, not how we build it.

Furthermore, we have to clarify that the interaction pattern described above is one of the possible combination in terms of interaction storytelling. It is possible to combine them differently or in new ways, according to meta-design attitude we suggest.
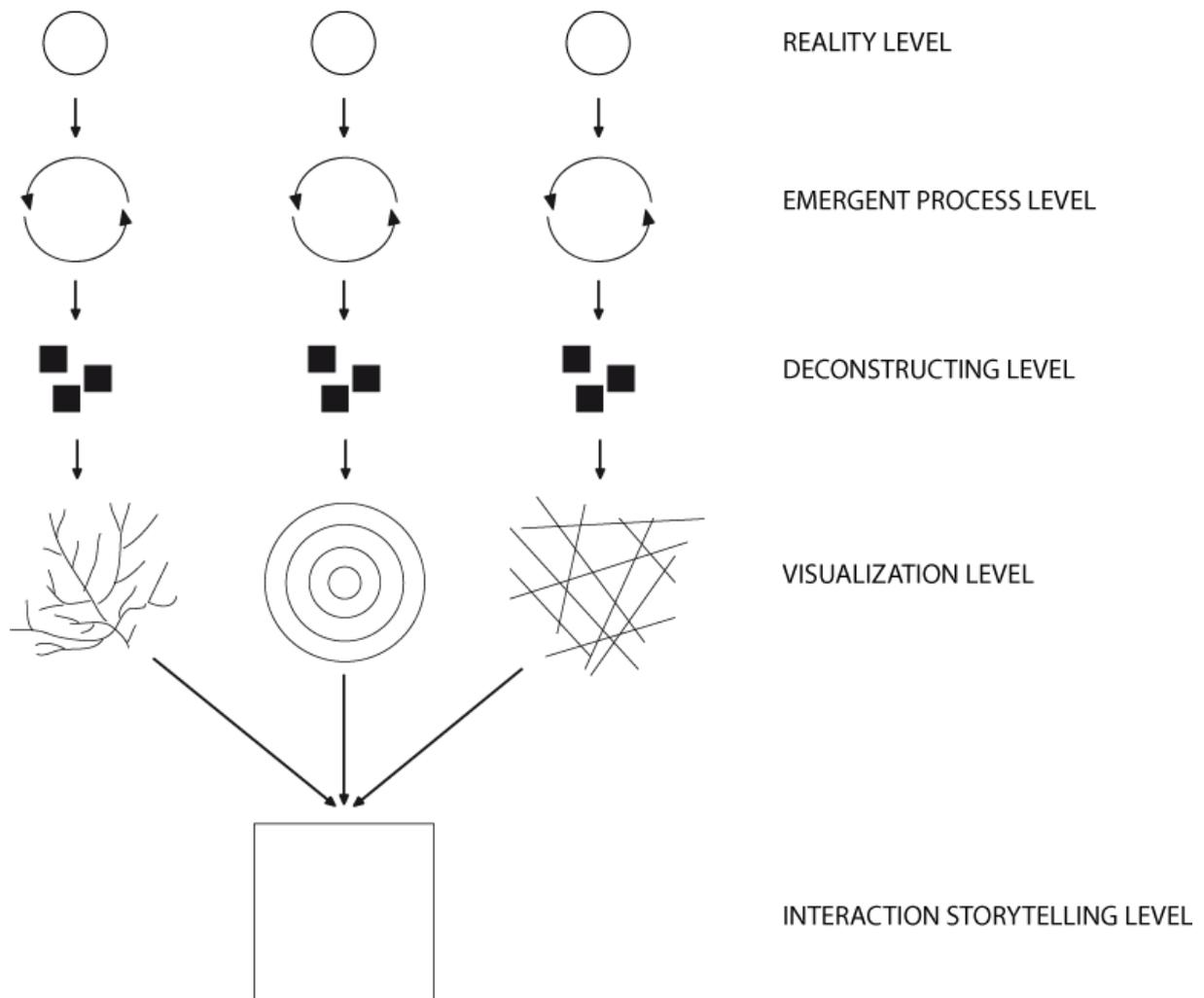
Figure 2. Sketch of the meta-design framework.

CONCLUSION

In a previous study we identified three emergent city properties expressed through environmental transformations. In this paper we try to systematize the process of interpretation of the processes of emergence. So we have prefigured a tool that gives to the designers an approach or an attitude of meta-design by extracting city properties from the complexity, visualizing them and coming back again to the complexity of reality through the storytelling level.

Thanks to this approach, designers could empathize with the attributes of the emergent city properties, in order to find suitable solutions that meet the city (and citizen)'s needs expressed through these emergent properties.

This approach allows the designers to understand the processes of emergence and their attributes through the use of visualization tools, in order to "empathize" with the city.

This type of approach can help to figure out very complex systems, as cities, in which, as the Gestalt Theory says: "the whole is greater than the sum of its parts".

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FROM SOCIAL MOVEMENTS TO THE COPRODUCTION OF THE CITY: THE RENEWAL OF THE RIGHT TO THE CITY IN THE CONTEMPORARY MAKING OF PUBLIC SPACES. THE CASE OF MADRID AND BRUSSELS

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Abstract/résumé :

The article is based on the observation of Madrid and Brussels, where we can find recent similar claims for including each of their citizens in the city-making processes. Although Madrid has no experience in participatory planning, and Brussels is considered as one of Europe's pioneers in this matter, with more than twenty years of experience, both cities encounter analogous citizen demands and self-organized actions for creating spaces that follow an ideal model that is more in line with some citizens' requests.

These demands range from asking for more possibilities in which citizens express their opinion and ideas about their environment (a new governance), to the requests for disposing of underused spaces for creating socializing places to gather (a new production of the city). Though, these urban social movements as Castells defines (Castells 1973) are not limited to mere demands, but also and nowadays systematically, they tend to pass to action and to hand the leading to empowered citizens.

Thanks to crowdfunding, some projects don't even wait until obtaining a public funding: once the building permit is given (for a permanent or temporary project), the budget for the realization comes from anybody who wills to be a sponsor. The online crowdfunding method can be applied also to crowd-thinking, crowd-creating and crowd-debating about the relevance of the project. Indeed, thanks to online networks and to mobile applications, citizens can not only express their discontent with the poor condition of a street or street furniture, but they can also make proposals and connect to other people to bring a collective solution to the matter.

This vast range of means of production of the city in which its citizens struggle to achieve their ideal of a more inclusive city-making process, supposes that the degree of citizen empowerment is also broad. Notwithstanding the fact that the means used by Madrid and Brussels' citizens to be included in the city-making are so diverse, many of these means claim to embrace a common Henri Lefebvre's Right to the City.

The article retraces the citizen-led and citizen-organized production of public spaces in Madrid and Brussels, intended as places to gather but also as places of discussion about the city-making, during the periods before and after the global crisis of 2008. The idea is to find the ways in which not only the governance is reconsidered to include citizens, but also the urban practices are questioned about their inclination to confine citizen participation only to the preliminary inquiries to a concrete project. Through the exploration of several cases of city-making which include citizens of Madrid and Brussels in the processes, the article questions which kind of Right to the city do they constitute: which are the city models defended by these practices (whose rights to what city? Brenner et al. 2012)? Are they a revision of Lefebvre's theories in a (global crisis) context? Or are they a reinterpretation of Lefebvre's Urban Revolution (Harvey 2013) responding to the contemporary withdrawal of the national state of many areas of the social life?

Keywords / Mots-clés :

participatory planning, empowerment, Right to the City, coproduction, public spaces

1. BEYOND THE OPPOSITION BOTTOM-UP / TOP-DOWN

1.1 From debate to action and vice versa

Nowadays, it has become evident for many urban planners to understand their practice in a systemic approach that relates planning with policy making, social inclusion and bigger issues instead than conceiving it as a mere spatial development. In this way, urban planning is constituted as a multi-actor system in which the actors are supposed to be included in every part of the negotiations to achieve a consensus or a compromise. But the division of the city-making processes in several separate fields is precisely what enhances the segregation between an elite of different experts (responding about mobility, housing, green areas) and the relegated locals who want to express their ideas in participatory processes but feel overwhelmed by how the process is cryptically presented (supposing this participatory process actually occurs). The analysis of the last forty years of struggles for demanding citizen participation in Madrid and Brussels shows similar evolutions of the different actor interactions and roles, according to an institutionalization of participatory practices. This evolution varies from the demand of the creation of these practices, through the implementation of the methods to achieve a greater number and variety of participants, to the challenging of the concept of participation to include other forms than what is statutory.

Urban activism demanding for the right to interfere in the decisions made by politicians and public administration appears mainly related to demonstrations, debates, and media coverage. But is some occasions, the demand can be accepted, the demonstrations are calmed down and activist demands are included in planning procedures. An eventual institutionalization of the popular assemblies can even occur. Activists who are confronted with starchitects and top-down architectural practices end up demonizing the whole planning procedures as they don't correspond to an ideal of transparence and open city-making. In fact, many good architects from all over the world became known as starchitects because of what was untended as oversized ego: to people, architects seem to contest hearing citizen demands about the project. Nevertheless, this problem was more due to a lack in planning procedures that didn't include participatory processes, than to architect's ego. To the demonization of architects and planners by the activists, the first respond with a shift in their procedures, opening them to a more social perspective, offering their ears to people's demands, through participatory measures. Debates about urban renewal operations are also organized by less protesting groups such as architects willing to broaden the interest for their work, allowing the citizens to express their views about the plans or proposals presented. These debates can even take form of events or festivals to promote the urban renewal plans and call for remarks or proposals. What appears to be less visible is the production of the city by the groups that don't have a clear connection with activism or urban renewal plans, but one way or another they struggle to encompass more urban justice through local actions. These groups have somehow a double heritage: a first one coming from the tradition of anti-authoritarian activism of the seventies and a second one, coming from a more social practice such as advocacy planning. This double heritage produces nowadays a hybrid citizen engagement in which practices are no longer top-down or bottom-up: they are a combination of both.

There is a new portmanteau word for that: co-production. The co-production of the city is a new concept that combines the procedures of a market-driven economy with a multi-actor (intended as public and private stakeholders) for setting up projects of urban renewal. But it can be intended as an opportunity to engage people in the process: empowering them so as they can be involved as an equal part in the negotiations for the setup of the project. In this context, architects can choose to have the role of local projects instigators, fostering citizen empowerment so that people can make proposals, or to limit themselves to the role of mediators, orchestrating the participative process so that it achieves a greater citizen inclusion. This is what we can call today in several manners: Handmade Urbanism, Tactical Urbanism, Co-production of the city, Rebel Urbanism and Radical Urbanism (just to say a few).

In the end, several interpretations of participatory urbanism can be related to one same major fight: preserving and better using the environment as well as having major community engagement. Doing so, these practices (whatever they are called but from the bottom-up or from the mixed perception)

position themselves against the heritage of Modern Urbanism as a city-changing process (imposing the supremacy of big operations, segregated functions, cities made for cars, superblocks and towers).

2. FROM SOCIAL MOVEMENTS TO THE COPRODUCTION OF THE CITY

2.1 Triggers of the Social Movements in Madrid and Brussels

The end of World War Two led to a period of urban renewal in many cities of the globe that followed the precepts of Modern Urbanism. Even Spain, who did not participate in this generalized War but was devastated by its own Civil War, conducted big reforms and built infrastructures to reunite the country, mainly between the 50's and the 60's. During the mid-sixties, we can find similar citizen demands in Madrid and Brussels, struggling for a more social production of the city. In Madrid, with the end of the dictatorship approaching from the early seventies, local associations federated to demand the abolition of the authoritarian power and the creation of a social welfare estate that could provide better living conditions to city-center and peripheries' dwellers. The associations also fought against the excessive public intervention in infrastructures, at the expense of the investment in the consolidate city. In Brussels, the citizen association's fights were targeted against the big works for modernization of the city, demanding the return of the traditional city model.

Madrid, as a capital and industrialized city, has been attracting workers from all over the surrounding central Spain, especially after the end of the Civil war in 1939, increasing the number of inadequate housing and public equipment of the city. Despite the modernization of Spain through Franco's infrastructure works, the housing and public equipment popular complains were not totally satisfied by the end of the dictatorship in 1975. The last years of the Franco's dictatorship where characterized by anti-authoritarian struggles, similar to Paris' struggles during May 68' movement, although they were covered by the political context. During this repressed context several local associations were born. Despite the fact that many of these associations were related to the socialist or communist political parties, they had to defend the Right to the city (Lefebvre 1968) through nonpolitically related assemblies (to avoid repression). The end of the dictatorship marked the beginning of the democratic era and the increase of the creation of several local associations. More than twenty local associations were created in those years. Their struggles managed to achieve a well distributed network of public schools, decent housing, public lighting and water, consolidating the informal settlements of the suburbs and the slowing down of the declining city-center.

The Brussels's World Fair in 1958 gave green light to several big projects for high-rise office buildings and car infrastructures such as traffic lanes and parking lots. These big projects were considered as a same and unique process popularly called "brusselization" by its opponents. *Brusselization* was considered such a specific process that it was treated as if Modern Urbanism had more radical proportions in Brussels than in any other city that followed the precepts of International Style. This transformation period triggered a new critical movement that led to the creation of more than one hundred local committees to fight against evictions related to big projects and to promote urban planning through city reconstruction, following the ideal of compact city. Several of these committees were assembled under the name of Atelier de Recherches et d'Actions Urbaines (ARAU), created in 1969, and Inter Environnement (IEB), created in 1974, still active nowadays.

Local associations in that period struggled to return to the traditional city model, with human dimension (not made only for cars), small and medium housing (not towers) and the preservation of existing patrimony. Their struggles managed to achieve political acceptation of the demands and the inclusion of transparency measures in city-making with the public enquiry prior to every building project, compulsory since 1976. This shift in the urban agenda, was remarked by the architect Jacques Aron, formulating the hypothesis (Aron 1978) of a new turn in Brussel's urbanism practices: the militancy practiced by the quarter committees, ARAU and IEB was no longer against the political power but working as a pair to build the urban agenda. According to Aron, there were two groups of actors working together in the system of the city-making: the group constituted by public administrations + politicians + experts, and the one in which residents gather (temporally or in the long run) for demanding to be heard about the projects for which they feel concerned.

Despite the political differences, the first period of citizen activism in Madrid and Brussels was marked by the return of the model of the traditional city (after the shaking provoked by International Movement) and the return of the supremacy of the "local" citizen over the newcomer or the simple "user" in the media covered by the activists and local associations. The urban model to be followed was the compact city in which every quarter is self-sufficient in terms of decent housing, public spaces, social and cultural equipment and so on, all provided by the public administration with the agreement of the community.

2.2 Struggles for citizen participation in Brussels

Although Participatory Democracy was challenged during the sixties-seventies, arguing that people were henceforth sufficiently informed and active to be included in all the democratic procedures, Participatory Urbanism practices had to wait a little more. The 1998 Aarhus convention, formulated firstly during the Rio Earth Summit in 1992, established the conditions for the participation of the people in the decision-making processes related to the environment, but the translation in local laws of every signatory was subject to different interpretations.

Brussels became a separate Region in 1989, changing the distribution of the urban competencies, from the Federal to the Regional level. With the new distribution, the activism fights recovered more importance, since their demands were directly included by the institutionalized members of ARAU and IEB. The institutionalized activism, fostering a more social and environmental-friendly planning, managed to adapt the environmental laws of the Earth Summit, giving birth to the Quarter Contracts in 1994. These public contracts were established to implement urban renewal in the neighborhoods defined as most in need, with the help of participatory planning. The Quarter Contracts have been evolving since, becoming a model of locally engaged communities, but rising up some critics that questioned to major issues: how to apply them outwards than were they are statutory? And how to include the dispossessed and the deprived (not only well prepared people) in the decision-making?

Parallel to the urban renewal participatory practices, the old patrimony of Brussels was protected and the traditional city promoted. The teachers and students from the architecture schools of Brussels felt somehow, in the one hand, attacked in their competencies about how to deal with patrimony, and in the other hand, misunderstood when trying to give value to Modern architecture such as the Martini Tower built in 1958 and dismantled in the beginning of the two thousands. Thus, some of them started to defend the *architectural creativity* demanding more room for manoeuver when dealing with complex urban plans and urban renewal proposals. In 1979, the architecture teachers of the School of La Cambre who were close to the philosophy of ARAU were precluded from their teaching practice, leaving the self-called *creatives* teachers in the school. This event was surnamed the "Affaire de la Cambre", dividing the architecture debate among the activists in one camp, and the partisans of a new turn in architectural practice, in the other camp.

The occupation of the old train station building in Luxemburg Square in Brussels in 1995 (within the area of the European parliament under construction) was more a festive intervention to demand the right for citizens to express themselves about the urban renewal plans (for the European quarter) than the preserving kind of activism led by ARAU and IEB. Several other public debates were organized between 2000 and 2003 to make proposals against the dismantling of the Martini tower, enlarging the pros and cons of Modern Architecture. The architecture activists struggled against the associations ARAU and IEB, criticizing them as passéists or backward-looking. The launching of the debates and campaigns was made by a large group called Disturb constituted by several architects and even some activists from local associations. This kind of open-debate demonstration was defined as a new shift in urban planning by the architect Benoit Moritz: the second turn, referring to Aron's as first turn. The characteristics of this new type of citizen engagement were the open debate, the discussions about the possibilities of architectural creativity, the organization of competitions to have contemporary architecture proposals and a festive nature instead of a demonstrative one. The people engaged in these activities were not only architects but also artists, some local associations for social cohesion, and even people from the administration of cultural centers such as Recyclart.

The group Disturb gained media coverage in 2003 teaming up with several local associations from Flagey quarter for the organization of the call for ideas for the planning of the Flagey square. The building of a parking and a storm basin underneath the square was supposed to be covered with a simple concrete layer with parking lots. The call for ideas was expected to open the debate about public space renewal in Brussels, focusing in one question: how to achieve a more qualitative design while making the people involve themselves in the planning procedures, giving their ideas? The operation was a success story because the group achieved to make the city council organize a real competition in which the winner had to offer a good design (not only the concrete covering of the area) and engage with the local community in a participatory planning. By the end of the works, the architects were supposed to organize also a community group that will be in charge of the program of activities on the Square. Instead, the Council took the role of the programming. Several local groups of residents of the surroundings still nowadays organize activities on the Square but no purposed group is created to combine a locally empowered community.

By the end of the first decade of the 2000's, Brussels had two ways to enhance citizen participation. The first comes from the legal procedures associated to renewal plans in quarters defined as in need by the EDRLR perimeter (Espace de Développement Renforcé du Logement et de la Rénovation). The second is not meant to be intended as proper citizen participation but as it enlarges the popular debate and seeks for citizen alliance in the demanding for more open procedures (open competitions and collaborative workshops), it could be understood as a new activism that offers a greater Right to the city.

2.1 Struggles for citizen participation in Madrid

In Spain, the demonization of architects and their practices didn't come only by activists fighting for preserving their neighborhood: it came by the architects themselves. But these architects were not merely fighting to have more competitions an debates. With the example of the Bilbao effect, every major city in Spain wanted to transform their industry-centered economy into one driven by real estate and tourism. Madrid followed this trend, expanding the land use until doubling the surface of the city but not its population, exceeding the demographic previsions. This growing process was in fact part of a speculation bubble that exploded later on during the 2008 crisis. Facing that, some of the architecture students and teachers of the ETSAM school, decided to promote a more social architecture where the real needs of the population were met, and the end users can even be involved in the building of the projects.

Since creativity and the promotion of architectural and urbanism competitions were not lacking in Madrid's context, the citizen struggle close to the Brussels' case was to enlarge the discussion about urban planning and architecture to include the people in the city-making, instead of giving the project to a renowned group of architects that will not engage in participatory processes. In this sense, the architect Santiago Cirugeda from Sevilla started his career in 1996, inspiring many architecture collectives all over Spain, promoting a hands-on strategy that hacked the urban procedures to make people build their environment according to their desires, with their bare hands. His purpose is also to show young architects and students another way of doing architecture: closer to the people and their concerns, observing their environment, making proposals to be directly built with very little budget and finally not waiting for a competition to "appear" and save their lives. His guerrilla architectural practice proposes urban furniture for occupying boring squares, empty lots and even parking lots. His idea is to empower people to modify their living environment, while giving them another vision of architects (not only starchitects exist) so as people can express in larger urban debates about the reusing of the city through other ways than big renewal plans. The practice of Cirugeda became a sort of urban hack-tivism (as another group from Sevilla calls it: Hackitectura) or even art-ivism, somehow similar to the one developed in Brussels during the late nineties, beginning of the two thousands.

The urban renewal plans in Madrid followed Sevilla's trends: the procedures were applied top-down without public enquiry in such a violent way that not only local associations demonstrated but also architects in line with Cirugeda's views. As an example, the case of the renewal of the Agustin Lara square in Madrid can be paradigmatic. During the late nineties, local associations around the square

demanded the renewal of the medical center situated in one of the edges of the square. The public administration, facing the degradation and drug-trafficking in the area, decided to renew the square with an underground parking and a stone covering. Despite several demands of the local associations for a more family-friendly planning of the square, the renewal works ended up with no playground and no obstacles to obstruct the view of the police servants. The associations appealed to more socially conscious architects to make a counter-proposal. As a reply to citizen demands, the administration added a marquee for having a shadowed area and stone benches underneath. The whole struggle was documented during the central three years of the process, producing the documentary "A ras del suelo" (at ground level, which could be also understood as from the bottom). No participatory planning was achieved, in contrast with the case of Flagey square in Brussels.

2.2 The co-production of the city

In 2001, a group of architecture students from Madrid founded the collective Basurama (contraction from Basura + ama = love your trash), inspired by Cirugeda's new way of opening architecture to a more social practice to foster a larger debate about the reuse of urban resources. Their name was created for a festival organized to think about the renewal of the city through the reuse of its urban voids while rethinking how to have a better management of industrial waste. After seven years of trash-reuse, city-reuse, festivals, and workshops, in 2008 part of the members of Basurama export themselves to South America to explore other ways of community engaging for the "cause" of urban reuse, with the project RUS (Basurama 2011): Residuo Urbano Sólido (solid urban waste). Since this project, several playgrounds have been built in favelas and brownfields allover Latin America.

For the Nuit Blanche 2010 in Madrid, the municipality chose to give Basurama the curatorship role of the event. The group, often in contact with several other groups of architects, artists and *empowered citizens*, decided to organize a call for proposals to other collectives with the same philosophy to collaborate in the organization of the night event. Some groups who applied to the call decided to focus on the lighting, others on the games people could play, but every project had to have a reflection on how to create spaces for leisure and family-gathering that could become permanent. Thus, the temporary occupation of a 5000m² urban void in the city-center during the Nuit Blanche festival, ended up to be an excuse to create what it became Campo de Cebada: a community space where neighbors can gather to play basket, organize theatre events and outdoor screenings, take care of the orchard…etc.

The plot occupied by Campo de Cebada rules under a contract of use with the public administration that owns the site. The contract establishes that the people who manage the place must form a council and have an identified speaker, role taken by Basurama among other collectives. But the place is regularly managed through public assemblies in which everybody is invited to express his/her ideas and make proposals for the programming of the place. Campo de Cebada has thus won several prices (for its design and its management system), it has received media coverage (as an urban experience that challenges the way people can engage in a local community, built their own place and manage it) and has been remarked by the Academia (Erik Swyngedouw 2013) as a symbol of repolitization of the city, and Adam Greenfield (Greenfield 2013 and 2014), as another way to conceive Smart Cities: through Smart Citizens.

On the opposite side of Brussels' model, Madrid did not follow the environmental convention of Aarhus until 2008 with the modification of its Land Act to embody measures of transparency to urban planning. That meant that for more than fifteen years, Madrid was at the back of the pack with regard to participatory planning. Thus, it became a frequent claim for both activists (from the local committees) and for architects (from the art-ivism, festival-philosophy). That constitutes the mayor difference between Madrid and Brussels: in the first, there is no participatory procedures (so the fight is to create the frame for them), and in the second there are the Quarter Committees and a compulsory Public Enquiry but these procedures can't be applied outside specific perimeters and clauses. Despite this difference, and since at least 7 years, in both contexts people, architects and artists federate to rethink planning procedures to empower citizens to achieve a decisive role in the making of the city.

2.3 The enhancement of citizen creativity

After the first decade of the two thousands, the European program for culture changed from "Culture Program 2007-2013" to "Creative Europe 2014-2020": consecrating the beginning of the "creative" reinforcement programs. Since that, both in Madrid and Brussels we have been observing a sort of enhancement of citizen creativity in the promotion of culture.

In 2012, the German Goethe Institute of Berlin chose Madrid for the implementation of a first research about citizen participation and political engagement for urban issues, for a project called *participar.de*, in collaboration with the Cervantes Institute. This project was conceived as a platform to promote creative views of citizen participation (other than settled planning procedures). Two years later, a new project between the two cities was born: the We Traders travelling exhibition, focusing in the impact of the 2008 crisis on the collectives for citizen participation. Several other cities joined the project, such as Turin, Lisbon and finally Brussels. One city at a time, the local initiatives are presented in a format chosen by the local curators. The venue in Madrid was intended as an opportunity to gather all the citizen collectives that contribute to the city-making: environmentalists (engaged in the urban orchards networks), architects (who build urban devices for citizen empowerment), locals from the citizen associations (who organize festivals and debates about forms that combine Participatory Democracy with revisited citizen participation), etc. The Campo de Cebada was also presented during the venue as a local device that challenges the participatory practices and the way in which public space can be used and managed collectively. The exhibition in Madrid was pointed out by the other cities organizing the event as a quite remarkable because of the organizers' capacity to gather all the local participatory stakeholders in a collaborative production, taking the shape of an open regular debate. One of the explanations for this success is that the different collectives from Madrid knew already each other, forming a network of networks so that they could amplify the call for collaboration, having a bigger impact. This experience has been a trigger for other collaborations between the different collectives in Madrid.

The exhibition in Brussels was also intended to work on a regular basis, gathering people for debate, but it didn't really work. One of the reasons for this flop can be found in the fact that Culture in Brussels is divided in two communities: the Flemish and the French one. Thus, only the collectives that work in the two languages knew each other and started collaborating. But no collaboration is known to be started within the frame of the exhibition.

The exhibition SmartCitizens organized in Madrid during 2013, considered citizen creativity as the producer of a more social city instead of a Smart City. Paisaje Transversal, another collective from Madrid, curated the event making the statement that any city is smart without smart citizens. By doing so, the citizen creativity enhanced by the exhibition was focused principally in ways in which people can organize to compensate or overcome lacks in their everyday life, more than focusing on smart devices. Thus, the selected experiences presented were classified according in the roles people can play in the systemic frame of city-making: as sensors, as informers, as decision-makers, as entrepreneurs. The "sensors" refer to mobile or online devices with which one can demand for the reparation of one's street (such as Fixmystreet). The "informer" role is taken by people who use several devices to inform other how to deal with mobility-related problems (such as MyTaxi to share taxis, or UrbanSteps to know tips about public transportation). The other two roles, "decision-makers" and "entrepreneurs" are quite similar. The first relates to bottom-up approaches and the second also, but with a more decisive perspective, related to a complete co-production of the empowering device. The Campo de Cebada was classified as "entrepreneurship" because it is not only a gathering place; it is understood as a decisive tool for more inclusive negotiations during decision-making processes. In this way, a wide range of cases is exposed, offering a gradation in citizen participation that suits perfectly the different degrees of engagement people could have for the tailoring of their city.

The « Brussels Academy: making the city together » project was created in 2012 to offer free popular education (a sort of training but open to anyone) to urban issues in order to inspire people to involve in the making of the city. During 2015, the theme was Self City, focusing in 5 topics: Little revolutions (how to change the city without completely revolving the system), Reuse-repair-sharing economies

(for a better use of our objects and urban resources), Mobility (how to deal with the most trafficked city in Europe through other forms of travel), Public Space (collectives producing public space from the bottom-up) and Housing (Community Land Trusts and cooperatives). During the Mobility session, one case related to the concepts of SmartCitizens from Spain, was the one of Velodossier. This citizen initiative asked through crowdfunding to collaborate for the creation of bike lanes in Brussel. The slogan was "Buy yourself a piece of bike lane!" The goal was easily reached but after that, the project could not be realized because of bureaucratic problems. Nowadays, the project is still in research of an issue, to offer way to fund bike lanes and actually create them, without having to wait for the municipality to make them. In the end, many examples could be found in Madrid in Brussels that struggle palliate the contemporary withdrawal of the National State of many areas of the social life.

Another kind of training was created in Brussels in 2007 for the education of members of public administration and planning practitioners, called Pyblik. The training was conceived by some of the people from Disturb association as to complete the planning visions for the public space perspective, considering that there was no vision for how to create vibrant public spaces. Thus, the program created between several architecture schools in Brussels inherited from the second turn of urban planning's philosophy: to open architect's minds (especially those in the administration) to alternative participatory procedures and a more creative vision for public space. Changing the format every three academic years, Pyblik is nowadays constituted by a series of thematic conferences addressed mainly to public administration, but anyone can join.

3 CONCLUSIONS

3.1 Towards a third shift in participatory planning

With the enhancement of the citizen creativity applied to the city-making, we are assisting nowadays to a novel period in planning that focuses in training. Training of the people, as to give them tools for action, assuring a greater citizen empowerment; and training of the planning practitioners, as to make them adapt to a new era of participative procedures not prescribed by law, more creative and less predictable.

In Spain, the absence of participatory measures triggered the fight of the local associations for the right to express and contribute. In this context, architects have become experts in mediation (between the different stakeholders involved in planning) and in fostering new community projects. Thus, the training offer focuses on popular education for engaging communities, giving examples of urban devices created to allow civic engagement. This new experts in mediation are so many in Spain, that had to aseemble to create a bigger movement. In each city, they create also micro-cartographies to map the struggles that can be related and collaborate. The Do It Yourself Institute, created in 2014 in Matadero (a cultural center in Madrid) looks like a normal exhibition but it is in fact a research-based experience that creates prototypes to be used by activists (such as Occupy Madrid), collectives as Campo de Cebada and so on. In the same line, the Citizen Parliament was created by Zuloark in collaboration with Matadero to build mobile multi-position furniture that invites people to express themselves over political and urban agenda matters. When the idea arrived to Brussels in 2010 through one of the members of Zuloark, it had to be changed and reconsidered so as to meet local demands, and to adapt to a less networked mediators' context. As a conclusion, we could say that Madrid's training is more centered on the people, to foster bottom-up initiatives, than in the architects. Few job perspectives remain for the architects who practice the mediation approach in Spain: they tend to enlarge their practices (consulting, curating, training, research…) as to make a living from this more inclusive philosophy.

In Brussels with the presence of participatory planning laws, the context is divided in two camps: on one side, activists trying to empower people through the education to civic engagement (ARAU School, IEB publications, resident platforms) and on the other side, architects willing to educate the public administrations to open their minds to participatory procedures and architectural creativity. The long experience of the Quarter Contracts (more than twenty years running) has created a body of practitioners specialized in participatory practices. Despite the experience, these stakeholders struggle

to apply participatory measures outside the heavy-regulated planning frame. These professionals have become the specialists that apply regularly to act as mediators for the many call for community projects organized in Brussels for funding local collective projects (such as Quartiers Verts, for the greening of a quarter). In this context, the Brussels Academy ends up to be centered in the Academia, the activists publications focuses on the residents, the Pyblik training speaks to public administration, and participatory planning experts are relegated to social work.

What is necessary to put in question now is whether the division in Brussels into several citizen initiatives that work separately and trainings that address different stakeholders of the planning process, could be an initial state of what happened in Madrid during the last ten years, of if it is another complete turn on the way planning in made in Brussels. Could it be the third turn?

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THE DIVERSITY OF HOUSING TYPOLOGIES IN THE SERVICE OF THE COMPLEXIFICATION OF INHABITANT'S NEEDS AND EXPECTATIONS
Observations in the heart of Hainaut

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Big changes constantly disrupt the society and the world. Populations evolve as well as in their lifestyles as in their ideals. Based on the INSEE survey data, Yvonne Bernard[1] has clearly identified those evolutions since the nineties. These social transformations influence the lifestyles within the habitat: the generalisation of woman's work, the modifications of the family group (emergence of a large number of single-parent families, recomposed families, person living alone…) and the reduction of working hours (involving spending more time at home), including the flexibility of use (influenced for instance by the « work at home » which implies the organisation of a work place within the household) cause changes in the way of inhabiting. « *Ainsi la forme de l'habitat et son évolution reflètent très largement celle des mentalités, des moyens d'existence et des modes de vie.* »[2] A difference can also be seen between generations: while for the old generations, the habitat is constituted by private and public spaces clearly differentiated (room dedicated to the everyday life – room dedicated to the family – room dedicated to couple's intimacy), for the young's, spaces tend to interweave, they open up.[3] Not to mention the important demographic evolution that we are facing. There are two reasons for this evolution. Whereas life expectancy is increasing (resulting in a more and more long life), the number and the proportion of old people in the population increase.[4] In addition to those changes, energy needs complicate the whole. The current standards are still little respected: the existing housing stock suffers from critical gaps in terms of energy savings and comfort. But also from problems linked to the financial aspect: a more and more precarious society, difficulties to become landlord, social authorities more and more solicited for social housings construction… In some cities (and even more in the study area specifically targeted: the center-Mons-Borinage), the population has important financial difficulties which does not foster the access to a correct and decent housing. Therefore it is required to rethink housing; to innovate in order to find adaptative solutions for everyones. Housing and its

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[1] BERNARD Yvonne *L'habitat à l'épreuve de la réalité pratique. Quelques hypothèses prospectives* [online] http://www.habiter-autrement.org/01_tendances/06_tend.htm (consulté le 15 09 2015)

[2] ROULEAU Bernard, *définition de l'habitat.* **In** : Pierre Merlin et Françoise Choay, *Dictionnaire de l'urbanisme et de l'aménagement*, presses universitaires de France, 1988, p 392 que nous proposons de traduire par : Therefore the form of habitat and its evolution reflect widely the one of mentalities, livelihoods and lifestyles

[3] DREYER Pascal, *Limiter les conséquences de la vieillesse et de la dépendance, Agir sur l'habitat et l'environnement.* [online] **In :** Gérontologie et société, 2008/2, Fond. Nationale de Gérontologie - n° 125 URL : http://www.cairn.info/revue-gerontologie-et-societe-2008-2-p-167.htm (consulted on the 20/09/2015).

[4] CHARLOT V., COBBAUT N., DE METS J., HINNEKINT B., LAMBERT M. pour LA FONDATION ROI BAUDOUIN, « La maison de repos du 21ième siècle. Un lieu de vie convivial, soins inclus. À l'écoute des résidents, du personnel, de la direction, des experts. Suggestions et exemples de nouvelles initiatives », p 16 [online] URL : http://www.uclouvain.be/cps/ucl/doc/aisbl-generations/documents/DocPart_Habit_MaisonRepos21eSiecle_2009.pdf (consulted on the 23/10/2013)

conception methods have to evolve with the social changes in order to answer the new and deeply more **complex** needs generated by it.

First of all, although it is built on a theorical architectural framework, it is an empirical research method. The research is continously implemented by evolutions and new trends in terms of habitat's space composition through press review[5] and site visits. Examples are collated for the purpose of understanding the caracteristics of the emergent and leading typologies.

This construction of typologies is based on the cross-checking of an observation of the leading housing forms that seem to extend an out-of-date industrial production from the 19th century and of alternative habitat forms that inspire an updating of Durand's concept. Would this updating of the typological concept and especially of its use allow to better consider the changes in the current needs? By extending the classical field of survey and by an adaptation of the mechanisms in the use of the typologies inspired by Lucan, we suggest to switch from a causal perspective of the space composition to a systemic-approach allowing for a greater consideration for the growing complexification of the expectations.

HOUSING TYPOLOGIES AS CURRENTLY DEFINED

But what is a housing?

The tacit definition of what a housing is, strongly induced the observation. It seems that we associate to the housing the « popular » Larousse definition: « *Partie d'un immeuble, d'une maison, où l'on habite*. »[6] The image of the house or the apartment building seems to stick to the one of the housing.

The consultation of sales offers in estate agencies shows in an exemplary way that perception. This restriction of the notion of housing generates a small variety of housing types offered for sale. Little housing typologies are distinguished: essentially villas and single-family homes as well as apartments rarely combined with other types. The "Guide[7] d'architecture moderne et contemporaine" (*Modern and Contemporary Architecture Guide,* literally translated in English)* is a nice example of inventory resuming a set of innovative architectural examples on the territory of the heart of Hainaut, aiming at identifying the richness of the innovative architectural production. The interest of the Guide for our analysis is to present for most of the buildings a plan view. This type of presentation allows to observe the development of some original housing programming especially focused on the integration of an office, a medical practice office or an artist's studio. But nevertheless the traditional housing programming dominates and cases that combine several different housing types answering the social issues previously identified (ageing population, reduction of the family size, impoverishment…) are very rare. Only an exemple of kangaroo habitat as well as the one of a single-family house associated with student accomodations stand out. Even the most experienced architects (which incidentally are not responsible for the programming) generate only a little variety of housing types with respect to what is observable on this territory. The main originality of the architects seems more formal than programmatic. A statement probably extrapolatable to other territories.

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[5] Selected from a series of key words such as « habitat », « housing », « society evolution », « architecture and urbanism »,…

[6] *"Section of a building, of a house where we live."* Larousse, computerized version, [online], URL : http://www.larousse.fr/dictionnaires/francais/logement/47655 (consulted on the 27/09/2015)

[7] DESMEDT I., BEN DJAFFAR L., *Guide d'architecture moderne et contemporaine 1885-2015, Mons et cœur du Hainaut*, Ed. Mardaga and the architecture section of the Federation of Wallonia-Brussels, 2015.

Apparently there is on the market essentially: single dwellings (as villas, semi-detached houses and attached houses); collective dwellings matching individual households (apartments); as well as collective dwellings regrouping sometimes within a same unit an important population (nursing homes, educational institutions, specialized hospitals, prisons, etc). The table below[8] shows the group of basic typologies spread out on the territory as well as the type of families living in those dwellings. It tends to bring to light the causal link between the household types and the architectural typologies existing in majority on the territory (which could be opposed to systemic links creating combinations, agreements and hybridizations between the same elements developed later). A domination of the individual housing with a trend for the elderly persons to frequent adapted housings such as the nursing home at end-of-life.
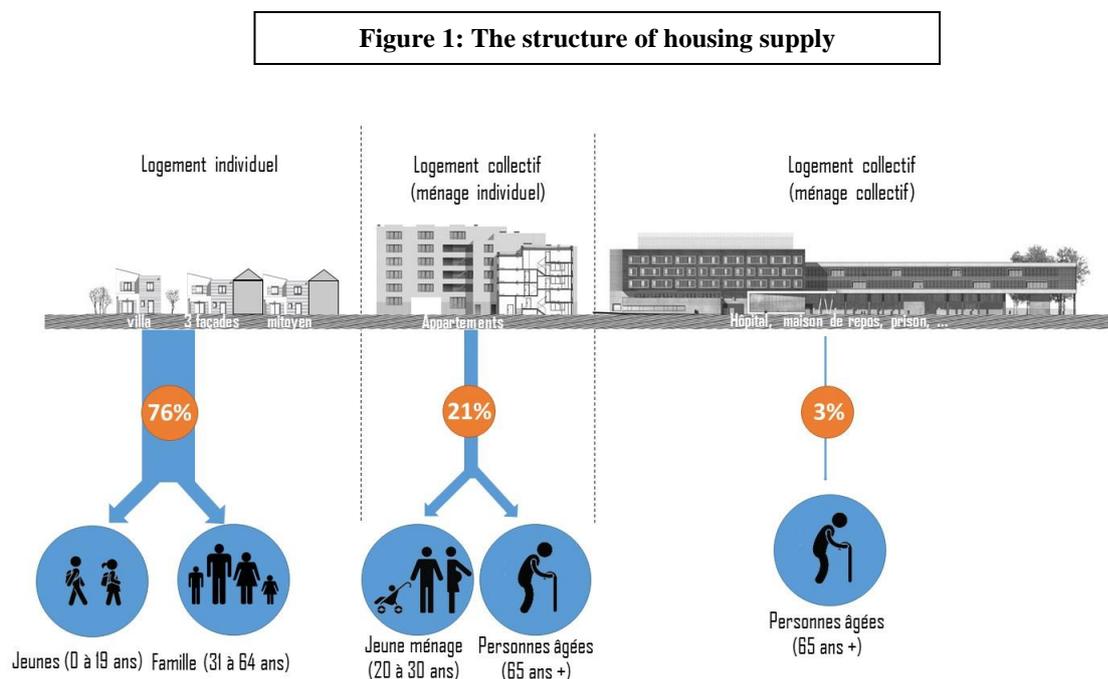
Figure 1: Typology of the current housings

Individual housing :::::::::Multi-family building (individual household):::::::::Multi-family building (collective household)

Joung's (0 to 19 years old)

Family (31 to 64 years old)

Young household (20 to 30 years old)

Working persons (20 to 65 years old)

Elderly persons (65 years old +)

The NSI's statistics confirm this housing structure[9]: distinguishing essentially single-family house (detached, semi-detached or attached), apartment, and studio. Single-family houses

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[8] Schematization of the causal relations, between leading typologies on the territory and social profiles, detected through the offer promotion.

[9] NSI STATISTICS DATA « Private housings occupied according to the housing type and to the building type » Table 00,40 2001

represent 76% of the housing (of which 43% is attached) and apartments 21%. There would be therefore only 3% of alternatives to these two main forms! [10] These statistics don't necessarily integrate homeless, illegals and hardly allow identifying all maladjustment generated by those housing types.

At the moment, the dream of many Belgians is still the detached villa remote out of the city-centre… Not only the production is focused on a particular type but we notice also that turnkey companies take more or less 61% [11] of the individual housing construction market. Those companies reinforce the production of standardized architecture and little diversification. [12] It generates other problems on the territory scale: all the statistical indicators prove it: the urban explosion continues to grow in Belgium. According to the 2001 Housing Census results, the proportion of single-family housing was still progressing during the decade 1991-2001 (+2,6%), notably by the increasing number of low-density housing (+0,3%). This will to build in residential suburbs has grown despite the crisis; provoking the weakening of the activities around the urban centres, in favour of the development of middle-sized cities or rural areas adjacent to big cities, maintaining this way "*the negative effects more and more severe in terms of transports (cost and time), environment et state over-costs on collective equipment and road infrastructure.*" [13] Simultaneously some main quarters in the heart of the cities comprise old buildings and progressively fall into ruin. "*Constituted mainly by private properties that are leased, this housing stock runs down or get reduced gradually as a part of the upper and middle-class leave the cities and as speculative projects are compounded particularly in Brussels. In this way, a part of the private stock gets transformed in residual housings (de facto social housing) for the working classes that can not access the new residential construction market but also for the foreign population arrived in the fifties.*"[14] Is this state reversible or is Belgium condemned to become a gigantic periphery zone mono-functional with a mono-type architecture?

At first sight, the current housing market exploits very little the housing diversity. Though society and its needs are in constant mutations and there is an increasing multiplication of family profiles. We face also a serious increase of elderly people; will they live in this mass of isolated housings that are still widely taking shape?

Simultanemously, many problems appears from new constructions. A gap between citizen lifestyle and innovations chosen by experts without consulting the population can be

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[10] VANNESTE D., THOMAS I., GOOSSENS L., *Le logement en Belgique : enquête socio-économique 2001.* [online] URL : http://statbel.fgov.be/fr/binaries/mono_200102_fr%5B1%5D_tcm326-35799.pdf. (consulted on the 27/09/2015). They can be hidden behind the « other » types or behind the « no answer to the question » knowing that the initial categories of the questionnaire might have prevent the person answering to adequately define the type of his housing.

[11] COENE G., VANHEE N., *Construire ou rénover: plaisir ou fardeau,* **In** : Test achat (mise en ligne 01/03/2006) URL: http://www.test-achats.be/maison-energie/nc/article/notre-grande-enquete-sur-la-construction. (consulted on the 26/09/2015).

[12] VANDAMME Thomas, *Le contexte de la maison individuelle en Belgique*, Faculté d'Architecture et d'Urbanisme de l'université de Mons, mémoire en vue de l'obtention du diplôme d'architecture, 2014

[13] DESSOUROUX C., ROMAINVILLE A., *La production de logements en Belgique et à Bruxelles – Acteurs, dynamiques, géographie*, [EN LIGNE] **In** : EchoGeo, 15 | 2011 : décembre 2010/février 2011, URL : https://echogeo.revues.org/12279?lang=en (consulted on the 26/09/2015).

[14] DESSOUROUX C., ROMAINVILLE A, ibid.

observed[15]. This new and imposed way of inhabitating, despite being ecological and in favor of the planet, generates various problems such as the use of a green wall that increases insects invasion on balconies up inside the dwellings, the floor dry cleaning or the setting up of standby switches which should be a simple energy saving technique is actually also an everyday problem (such as the automatic extinction of all electrical and electronical appliances (notably the one of the television and of the decoders)) that is disturbing. This lack of communication among inhabitants and thus the inhabitant's misunderstanding of the use of their housing, put at risk this new way of habitat. It brings the question to mind, will the eco-districts cause living sickness similar to the one produced by subsidized housing?

ALTERNATIVE HOUSING FORMS TO PUBLIC AND COMMERCIAL TYPOLOGIES

Therefore new alternatives to traditional housings flourished. For the seniors, care residences, reception centers, nursing homes, short-stay centers, day care centres, night reception centers, small living units, residences for elderly people… emerge on the territory. Not only to answer the growing demand but also to offer more alternatives to the traditional way of "housing". For some others, alternative accomodation forms such as settled communities or the kangaroo house multiply today. The traditional way of inhabitating is therefore shocked and tends slowly to be replaced by the creation of new ways of living one's dwelling. A multitude of typologies live together – old and new – to satisfy the different society needs. Although the statement is alarming. The global evolution of the housing stock since the last 50 years is far from being satisfactory. According to the Federal Planning Bureau, the number of inhabitants in Wallonia should be around 3,850,000 in 2030. This represents an increasing of 270,000 people compared to the figures of 2014 (3,576,325).[16] The number of households should switch from 1,541,939 to 1,729,000 (2030) or 2,000,000 in 2060 which represents an increasing of 190,000 units for 2030 and 460,000 for 2060 (it is actually the biggest projection for Belgium within the three Regions).[17] Currently Wallonia answers partially the needs by constructing 14,000 new housings each year.[18] But if we desire to answer the current standards, the price of housing will rise. Would households in vulnerable situations be able to pay their house in the projected conditions?

Currently, 70% of the working population with two salaries can afford a 220,000-euro house contracting a bank loan at 4.5% during 25 years. If we analyse Johan Albrecht and Rob Van Hoofstat's[19] projections, if the construction price was rising of 10% (for example following more severe energy standards such as the Passive) and would reach thus 240,000 euros, they would be only 38% households left to be able to afford it.[20] It is an access to housing cut by half! This indicates that people that are working are in dropout phase and that construction

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[15] RENAULD Vincent, *La vie en éco quartier: « C'est beau, mais y a plein de bestioles »*, [online] **In** : Le nouvel observateur, mars 2014. URL : http://rue89.nouvelobs.com/2014/03/02/ecoquartier-cest-beau-y-a-plein-bestioles-cest-crade-250335 (consulted on the 05/04/2014).

[16] VANDRESSE Marie et Al., *Perspectives démographiques 2014-2060 - Population, ménages et quotients de mortalité prospectifs [EFPOP1460]*, [EN LIGNE], Bureau fédéral du Plan et Direction générale Statistique, Bruxelles, 2015 URL : http://www.plan.be/admin/uploaded/201503170937470.FORPOP1460_10926_150310_F.pdf p. 17 (consulted on the 29/09/2015).

[17] VANDRESSE Marie et Al., Ibid. pg. 47

[18] DEFFET E., *« quartiers nouveaux : 400 sites en vue. »* In : LE SOIR of 02/09/2015, p 4

[19] ALBRECHT Johan, Rob VAN HOOFSTAT, *Pénurie d'habitat. Vers une rénovation de la politique du logement*, [en ligne] Itinera Institute, 2011, Bruxelles, p. 123 URL : http://www.itinerainstitute.org (consulted on the 27/9/2015)

[20] This calculation is based on the principle that all other elements stay equals (no evolution in household's budgets, constant purchasing power, same square meter built, maintenance of the detached house type…)

based on promotion may collapse. Therefore we can imagine that a lack of housing development would accumulate by 2030 and would affect mainly vulnerable people…

Yet "*the lack of housings leads sometimes to the use of non-housing buildings that don't meet the living conditions: rough construction, vehicles hastily converted, etc. for housing purposes. This produces then makeshift accommodation.*" [21] Since the seventies, Turner[22] claims the right to housing for everyone and questioned himself about the method of production of the habitat. Nowadays, these statements still haven't been able to lead to a situation improvement even if exemplary solutions such as the IBA of Berlin have emerged. Some indicators such as the multiplication of homeless and the unhappiness in big cities seems rather showing a worsening of the situation. Massive housing production is still focusing on essentially low-density stereotypes, attached social housings and standardized collective dwellings that are not adapted to the identified social transformations. This production is actually the reproduction of architectural types very little diversified that seem to be based on a misunderstanding of Durand's theories, by taking into account only the part focused on the Polytechnic School consisting on setting the building industrial production methods without consideration for his thoughts regarding space composition.

The typological approach set by Durand, still seems to be used unknowingly as a benchmark, and some principals deserve to be recalled and others to be improved. The origin of these methods can be set at the time of the emergence of the Modern Era. The Revolutionaries and more specifically the Encyclopaedists will build the basis for the scientific methods. In architecture, JLN Durand[23] builds principals that are interesting to put into perspective in order to better understand the current approaches or even to reactivate or overcome some of these principles.

The publication "*Recueil et Parallèle*" (can be literally translated as "*Collection and Parallel*") of Durand expresses the principals he has followed to build his typologies. It shows how we, for the first time, switch from an architectural theory based on tradition and style reproduction to a rational theory based on systematic analysis of forms leading to scientific classification. A parallel with other scientific approaches exists, for instance the ones regarding fauna and flora classification. He would not especially go through site observation but for efficiency issues he would refer to several works from which he would extract architectural plans that he would instruct to this goal. Thus he classifies the different buildings in different "species" which are the programs. He classifies different space types according to cultural mores, practices, climates and materials. [24] It is consisting thus on a synthesis of the beginning of the 19th century of the different architecture types in space and in time. Yet, this universal approach might be put in parallel with the current massive construction of turnkey-style buildings. It requires simply choosing a building type out of a catalogue. Some justification elements from his "collection" ("Recueil" in the original French text) (refer to the written introduction from Durand) expressly motivate his approach by a pragmatic will for

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[21] MERLIN Pierre, *définition de logement.* In : Pierre Merlin et Françoise Choay, *Dictionnaire de l'urbanisme et de l'aménagement*, presses universitaires de France, 1988, p 442

[22] TURNER John F C, Robert FICHTER, *Freedom to Build, dweller control of the housing process*, Ed: Collier Macmillan, New York, 1972

[23] DURAND, Jean-Nicolas-Louis; *Recueil et parallèle des édifices de tout genre anciens et modernes, remarquables par leur beauté, par leur grandeur, ou par leur singularité, et dessinés sur une même échell*e, Paris, 1801

[24] J-L-N Durand, *Précis, I*, 1802, pg 1

efficiency and time saving. The development of work division, mass production and process simplification announce handicraft's end and the emergence of line and prefab production. Therefore we could consider turnkey catalogues as a caricatured application of his approach. As it is the Modernism Period, it may be considered that his first architectural goal is to create mass housing. The « *Cite Radieuse* » (« *Radiant City* ») is a nice example or even the Villa Savoye which is above all considered as a work of art. Yet Le Corbusier's main goal was to answer the issues of his time and to create a product to multiply as his subdivision plan of Savoye Villas attests it. [25]

Figure 2: Sketch of Le Corbusier showing a housing development constitued of Savoye Villas (Précisions, Crès, Paris, 1930)
Image of the subdivision plan/villa Savoye
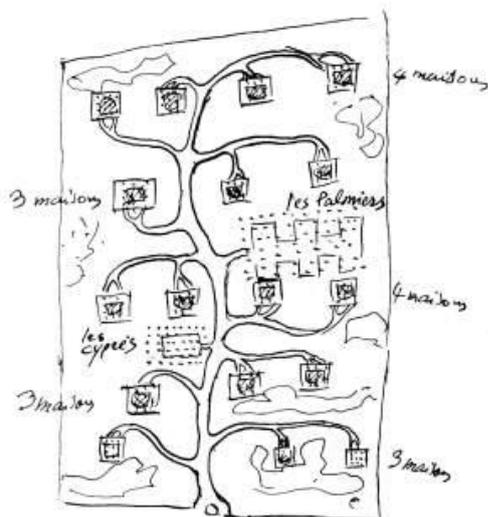
As Kaufmann[26] explains it, at the end of the 18th Century with the emergence of the Neoclassicism, which is the framework in which Durand is working, the heteronomic (complex, baroque) architecture switches to an aesthetic and autonomous architecture. The composition elements are no more chained together as in Baroque but become independent from one another marking the advent of the Neoclassicism. This corresponds to the emerging rational culture. In the same vein, the social contract of Rousseau allows to each individual to become independent from his family. The same is true for the symbolic of the architectural forms.

From an industrial point of view, this corresponds also to a decomposition of tasks in order to facilitate the production. The concept of autonomy of architecture constitutes the cornerstone of Kaufmann's demonstration linking, in provocative way for that time, the aesthetic of Ledoux to the one of Le Corbusier. This autonomy indicates the independence of the building

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[25] HUET Bernard, *Sur un état de la théorie de l'architecture au XXe siècle*, Ed : Quinquette, 2009, p. 55
[26] KAUFMANN Emil, *« de Ledoux à Le Corbusier : Origine et développement de l'architecture autonome »*, Seuil, 2012

elements but also of the buildings between each other, through the freedom in interior layouts and the use of basic geometry.

Durand stands at the crossing of two major innovations: the one of the emerging scientific approach (explaining his construction of typologies) and the one of the industrialization requiring the advent of a simple and multiplicable architecture. Considering his first scientific essence, Durand produces an inventory allowing understanding the architectural production in order to classify the different types of architecture as we classify plant and animal species.

To conclude on this ambiguity, we remind you that since the emergence of human rights, people demands of equality will rightfully generate access to housing for everyone during the states democratization after First World War. This generates mass housings that modernist architects will try to precast and to standardize. Based on a dogmatic and universalising conception of the needs, the use trend of the typologies targets the identification of a causal relation between the « universal » man and architecture: a type of person = a type of architecture. Yet nowadays, the model has become somewhat more complex.

AN OTHER DEFINITION FOR HOUSING

In the light of the apparent inadequacy between current surveys and population growing diversity, wouldn't a new typological construction consider adapted solutions?

A global and pertinent definition for our statement is the one of Pierre Merlin: « *a dwelling is a group of rooms, dedicated to housing and grouping one or more persons constituting a household: a functional unity of which spatial organisation offers an answer to society standards in regards to a specified period. The dimension, the form, the internal layout, the level of equipment of the dwelling are also linked to the structure and to the economic and social level.* »[27]

Couldn't we suggest a redefinition that would allow incorporating in a more comprehensive way the interest of the current housing forms including the atypical ones? This redefinition would offer an enlargement of the field of survey to detect new types of habitats that would better answer the needs and expectations of our time than the massive and stereotype production generated following the Modern Architecture International Congresses.

A central point of this definition of the dictionary of Urbanism is the household. It seems that the implicit definition of it is the legal composition of the family. Yet this composition is undergoing great changes and quickly recomposes itself. By taking into account this aspect, we can expand the field of housing to « any space where a human person lives (whereas his household is officially recognized or not) » in Belgium. In this way our observations extend to many other living places. [28] Therefore these spatial organizations may be used in parallel with more conventional housings. In order to structure our typology, forms are collected according

[27] «un logement est un ensemble de pièces, destiné à l'habitation et regroupant une ou plusieurs personnes formant un ménage ; une unité fonctionnelle dont l'organisation spatiale offre une réponse aux normes de la société à une époque bien déterminée. La dimension, la forme, l'organisation interne, le niveau d'équipement du logement sont quant à eux, également liés à la structure et au niveau économique et social. » MERLIN Pierre, *définition de logement.* **In** *:* Pierre Merlin et Françoise Choay, *Dictionnaire de l'urbanisme et de l'aménagement*, presses universitaires de France, 1988, p 392

[28] These living places do not take into account the administrative and legal aspects linked to the residencial places issues which may be sometimes reduced to simple letter boxes.

their possible occupation time (long term, average (transitional) term and short term). This should allow to take into account the possible affective investment and thereby to consider the possible level of requirement expected towards these types of housings.

Figure 3: Table of typologies (identification of all spaces where we are housed (spend nights))
Legend: Long term / average (transitional) term (transitional) / short term
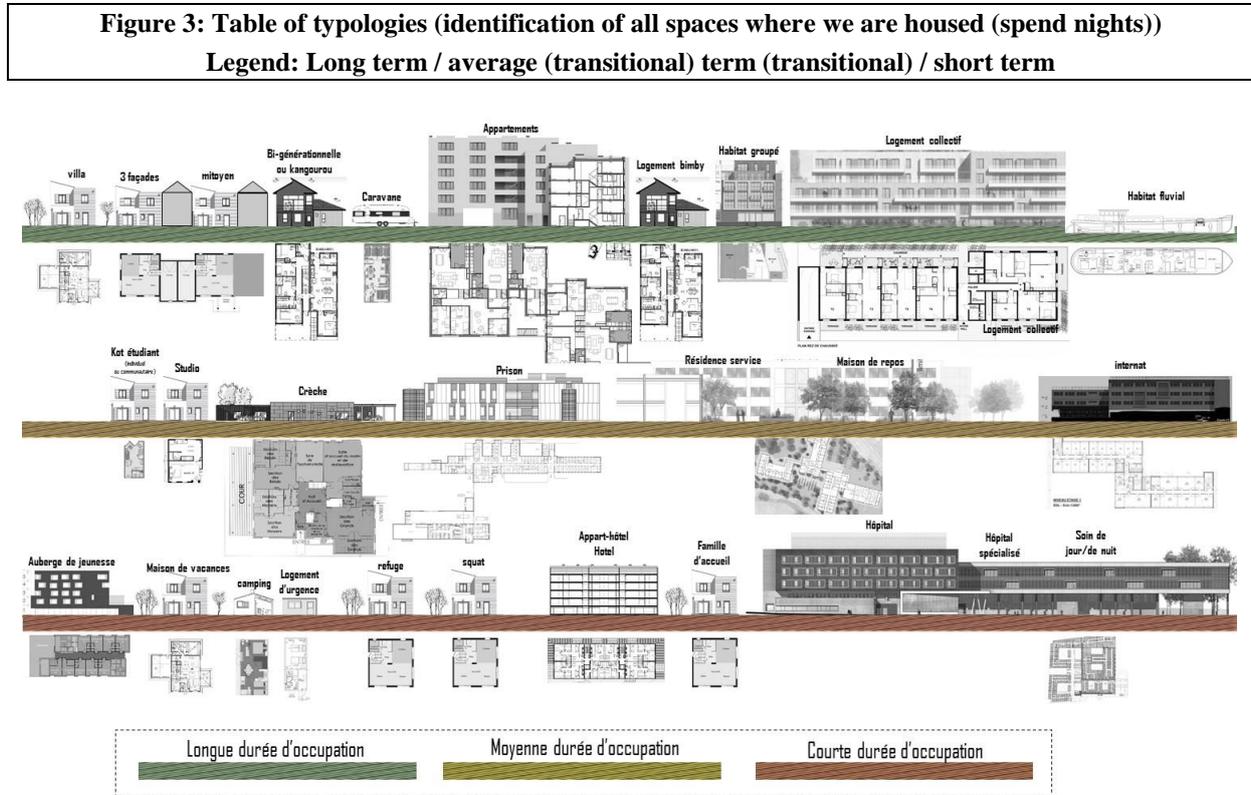
Among these, we can mention:

The group settlement, which is part of the new types of habitats, is currently emerging. It possibly comes from the crossing between the rise in property prices, the will for people with low income to become landlord, the will to build as being part of a group, and the will for a citizen's conception. It offers a clear financial benefit: all project expenses are shared (land, architect, technical team, building materials, and installation) generating a cost between 5 and 15% less than a conventional habitat[29] with the same equipment. Owning property becomes possible. Furthermore, future landlords generally have a will to invest in housings layouts arranged as empty boxes to be filled according to their desires and surroundings. More and more people seem to be attracted to those initiatives and notably to the participative aspect offered by those types of projects. [30]

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[29] FRAAS Serge (Architecte du projet Brutopia), *Coulisses du projet Brutopia, projet de logements collectifs et participatifs, lauréat 2013 du Prix THE BLUE HOUSE/.* Oral communication In : Event organised by La fondation pour les générations futures, the 3/10/2014 in Brussels

[30] FRAAS Serge, Ibid

Out of this emerge a project that tries to take into account everyone's expectations. It naturally establishes, before even entering the housing, a better communication and confidence between neighbours. These assets will continue within the provided sharing places such as gardens, rooms, offices or garages for everyone. The mutualisation of the spaces allows for more comfort for less money. We observe a growing trend to share spaces and belongings (ex: car sharing); indeed society tends to individualise the population while, for some people, emerges a need to switch to a sharing lifestyle.[31] In Belgium start more and more projects of that type as the examples of Brutopia, the Casa Nova Co-housing in Brussels or also the co-housing project in Clabecq. Seeing life's conjectures evolving wouldn't this type of habitat better answer the expectations of many Belgians?

Still little widespread, **the "kangaroo" house** may answer two very current issues. The first one is the desire of the elderly persons to continue their life at their place as long as possible (avoiding this way the retirement house for example). The second issue is to help persons that have difficulties to become landlord, persons with low income.[32] This way, elderly persons occupy the ground floor while the first floor is used by the other part (family, student…). In the situation where there is an aged person and a student in the same dwelling: company and support is given to the senior and at the same time the student can afford a decent housing for a reasonable price.[33] And when it is a family that accommodates a senior, it allows rescheduling its entry to the retirement house.[34]

The third example illustrates young families who cannot afford property because of the land price too high. These families search for one-floor house that they would extend with a first floor and eventually live in this extension. This alternative is very close to the Bimby spirit (Build in My Back Yard). These projects attract mainly by their financial aspect; indeed only the construction needs to be financed as the land is already paid by the owners. Unfortunately no legislation exist for the moment: many questions regarding the law are still pending: What are the rights of the two parts regarding the habitat? Regarding the land? If the aged person died, can the heirs claim ownership of the house in its entirety? How are organised the inheritance rights? So many questions do not facilitate the practical application of this new type of housing.

Nowadays housings construction is becoming more complex; many singularities are noticed through different examples. These examples are of course non-exhaustive and become more diversified with time.

Within the complexification of the society and the build environment, one of the main current trends is the demographic evolution: we live more and more long and the number of aged people is growing. The statement regarding the retirement house produced by the Roi Baudouin's Foundation[35] illustrates the fact. For instance in 16 years the number of very aged

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[31] Site du projet Brutopia. [online], URL : https://utopiabrussels.wordpress.com/the-project/ (consulted on the 25/09/2015)

[32] LUALABA LEKEDE Anoutcha, [en ligne] *L'habitat kangourou,* **In** : Question Santé, Edition 2007, p.3, URL : http://www.atoimontoit.be/index_htm_files/habitat_kangourou.pdf (consulted on the 20/08/2015)

[33] LUALABA LEKEDE Anoutcha, Ibid. pg 8

[34] HABITAT ET PARTICIPATION ASBL, *Guide pratique habitat groupé*, LLN, 2007, [online] URL : http://www.habitat-groupe.be/IMG/pdf/guide_pratique.pdf (consulted on the 20/08/2015)

[35] CHARLOT V., COBBAUT N., DE METS J., HINNEKINT B., LAMBERT M. pour LA FONDATION ROI BAUDOUIN, « La maison de repos du 21ième siècle. Un lieu de vie convivial, soins inclus. À l'écoute des résidents, du personnel, de la direction, des experts. Suggestions et exemples de nouvelles initiatives », p 16 [online] URL:

persons has increased by more than 37%![36] Ageing is an important challenge that deserves serious consideration! New alternatives to accompany seniors in their ageing emerge: residential care, day reception centres, nursing homes, short stay centres, day-care centres, night reception centres, small life units, seniority centres. These different typologies are often provided with an adapted medical accompaniment. Other type of alternative accommodations can answer the needs related to ageing: the grouped settlement, the "kangaroo" house or the concept of foster families. However another type can also be included: fostering a student at home (renting a room to avoid loneliness). We may add also caravans that, by lack of means, become illegally residences for some of them. In other words the group of seniors concerns an **important part** of the different **emerging typologies** previously identified.

Knowing the demographic projections, it is essential to answer the **growing demand**. Therefore a thoughtful and adapted habitat would no doubt allow to postpone if not to cancel the move to a retirement house. Can we overcome the confinement of aged people that often feel lonely at home via a thoughtful and possibly communal architecture?

An alternative to the retirement house or the loneliness of some seniors in their own residence is the **collective dwelling for elderly people**. This may be considered as a hybrid form of the two traditional types of habitats. It is actually a new type of accommodation dedicated to able-bodied seniors who wish to live in community. This situation can happen when for instance children leave the familial residence or when there is loss of a spouse. This system allow to people not to feel lonely and at the same time to keep their independence. It offers no additional service outside of being a residence (not as the residential care or as the retirement house). The accommodation includes generally two parts: a private zone containing a bedroom and a private living room and a communal zone including generally: kitchen, living room, bathroom…[37] On a space point of view, this type of housing offers most of the time comfortable life areas as well as in terms of equipment as in terms of habitation surfaces for an affordable announced rent. [38]

THE COMPLEXIFICATION OF THE HOUSING'S CONCEPTION METHODS IN REGARDS TO THE EMERGING NEEDS

In the light of the multiplicity of emergent types and of the diversity of social profiles, the five classical types often exploited as a turnkey catalogue constitute an out-of-date typology that do not answer the demand. The variety of forms of housing might be compared and confronted to the conception process used. Therefore it is no more question to juggle between five basic types (attached house, detached house, semi-detached house, apartment and other minor alternatives (hospital, retirement house, etc.) but to add other existing types completing this way **the demand for a diversity of ways of living**.

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http://www.uclouvain.be/cps/ucl/doc/aisbl-generations/documents/DocPart_Habit_MaisonRepos21eSiecle_2009.pdf (consulted on the 23/10/2013).

[36] CHARLOT V., COBBAUT N., DE METS J., HINNEKINT B., LAMBERT M, Ibid. pg 16

[37] Internet Website of the association Abbeyfield Belgium asbl . [online], URL : http://www.abbeyfield.be/fr/etre-habitant (consulted on the 29/09/2015)

[38] Internet Website of the association Abbeyfield Belgium asbl . Ibid.

Therefore we could consider giving an answer, for instance, to lonely persons who want to stay in contact with their children without perturbation them in their housing; students who want to stay in contact with their families; sick people who want to stay close to their family…

An additional aspect should be taken into consideration: **combinations** (that put together two types together with one communal entrance for instance), **layouts** (that organize the combinations in a wise order) and **hybridations** (that create an other type based on two existing types) between types are possible. We will see how their wise juxtaposition or their modification generates also another form of habitat answering better the current needs. This way we would allow for a growing complexification of the possibilities in housing layouts answering probably better the intense diversity of expectations and social profiles. This approach of combination, of layout, and even of hybridation of typologies allows overcoming the stereotyped approaches from the housing industrialisation. This way a systemic logic much more complex emerges. Our housing entry key that is linked to the notion of household, lead us to consider systemic in relation with family. As Gregory BATESON seems particularly inspiring in this field and could be considered as the "grand-father" [39] of the professionals in the field, the reformulation of the systemic by a group of practitioners in familial therapies could be particularly operational for our statement on housing. *"Bateson insists on relations between things, on their hierarchized formal structuration, on what he calls "structure that links": everything intertwine, influence and set this way a dynamic. The system of linear causality does not stand anymore. When different elements are in interaction, the behaviour of one element becomes a "cause" for the element that follows in the interaction circuit: the linear causality becomes circular!"* [40]

If from each five basic types – which are the villa, the semi-detached house, the attached house, the apartment and the minor group of other housings – a set 3 sub-types are imagined in each of the five types (for instance the modest worker's housing, the average housing and the large housing moving towards the bourgeois type) linked to the kind of household; 15 combinations are possible… This logic is still causal as for each type of housing, one type of profile matches (as illustrated in Table 1).

Yet the interest to "destandardized" is to offer a variety of solutions through types combination, to answer to the lack of housing mixity on the territory (we remind you the large part of the market owned by the turnkey buildings) and to view the complexity of the variety in parallel with the **more and more diverse demand** of the population having different social profiles. As Turner explains it, man should not enter in boxes that are predetermined by standards (this tends to reduce housing quality instead of enhancing it), but should have the possibility to make his own choices by being involved in the production process. [41] It is the reason why, inhabitants are sometimes more happy in their slum, where their social

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[39] GAILLARD Jean-Paul, *« Sur le façonnement psychosociétal en cours : enjeux psychothérapeutiques et éducatifs »*, *T*hérapie Familiale 2007/4 (Vol. 28), p. 350. DOI 10.3917/tf.074.0349

[40] PAESMANS Cécile, BILOCQ Céline , JULÉMONT Carine , STASSE Jerôme, Gregory Bateson, *lesson notes* [online], URL : http://www.systemique.be/spip/spip.php?article186 (consulted on the 29/09/2015)

[41] TURNER John F C, Robert FICHTER, *Freedom to Build, dweller control of the housing process*, Ed: Collier Macmillan, New York, 1972, p. 173-174

environment suits them, rather then in a government housing that would cost more but would not answer their needs. [42]

If we transpose this destandardization to the spatial composition, by applying the same exercise than the one applied in classic typology on our un-standardized housing conception, we multiply the possibilities. Simply by combining the 31 different types of habitats (non-exhaustive list) to the 3 basic sub-types, **the whole is clearly becoming more complex**. In a systemic logic, these 93 new types can recombine with each other. If we combine only 2 types with each other, there are already 93x92/2 possible combinations at the start, this means 4278 new types… And by combining them 3 by 3, the result is 129,766 new possible types. This quick calculation shows that if we accept to combine the architectural types with each other, the composition would be much more complex than our current conception methods that works with separated categories. Of course, the main goal of this calculation is not purely quantitative but is also to bring to light the qualitative aspect of **the offer of housing mixity** that can be offered to all the different population types.

We should stay conscious that some combinations are of course more likely than others; as a single-family house combined with a student room or even a retirement house with a care residence would be more realistic than the example of the nursery with the prison. Therefore it is no more only 15 types, but actually billions of possible combinations, **hybridisable** and **recombinable** with each other! Knowing that the basic models to be combined are probably higher than the ones considered (for instance, the inclusion of the household size, of the recomposed families, etc.) the new considered possibilities show a **growing COMPLEXITY**!

The project of the Architectural Firm Vortex in Mons, initiated in 2010, shows one of the possible combination; associating, at the ground floor, a single-family dwelling and at the levels above, 4 student units.[43] The Royal Institute Saint-Exupéry[44],, based in Leernes, illustrates also the implementation of alternatives to traditional housings. This YRS (youth residential service) host children between 6 and 18 years old. Once they are over 18, they have to leave the establishment. In order to optimize their level of independence and to ease their move, the establishment has implemented inside its structure supervised studios that children can access as soon as they are 15.[45] Seeing this hybridation model between institution and conventional housing, we could consider many other pertinent types. For example, some variants are to be developed between two extremes that would be the individual house and the hospital. Some people going to hospitals do not especially need 24hrs day assistance; while others have lost their self-sufficiency mechanisms.[46] The production of variants, doing the intermediate between the two basic types, would allow gaining a progressive autonomy: thus, as the children learn how to progressively leave the group, how to manage a budget, to have activities and to have their own independence; the hybrid architecture (hospital – house) would help sick persons to *progressively* gain their autonomy back.

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[42] TURNER, John FC, *Le logement est votre affaire,* Paris, Seuil, 1979,p. 69-80

[43] T.W. in *Guide d'architecture moderne et contemporain 1885-2015*, Mons et cœur du Hainaut, Mardaga, p 83

[44] Internet Website of the Institut Saint-Exupéry. [online] URL : http://www.saintexupery.be/index.php/organisat (consulted on the 29/09/2015)

[45] Interview with the psychlogue of the Institut Saint exupery, Leernes, Mrs Tamara Costalunga

[46] Typology developed by Ornella Vanzande as part of investigations within the architectural composition section of Pierre Callewier « *Mixités, laboratoire de l'habitat* », project that has been awarded of the terre cuite price in 2013.

Considering the extent of the issue, it is no more question of a list of types but is rather a way to deeply reconceive housing programming based on the understanding of the typologies!

TOWARDS A NEW BASE OF COMPOSITION: THE CONSTRUCTION OF CROSSED TYPOLOGIES

If we refer to the approach of Jean-Nicolas-Louis DURAND (1760-1834) who, through his *Précis des leçons d'architecture* given at the polytechnic school, demonstrates a methodological approach of the architectural composition. In this way, he establishes "universal" principles based on the comparison of many types. "*The declination of genders, species and varieties describes thus an arc that goes from the more general to the more particular, from the more universal to the more local*" [47] His goal is to search for the **best model** to copy. He announces the industrialisation of architecture – we could, this way, repeat models by slightly adapting them – almost as turnkey catalogues do today. In this way, Durand is the first to suggest a systematic approach: "*decomposing to analyse, decomposing in parts and elements that are comparative supports. Durand breaks down the building; he isolates the constituents according to the considered programme and according to a systematic composition method*". [48] Therefore he joins the position already expressed by the Quatremère de Quicy[49] for whom "***genius does not consist on inventing new elements but on inventing new combinations of these elements always the same, and these combinations are infinitely variable***." [50] The compositions and/or the articulations between different elements in the architectural composition are highlighted in Durand's words, more than their inherent qualities.

According to Jacques Lucan, the systematic theory of Durand is composed of three determining factors that constitute the base of his pedagogy[51]: the historical models, unanimously recognised references; the types, based on those references, constitute the universal principles; the method, or the art to articulate these elements each other. Although Durand's approach is broadly contested and criticised, Lucan reminds us that he is still a referent in the composition theory. In this way, Lucan traces the parallel with the syntax; undifferentiated elements serve multiple arrangements via the multiplicity of *combinations* and *assemblies*. "*The parallel between these elements can also become a preparatory phase for the implementation of a project (…). Each of these plans (including the one of the Château of Versailles, of the Rohan Palace, etc.) reclaims the general arrangement of a referent castle or palace by adopting its typology, which means the arrangements of the parts and courts, their relationships and their contrasts but without care for its geometry.*" [52]. In this sense, the parallel between different projects allows the preliminary analysis of space composition and then opens up perspectives on the possibilities to create a project while using and mixing the different elements each other.

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[47] DURAND J-L-N, P*récis*, 1, 1802, pg 1

[48] LUCAN Jacques, *Composition, non-composition, Architecture et théories, 19e – 20e siècles,* Presses polytechniques et universitaires romandes, Lausanne, 2009, pg 34

[49] QUATREMÈRE DE QUINCY Antoine-Chrysostome, Encyclopédie méthodique, Architecture, Paris, 1788, « Cabane », p. 385.

[50] LUCAN Jacques, Ibid., pg 35-36

[51] LUCAN Jacques, Ibid., pg 48

[52] LUCAN Jacques, Ibid., pg 46

By positioning ourselves on that last point, on the continuity of Durand's and Lucan's principles, our analysis differs itself in different points.

1. The empirical approach is specifically tested from a housing redefinition.

2. Besides the questions of combination and arrangements that we extend, we look at crossing this directly with the users. By combining different types with each other, the aim is to create other types, and sub-types answering better the current society needs.

3. This comes to the development of a double crossed typology: the one of housing types and the one of users types.

CONCLUSION: FOR A CREATIVE USE OF THESE CROSSED TYPOLOGIES

It is clear that in the light of the current trends and society evolutions (social, environmental, economic, cultural), it is important to focus on conception methods as well as on today's emergent typologies. The structure of the NSI survey shows a very little number of housing types on the territory. This conclusion is questionable as it is possible for some habitat forms to be much more present than what the numbers reveal. The identified emergent types are hidden in sub-categories to the benefit of an apparent uniformisation of types. For instance the kangaroo house of the Modern and Contemporary Architecture Guide could be classified under the single-family house section. If it is possible to state that new housing forms are emerging, it is hard to see if the phenomenon overcome in numbers the 3% of unknown in statistics.

These typologies cannot be in any case detached from the typo-morphological notion of the territory. It is for operational purposes of the analysis that, at this state, to break down the system, the morphological aspect is not taken into account. Of course, in order to offer an adequate answer on the territory, typologies should talk and communicate to each other and come together.

Besides the elderly user type, other types should be more deeply explored. The core of the prospects opened up by this research is not only to move the problem from the quantitative production issues to quality in typological proposals, it is also to think about the programming. This issue goes through the crossed typologies allowing including upstream the order that architects and other building technicians could enhance. The reason for the weak programmatic originality, illustrated in our survey based on the Modern and Contemporary Architecture Guide (which appears potentially rich in innovations), is better explained through the program definition rather than through the architectural composition issue.

This concerns the habitat conception process and implementation issue. These current processes do not seem appropriated to answer the needs because they go through stereotypes solutions that do not exploit the interest of combinations, arrangements and hybridations that proposed crossed typologies do. The issue extends to the correct articulation between the evolving demands, the spatial composition offering new perspectives, the stereotyped offer on the market and the regulation still too much based on standards that do not specially answer the current expectations. A way to heighten awareness amongst the inhabitants to the challenge of building freely their own housing identified by Turner: his famous "Freedom to build".

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FIGURES

Figure 1   Typologies of the current housings

Picture house elevation (google picture) URL :http://www.habitatdavenir.com/maisons-muse/t5-r1/

Picture apartment (google imqge) URL : http://cargocollective.com/marinebeaumanoir/Une-Valse-a-Mille-Temps

Picture hospital (google image) URL: http://www.google.be/imgres?imgurl=http://sa13.fr/IMG/jpg/facade-color-nhap-web.jpg&imgrefurl=http://sa13.fr/spip.php?article96&h=167&w=780&tbnid=KWbkgRcFQ8yYLM:&docid=s_5SXvW Q7BP5IM&ei=oRcBVtqgAobaUYaFvoAF&tbm=isch&ved=0CE0QMyhKMEo4ZGoVChMImvWz1qKKyAIVBm0UC h2Ggg9Q

Figure 2:   Sketch of Le Corbusier showing a housing development constitued of Savoye Villas (Précisions, Crès, Paris, 1930)

Image og the subdivision plan /villa Savoye URL : http://www.nogoland.com/urban/publications/urbanisme.htm

Figure 3:   Table of all typologies (identification of all places were we are housed (spend the night)

L'APPROCHE TYPOLOGIQUE PROCESSUELLE COMME MODELE SYSTEMIQUE DE LECTURE DES REPRESENTATIONS GRAPHIQUE DANS LES CONCOURS D'ARCHITECTURE

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Abstract/résumé :

Dans le cadre de cet article nous allons expliquer la démarche entreprise pour essayer de mieux comprendre les productions actuelles d'image d'architecture. Pour ce faire, nous avons effectué des recherches sur deux niveaux complémentaire ; la systémique et la sémiotique. Si la deuxième nous permet d'utiliser des outils concrets d'analyse de l'image la première nous offre les bases théoriques pour expliquer l'objet d'étude qu'est l'image. Nous nous attarderons dans cet article sur les emprunts fait à la typologie processuelle comme approche systémique étudiants le territoire et le bâti et plus particulièrement sur la notion de moment de crise point de départ de la compréhension d'un phénomène aussi complexe que la représentation graphique du projet.

Keywords / Mots-clés :

systémique, sémiotique, typologie processuelle, crise

Nous assistons depuis quelques décennies au développement de nouveaux modes de production des représentations graphiques en architecture. Dans le cadre plus particulier des concours d'architecture, les candidats sont confrontés à un enjeu de recherches et d'innovations – non seulement architecturales et urbaines – mais aussi dans la manière de représenter et de communiquer les projets.

Quelles sont les nouvelles stratégies de communication portées par les représentations graphiques du projet que l'architecte cherche à mettre en place dans un concours d'architecture ? Existe-t-il une logique commune, liée aux nouveaux modes de production, à ces stratégies de communication du projet ? Ces nouvelles typologies de représentation graphique ont elles une influence sur les typologies architecturales produites, plus particulièrement dans les concours d'architecture ? Voici quelques exemples de questionnement que suggère la question de la représentation graphique dans les concours d'architecture.

Néanmoins, un préalable à toutes ces recherches, dans un souci de rigueur scientifique, c'est imposé à nous. Il s'agit d'élaborer une méthodologie de lecture de la représentation graphique du projet d'architecture déterminant les éléments signifiants et les rôles qu'ils jouent dans la communication du projet. La difficulté de définir cette méthodologie réside principalement dans l'intégration des différents types de représentations graphiques utilisés dans le projet architectural ainsi que la dimension temporelle de leurs évolutions.

Les « images » produites dans les concours d'architecture portent la responsabilité d'une charge importante en termes de message expliquant et justifiant le projet proposé par l'architecte. C'est cette production « d'images », ou plus généralement de représentations graphiques, post-conception, qui nous interpelle plus particulièrement. Notons que le rôle important de la représentation graphique en

architecture ne se limite pas au seul moment du concours mais intervient tout au long du processus de projettation et de sa mise en œuvre.

Comment donc analyser un phénomène aussi complexe que celui de l'image en architecture ? Quelle méthodologie adopter ? Nous ne pouvons considérer correctement l'objet de notre étude si nous ne lui reconnaissons pas son caractère complexe. Il ne s'agit pas seulement d'un « support » graphique mais également d'un « système » de communication complexe et privilégié du projet d'architecture.

Considérer la représentation graphique comme un système complexe lui confère des caractéristiques d'instabilité, de fluctuation, de créativité, d'ambigüité … (D. Durand, 1997) un phénomène qui ne peut être appréhendé simplement en le décomposant en la somme d'éléments qui le constituent et à analyser séparément. La complexité du système est due aussi à la complexité des relations qui existent entre ses différents éléments finis. Daniel Durand, dans un schéma nous présente les différents systèmes existants. C'est à partir de ce schéma que nous avons cherché à positionner la représentation graphique du projet par rapport aux autres systèmes.
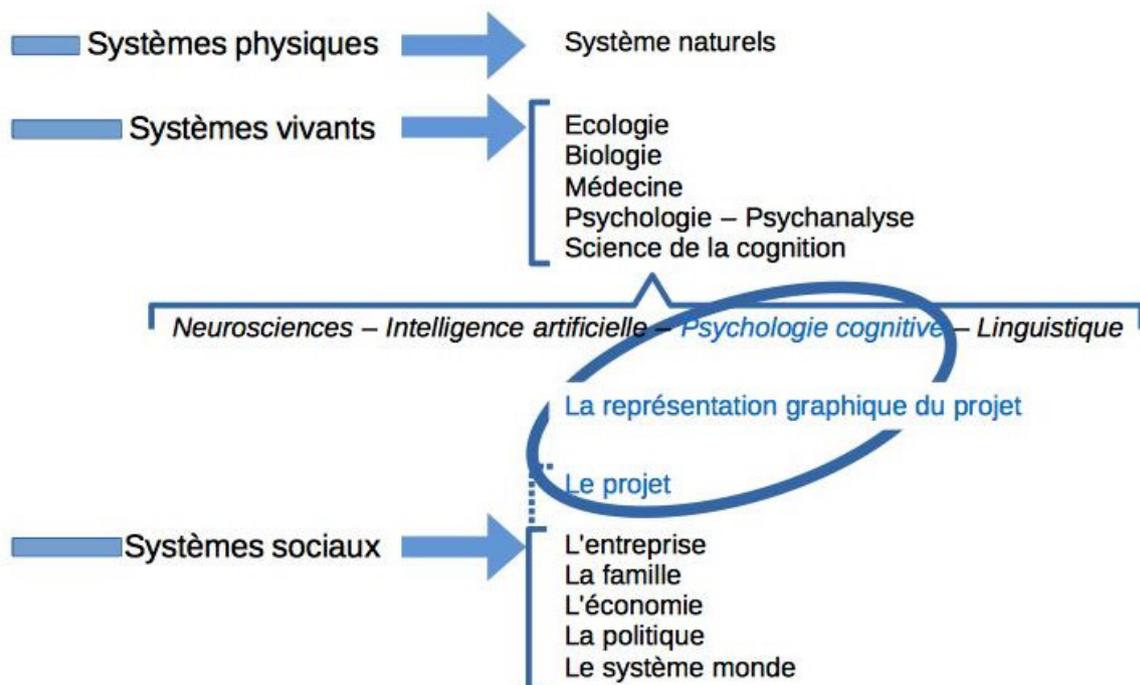
Fig. 01 : Positionnement de la représentation graphique dans les familles de systèmes.
Source : A. Boutemadja en complétant de schéma de D. Durant, 1979.

Parler de système de communication, nous mène bien entendu aussi vers la sémiotique et tous les développements effectués sur la rhétorique de l'image (U. Ecco, 1976). Dès les années soixante et septante, l'image étant un élément caractéristique de nos société modernes, elle a fait l'objet d'analyses multiples dans le cadre de la sémiotique et plus particulièrement dans le cadre de la sémiotique visuelle (Groupe μ, 1992). De ce fait, l'image a été considérée comme un système complexe porteur de signes et de significations. Grâce à des travaux comme ceux d'Umberto Ecco, du groupe μ, de M. Joly, … il est donc possible de se munir d'outils d'analyse de l'image pour étudier la représentation graphique dans les concours d'architecture.

Ce qui fait la spécificité de la méthodologie que nous cherchons à mettre en place est l'intégration et l'adaptation de méthodes développées dans deux disciplines, la systémique et la sémiotique – deux disciplines qui ne sont pas totalement étrangères l'une de l'autre. C'est cette démarche itérative d'intégration et d'adaptation des outils de ces deux disciplines aux exigences de l'analyse de la représentation graphique du projet architectural qui va fonder notre méthodologie. La systémique nous permet de comprendre les relations complexes qui existent entre les différents objets graphiques et cela à toutes les échelles de la présentation. La sémiotique nous permet quant à elle d'emprunter des

outils concrets d'analyse d'un « type » d'image choisi ou d'un objet graphique particulier mais en relation avec les autres.

Pour bien comprendre les stratégies de communication mises en place quasi exclusivement par les architectes au travers du support graphique afin d'expliquer leurs idées, il est important de dépasser le cadre de la simple image et de prendre en considération l'ensemble du support graphique soumis lors du concours. Il s'agit donc pour nous d'un système complexe constitué d'une hiérarchie d'éléments présentant des relations multiples entre eux. Au travers de la systémique, notre volonté est de mieux comprendre les mécanismes de production de la représentation du projet en architecture dans le cadre des concours d'architecture. Il s'agit d'identifier les éléments qui les composent ainsi que les relations qui existent entre eux et à différentes échelles. Pour le réaliser, nous avons décidé de nous appuyer sur une approche systémique utilisée en architecture pour comprendre les mécanismes de formation et de transformation du bâti et du tissu urbain (S. Malfroy, 1986). Il s'agit de l'approche typologique processuelle élaborée pas S. Muratori et puis précisée par G. Caniggia.

Cette approche s'appuie principalement sur les recherches effectuées dans le domaine de la biologie cherchant à expliquer les évolutions physiologiques et morphologiques chez les êtres vivants. C'est de cette confrontation avec le domaine de la biologie que Muratori et Caniggia considèrent la ville comme un organisme complexe subissant des influences le faisant évoluer à des fins d'adaptation (S. Malfroy, 1986). La même condition et appliquée à différentes échelles, le quartier, le bâti, … sachant que chaque échelle doit être comprise dans le cadre de son contexte plus global et par les composants qu'elle contient. Un autre aspect important dans la question de l'évolution est le fait de la considérer non seulement à travers sa dimension temporelle mais aussi à travers sa dimension spatiale par des variantes intégrant les contraintes particulières du contexte. L'approche typologique processuelle se base sur l'idée forte que les mutations se déroulent suivant un rythme de succession entre moment de crise et phase de stabilité. Cette notion de crise est très importante et fondatrice de l'approche ; Muratori, par cette question de crise, cherche à expliquer les processus de mutation du territoire et du bâti en s'appuyant sur les recherches menées dans des disciplines comme la biologie ou la cybernétique qui, à leur tour, s'appuient sur l'approche systémique pour introduire un degré supplémentaire de complexité dans les démarches scientifiques classiques.

Le moment de crise est le moment charnière entre deux phases successives. Muratori considère dans ses lectures du territoire que la phase en aval est forcément mieux que celle en amont. Il explique cette différence par les acquis nouveaux que le moment de crise permet d'ajouter dans la mutation d'une phase à l'autre. Une phase, quelle qu'elle soit, est forcément un moment de stabilité dans le sens où les acquis répondent aux besoins de cette époque. Dans le cadre du bâti nous pouvons parler d'un style architectural, de techniques de constructions. Dans le cadre urbain nous pourrions parler d'un mode d'implantation, de visions particulières du regroupement du bâti, de réglementations urbanistiques. Au niveau du territoire Muratori nous parle de typologie d'implantation par rapport au relief et aux ressources naturelles, alimentaires, énergétiques et par rapport aux modalités de transports. Le point commun entre tous ces éléments reste un socle de conscience collective, d'acquis considérés comme suffisants pour répondre aux besoins d'usage. Nous pourrions établir (et Muratori le fait aussi) cette réflexion sur les objets de tous les jours (au design) qui lorsqu'ils répondent aux besoins d'usage de l'époque deviennent des objets journaliers dont les signes et les codes sont applicables aussi aux autres échelles (bâti, …, territoire). Si ces codes et signes ont intégré une sorte de conscience collective, cette intégration a dû se faire au travers d'un moment de crise où les besoins et les aspirations évoluent et fond évoluer les objets quelques soit leur échelle, à partir du moment où ils doivent servir à nouveau.

Nous pouvons au travers de l'approche systémique (support de base de la typologie processuelle de S. Muratori et G. Caniggia) élargir le champ de cette lecture à partir de moments de crise et de phases de stabilités, à d'autres phénomènes, sociaux, économiques, …. Nous pouvons aussi constater cela au travers par exemples d'objets usuels de tous les jours. Nous pouvons constater que les évolutions qu'ils connaissent sont fortement liées à la nature des besoins changeants et la capacité d'adaptation que peuvent avoir ces objets.
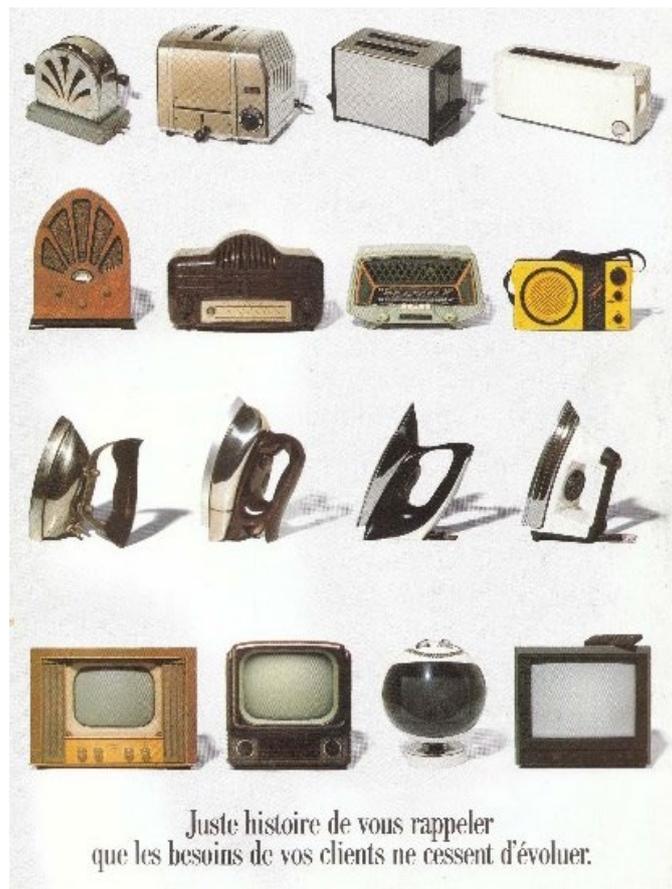
Fig. 02 : Extrait d'une image publicitaire sur l'évolution de certains appareils domestiques.

Finalement de moment de crise apparait avec l'avènement de nouveaux besoins. Ce moment particulier devient le théâtre de recherches innovantes, d'expérimentations diverses qui n'aboutissent pas forcément à des solutions et connaissent parfois l'échec. L'important étant d'en tirer des leçons qui permettent de changer de cap en termes de recherche.

Dans le cadre du bâti, Muratori, revient sur les notions impliquant ou enclenchant des moments de crise notamment par la notion de « choix » (S. Malfroy, 1986). La multiplication des choix induit donc des crises. Ne plus avoir des réflexes spontanés est susceptible de provoquer des moments de crise et ce n'est que lorsque le choix est fait et acquis par tous que nous repassons par une nouvelle phase de stabilité. Cette notion de choix peut aussi apparaitre lors de rencontres entre des cultures différentes (des modes de vie, des modes d'agir différents). L'une influençant l'autre, des expériences sont faites avec leur lots d'échecs et de choix jusqu'à créer une culture hybride plus stable. Evidemment ces problématiques de choix et de rencontre de cultures s'appliquent au bâti mais aussi à d'autres éléments, notamment culturels.

Tout ceci nous montre bien que cette vision des choses est applicable à différentes disciplines et domaines liés à une société ou à une civilisation. Elle n'est donc pas exclusive au système bâti ou territorial. Dans cette logique de succession de moment de crise et de phase de stabilité, la notion de durée, de l'une ou de l'autre dans le temps n'est pas définie. Les moments de crise peuvent être assez longs et ne se terminent qu'après un nombre, qui peut être important, d'expérimentations.

Ceci est particulièrement vrai à notre époque où les moyens de communication, non seulement entre personnes d'une même culture, mais aussi entre personnes de cultures différentes sont importantes. Les différents évènements historiques que nous avons connu depuis un siècle maintenant nous montrent bien la succession de moments de crises importants dans différents domaines et qui ont une implication sur nos modes de vie de tous les jours. Le renouvellement permanent des besoins et aspirations d'une société de consommation contemporaine nous met en permanence dans une posture

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d'expérimentation, d'innovation caractéristique des moments de crise décrits par Muratori. Cette situation très caractéristique de notre époque touche bien évidemment l'architecture. La mutation d'attitudes et de postures architecturales témoigne bien d'innovations permanentes et la recherche aussi permanente de solutions architecturales très diversifiées. Nous sommes loin d'avoir adopté une posture commune, inscrite dans une conscience collective et que l'on considèrerait comme posture définitive répondant à l'ensemble des préoccupations de notre époque. Nous pouvons en dire autant de tout phénomène culturel, sociétal, économique, politique, … etc.

Cette clé de lecture que nous propose Muratori n'a jamais été autant d'actualité et pertinente pour mieux comprendre l'évolution de nos sociétés et cela dans tous les domaines. C'est aussi une clé de lecture de la production artistique de nos sociétés et qui démontre bien la difficulté de citer la production actuelle dans une chronologie historique caractérisant une période stable. C'est au croisement de la production architecturale et la production artistique, notamment dans les arts illustratifs (peinture, BD, …), que nous nous sommes intéressés au monde de la représentation graphique du projet, qu'il soit architectural ou urbanistique.

L'évolution de cette discipline peut aussi être expliquée dans un mécanisme successif de moment de crise et de phase de stabilité. De même que pour l'architecture, nous vivons une époque ou graphiquement nous sommes dans une phase d'innovation permanente et de création de solutions multiples en termes de représentation graphique du projet. Nous vivons donc un moment de crise important dans ce domaine ce qui rend sa lecture d'autant plus compliquée. Parmi les facteurs qui influencent le plus ce moment de crise dans la représentation graphique du projet, il y a les nouveaux modes de communication (les TIC) qui évoluent perpétuellement, inventant les besoins puis cherchant à y répondre. Ces nouveaux modes de communication inventent de nouveaux codes et symboles qui sont intégrés dans la communication graphique des projets, notamment dans les concours d'architecture.

Dans l'approche Muratorienne la question des moments de crises et des phases de stabilité permet une mise en contexte historique de l'évolution de l'objet d'étude. Muratori crée une nouvelle notion de « typologie » pour désigner l'objet d'étude (S. Muratori, 1967). Cette notion est complexe et dépasse sa mise en perspective en tant que « modèle » dans d'autres approches typologiques. Le type pour Muratori, n'est pas un modèle dans le sens où nous ne pouvons créer d'objet « type ». Le type en soit n'existe pas. Il est la quintessence d'une somme d'expériences qu'on peut décrire mais ne pas reproduire. Nous pouvons donc entrevoir dans différents modèles un type donné.

C'est ce côté universel dans l'utilisation de la systémique et de l'approche typologique processuelle qui nous permet de nous appuyer sur ces travaux pour clarifier la lecture des représentations graphiques en architecture. Pour nous, la compréhension des mécanismes de production de la représentation du projet dans le concours d'architecture passe par l'étude de son processus évolutif dans le temps et dans l'espace.

Pour identifier les relations qu'elles établissent entre elles nous avons emprunté à la typologie processuelle, qui elle-même l'emprunte à la systémique générale, la notion de « niveaux d'agrégations », ce qui nous a permis d'identifier des niveaux de relations différents. Pour le concours Europan, nous identifions trois niveaux d'agrégations graphiques. Le premier niveau est celui des typologies graphiques de base ; schorèmes, schémas, plans/coupes/élévations, image 3D et textes. Il s'agit du niveau d'agrégation graphique « dessin » de base, qui est l'entité de départ nécessaire à la constitution d'une communication graphique et en même temps une typologie constituant un système global autonome. Le deuxième niveau d'agrégation graphique est celui de la planche, constitué d'une composition complexe de « dessins » et en même temps constituant elle aussi un système de communication graphique global et autonome. Le troisième niveau d'agrégation graphique concerne le panneau constitué des trois planches offrant un niveau supplémentaire et supérieur comme système de communication global et complexe.
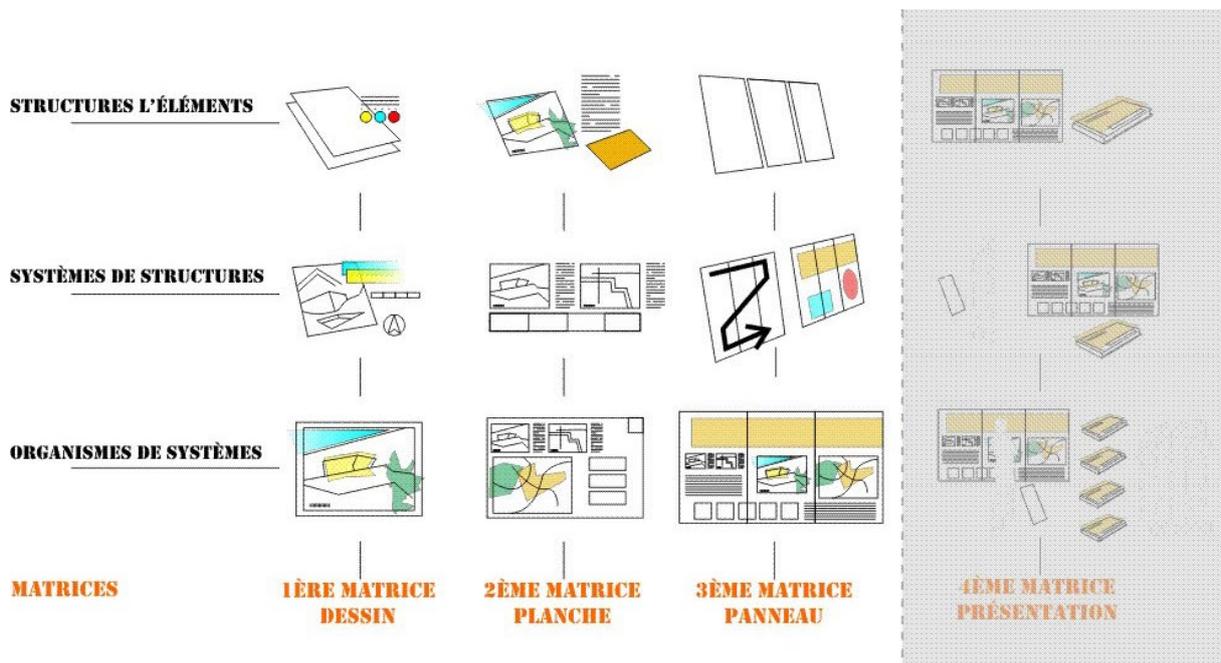
Fig. 09 : Dessin des relations existantes entre les différents niveaux d'agrégation. Sources A. Boutemadja

Toutefois, l'étude de la représentation graphique du projet ne peut se limiter à l'identification des éléments constituants de la matrice image à partir de systèmes simplement graphiques mais se doit d'intégrer également l'identification de ses éléments signifiants. Les trois niveaux d'agrégation graphique nous montrent bien la complexité des relations hiérarchiques qui existent entre les différents éléments. Ces éléments s'articulent entre eux pour porter un message tout aussi complexe. Il semble donc pertinent d'analyser chaque niveau d'agrégation graphique pour mieux comprendre la complexité du message transmis par les architectes. Ainsi, l'analyse de la représentation graphique d'un projet sera plus complète sur base d'une analyse de ses différents niveaux d'agrégation que si on se contente d'analyser chaque « dessin » ou image séparément.

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