

# Introduction

Structuralism in architecture, the most famous in Dutch scene during 1960's – 70's, was an example of a new way of thinking about concept of architecture and architects.

# Beginning in Humanities

It all started at the turn of the 19th and 20th century in humanities as an opposite methodology from classic analytical method. Structural method tried to focus not only on separate elements and their properties, but also on relations between elements and rules which are based on these relations. If we knew the structure of the rules, we would be able to know all variations of elements even before we found them. The best example of these ideas can be seen from the difference between “language” and “speech” where language is defined as a structure with rules and speech is the final group of elements which we use to tell something.<sup>1</sup>

# Architecture context

In the first half of the 20th century society was influenced by the consequences of the industrial revolution as a mass society, poor health conditions in cities and the population explosion. The architects tried to find new revolutionary conceptions in avant-garde which are mostly connected with new political movements. There was also a breaking point in traditional architecture movement with rising modernism: Le Corbusier and Bauhaus. The modernism seemed to be the answer for this period.

After World War II new members of CIAM started to criticize the unhuman aspect of modernism. In a devastated Europe, with the victory of democracy in the war and the need for urbanism to rebuild cities, they wanted to push classical modernism further.

# Aldo van Eyck

We can speculate why? Perhaps because of the density and high level of urbanization, or the sensitivity to social connections. But the Netherlands was the main scene of structuralist ideas. We could say that it began with the architect Aldo van Eyck and his first job as an urban designer of playgrounds for kids. After that he was inspired by new anthropology methods and travels to primitive cultures. As a result, he started to manifest his dissatisfaction with unhuman and non-contextual modernism at the CIAM conferences and through the Forum magazine. He was also a founding member of Team 10, a group of architects from different countries with similar ideas, which was the signpost for new movements in the future such as metabolism.<sup>5</sup>

# Team 10

Members of this group designed the most impressive projects starting with Eyck's Orphanage in Amsterdam [5]. The open concept of small units connected to each other which can potentially grow to the end of the site. And as Aldo van Eyck used to happily say, there is no difference between a building and a city. With his words “by us, for us” he put the role of a user into the centre of architecture and buildings. The influence from anthropology was clear.

These ideas project also into other architects such as Piet Blom with his Noah's Ark project presenting 3D labyrinth concept [6], Shachar Woods and George Candilis's project of Free University in Berlin [10] and Herman Hertzberger

who is the author of Montessori school in Delft and Centraal Beheer headquarters [7], the masterpiece of structuralism. They share their interests and incorporate the new ideas into their projects independently.

We can use Hertzberger's Centraal Beheer as an example that easily tells a story about the term structure in architecture and difference between a structure and an infill. The structure isn't only the final construction consisting of basic elements, it is a principle that defines the foundation for further use. Because we don't know what will happen in the future, what will be the user's needs, and how quickly they will change. The rest of the building inside the structure is the infill which can be rebuildable, reorganized.<sup>6</sup>

# Reach

Projects and texts presented by Team 10 during the 1950's – 70's inspired or became a foundation for other not only architectural groups such as Archigram and their project The Plug-in City [2], Yona Friedman and his Spatial City project [3] or painter Constant Nieuwenhuis and his New Babylon [4]. All of these projects aimed to design a future global city. The last one having probably the most radical concept with developing ideas such as a new society order, “homoludens”, nomads and having maximal freedom while abiding minimum rules. In competition for Hauptstadt in Berlin in 1958 Alison and Peter Smithson based their concept on Constant's ideas, however without success. The New Babylon project ended in 1974 and has never been realised.<sup>7</sup>

# Metabolism

Probably one of the strongest movements, which was highly manifested, was Japan's Metabolism. We can't say that Metabolism is a child of Structuralism. They started around the same time and developed on the opposite sides of the world. Team 10 and Metabolists first met at CIAM conference in 1959, where Kenzo Tange presented his Skyhouse and Marine City [8]. A year later a number of Team 10 architects attended the Japan World Design Conference in Tokyo.

If we said earlier that Dutch Structuralism was influenced by anthropology, Japan Metabolism came from traditional Japanese culture and was inspired by nature.

*In Metabolism they use a parallel of a “tree” as a permanent structure and “leaves” as temporary elements. The “tree” can grow, die, or regrow and the “leaves” can follow needs.*

There are some other differences as well. Both groups agreed with the criticism of CIAM. Dutch structuralists wanted to improve modernism and metabolists were more focused on the new way of understanding and designing the environment in opposition to the functionalism and its mechanical methods. Where the structuralists understand the society in the terms of identity, belonging and neighborhoods, the metabolists think about the revolution of the mobility where the neighborhoods start to be meaningless.

Both groups felt that there were differences between them, mainly in terms of culture, geography and political context. Team 10 was impressed by the work of the metabolists. They mentioned that the megastructures could be an answer to a mass society. However, there is a need for a more human scale.<sup>8</sup>

# Slow End

At the beginning of the 70's, when the Centraal Beheer was completed, everything seemed very optimistic. However, in the academic context, where mainly Aldo van Eyck and Herman Hertzberger taught structuralism, it was still very difficult to talk about the subject. They were

**afraid of establishing the term structuralism officially**

because of the danger of misunderstanding the meaning of the term. On the other hand, there was the rationalist movement (around William of Tijen) at the TU Delft, which wanted to retain the leading role at the faculty.

At the TU Delft they used the name “Forum architecture” instead of structuralism for the architecture around Team 10 and Forum magazine.

In 1976 the conflict with the Marxist group (based on the events of 1968) and 5 professors (including A. van Eyck and H. Hertzberger) ended with them being dismissed from their jobs for more than a year.<sup>9</sup>

After this and with the

# rise of postmodernism

with Robert Venturi and Aldo Rossi (manifested in 1966), all their efforts to improve classical modernism seemed to be in vain. Aldo van Eyck summed it up in his sentence:

*...being attentive to the “constant and constantly changing” did not mean establishing the change only: “I have heard it said that an architect “cannot be a prisoner of tradition in a time of change.” It seems to me that he cannot be a prisoner of any kind. And at no time can he be a prisoner of change.*

# Conclusion of the gold age of structuralism

From today's perspective, we could say that Aldo van Eyck was ahead of his time with his Orphanage. It was he who opened up the subject and fought for a more humane modernism. However, he never identified himself as a structuralist. After building the orphanage, he continued to publish and teach history at the university, but he never developed his projects in a structuralist way.<sup>10</sup>

Although the other members of Team 10 followed in Eyck's footsteps and designed important projects, there were also major disappointments in the competitions (Hauptstadt in Berlin, City Hall in Amsterdam, etc.). Team 10, which never defined itself as a movement wasn't strong enough to offer a new architectural concept that could meet with the needs of society. The rise of the postmodernism, with its loud rejection of the modernism as boring thing, started from scratch and returned back to history, context, and individuality.

There were probably also the practical issues within structuralism, such as:

# hard orientation within the system

**not enough individuality  
the physical structure seems to be too dominant and determined  
non-iconic visuality  
lack of complexity**

However, some of the original members still tried to apply this theoretical concept. Herman Hertzberger influenced future generations of architects through his famous book Lessons for Students in Architecture.

# Consequences and Post-structuralism

## Breakthrough studies

The last quarter of the century has seen the emergence of new studies, most of which are not directly related to the original structuralism but which had helped to develop it for the future. We can mention Christopher Alexander and his studies around the topology and patterns<sup>11</sup>, Chaos Theory, Frei Otto's form-finding experiments in an urban context<sup>14</sup> or post-structuralist philosophers Gilles Deleuze and Félix Guattari, especially with their texts on Rhizome<sup>15</sup>. These new theories and the rise of a computer age were attractive ideas that helped architects move forward.

## Rule-based and computer design

Probably the most famous is the voice of parametric design, which later gave us the term Parametricism, first defined by Patrik Schumacher in 2008.<sup>16</sup> If we go to the beginning of the story, between the linguistics and the anthropology, we know that the structure was defined as a set of internal rules between elements. We can see the parallel with this parametric design where we use rules (independent or combined into an equation) and entry parameters. We can call it also as rule-based design.<sup>17</sup>

It is necessary to be careful because not all projects that use the parametric way of design need to be fully rule-based. It can be divided into the iconic design which uses the parametric after the classical architectural composing as a tool for complex construction and design such as Frank Gehry. On the other hand, we can also find examples of mathematically based design where the parameters and rules are used from the beginning, for example in the Greg Lynn's approach.

We can say that this principle uses the rules to build the final image of the building and through different conditions or parameters, which can be unique, we get more complex design. The same rules can be used many times in different contexts.

However, from the original side of the structuralism in Dutch architecture, there is much less discussion about the primary and secondary structure and the role of the users and how the result can be absorbed and adapted to their needs over time. After establishing the equation and parameters, we “bake” the process and construct the building. We can compare this with Herman Hertzberger's sentence:

*“Authentic structuralism, as derived from the cultural anthropology of Claude Lévi-Strauss, provides insight into the reciprocal dependencies that exist between the*



**individuals and the community.”**

**Specific direction of FA BUT**

Not far from us, the word structure is also used in our alma mater. Professor Jaroslav Drápal has it in his theory of architecture as the source of his term “structurality”. Even though he follows the same examples of Aldo van Eyck, such as Paul Klee’s drawing “Medieval Town” (1924), he wasn’t influenced by anthropologic structuralism. His interpretation of structure as a relations between elements are more based on principles such as crystals and the chemical crystal lattice. In architecture, he promotes

**“structural thinking”**

which helps to define the main parts and a unit, the primary and the secondary.

**„In the concept of an architectural work, the issue is the structuring and hierarchization of a complex issue“**

He describes the word “structure” in architecture as a final realized project consisting of special, constructional and form relations. Even though his definitions lack the social context, which was used in Dutch scene, his work has a similar basis to the linguistic theory and it’s a nice example of independent local direction.<sup>19</sup>

**Current Society**

Before we start thinking about applying structuralism in the present, we should briefly analyze the current society. The last few decades show us new challenges like an increasing pace of life, internet and social media revolution, revolution in access to information, entertainment and consumerism, etc.

Zigmund Bauman, in his book The Liquid Modernity, nicely describes the shift from classical modernism, the period of mass society gathered together in one place with the strong position of a family, community and place. It was the long-term states one that was important for survival. Being strong and solid was better and useful for life. However, after the World War II, we can observe the unexpectedly increasing speed of change. The strong and solid concept starts to be limited and unadaptable in the fast-changing world. There appeared to be a place for the new concept which he named “the liquid”.

**Instead of being strong and solid, it’s much better to be flexible and adaptable.**

Those who remain solid lose their chance of success. As a result, he sees the shift from community to individualism. Strong and solid relationships, such as a family, community, or a life spent in one place are losing their value. As a result, we are now pushed to be quicker, more flexible and less limited in all aspects of life.<sup>20</sup>

It’s no longer difficult to change where we live, what field we study, our work or our friends and families. In society that has for the last few decades been surrounded by this combination of endless possibilities, we can observe a

**new fever for change.**

Consumerism (not only material oriented but also in entertainment) has also left its mark.

**Current Architecture**

Looking at the current state of our architectural environment, on one hand we have a huge demand for housing (influenced by changing lifestyle and still growing population) and on the other hand a clash with regulations which make the process more expensive and time-consuming. Issues of identity are also part of this, and are holding us back.

We got stuck somewhere between urban sprawl and housing estates.

**Sprawl is the fulfillment of an individualist dream.**

You can do anything you want on your plot. And because most of us don’t have much, you’ll probably design your own house or pick something out of a catalogue. The final result may not be pretty, but the important thing is that you have a roof over your head and a long way from anything or anyone but yourself. Dream of an individual freedom.

But from a global perspective, it’s unsustainable – materially, spatially and morally. With the rising cost of buildings, it will also be far less available in the coming years. Even though it contributes to the disappearance of the gradient between public and private, in this space

**we lose density and our sense of understanding others, sharing, and mutual development.**

The public begins to be just an utility for the transfer from one private space to another. We use it, but it doesn’t feel like we are part of it.

The housing estates stand on the opposite side. It’s effective in the use of space, energy and money. It creates more available housing and a denser urban area. On the opposite side of sprawl, we have a small area of private space and a huge area of public space.

**A uniformed space for mass community.**

However, the space between buildings is usually not full of life. The inhabitants can use it, but they do not change it themselves. It all looks like one project made by some nameless architect. As a result, there is

**no space for individuality, creativity, interventions and changes,**

which could absorb new social wishes. As in the first example, the private and the public are strictly separated. However, the private part isn’t visible and it’s only within the same buildings.

After the period of modernism, communist brutalism and postmodernism in our country, whose projects were perceived as an image of the architectural ego, we are now witnessing a new style.

**Being contextual and neutral is the easiest way**

to lose the sign of arrogant architectural ego. The results aren’t that special, but no one will hate it. Better for marketing and sales.

It all seems like a magic circle where we jump from the uniform housing estates to the crazy houses in the urban sprawl and back again. As a result, we still have control over the final design on the architect’s side, and we hide it behind neutrality.

**trust the users and find**

**a compromise between our control and their?**

A win-win compromise?

**Between Homogeneity and Diversity**

In the context of the previous chapter, I would like to continue in a more theoretical way. The question of homogeneity and diversity, uniformity and vast differences sounds similar. It’s a complex issue, and we can look at it from many points of view. However, as architects we work with these terms in a very ordinary way and our sense of them has a huge influence on our urban environment.

Most of us perceive the high level of uniformity as a negative aspect, as well as the huge differences.

**Uniformity is too boring and huge differences are too radical.**

We normally design a new project to keep our environments nice, starting with a building and ending up with a public space.

If we look back at the two examples from the golden age of Dutch Structuralism: Constant’s New Babylon and Hertzberger’s Centraal Beheer, and interpret them we will see that New Babylon works with different types of construction that are plugged together. The primary and secondary elements change their form in relation to needs of the final program. The result looks like a beautiful chaos with a diverse space full of unexpected situations and contradictions. It’s an open system that offers infinite types of space and can absorb change without disrupting the whole.

If we look at the Centraal Beheer, the first frame the construction, which represents the primary structure, is strict with a clear order. Inside you can do it however you like. The structure offers enough stability to provide the user with basic needs such as space, corridors, orientation, ventilation, light, heating, etc. and possibilities to easily change the purpose of the space. The order tells us that we are all on the same level, equal and able to express our individuality.

Both examples offer users flexibility and adaptability. However, New Babylon, which is more open and divided than Centraal Beheer, is too chaotic and complicated. It is also easy to imagine that the Centraal Beheer, on a larger scale, could be too homogeneous and limited by its structural order.

**position of the role of the architect and user in architecture**

that was supposed to help structuralism push the classical modernism in more a human, individual and diverse way.

We could say that an architect creates homogeneity through some kind of order (cultural, economic, etc.) and diversity through his ego. The user, on the other hand, can choose between stability and comfort, which tends to lead to homogeneity, or freedom and insecurity, which tends to lead to diversity.

**How We Perceive Change**

If we look at the user side, there is a question about change perception. Structuralism works with the terms such as changeability, flexibility, adaptability, and absorption. The goal is to be more effective and open to actual needs.

However, we can look at the small practical situation of how users use the options and flexibility of a space. Imagine a lecture room in your school where you go several times a week. There are many variations of where students can sit. However, even though there is no seating plan, the students will probably sit on the same chair in the room. Based on this, we could say that even though we have many options, after a few tries we find our safe and comfortable position and start to be lazy to think about different position. It’s naturally comfortable for us and it save our energy which we must use when we deciding between something.

What we should take away from this example as architects is that a situation with many options doesn’t necessarily mean more useful flexibility. Especially when there are no indications to help us decide which solution is better for us.

We can say that it’s still better to give users more options on how they can use or change the space, but it’s also much better to show them some final variations as an inspiration for easier decision-making.

We can go deeper into the various projects that touch on the theme of polyvalent space as defined by Aldo van Eyck and Herman Hertzberger. In Constant’s New Babylon, he thought of the users as “nomad-humans” (creative people who don’t have to earn and own stuff) and nomads who will travel through his construction. This means that there is less need for a stable non-changing space. The nomads find the

**right place depending on its conditions**

and use it for a short time for their purpose. The spaces in the construction are diverse, with different conditions and with options to

**finalized or change it by a current user.**

The second project I would like to mention is the Hostel from the book (w)Ego made by The Why Factory. The Hostel works with the concept of a movable construction (walls, floors, ceilings) based on the actually space used. Because most of the spaces aren’t used 24 hours a day

**the volume of the space is constantly changing**

and it’s bigger where we actually use the space and smaller where we leave the space alone. The goal is to create a building with much more effective use of space and to offer the maximum specific with minimum of the volume.

We can see that the first project works with the idea of changing the space in the hand of the user, who has all control over the change. In contrast, the second project

**uses some kind of system which is optimized and sets the boundaries of what is able or not.**

The system provides a comfortable solution where the user doesn’t have to decide about...