Form powers function?

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1. Introduction

From what Vitruvius proposed about firmitas, venustas and utilitas and what modernism claimed about form following function, it is easily understood that the lead distinction in architecture is that of form vs. function. It took a while until somebody questions “form follows function” which dominated the design of architecture and the success of the modern movement through the 20th century. The first one who questioned “form follows function” was Peter Eisenman in mid ‘80s, by proposing instead that architecture should enable function but not celebrate it.

The last few years Patrik Schumacher, the theoretical of parametricism, questions again the “form follows function” of modernism and proposes instead “form powers function”. This way he tries to compose a comprehensive theory of parametricism which is all about creating something new and getting away from the traditional way we design and see architecture. This paper discusses, how Patrik Schumacher came up with the new proposition of form powering function, what he means and what is he trying to achieve with it. In the end, it questions the way his office is applying this theory on the buildings it has designed.
2. Form powers function

2.1

Patrik Schumacher, collaborate and right-hand of Zaha Hadid Architects, has published the last fifteen years numerous articles theoritising a new agenda for architecture. In his latest attempts of expressing a new unified theory of architecture and a new style called by himself “Parametricism”, he wrote and published a book in two volumes which is named: “The Autopoiesis of Architecture”. As he claims:

*Contemporary avant-garde architecture is addressing the demand for an increased level of articulated complexity by means of retooling its methods on the basis of parametric design systems. The contemporary architectural style that has achieved pervasive hegemony within the contemporary architectural avant-garde can be best understood as a research program based upon the parametric paradigm. We propose to call this style: parametricism.*

Being leaded himself by the needs of the society of the 21st century, he tries to make the new style of parametricism, the only valid for architecture in the future; the great new style after modernism. In the discipline of architecture, the lead distinction is form vs. function. Unlike modernism which was leaded by principles of separation and repetition, parametricism is being led by the principles of differentiation and correlation. Moreover, he is trying to redefine the lead distinction, and get away from theories of modernism which claimed that form follows function. In the end he proposes completely new guidelines not only in terms of form creation and design program, but also in terms of architectural theory.

Every new style that is proposed in architecture needs a comprehensive architectural theory. The reasons are for organizing the ideas and the people who are designing using this new style, which is parametricism for us. It is also important if you are trying to work in an office and lead many architects across a multiplicity of projects, different in terms of program and scale. Finally it is important for oneself, so that one will be able to eliminate all contradictions within one’s own efforts; so that one doesn’t stand in its own way all the time. You can only lead a coherent practice with a coherent theory.

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1 Parametricism as Style – Parametricist Manifesto, Patrik Schumacher, 11th Architecture Biennale, Venice 2008
2 Parametricism and the Autopoiesis of Architecture, Lecture by Patrik Schumacher. SCI-Arc, Los Angeles, September 2010
2.2

It is necessary for us to agree that in parametricism all elements are considered parametrically malleable. Unlike every other former style of practicing architecture, I dare to say from the beginning of architecture until today, including modernism, parametricism is not working with platonic solids, with rigid, hermetic and geometric figures by just composing them. Nobody will claim the opposite regarding the use of such forms by modernism. Although modernism, compared with classical architecture, was allowed, and did stretch proportions, gave up on symmetry creating a more dynamic equilibrium and leaving for the user a bigger degree of freedom, he remained classical to its internal structure, avoiding the break with the tradition and the classical forms; unlike the change that happened in the rest of the arts during the same period of time.

If somebody looks how Patrik Schumacher and his followers are doing architecture he will realize that they are using nothing more than splines, blobs, nurbs, and particles, all organized by scripts. This turn in the way we conceive and do architecture started with the formal investigations of Peter Eisenman and Greg Lynn. Peter Eisenman being lead by deconstruction theories using various techniques for designing architecture; through gridding, scaling, tracing, folding and scripting, he designed buildings that were more of experiments. Greg Lynn by starting speaking about blobs in 1995 introduced also new forms into architecture. By this way the start was made, by getting away from the traditional drawing and designing techniques, and by these I mean drawing with ruler and compass, making rigid lines and rigid figures, and introducing and working with dynamical systems.

As Patrick Schumacher claims, avant-garde styles might be interpreted and evaluated in analogy to new scientific paradigms, affording a new conceptual framework and formulating new aims, methods and values. Therefore: “Styles are design research programs”. Every research program requires its hard core of design principles and a characteristic way of tackling design problems and tasks. So the style or research program consists of methodological rules; some that say which paths we should avoid (negative heuristics) and others what paths to pursue (positive heuristics). Because a style is not only a matter of forms and formalism, but it also introduces a particular attitude and way of comprehending and handling functions and program, Patrik Schumacher introduces a series of negative and positive heuristics for both form and function.

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Formal negative heuristics: avoid straight lines, avoid right angles, avoid corners, avoid rigid geometric primitives like squares, triangles and circles, avoid simple repetition of elements, avoid juxtaposition of unrelated elements or systems, and avoid familiar typologies

Formal positive heuristics: hybridize, morph, deterritorialize, deform, iterate, use splines, nurbs, generative components, script rather than model, consider all forms to be parametrically malleable, differentiate gradually (at variant rates), inflect and correlate systematically

Functional negative heuristics: avoid thinking in terms of essences, avoid stereotypes and strict typologies, and avoid designating functions to strict and separated and discrete zones

Functional positive heuristics: think in terms of gradient fields of activity, about variable social scenarios calibrated by various event parameters, think in terms of actor-artifact networks

Somebody could interpret and use the functional and positive heuristics away from one another. But in parametricism those two make sense together. In order to translate and achieve these functions into form someone needs the formal heuristics. The projects that are coming out of the Zaha Hadid Architects office show the richness of the formal vocabulary used in parametricism, through the richness of the types of structures of various scales it is addressing. This can also be reviewed in the project Nordpark Cable Railway, of Zaha Hadid Architects in Innsbruck, Austria, in which the different kinds of roofs were successively adapted in the different site conditions creating different final forms; however without losing the formal consistency between each other. The hallmark of parametricism is exactly this kind of unity within difference and difference within unity in the various scales of architecture from the tectonic detail to urbanism; the elegance of the ordered complexity which is produced and the sense of seamless fluidity, akin to natural systems.

In such a style as parametricism, which claims universal validity, what is most important is formal coherence, from the tectonic detail to the scale of the city, why not of the whole world. This is easily represented in the design of the Kartal-Pendik Masterplan, in Istanbul, Turkey, which Zaha Hadid Architects designed in 2006. Using parametric software in this project they achieved a worth-while collective value: “The unique character and coherent order of the urban field that all players benefit from, if adherence can be
The design in all the scales of the city produces an elegant, coherently differentiated city-scape. This ordered complexity replaces the monotony of other planned developments and the disorientating visual chaos which was the outcome of until now planned contemporary city expansions. The interarticulation between cross towers and perimeter blocks, as well as the system of parks that are spread into the city achieve the rhythmic flow of the urban fabric, and give a sense of organic cohesion. In addition, the system of the facades used throughout the city, makes the exterior of the blocks look heavier than the interior. This results in a flow of the public space where a block opens up, via the gradient transformation between the outer and the inner articulation.

No other style could have achieved the formal coherence in such different site conditions and scales with so many variants; especially when confronted with a large scale development of this kind. But this consistency depends upon the adherence to the strictures and impositions discussed above. That implies that the parametricist continuation forged by different architects is possible in myriad different ways, but never random. Patrik Schumacher says: “Large scale projects in Beijing and Cairo prove that parametricism is able to deliver all the components for a high performance contemporary life process.”\(^4\) That is why parametricism will succeed in changing our perception of the built environment, exactly as modernism did on the dawn of 20\(^{th}\) century.

As we already said, styles are research programs, and as such they must redefine their fundamental categories. In architecture the lead distinction is that of: form vs. function. Parametricism tries not only to redefine our perception of form and function, and get away from what modernism claims, but also to redefine the relationship between form and function in response to societal challenges. If we look at the history of the whole evolution of architecture, we could easily come to the conclusion, that social order requires spatial order and that society doesn’t exist without a structured environment. So, it is at this point, at which Patrick Schumacher claims that spatial organization sustains social organization. Parametricism by creating endless forms, it organizes and articulates life; so “form powers function”.

3. Ideas behind theory

3.1

Nevertheless this is not the first time the lead distinction of modernism, form follows function, is questioned in contemporary architecture. Peter Eisenman in his reply to Jacques Derrida\(^5\) claims that architecture needs to break apart the strong bond between form and function and always be and look like architecture. By displacing the traditional role of function, as the modernists understood it, it does not deny that architecture should have a function, but rather suggests that architecture should have a function, but without symbolizing it. Thus architecture should enable function but not celebrate it.

For the time being we must concentrate on what Patrik Schumacher is claiming by saying form powers function. First of all we should ask ourselves why he didn’t just reverse what modernism claimed; “form follows function”, into “function follows form” and instead claimed that “form powers function”. It is clear by the analysis of his theory that he wants to produce something new in terms of architectural form, as well as in terms of architectural theory.

The problem which he would have, regarding function follows form is that it does not sound new. Although somebody could conceive both quotes, form powers function and function follows form, as basically the same, there is a critical difference between those two. This difference lies on the verbs of the quotes; between powering and following. Let’s assume that somebody had to follow a model. He would be good in following the model, only when he would be able to reproduce it in every single detail. So following in this case is about imitating and recreating, rather than creating something new, such there is no need in doing so. Additionally he is not trying to force a function into a form, which would be the case in function follows form. On the other hand, he tries to create something new; otherwise his new theory would not have accomplished anything new. As a result, when form powers function, is about creating a new function, organizing and articulating function as Patrik Schumacher himself claims.

On the other hand, Peter Eisenman, by saying that architecture should enable the function but not celebrate it, claims something completely different. Although his quote has a common point to that of Patrik Schumacher, in denying the form follows function of modernism, and proposing instead one new theory of architecture. This idea of Peter

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\(^5\) Post/EI Cards: A reply to Jaques Derrida, “Assemblage” no.12, p.12-14, 1990
Eisenman comes from his conviction of making architecture without origin, architecture without author. He tries to avoid origin, and by using an arbitrary process he ends in a non-specific end. As a result his architecture doesn’t contain an aim as well. By doing this, he creates an autonomous object which speaks of itself; he avoids reproducing anything that was known until then in the discourse of architecture. So his architecture contains no signs, no narrative and no direction. By not wanting any starting point he also claims that function should not be the starting point of architecture as well. Therefore the final form should not represent the function, or anything else. The object for Peter Eisenman should be autonomous, having no identity or significance; it should speak by itself.

3.2

As it is easily understood, both Patrik Schumacher and Peter Eisenman consider form to come before function. The difference on what they propose lies on the different way they understand representation and sign. It is obvious that their ideas come from a different origin; Patrik Schumacher has been influenced by Gilles Deleuze and Peter Eisenman by Jaques Derrida.

Gilles Deleuze in his work “Bergsonism” argues that to restore the difference in thought we must first untie the knot which consist of “representing difference through the identity of the concept and the thinking subject”. He suggests that ideas should be conditions of genesis, conditions of creative transformation of things, rather than being identity-preserving shackles. He concludes that philosophy aims not in stating the conditions of knowledge, but at finding and fostering the conditions of creating and producing something new. According to Gilles Deleuze when philosophy does not create something new, it is not creative knowledge. Patrik Schumacher thinks of parametricism the same way as Deleuze thinks of philosophy. Patrik Schumacher states that in parametricism, form powers function; therefore he wants to create something new by using an exceptional form and not only represent something that already existed.

On the other hand Jaques Derrida understands representation together with sign, from a different point of view. He claims that the relationship we find in structuralism between signifier and signified is not correct. He wants to reverse the widespread conviction that a sign literally represents something, because a sign could always refer to yet

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6 Bergsonism, Gilles Deleuze, Zone Books, New York, 1991
more signs ad infinitum. Thus there is no ultimate referent or foundation. As in this text, nothing guarantees that another person will endow the words I use, with the particular meaning that I attribute to them. For example, when reading the word "water", we might think of water drops, a lake, the chemical symbol H₂O, and so on. We don't necessarily think of a predefined image of water; there is no such thing as a universal referent or foundation of water. And then, each of the different signifiers in which the word water could refer, according to our perception, could trigger another signifier, with no ending. So we conclude that a sign can represent more than one thing, yet it cannot represent anything. The same way thinks Peter Eisenman of the use of sign in architecture. He wants to free the object which he designs from sign, narrative and direction, because it could for someone represent more than one thing, thus it could not represent anything. He makes architecture without origin and without author. Function cannot be the origin so the final form that is produced should not represent the function. Therefore Peter Eisenman states that architecture should enable the function but not symbolize it.

To sum up, it is necessary to understand that what Patrik Schumacher is after, is the pursue of creating something new out of the forms produced by parametricism. Form should power something that is at least slightly different of what other styles of architecture could have provided. Patrik Schumacher claims that MAXXI, in Rome although it was designed 10 years ago, it is a successful, early parametricist project. By taking this statement of his into account we will analyze MAXXI the way Patrick Schumacher would want us to see it and in the end we will criticize it in the terms of “form powers function”.

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8 Parametricism and the Autopoiesis of Architecture, Lecture by Patrik Schumacher. SCI-Arc, Los Angeles, September 2010
4. Museum of Art of the XXI century (MAXXI)

4.1

The design of MAXXI started about 12 years ago as a theoretical project; it was understood, by the Zaha Hadid Architects, from the beginning as a radical experiment in design research. Even after its completion as a building MAXXI remains a theoretical project in the sense that it is an architectural manifesto projecting the potential of the new architectural style: parametricism.⁹

As I have already mentioned, parametricism tries to introduce new concepts as well as new values in the course of architecture. This happens in terms of a richer and expanded formal repertoire as well as a new definition and understanding of function. As a result MAXXI is acting as a built manifesto for the values represented in parametricism, by trying to organize and articulate life, which is its general aim. To accomplish this, parametricism tries not only to intensify the internal cohesion and differentiation through an ordered complexity of the architectural design, but to also create continuities between the building and the urban context.

4.2

As Patrik Schumacher claims, cultural buildings in general, but especially contemporary art centers, are the perfect vehicles for stating architectural opinions, thus a new architectural style. This has to do with the openness of contemporary art, which is trying to reflect new social phenomena and ideas. Art was always about invention and experimenting with new, as also Adolf Loos stated, in “Ornament and Crime”. Contemporary art has no specified content and typology and tries always to re-interpretate the very concept of art; art is the zone of incubation of all ideas, including architectural ideas. This is easily understood when somebody thinks of modernism, and the way modern art stated the values of modernism long before they were adapted, if they ever were completely, in architecture. The architectural frame, which in our case is the museum, should be a catalyst and incubator of art and furthermore the ideas which art is expressing. It is all about

“brainstorming about brainstorming"\textsuperscript{10}; achieving something new by designing an exceptional form.

In the site in which the MAXXI was built two urban grids meet. The Zaha Hadid Architects were confronted with this challenge, so the design took its initial point of departure, from the geometry of the surrounding urban context. [Picture 1] The second decisive design concept was the imposition of a strong rigorous formalism; the formalism of parallel lines that bend, branch, bundle or intersect, which were later interpreted as walls, beams, ribs, staircases and lightning stripes.\textsuperscript{11} As the design moved on, the formalism gained functional significance, by becoming a wall everywhere thought of as a potential exhibition surface and the fundamental space-making element of the design. The walls remain mostly parallel, and the curves coming from the change of the urban grid create exhibition spaces between walls, as well as interior and exterior spaces, but rather enhancing than losing the continuous flow of space. The flow of the walls defines two streams: one major – the galleries and one minor – the staircases and bridges. [Pictures 2, 3] As a result, every single one of the architectural elements: walls, beams and ribs as well as ramps and staircases is being created by the strict formalism of linear, streaming elements, contributing to the circulatory flow of the visitors.

This flow of people inside the museum is achieved by the project’s formal unity and coherence and it is thus understood internally as a field rather than externally as an object.\textsuperscript{12} The interplay of a multitude of architectural elements mentioned earlier results to a space which cannot be grasped in a single glance. The fluid sequence of space results to an open-wandering through the building without a beginning or an end-point. MAXXI abandons the traditional room-by room museum layout, in favor of an open, dynamic flow of people wandering throughout the building, through an ordered complexity. By creating surprising shifts of space, draws the visitors further, bringing new aspects in view and offering new choices to continue their path.

5. Conclusion

5.1

In our case it is necessary to criticize MAXXI in terms of a museum, which through its own formal vocabulary creates something new in terms of function, organizing and articulating life in a way that could not have been differently achieved. That is why Patrik Schumacher things of parametricism, as a style in which form can produce and organize function.

Nobody can argue against MAXXI, that its design has been lead by a strong formalism, that of parallel lines that bend, branch, bundle or intersect which by this ways create space. However the architects of the museum argue that this exact form is the one which organizes and achieves a high performance function. The main achievement in the design of MAXXI in terms of function is the circulation model promoted by the architects. The open flow of visitors which is achieved in the building, results to a wandering through the exhibited art, with no pre-determined path, through an open continuously flowing space. By this way the architects try to move away their design from what we could call, a museum as an object-container, and produce rather a campus of art where the ideas of art will be promoted by the design itself. This function though can be achieved by much more conventional styles other than parametricism, as it has already been achieved in a number of museums around the world.

As I have already mentioned, somebody could see MAXXI as a building, which though complex, has a formal consistency. That happens exactly because the Zaha Hadid Architects when designing the buildings what matter most is the signature-forms they use through every scale of designing, until the tectonic detail. At this point somebody can strongly argue that it is quite difficult to match the quieter needs of art, in a drama of spectacular architecture in which the only thing matters is that of creating exceptional forms. This exact building has such a signature-form that somebody could understand it as a Zaha Hadid building. It is all about the form designed and not about the function it could achieve, although the architects claim that in parametricism form powers function.

The Zaha Hadid Architects through their design of MAXXI run the risk of creating spaces which are in a large degree self-referential. If we agree that the main mission of a museum is to show and subsequently to promote the art it contains, the art showed in MAXXI can be very easily overwhelmed from the sculptured spaces and exaggerating forms
created by the Zaha Hadid Architects, thus making the museum a self-referential piece of art. As a result the architects run the risk of creating exactly the opposite function of what they were aiming to; that of making the art less important than the museum itself. The building was seen like this from its first opening, when it contained no art to be exhibited and everybody admired of what it is, little concerned about the level of the art it could would eventually have to exhibit. At this point somebody could argue about what a museum is for, what its mission should be; a question which cannot really be answered in the present paper. But in our case MAXXI will not be a catalyst and incubator of art and furthermore the ideas which art is expressing, rather it will make art in the museum less important than the museum itself.

5.2

To sum up, I agree that “form follows function” is an idea of modernism which could and should be revised and has been revised several times, but each time aiming to a different target, and coming from different roots. In our case though, “form powers function” of Patrik Schumacher has the potential to create something new in terms of architectural theory. Even though form comes before function in this particular theory, and somebody could argue against parametricism that it is a form-oriented style, it has more potential as until now the built paradigms have shown us. But the way the Zaha Hadid Architects are designing their buildings so far has shown the complete opposite. Another paradigm could be the Vitra Fire station of the same office which because of its exceptional form not only it was not functional but it also lacked the basic security measures, thus it was illegal and because of this never been used as a fire station.

If we remember the list of positive and negative heuristics, we can understand that the form comes always into priority compared to function. This is why, what matters most to Patrik Schumacher is the formal consistency and complexity of the final form, rather than the function which the form can create. Thus “form powers function”, as a theory, needs buildings to be built that can justify it and not all the way round.
Picture Index

Picture 1


Picture 2

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