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Research Paper

Anatomy of Architecture Based on the Creation of Space for Activity

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Abstract

Currently, the research and analysis of the anatomy of architecture are very scarce to find, although this issue is very important to use to interpret the architectural artifact and also for designing architecture. If a researcher or designer understands correctly about the anatomy of architecture, then the results will increase the value of the natural environment and the value of the human environment. This research is a theoretical research that raised the issue of the anatomy of architecture. The purpose of this study was to fully reveal all aspects that affected the anatomy of architecture and then put forward a new anatomy of architecture. In this study, two important theories of architecture made as a case study. These two theories analyzed, compared and elaborated in-depth. This research succeeded in compiling a new anatomy of architecture concept which departed from space created and its context. The results of this study are used as a reference for interpreting architectural artifacts as well as guides to designing architecture. Another benefit is to fill the scarcity of existing literature on the anatomy of architectural issues.

Keywords: *anatomy; architecture; space; scope*

1. Introduction

Currently, many new architectural forms emerged. If we classify in an extreme way, there are two opposite poles in architectural classification[1], [2]. One pole, containing architectures that designed without regard to the environment. At the other poles, there are also architectures that designed with great attention to the environmental conditions where the building stands. The environment mentioned above is the human environment and the natural environment, where the architecture located. While the architecture itself, categorized into a man-made environment[3]–[6].

The form of architecture is a composite and arrangement of enclosure elements which arranged based on the space inside[7]. This space triggered from the human need to do activities efficiently, effectively and comfortably. This architectural formation is then positioned into a context of place, which the merge and composition of the enclosed elements should also consider the constraint and potency of its place. This argument holds that a form of architecture or a combination and arrangement of the enclosed elements has a very close relationship with the human context and its place. If the relation between the architectural elements corresponds to the human environment as its users and in line with the natural environment as its place, then undoubtedly the architecture will have a positive impact on both environments[8]–[10]. Ultimately, the architecture is also believed to have an impact on the success of accommodating its function and at the same time expressing its meaning[11]–[13]

The combination and composition of these architectural elements referred to as the architectural structures. The identification and description of architectural structures or architectural anatomy is a very important issue to study in-depth. Research and books that concerned about this problem are very scarce to get. If obtained, almost always the content departed from the knowledge outside architecture[14]. Alternatively, existing research refers to certain architectural types such as vernacular architecture[15], [16]. To date, research that addresses the architectural anatomy associated with the context of the environment has not been found.

This theoretical research puts forward a new anatomy of architecture reading tool that could be used to read architecture as well as could be used to design the architecture. This new reading tool already covered the issue of the human environment and the natural environment.

The purpose of this theoretical research is to explore all aspects of how the relationship between the anatomy of architecture with the natural environment and with the human environment. Then synthesized it to compose a new reading tool. The benefits of research results can be used as a new reference to read the architectural formation in a more comprehensive way. Another benefit is as a reference for designing a complete architecture with regard to the natural environment and the human environment. The results of this study are also expected to trigger as well as to provide advice for a new study on the issues of the anatomy of architecture.

2. Material and Methods

2.1 Material

This theoretical research raised the issue of the anatomy of architecture and its relation with a human being as its user as well as its relation to the place where the architecture located. Referring to the issue anatomy of architecture, then the research step determines the relevant theories as for the case study. The criteria specified were: firstly, the theories contain the issue of the anatomy of architecture Secondly, these theories based on the

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results of empirical research. This is important because this study involves human reactions to architecture. Thirdly, the theories contain a relatively complete description and analysis to be studied further. Fourthly, theories could support the research aim of composing new anatomy of architecture reading tools that could be used to interpret existing architectural artifacts as well as a reference for architectural design.

Until now, books of architectural theories that meet the above criteria are still rarely available. Nevertheless, this research succeeded in selecting two theories that fit the above criteria. First theory: Theory of Thomas Thiis-Evensen's. The book published in 1987[17]. Although this theory does not directly touch the aspect of the place directly, the description of a building was very sharp. Second Theory: Theory of NJ Habraken. The book is written in 1998. The title of the book is Structure of The Ordinary[18]. This theory does not specifically address anatomy of architecture, however its explanation of the anatomy and physical order hierarchy and its relation to the territorial order is very complete.

2.2 Recent Theories in the Anatomy of Architecture

Both theories that determined case studies then analyzed in-depth based on the issue anatomy of architecture. The important material in both theories was then described in detail. The parts that have the potential to be used as analytical frameworks separated and traced in a critical and profound way. The search is on finding the definition, intention, and background of thought that influences the theories. Important parts of both theories compared, analyzed and then rearranged. The rearrangement is emphasized on how the relationships formed between the anatomy of the building and the anatomy of the place. Elaboration of these two theories produced a relatively complete anatomy of architecture to interpret architectural artifacts, as well as a reference for designing architecture.

Thiis-Evensen in his book Archetypes in architecture did not specifically put forward the anatomy of architecture. He proposed archetypes of architecture, as a basic form consisting of elements of roof, walls, and floor. When Evensen breaks down the building, he indirectly puts forward the anatomy of a building. His research used a phenomenology approach to discover existential-expression in architecture. The thesis used as one of the scopes of the anatomy of architecture.

While in his book The Structure of The Ordinary, Habraken explained about three orders, namely: form-the physical order, place-the territorial order, and understanding the cultural order. Similar to Evensen, Habraken also did not directly address the anatomy of architecture. On the other hand, he proposed the organizational structure of the city and its hierarchy as the main concept. He emphasized the role of control over every level of this multi-level structure and hierarchy. At this point, he also actually put forward anatomy of architecture. The approach based on a very powerful structuralism for reading relationships. After elaboration, the analysis used as one of the scopes of the anatomy of architecture.

3. Results and Discussion

3.1 Space as a Starting Base to Create Architecture

Humans in the world always need space for doing activities. The aspects of efficiency, effectiveness, and comfort must be fulfilled to carry out certain activity perfectly. For example, a space for sleep has different level of efficiency, effectiveness, and comfort from a space for doing office activities. Space that was once is abstract because it has no clarity of its boundaries (its enclosure-elements), began to change into a room when its enclosures become more measurable and real.

The need for space to settle (daily activities) is still abstract and then turned into a simple building (there is only one room in it). The term space then began to change into a room. Enclosure-elements of this room need relation with outer space, such as to get light or to get fresh air exchange. The degree of openness to its enclosures corresponding to the needs of the room begins to apply. This simple building needs to put into a site whose requirements support the efficiency, effectiveness, and convenience of the building. Ideally, the site has a flat contour to put the building so that the building can stand well and sturdy.

The site must also make sure that the building existence is not easily wobbled in a strong wind or hit by landslides or tree ruins. The site should also guarantee the people living in it against the need for water sources and areas to dispose of all human waste. Enclosure-elements of the building should always pay attention to the relationship between interior-space and exterior-space (site). So anatomy of architecture must base on this whole process. Maintaining anatomy of architecture with head-body-legs metaphors will not fit with the above process since there is no space involved in it. The head-body-legs anatomy is only suitable for man-made objects that have characters such as the human body, such as a temple monument or like other sculpture monuments.

Architecture always departs from space, so architecture characterized by spatial character. Thus, the anatomy of architecture must leave from space with its context. In the scope of the building, the emphasis is on the space and its enclosures limiting the spaces. In the scope where the building placed on a site, the emphasis is on the exterior-space that surrounds it. Then on the scope of surrounding environment, the emphasis is on the place and the position of the site against other sites around it.

3.2 Anatomy of Architecture Based on Space Created

Space-based anatomy can start from a wide scope, or can also leave from the smallest scope. These two points of view are the starting point of analysis. However, all the spheres associated with the space created must be included in the anatomy of architecture. Do not let anatomy of architecture be trapped narrowly only on the enclosure-elements in a building. Then, how do we assess every scope in the anatomy of architecture? How to assess each scope of the anatomy of architecture based on two approaches. First structuralism, second phenomenology. Or it could be both approaches combination. In structuralism, space-forming elements or space-enclosure elements expression considered as an architectural sign that has a certain meaning behind it. In the phenomenology approach, all space-forming elements or space-enclosure elements expressions determined in a shared experience.

Both of these approaches have their respective advantages and disadvantages. Structuralism used in the scope of surrounding environment, the scope of the site and the scope of the building, while phenomenology used on the scope of shape and the scope of the material. Both approaches are principally intended to read the properties and composition of each scope. This research succeeded in putting forward anatomy of architecture whose composition used to read property and composition architectural artifacts. Anatomy of architecture organized as follows:

1. *The Scope of The Surrounding Environment*. The emphasis of the anatomy of architecture on the surrounding environment is: how building mass (plus sites) surrounding it create space for existing buildings (plus sites). At this stage, the site selection becomes the most important thing to support the desired expression. For example, A site that is frontal facing the axis of the road will express a different meaning to the site whose position lined side by side on a street. In this scope which is important to assess is the dominant expression that emerged from the building (plus site). The dominance of expression can arise from the composition or property of the building (plus site). References used to assess the building composition is the principle of position and the principle of arrangement. While the reference used to assess building properties is the principle of internal & external quality

2. *The Scope of The Site*. The emphasis of the anatomy of architecture on the scope of the site is: how to lay out building mass to form exterior-space within the site. At this stage, the quality and measure of space created within the site become the most important thing to support the desired expression of the building. For example, The larger volume of space created in front of the building will make the building viewable in its entirety. The monumental expression on the building, for example, will create due to the human distance space. In this scope, the dominant expression that emerged from the building will be considering. Dominant expressions can arise from building properties or from building compositions.
3. *The Scope of The Building*. The scope of the building consists of three important points: first, enclosure-elements, second, structural elements and third, ornaments. First, the emphasis on the anatomy of architecture on enclosure-elements is: how all the enclosure-elements, roofs, walls, and floors create interior-space. In principle, the roof is the divider of space with the sky, the walls are to limit the space with the landscape and other humans, while the floor limits the space with the ground that we stand on. Similarly, how internal and external properties attached to the enclosure-elements play a role in the creation of interior-space quality. At this stage, the shared-experience approach (phenomenology) believed more suitable for reading the existential-expression of all the enclosure-elements. While the approach of architecture as a sign (structuralism) believed to reveal the layers of pragmatic meaning to layers of symbolic meaning attached to the entire enclosure-elements. Second, The emphasis of the anatomy of architecture on structural-elements is: how properties and compositions of the structural elements create interior-space. The structure and construction of the building can also be enclosure-elements, but can also be separate structural elements as well. Third, the emphasis of the anatomy of architecture on ornaments is: how the ornaments in the room (stand-alone or attached to the enclosure-elements) act as signs that have meaning to the interior-space creation (space).
4. *The Scope of The Shape*. The emphasis of the anatomy of architecture in the scope of shape is the degree of openness and closure and the enclosure-elements surface quality. Both should be aimed at supporting the planned activities in the room. In this scope of shape, the interwoven relationship between the interior space and the exterior-space must be in line with the planned activity. It should also be noted that the openness and closeness of the enclosure elements will create an expression on the inside of the building and at the same time on the outside of a building.
5. *The Scope of The Material (Sustainabilty)*. The emphasis of the anatomy of architecture on the material scope is on: the availability of all material sources used. Whether all material used comes from the surrounding environment or is not found in the surrounding environment. Thus, if the source of all materials is continuously available to the surrounding environment, it is expected that: first, the building will sustain; second, the building will not have any foreign expression because it uses a local material known to the public

4. Conclusion

Based on the analysis, this study concluded that:
Firstly, the anatomy of architecture must base on the space created. Without based on the space created, the anatomy of architecture will not touch the essence of architecture, anatomy will only be the anatomy of an object that has no spatial character. Anatomy of architecture can no longer be grounded or focused on the metaphor of the human body, but rather on the fact that humans merge with the purpose of creating space for activity.
Secondly, the anatomy of architecture must complete from the scope: surrounding environment, site, building, shape, and sources of materials. The structure of anatomy of architecture not only in buildings but based on the overall creation of the interior space and the exterior space that includes it.
Thirdly, the new anatomy of architecture can use as a starting point of research with the anatomy of architectural issues. The results of this study also open the possibility to use as a reading tool for other research issues or analysis related to the anatomy of architecture. Thus this research is open for further development to enrich the theoretical treasury of architecture.
Fourthly, as a tool for designing, the anatomy of architecture is used to create an architecture that can have a positive impact on the natural environment which in turn adds value to the human environment.

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