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Abstract

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ARCHITECTURE - CRISIS AND MODERNITY. FROM WALTER GROPIUS TO BEN VAN BERKEL

C. EL KHOURY¹

ABSTRACT

The transition from the industrial society to the information society has brought profound changes, even for what concerns the architecture and the way of operating of the architects. Just think of the emergence of big events and themes of recent years, such as the abandoned areas, or to the new conception of the metropolitan landscape, or even the development of an ecological conscience, not to mention the technical potential linked to electronics also in the construction industry. The book illustrates the path that goes from Walter Gropius to Ben Van Berkel, stressing the moments of crisis and the catalysts of this process and focusing the efforts of architectural research and its protagonists to deal with these constant changes. This paper develops concepts of methodology and theoretical models in architectural culture, allowing to contextualize and to announce the issues around which articulate the "dynamic" model, understood as a support for the creative phase of the project, led by the contemporary society of information systems. Although many previous events marked the field this time and cannot be forgotten, a study focused on the main theoretical models of design from 1920 is needed to describe the state of the art consists in that field. At the time of their creation, these methods and models of world architecture have provoked many reactions, positive and / or negative, but mostly exciting.

KEYWORDS

Parametric design, 3D modeling, theoretical model, architectural concept.

1. INTRODUCTION

The First World War has left its mark: the new means of transport (car and airplane), new materials and new construction techniques appear, changing the way we think the projects. After the 1917 revolution, the Russian Constructivists meet the utilitarian needs of the new communist society through the application of the new language of geometric abstraction. Close to the Russian constructivists, the De Stijl movement emerged in 1917. The Dutch Neoplasticism supports the formal austerity and creates a new "style", which meets the requirements of industrial society. Within this trend, the Dutch architect Theo Van Doesburg (1917) saw the birth of an era "new" where the company would be opposed to any subjective considerations on architecture.

"From 1923 to 1929 it is stated in architecture, urban planning, design an impressive array of innovations. They are substantive responses, and disruptive for the first time convincing. Born in this short span of time a common feeling, shared substantially in different parts of the world and profoundly distant from the past. "(Saggio 2010, p.23)

In Weimar, the Bauhaus, founded in 1919 by the German architect Walter Gropius, it offers with its "masters", a teaching centered on rationality and functionality. During the first period of Weimar, Walter Gropius introduced the program started at Deutscher Werkbund: theories of

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the Bauhaus are "functionalist", meaning that "if an object is well designed to meet its intended use, the beauty will come as surplus "(Gombrich 1950). It is the search for a synthesis between art and technology, "to give to the products of the machine a real and meaningful content" (Gropius 1935). The design is then the production of objects and the creation of real "products".

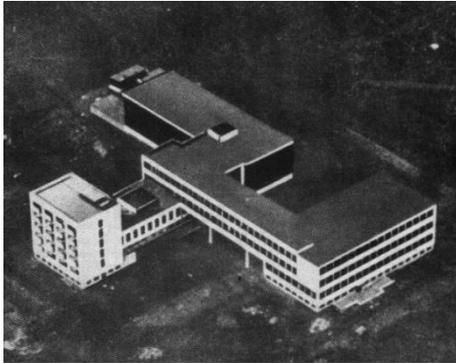


Figure 1– The Bauhaus by Walter Gropius at Dessau (1926).

The possibility of the transfer of specialist school of Bauhaus Weimar on the outskirts of Dessau is his moment of rebirth fundamental. The new building in Dessau breaks all schemes with the past thanks to an analytical view and antiperspectival. The Bauhaus is the first example of a new idea of the city that still was nothing more than a mental landscape of functionalist. The transparency thus becomes a catalyst for the whole movement modern, antirhetorical and antisymbolic, is pivotal hygiene, lightness and modernity to move the achievements of the new industrial architecture in a dimension not only practical, but also aesthetic.

Alongside initiatives constructivist, the concept of "structure" and "construction set" appears in Le Corbusier in its draft "standard backbone 'Domino' to build in large numbers" (1914). The building is no longer a mass, but a "building" determined solely by an internal structure and curtain walls. In developing its architecture "functional", he developed the concept of "machine à habiter" (1923) to symbolize the house built with a design method is objective and rational, that is, the search for a scientific method of architectural design. He also developed the Modulor (1950, 1955) as a set of rules of composition, similar aesthetic considerations of the Treaties (neo) classical.

2. CRISIS AND MODERNITY

The word modernity of accession different: it can be understood in different ways depending on the context, can change culturally, socially and historically. Modernity is the effort to groped to respond to the world crisis with a new aesthetic consciously addressing the depth and complexity of the crisis that we are ahead. The paper deals with about eighty years of history that see the shift paradigm. From industrial era to the information one. That's why it's called from the Walter Gropius to the Ben Van Berkel.

Our relationship with the computer must be a structural time, Cultural and formal. Structural cause and the entire society that revolves around the value of the information, cultural orientation because in this new scenario, fundamental and formal because the procedures implemented in the computer thinking can affect the way you think the architectural form. The term information revolution, and English information technology revolution in Architecture, and was chosen to emphasize a parallelism. In the twenties of the twentieth century avant-garde architects had the ability to completely redraft the architecture in the

wake of the new mechanical and industrial world. It was a revolution because the architecture edits all parameters of operating.

Today we are in a different era. The key words of the architects have changed: you think in terms of customization and standardization no more, no longer through division processes in cycles or the assembly line, but the unity between diversity, the city is no longer designed for single-purpose areas, but in a set of interacting uses and functions, plus the idea of repeatable model it is not expected, but in terms of adaptability and individualization.

The spaces tend to be more and more multifunctional and are created through complex geometries, the construction is made with special pieces created through guided drills from digital models, but above and the information that is becoming an essential component of a new architecture and a new environment urban.

Information technology is emerging as the central paradigm for a new phase of the whole architecture. And the dynamic interconnections that are the heart move from the world of digital models to the reality of a reactive architecture, sensitive, interactive.

3. METHODOLOGY OF MODEL CONCEPT

According to Antonino Saggio (Saggio 2007), there are three types of model families, the first is conceptual and decision-making, the second is scientific and the third is semantic.

The decision models are the attitudes of procedure carried out by the architects during the design; definition and implementation of the project with the aim to make choices and space have four subtypes:

Objective, Performance, structuralism and diagrammatic

The first three sub-types of decision-making models are synthesis and final realization in the only model which, idealistically, should be continued and exploited by the architects of today, and that I intend to develop in the next few chapters.

3.1 Objective (years 1920)

At the birth of functionalism, rationalism and modern architecture in the twenties of the twentieth century, it is very natural that architects definitely wanted to have a new approach, which has the world in this new architecture permeated by the industry. This new way of making decisions consists of standardized analytical processes, a logical, cause-effect (between form and function, economy and structure, form and program). The reasoning proceeded "from top to bottom" also called top-down approach and responded to an if-then, arranged in a linear fashion as an assembly line. In a world permeated with rationality (the calculation and objectivity) and positivity, then of industry, this argument also affects the world of architecture. The real obsession of this historical phase revolved on the concept of objectivity.

Alexander Klein works taking as a "unit" the man and his "size" anthropometric. He calculated and planned the spaces according to the functions of which the individual would have required. At the center of design practice manuals such Neufert imposed a whole series of models in function of the different types and scales of intervention.

This great effort of objectivity we have seen particularly in public housing: objectivity of the situation needs objectivity and objectivity of the solutions. The flow that in the field of public housing in the twenties and in the following decades is also based application socio-political when people living under standard, finally acquired a standard.

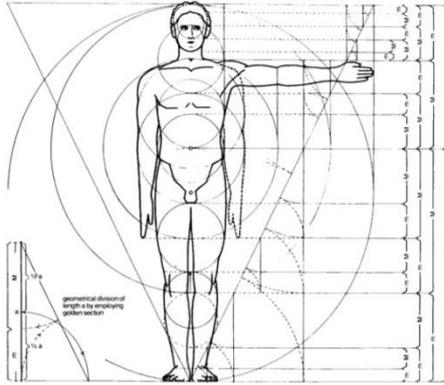


Figure 2– The Neufert manual based on the study of the man, of its measures and the right space.

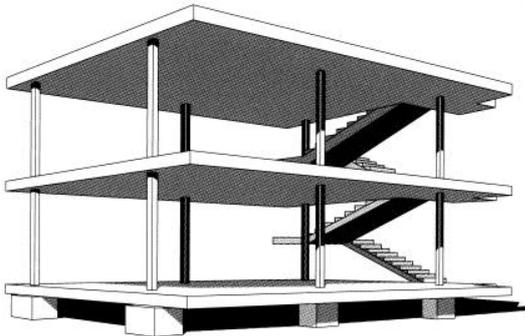


Figure 3– Construction in series domino house. Le Corbusier (1914)

The idea of standardization of industrial society, the absolute functionality of a model is always the same, ideally mechanized production, object-insertion machine, this reasoning is "based on the industrial paradigm tends to think through the great word of objectivity, which becomes the word-box all the others: the need objectivity, objectivity of the solution, and this creates a mental model and decision-making. The development of this approach leads to the representation through the famous block diagram, the method that is poured also in the logic of the project. What is a block diagram? It is a method for quantizing scale the surfaces of the project. The second argument is the study of the surroundings, which is what must be close to what is typically a logical organization that stems from a business model. "

This idea of housing (housing) and its mode of design stems from a fundamental concept and is translated into architecture of the Ford T. The idea that there might be a prototype of the perfect machine for the assembly line in million units absolutely identical and thought Family type of new urbanization American to respond with efficiency, functionality and standardization to new phenomena of industrial society. Henry Ford said: "The Ford T can be any color so long as it is black".

After World War II, Le Corbusier realize the dwelling units. The city that he was planning at that time was made up of a series of homogeneous compartments and was presented as an idea of a macro element placed on a platform.

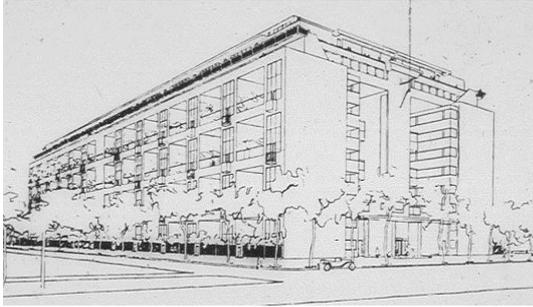


Figure 4– Immeuble villa. Le Corbusier (1922)

3.2. Performance (years 1960)

This need leads to the second decision model (strongly wanted at the time by Christopher Alexander, who is the key figure for this reasoning called "performance"). This part of the same principles of objective model, which exacerbates the research needed, defining and breaking down each element able to define a specific function, and that decomposition will result reasoned decision that will shape the performance model.

Pertaining to a belief in progress computer, the "need for rationality" (Alexander 1964) supported by some architects to become some methodologists' "urgency" to find a logical method to deal with the "irresponsibility" that uses the traditional architect 'arbitrary to conceive the work.

Christopher Alexander, the functional problems become less and less simple, but the designers rarely admit their "inability to solve them."

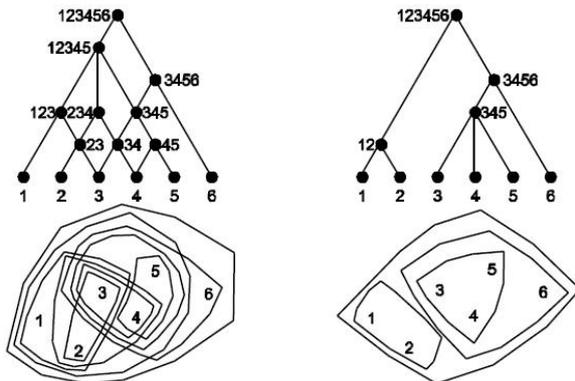


Figure 5– The city network is not a tree. Christopher Alexander (1965)

When not learn clearly a problem to find a solution, "falling out of a formal agreement arbitrarily chosen." The problem thus remains unresolved because of the complexity it presents. This criticism was shared by many methodologists era who believed that architects, often overwhelmed by the problems considered, reuse of solutions already made, conventional and reassuring rather than addressing the real problems.

There are many principles that Alexander placed at the base of the language of the pattern and its use: participation, growth process for parts, organic order, diagnosis and coordination.

The Alexandrian design paradigm is different from the traditional methods of planning and design. Not so much the foreshadowing of the future state contained in a drawing or a plan to ensure the consistency and quality necessary to the process of transformation of the urban

"In the sixties, born in cultural reflection, research and description of some categories, it is a way of thinking that pours in philosophical thought and that has had major influences in the field of architectural design. The structuralism model was born as part of cultural anthropology with the theoretical work of Claude Levi-Strauss, who is the first to analyze some family structures, behavioral, social and religious of primitive peoples, using as a model the interpretation of structural linguistics. It means that there are patterns, rules framework, of "frames" or structures, that characterize the organization of these communities and, at the same time, there are changes that move within the system of the general rule. "The structuralism order hierarchy is an ordering principle of reality, whether it reasons with a top-down, synthesizing, whether it reasons with a bottom-up logic, analyzing. John Habraken is the most distinctive personalities from the theoretical point of view in architecture, he creates the SAR group whose philosophy this idea to move within this system of "hierarchies to decide". The latter are structuring compatible with a set of variations to these choices of fixed structures, to use the terminology its structural anthropology, and which have a system of very numerous variations within these structures.

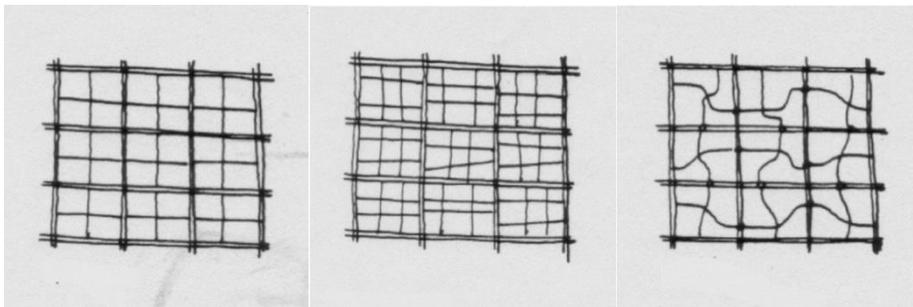


Figure 7– Set of sketches of compatible variations within fixed structures (example of partition walls). Notes on hierarchy in form. N. John Habraken

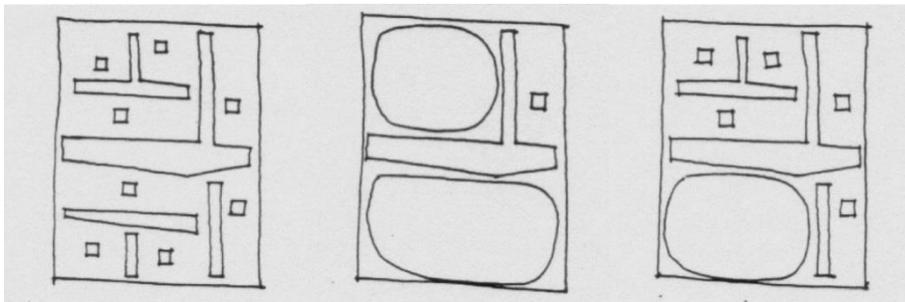


Figure 8– Set of sketches of compatible variations within fixed structures (example of subdivision of spaces). Notes on hierarchy in form. N. John Habraken

While in the first case the decision model everything moves in a very prescriptive and linear through these concepts of objectivity (pre) and very driven solutions, move within this logic (dialectic) between structures of First Instance and many variations that are compatible with them, changes the way of thinking and design. Do not create more of the blocks are all equal, homogeneous and made objective than those who are the needs of a new working class, for example, but you get into a different logic, more dialectic that moves in some terms.

This is a type of reasoning that has had some very interesting influences within design courses in general (urban planning - architectural).

3.4. Diagrammatic (after 2000)

Finally, the last type of decision model is and diagrams representing the real leap of logic to its specific dynamic character. This word (diagram) is dense with meaning, us closer to a more contemporary and thought of a way to approach a model that can guide choices.

According to Antonino Saggio (Saggio 2010, p.417) "plot prefigures a series of relationships between the parties that are topological and / or parametric or that there is a very wide field of geometric deformations compatible with the original approach. [.. .] It is the creation of some reports that must characterize the final outcome; these relationships constitute a sort of DNA code generator and regulator of the development of the project. The outcome will depend on the events involved in the development of the project as if they were variables to evolve towards a code-diagram final form rather than another.

- The diagrammatic thought

The diagram is a technique conceptual and formal, it does not contain precise and concrete solutions; its purpose is to disseminate the ideas in the mind of the designer, is based on the heuristics, that is not delimited ordered structures precise. The diagram delays typological definition being between form and words.

According to Deleuze, the first part of every architectural process has little to do with a process machinic type. Usually, after having defined the program, the initial step is the production of a first diagram; this diagram can generally contain a description of functions organized according to type and further elaborated on the basis of considerations than the site. A second chart depicts all aspects of the site, defined by many factors: not just by his physical condition real, but also by his stories past and present. The diagram of the site interacts with the diagrams of function and type in an iterative process that produces a mixture of the three levels.

This organization tripartite generally works the same way in which it develops most of the conventional methods, in the sense that, similarly to them, produce the shape of a container two-dimensional planimetric. This container is usually extruded into a three-dimensional volume. The second stage is probably the most difficult, it requires the choice of an external agent, another diagram, almost a Deus ex machine which describes processes which, once overlapped to produce a first diagram blurring, a blur. Such a device may not be immanent in the first diagram but must activate a process that has the ability to change it.

4. TOWARDS AN INTELLIGENT MODEL?

The information revolution and the evolution of digital tools (the spreadsheet, database, and hierarchical systems) allow the architect to approach the design process dynamically. This process, from the initial idea of the project until its final form requires many adjustments are incompatible with a linear approach. This model is structured for querying and proceeds with a way to reason what-if-? Operating with a deductive approach.

- Hierarchical structures.

The idea of the hierarchical structure is coming into many programs (the most famous is Autodesk Revit Architecture). Models that can be used in architecture are so endless, we need only find the Convention for the transfer of information in three dimensions. This raises a new tool for architectural design: the BIM (Building Information Modeling). It is a process of generation and management of the construction data during the design of the project. BIM can contain any information regarding the basic structure and its parts, stored and organized in families. It is a high expression of the hierarchical system and is characterized by interactivity, efficiency, dynamic processes.

1. Efficient: because it has a capacity to store data and then receive and absorb the mechanisms of database and spreadsheet.

2. Intelligent: because it has a simple mechanism that generates it. It consists of blocks and components to vary the primitive elements that constitute them, will change the entire system. This makes it a model capable of evolving to changing choices of the designer.

3. Semantic: because it has a great symbolic power carried by its various hierarchical levels.

4. Interactive: it responds to the approach of What-If. This is a more immediate to understand but that has a very incisive power.

The catalyst is the process that contains all aspects characterizing a new paradigm, creating a new aesthetic (as a vision and understanding of the world). If the prospect Renaissance era was the catalyst, the transparency in the industrial era it was made by a "new objectivity".

"Transparency is used in the first Bauhaus in antiperspectival key, given that the long horizontal bands of windows flatten and remove depth to the vision, but also the use of large glass surfaces on the stairwells and the dematerialization of the angle of the laboratories it scans. There is more separation between the inside and the outside." (Saggio, 2010, p.44)

The new catalyst is the interactivity of contemporary architecture. This stems from the fact that interactivity is the reification of hypertexts, and then the computer language.

The interactivity is what allows that effect mirror between the instrument and what with it is produced. This is the great power of the instrument as a whole and not as a tool, its ability to shape the world in his own image and likeness.

What then it makes the fundamental characteristic of interactivity in the model is its capacity to become the same architecture as the model! The problem was not representing space gothic with the prospect, but architecture that was itself perspective. It is a next-generation architecture that incorporates the model. The plan is always more complex aesthetic, because it works for discontinuities. In contemporary interactivity it is manifested at three different levels:

- Litigation: mainly supports all the creative phase of the project.
 - Projective: it relates to a type of interactivity that invades only a part of the project.
 - Physics is a deep level of interactivity, inherent in the work, it generates and governs it.
- The building is entirely designed and built by the BIM. It is an 'architecture that is able to react, to adapt.

5. A MASTERPIECE

Another project related to the theme (how to make choices) is the Mercedes Benz in Stuttgart. Ben Van Berkel has managed, in this work, to combine the theoretical world of the computer models and the more practical aspects, constructive, economical and functional, creating an intelligent model. Let's take a look to this building to understand within this type of theoretical model, what is happening in this solid project and architecture built.

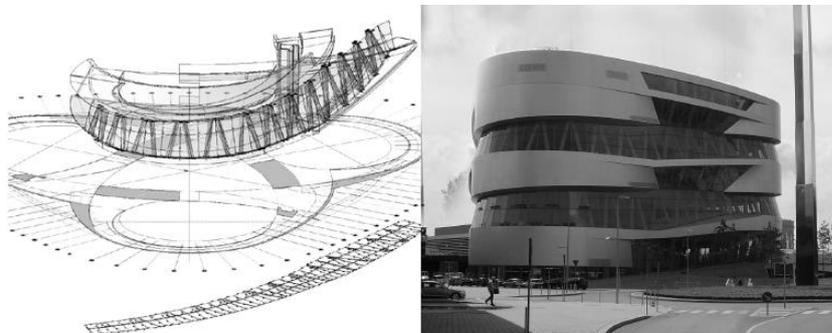


Figure 9—Mercedes Benz Museum, Stuttgart, Germany. Ben Van Berkel (2001-06)

The process of architectural design undergoes a complete revolution compared to the previous standards, since it allows a completely innovative approach in the management of the project. The ability to break out of the established patterns, structures and binding forms standardized finally becomes concrete, and in parallel we have the tools to be able to control and "imagine" forms, spaces and compositional connections previously not even conceivable. The tool becomes value, the crisis overcome and opens a new era for the architectural design.

Why this kind of model is important? Because it is the space! It is the space through a choice that give a big difference between this dynamic diagram and a design that looks like "dynamic," but it is not actually. The Mercedes Benz Museum is the base drawing of Wright Guggenheim Museum, which, essentially, is, based on a spiral almost the same, which it turns, covered on the top and inside the volute; there is the path, at the same time exposure and distance.

Apparently similar but, in reality, the Wright scheme has few "negotiable" rules because if we notice, we can do it a little bit bigger or a little bit smaller but, in the end, his rule is static. What happens instead in the Mercedes Benz Museum. First, the plot is not only adaptable topologically-geometrically, it is adaptable functionally-distributive! It can allocate different activities, up to change the nature of the space, from the arrival area to the path space! (Saggio, 2015)

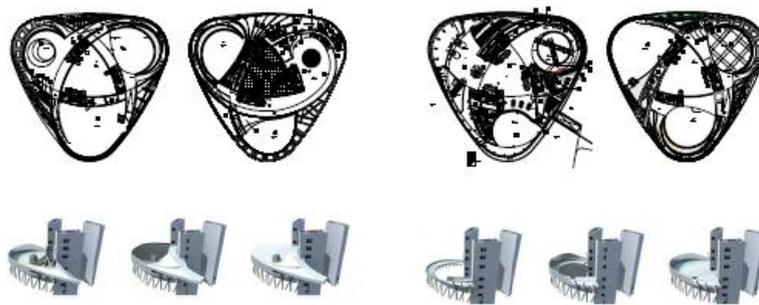


Figure 10– Plans and 3d models of the Mercedes Benz Museum, Stuttgart, Germany. Ben Van Berkel (2001-06)

The idea of van Berkel is "not" to use the center space as a space of circulation, because if I put the ramp in the central space have slain the project immediately. However, the brilliant idea, which is nothing but an embodiment of the diagram, is to put the service spaces in the vertical and the loop services "around" the central lobe: the engine of the project is here. And the success of this solution derive the next. This kind of triangular ring surrounding the central space evolves in three major structural pylons, plant and distribution, as it were the core of a tall building.

The big problem of Wright's Guggenheim is that, despite all this implied dynamic, actually when it is accessed you find yourself under the dome. It is as if you were in the Pantheon: it is static! However, UNStudio covers the central space on the top. It is covered with a technique layer. There are three. The first layer is the one of the mark, that is not an advertising image but the same diagram, the second is realized with a tarpaulin tensile structure and that does not play geometrically as the other, and then the third is an effective coverage from which the light passes.

According to Antonino Saggio (Saggio, 2015) the three things together not static the space but make it dynamic, which is essential. When you drive down the building you are in a kind of roller coaster, the realized diagram; at times, it is inside the trefoil system and in others, it is outside. When traveling outside you see that one off is "the car landscape", with highways,

intersections, interchanges and, incredibly, we understand how the building is also deeply rooted in a contemporary landscape of which represents a peak, a masterpiece. Of course, everything in this building could be traced with this idea but, in the context of this paper, and at this time, it was essential to make you understand what is a diagrammatic model and takes the form of an architecture designed with it and through it resolved.

CONCLUSIONS

Finally, this paper studies the design process in general, from Walter Gropius to Ben Van Berkel. When a designer targets architecture, giving a conceptual framework, a graphical presentation and some theoretical tools throughout history in an arch of times of about 80 years. Today we are facing a new paradigm in architecture that is the Information Technology. With the Bauhaus Walter Gropius has made a revolution in architecture. It was a revolution because the architecture changed all the parameters of operating. Today we are living in the information society that made a revolution in architecture. Ben Van Berkel has been included within this path to open the theme of the diagram. Because, while in the thought of Eisenman, after all, the logic is not intimately information and not intimately scriptable, van Berkel is a “digital native”. These new paradigms in the design are not just fashion but are the furrows of reasoning through which architecture comes into contact with other sciences and with the change of the whole society. Born this different mode of operating. Each designer is free to extend our work and adapt the dynamic theoretical model defined here according to his needs and the situation of the project to be conceived, when he elaborates particular theoretical models. The combination of the general vision of the process. The first modeling, the definition of different cognitive operations at the work of the second and the interactive questioning of the architectural models of the third makes the dynamic theoretical model useful in any design situation. The theoretical framework makes it possible to meet the requirements of scientific validity, while leaving the flexibility necessary for its punctual use. This theoretical model is therefore applicable by any designer to any architectural project.

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