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Four Aspects of Architectural Tectonics Through Exploration of the Meaning of Tectonics with a Systematic Literature Review Method

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Abstract. Architectural tectonics which has a meaningful relationship with aesthetic and construction aspects in buildings is still sometimes understood separately from one another. In addition to the need for architectural practice and education, in this context, this article seeks to enrich the meaning of architectural tectonics by exploring and synthesizing meaning from leading online and architectural dictionaries as well as various libraries of journals, proceedings, reports, and architectural books. Tectonics in architectural research and design still needs to be explored where this concept can be useful in the design process because it does not separate structure and aesthetics in architecture. In this study, it is known that there have been various theories from architectural experts about the architectural tectonic theory from 1781 to 2022. This research is a literature review method with a systematic review method with synthesis results through narrative (qualitative) techniques from analogy processes and meaning synthesis. The results of this study, among others, produce the meaning of tectonic in synthesis 1, namely architectural tectonics in aspects of the appearance on the surface, aspects of tectonics processes, and aspects of internal factors. Meanwhile, in synthesis 2, other aspects were produced outside of the three aspects in synthesis 1.

Keywords: tectonics, architectural design, structure, aesthetics

1. Introduction

Starting from the encounter understanding of the structure and architecture in design as well as research and architectural education are often still trapped in something separate (Juniwati & Widigdo C., 2003). When reading architectural works, the forms created have been composed of structures and constructions that contain aesthetic aspects and their ability to accommodate human activities. Then further, even though they already understand this concept, often architects still have not applied the theory of architectural tectonic and its uses/benefits in architectural design. This may occur when references to tectonic literature still require difficult understanding or also because the concept of tectonics is rarely promoted in the learning process of architects during their studies or other education.

(Surya & Priyomarsono, 2016) explained that an understanding of architectural tectonics makes it possible to answer the challenges of today's architectural design. The challenges of tropical architecture as well as architecture with an insight into local cultural identity can be solved by understanding the concept of architectural tectonics. Because there are aspects of craftsman skills that are in accordance with the potential of the environment at the location of the design object and combined with the understanding of the architect/designer who not only understands the concept of building robustness but more than that how to express the beauty contained in it.

Various references to the theory of architectural tectonics are known to have various theories from architectural experts. Starting from the theory of classical tectonics as put forward by:

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Karl Freidrich Schinkel, Karl Bötticher, Gottfried Semper, Robert Maulden, Kenneth Frampton, Francis D.K. Ching and James F. Eckler, as well as Chad Scwartz. Also in addition, regarding the digital tectonic theory that has been put forward by Al-Alwan and Mahmood where this theory underwent a development in 2020. As for Indonesia, the tectonic theory of Y.B. Mangunwijaya, Ch. Koesmartadi and Josef Prijotomo were further discussed.

Thus, the preparation of this article was carried out in various steps in the order of presentation. The initial stage is the process of compiling the meaning of tectonics in architecture which contains deepening of its meaning and conclusion of meaning from leading online dictionaries and then analogizing its meaning with that of geology (synthesis 1). Then look at the concepts and meanings of tectonic theory from experts from the early 1800s to 2022, on architectural works and on research that has been carried out to date in the world and in Indonesia (synthesis 2). After that, from understanding the meaning of each (synthesis 1 and 2) further analyzed so as to produce architectural tectonic aspects in understanding the meaning of architectural tectonics. It is hoped that the stages and the outputs/results of the analysis in this study can enrich the understanding of tectonics as well as a means of learning about architectural tectonic theory for both students and architectural practitioners.

2. Methods

This study uses a systematic review method by synthesizing the results using a narrative (qualitative) technique. Conducted with a systematic review stage framework inspired by (Siswanto, 2010) including:

1. Identify research questions in the form of: what are the tectonic aspects of architecture through exploring meaning in theory and dictionaries.
2. Through the research protocol: the research methodology approach is known, namely qualitative; the research team comes from the field of architectural science; follow the stages of research; the search for articles is carried out systematically; the criteria for articles to be considered are architectural tectonic topics both in the world and in Indonesia.
3. Pay attention to library sources of research materials and select them: quality online dictionaries and journal articles and proceedings, architectural books published by quality publishers selected based on the level of usefulness of tectonic concepts in retention sources.
4. Synthesize the results and present the results: with a narrative technique, where there are 2 synthesis processes, namely synthesis 1 and synthesis 2. Synthesis 1 is carried out by looking for tectonic meanings from various leading online dictionaries and then synthesizing them into synthesis 1. In synthesis 2, there are various conclusions meaning according to tectonic theorists associated with aspects in synthesis 1.

3. Discussion

3.1. Synthesis 1: The Meaning of Tectonics in the Dictionary (Architecture and Geology)

The meaning of the word tectonic in the dictionary, consists of several meanings. In the online dictionary (Etymonline, 2022) that in 1650 the word tectonic is known to come from the Early Latin, namely *tectonicus* which has a meaning related to buildings and construction. Later in 1850, tectonic meant "building or constructive arts in general". And recorded since 1887-1899 understanding of tectonics in geology has emerged, which means "maintaining to the structure of the Earth's crust". Some of the meanings of tectonics from the dictionary are in the following table (table 3.1). It is known that the word tectonic has a development in its meaning where it originally came from the branch of construction science as well as architecture and then appeared in geology, such as the mention of tectonic earthquakes and so on. This became interesting, where the word tectonics was then deemed suitable by geological scientists to use it also in their science. Furthermore, in the science of architecture itself, it is necessary to

examine in depth what the meaning of tectonic is. Was the meaning of tectonics originally in the art of building construction and architecture or in the understanding of tectonics by academics and practitioners of architecture as something related to earthquake tectonic or geological science.

Table 3.1. Table of tectonic meanings from different dictionaries (Ching, 2012; Dictionary.com, 2022; Etymonline, 2022; Grahm & Garde, n.d.; Press, 2022)

No	Meaning of tectonics	Source
1.	Arts and crafts	(Grahm & Garde, n.d.)
2.	The science/art of shaping, decorating, or assembling materials in the construction of architectural buildings.	(Ching, 2012)
3.	Architectonic means the unified structure or concept of a work of art.	(Ching, 2012)
4.	Building or construction art in general	(Etymonline, 2022)
5.	Related to building and construction	(Etymonline, 2022)
6.	Build a building	(Etymonline, 2022)
7.	Builders, carpenters, wood workers	(Etymonline, 2022)
8.	Tectonics in geology refers to the structure of the earth's crust	(Etymonline, 2022)
9.	In geology refers to the push / force or condition within the earth that causes the movement of the earth's plates, resulting in movement (tectonic valleys)	(Dictionary.com, 2022)
10.	Related to architecture	(Dictionary.com, 2022)
11.	In geology refers to the structure of the earth's surface	(Press, 2022)

There is the concept of a physical entity in terms of architectural tectonics. (Hurol, 2016) explains that tectonics can be evaluated by quantitative and qualitative methods. Method by evaluating artistic value (qualitative) and engineering value (quantitative). Both methods of assessing aesthetic value (usually phenomenological) and engineering value (usually quantitative) can be further developed using analytical techniques. The analytical approach makes it possible to discuss the role of each physical entity. The two concepts of tectonic analysis presented by Hurol were later known as aesthetic tectonic value analysis and structural tectonic value analysis.

The meaning of tectonic is tried to be extracted from the dictionary about the meaning of tectonic in geology. (Dictionary.com, 2022; Etymonline, 2022; Press, 2022) explains that tectonics in geology is the surface structure of the earth's crust caused by the movement of the earth's plates and forces/pushs or conditions from within the earth. However, if we look at the meaning in architectural tectonics, when we then relate it to tectonics in geology, they both produce a physical appearance in both sciences.

Then it is further analogized one by one segment, it can be analogized as follows: the surface structure of the earth's crust (in geology) can be analogized with the expression/display of the art of building construction/architecture (in architecture); caused by the movement of the earth's plates (in geology) is analogous to structure and construction, the process of making (building and assembling) from craftsmen, and arts and crafts (in architecture) and the style/push or condition from within the earth (in geology) is analogous to the concept (in geology). architecture).

In this 1st synthesis, it is concluded that the meaning of tectonic is where tectonic is the physical appearance of an artistic building; and produced through the process of making (assembling, building) by craftsmen; with the impetus of an underlying concept; and can be analyzed with qualitative analytical techniques or quantitative analytical techniques.

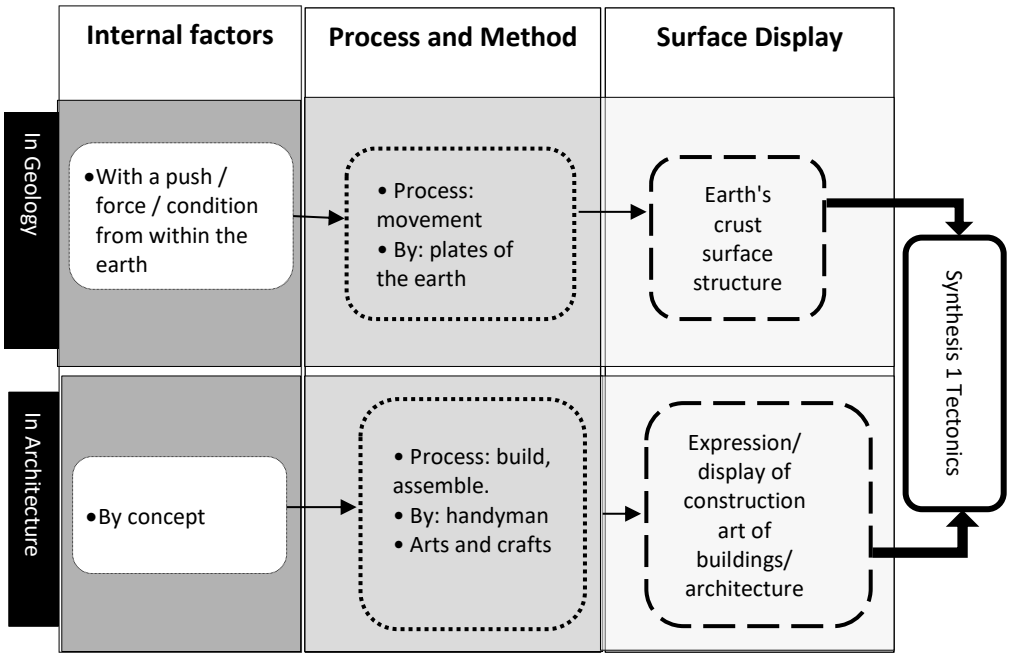

Figure 3.1. Meaning of Tectonics (Research Team Personal Analysis, 2022)

3.2. Aspects of Architectural Tectonic Meaning

Weaving the meaning of tectonics since 1781 with the initiator of Karl Freidrich Schinkel to Al-Alwan's 2020 tectonic theory of digital tectonics and Y.B. Mangunwijaya's tectonic theory and Josef Prijotomo's in 2022 (in Indonesia). These theories in the schematic chart below are then called: Classical Tectonic Theory, Digital Tectonic Theory, and Architectural Tectonic Theory on the Indonesia. Then, after that, it is concluded that the meaning of tectonics in synthesis 2 by paying attention to the three main parts of tectonics obtained in synthesis 1 then produces architectural tectonic aspects.

Karl Freidrich Schinkel lived from 1781 to 1841 (Bharoto & Malik, 2009). (Wolf, 1997) in his dissertation explains that Karl Freidrich Schinkel found there was a strong interest in the mechanics of the ancient Greek temple form and the Gothic dome reflecting the attributes of human innate subjectivity. He was further inspired by German Idealism, that the structure of modern architecture is a metaphor for subjectivity. Subjectivity is meant as a representation of the human self of subconscious desires which are manifested in real building materials and are determined by structural space, and repetitive mechanical elements. He explains that tectonic theory is derived from the Greek word for artisan (*tektonen*), also defining an identifiable Anschauung aesthetic and the necessary form of visual knowledge that preserves developmental-guided cultural and social ideals. Similarly, tectonic ornamentation provides mythical allegory about the immortal nature of the human soul and its need for visual confirmation in architecture. Ornament plays a rhetorical role and functions as a critique by using language in a poetic way to satirize the human unconscious, the ultimate unity with natural matter.

In the early 1800s, a revolution in construction practice led to experiments with new materials as the main structural system of a building. Bötticher introduced a focus on construction rather than materiality leading him to embrace new technologies. In 1844, Bötticher's writings had focused solely on Hellenic (Greek) and Gothic (German) but two years later he realized the potential of iron and began to adapt his thinking to suit developments in construction technology. Later in Bötticher Theory, requires that the core form is completely hidden in an

equally important system: the *kunstform* or the art form. In other words, an art form is an ornament that encloses a construction but actually expresses the structural forces, rules, and physical manifestations beneath the surface. For Bötticher, matter is not a problem; instead, beauty comes through the creation of ideal stability and relationships between parts of the construction (Schwartz, 2017b).

(Semper et al., 1989) describes the four-element theory of architecture which was initiated in 1851, which was very important in the development of the theory of architectural tectonics. The first element that marks it is the fire place / fireplace as a source of warmth, lighting, and food preparation as the core. Around the core, the first element is formed where the religious concept is placed in the place of worship. In society, the core area provides focused sacredness and takes shape and structure. In addition, the other three architectural elements are the roof, the enclosure/boundary, and finally the mound/hill. (Schwartz, 2017b) describes the four elements of Semper then classified into two construction typologies: tectonic and stereotomic. The term stereotomics comes from stereotomies or the practice of cutting and shaping stones for construction. In addition, tectonic which takes a more specific definition compared to its characterization from all fields of study, refers to lightweight assembled structures. This distinction is characterized by the root word *tekton*, which focuses on the practice of carpentry. For Semper, material selection is very important for architectural development. Materials must be selected specifically for each project at hand. Selecting the right material for each particular condition, according to Semper, allows the expression of the ideal in the building and ultimately for the beauty (Schwartz, 2017b).

Then the concept of tectonics was further coined by Robert Maulden. (Maulden, 1986) explaining that tectonics in architecture is defined as the science or art of construction, both in relation to use and in artistic design. Thus, tectonics does not only refer to the activities required to create a construction material that answers certain needs, but more than that also to the activities that elevate this construction to an art form. It is concerned with the modeling of matter to present matter: from physical to meta-physical, tectonic begins to speak of poetic constructions. (Maulden, 1986) also conveys the idea of architectural roots (tectonic subjects) in time and place which depend on external and internal aspects of various building references. The intrinsic properties of a building are structure/enclosure/border, services, connections/details, materials/techniques, and natural forces, etc. which are the subjects of tectonics. External tectonic subject where building tectonics manifests the character of a place as part of a historical continuum. To construct tectonic is to manifest our existence on this earth and now in relation to certain phenomena from a place. (Maulden, 1986) then explains the purpose of architectural tectonic analysis as a rich and diverse set of cultural readings is another goal of tectonics. The consequences are twofold: the possibility of different interpretations of the same tectonic object and a kind of "depth." This change in significance can occur over a long period of time, such as from one culture to another, but it is also possible simultaneously that two people looking at the same object will "see" two different things. It is a kind of ambiguous form that allows distinction. Next up is the concept of depth that a building tectonics pays attention to: materials, details and joints, will have the capacity to reward the user in the smallest detail.

Kenneth Frampton in (Frampton, 1996) said that tectonics is an art of unification. Art here must be understood as *tekne* and therefore shows tectonics as a collection, not only of building parts but also of objects, then becoming works of art in a narrower sense. (Kim, 2006) briefly conveyed Kenneth Frampton's tectonic term which etymologically refers to the art of construction, the term tectonic cannot be separated from technology. On the other hand, technology in architecture does not retain the meaning of the poetic knowledge of Architecture. Thus, tectonics revived by Frampton became the need to express a more high-value and interesting level of construction. Technology began to be presented by Frampton in enriching

the meaning of tectonics in the development of his theory. Although technology has a tendency to industrial development which can eliminate the concept of art, but the poetic concept that previously existed in tectonic theory is able to survive.

(Bharoto & Malik, 2009) explained that understanding tectonics through Kenneth Frampton's perspective does not only look at architectural works physically but also non-physically through efforts to bring architecture closer to humans. The notion of tectonics is an understanding of Frampton's tectonic framework that is widely developed according to the substance contained in the realm of architecture, both in direct contact with the creation process of architectural works and those that are not in direct contact, such as the profession of an architect and the ethical framework of an architectural work. The tectonic substance as a discourse in architecture is not defined as a single narrative, because within Frampton's understanding of tectonic development there are still wide spaces for development. Both in terms of materials, implementation methods, construction, and even culture. Subjectivity is still accommodated in tectonics, especially when it comes to culture, experience, and human expertise as development implementers. The study of the history of architecture can also use tectonic discourse as an expression of the truth value of the culture inhabiting a nation, especially for nations that have experienced colonialism, where the writing of the history of architecture is assumed to be based on the perspective of the colonial nation (orientalists). Tectonic discourse can also be used as an architectural criticism tool. This is due to the tectonic principle that sees the essence of architectural works through their association with the body. Tectonics emphasize spatial forms rather than mass forms. This point is actually less understood by architectural actors. Through association with the body, it is proper that architectural works that are wrapped in all forms of ism still have a soul that is identical to their environment and culture. Starting from here, the tectonic discourse will be in harmony with an architectural understanding based on phenomenology and critical regionalism.

In 2013, (Ching & Eckler, 2013) in relation to form explained tectonics with a new perspective that is used in understanding forms. According to them, form has several considerations in architecture that can be overcome by composition, relating to construction, or in terms of materials or characteristics of materials. Form refers to the physical character of the architecture. It defines the boundaries of space and determines the ways in which it is occupied. Furthermore, especially in the early stages of the design process, parts of a building can be understood in general terms. A system for forming forms is arranged in an arrangement to define space is called tectonics. The following are four tectonic elements: (1) mass is a shape that is proportional in all dimensions (base or base), (2) plane is a shape that is proportionally proportional in two dimensions, (3) frame is a shape that is proportionally similar in two dimensions, (4) The core is the formal element that acts as the focal point, idea, and centre for any spatial composition.

In 2017, (Schwartz, 2017b) stated that tectonics all tend to focus on the relationships between architectural elements that we tend to separate. Such as: space and construction, structure and ornament, atmosphere and function. Architectural tectonics seeks the relationship between the design of space and the reality of the construction necessary for its existence. Tectonics is included in the practice of architecture because this theory provides an opportunity to initiate a dialogue between the elements that make up architecture – construction and materiality, structure and support, space and function, context, and ornament and appearance. As long as buildings continue to have contact with the ground, continue to be influenced by gravity and natural forces, and continue to need to be assembled, fabricated, or constructed, tectonics will play an important role in the development of the built environment. Tectonics must be used to develop strategies for the contemporary world that seem to refocus on making things rather than making representations of those things. (Schwartz, 2017a) presents a framework for examining the core concepts embedded in the tectonic history and evolution of

architecture. Each of the following topics discusses certain characteristics of theories drawn from different historical and contemporary lines of thought, including: anatomy, tectonic + stereotyping, detail + connection, context of place, representation + ornamentation, space, and atectonics.

(Gao, 2004) describes the use of tectonics in digital forms. The representation of construction tectonic knowledge, which emphasizes structural joints and attention to detail in creativity, displays architectural forms through construction poetry. However, today's digital architecture emphasizes dynamic surfaces, with their three-dimensional curves, and the interior and exterior continuity of their topological spaces. These are all very different from the spatial forms produced by traditional tectonic views, making it impossible to explain these modern designs in terms of traditional tectonics.

By looking at the various developments of previous tectonic theory, the further development of tectonic theory can be divided into types of tectonic, namely classical tectonic and digital tectonic. (Al-Alwan & Mahmood, 2020) explains that tectonics is the integration of structure and construction, the application of technical aspects, and attention to detail in creativity in a harmonious and systematic manner that reflects cultural and aesthetic qualities, and relates to unique aspects (skills, methods, materials and proportion). This study explores the connotations of tectonic (classical and digital) in the theory of architectural theory and its role as the art of construction and artistic design. (Al-Alwan & Mahmood, 2020) divided the types of tectonics into: (1) classical tectonics: investigating the most important definitions of theorists to finally reach a comprehensive understanding of the definition and (2) digital tectonics: discussing terms related to digital architecture to obtain understanding of new architectural forms from a tectonic perspective. The important factors of classical tectonic, into three main aspects, which constitute the "classical tectonic triad". These aspects are: (1) Technique; represented by construction, technology, and representation, (2) Culture; represented by arts, crafts of empathy, and (3) Materials; represented by structure, science, and ontology. The important factors of digital tectonics, divided into three aspects, are described as the "digital tectonic triad". These aspects are: (1) Tools; represented by advanced programs and technical aspects, (2) Articulation; represented by poetic, aesthetic and cultural dimensions and (3) Assemble; represented by how to assemble the building elements.

In Indonesia, the concept of tectonics can be seen in many architectural works of Y.B. Mangunwijaya. In his explanation of the meaning of architecture, (Mangunwijaya, 1988) explained the root of the word architecture, which comes from the Greek words arche and tektoon. Where arche means the original / the main / the beginning, while *tektoon* which means standing firm and stable. When these two words are combined *architectoon* it can mean the main / actual builder or master builder. The word architectural tectonics is not explicitly mentioned in the explanation, but the word architectural tectonics is not explicitly mentioned in the explanation, but Y.B. Mangunwijaya in his work and view of architecture, holds strong architectural tectonic principles as well as in his explanations of other architectural works in the world. For example, in looking at a house without an architect in Africa which is made of clay but has a high structural value both logically and visually. Image is not only seen by Mangunwijaya as aesthetics, but also images are able to make us see ecological reasoning, for example, where something is harmonious, orderly, and harmonious.

(Sutrisno & Mahatmanto, 1999) presents an opinion on the stereotomic (heavy material) of the works of Y.B. Mangunwijaya where stereotomics can also be included in the discussion of tectonics in vernacular architecture and also in archipelago architecture. By following Gottfried Semper in general the term tectonics (tectonics) refers to the skill of arranging or making (weaving, knitting, weaving) using light materials (such as grass, reeds, rattan, ropes, threads, fabrics, membranes, etc.) from the use of heavy materials (stone, clay) which Semper

classifies as stereotomic. In the archipelago, weaving a material (still following Semper), needs to be further noted because bricks, coral, gravel, and other materials even though they are heavy in weight but when arranged, spread or assembled into a larger structure, can also be classified as as tectonic works. Furthermore (Surya & Priyomarsono, 2016) and (Leevianto & Aly, 2017) examined the tectonic concept by Y.B. Mangunwijaya. In both references to Y.B. Mangunwiajaya's design work that: the work is designed with the concept of unity and respect for nature (it can be seen in the space and materials/building materials); the elements that make up the space and structure are refined by ornaments that are rich in meaning; various tectonic advantages respond to development with today's technology; have distinctive characteristics and local identity; and is believed to be very possible to answer the challenges of globalization which has an impact on the results of architectural forms that tend to be universal in various places.

(Koesmartadi, 2021) said that in a case study of the beam circuit system in the archipelago's architecture, it resulted in the theory that tectonics did not cover construction, but on the contrary they exhibited the shape and structure of the construction to bring out a beautiful choice of interior components. In the case study of a village house, tectonics is an expression for the space that arises from the emphasis on structure and construction. Tectonics cannot be considered as a term of structure and construction alone. Then in Indonesia, another initiator (Prijotomo, 2022) explains tectonics in architecture, namely composing the construction section by processing an appearance that remains constructive but also looks artistic at the same time. The artistic weight of this construction is also one of the indications for the existence of architecture: architecture is present when construction is displayed with an enchanting artistic taste. From this, we can say that tectonics is the transformation of a building into an architecture. (Prijotomo, 2022) concludes that tectonics in the architecture of the Indonesia is a process of thought and feeling in processing construction and processing buildings, as well as products in the form of buildings/details/construction that are unique/characteristic. Tectonics can exist in various places, for example: plane trunk endings, pile-beam connections, shapes. Tectonics has the potential to be read as the evolution and development of architecture. The use of tectonics is as a pointer to periodization, an identity indicator, an intense representation (meaning/symbol), an indication of the modernity of Nusantara architecture, an artistic indicator (architecture is a science and art), a statement that there are subjective aspects in architecture (subjective individual and subjective group).

In some of the references above, it can be drawn important points related to understanding the meaning of tectonics, seen in the following aspects including:

3.2.1. Surface Appearance

Architectural tectonics in the aspect of appearance on the surface can be understood as an architectural expression visually (including in digital form) of form and space (Al-Alwan & Mahmood, 2020; Bharoto & Malik, 2009; Ching & Eckler, 2013; Gao, 2004; Koesmartadi, 2021; Mangunwijaya, 1988; Prijotomo, 2022; Schwartz, 2017b; Wolf, 1997). The visual appearance of this form and space, specifically in tectonics, is a wrapping ornament and articulation of beautiful or artistic construction expressions (Al-Alwan & Mahmood, 2020; Frampton, 1996; Kim, 2006; Koesmartadi, 2021; Mangunwijaya, 1988; Prijotomo, 2022; Schwartz, 2017b; Semper et al., 1989; Wolf, 1997). In relation to construction, the observable appearance of the reality of construction art can be found in the unique construction details and materials, connections (art of unification), construction technology, and poetic construction (Bharoto & Malik, 2009; Frampton, 1996; Gao, 2004; Kim, 2006; Koesmartadi, 2021; Mangunwijaya, 1988; Maulden, 1986; Prijotomo, 2022; Schwartz, 2017b).

3.2.2. Aspects of Tectonic Processes

The physical appearance that appears in architectural tectonics is produced through processes and methods, namely the process of manifesting building materials and creative details of composing constructions that are processed with thought, feeling and constructive processes that are connected to space including structural space and mechanical elements that are repeated and collected and space in relation to forming composing and understanding forms and forms (Al-Alwan & Mahmood, 2020; Bharoto & Malik, 2009; Ching & Eckler, 2013; Frampton, 1996; Gao, 2004; Koesmartadi, 2021; Mangunwijaya, 1988; Prijotomo, 2022; Schwartz, 2017b; Wolf, 1997). Another process is the practice of cutting, forming construction and assembling (Al-Alwan & Mahmood, 2020; Bharoto & Malik, 2009; Ching & Eckler, 2013; Maulden, 1986; Semper et al., 1989). In addition, another process is a metaphorical process of subjectivity and brings humans closer to culture (Al-Alwan & Mahmood, 2020; Bharoto & Malik, 2009; Wolf, 1997).

3.2.3. Internal Factors

In producing architectural tectonic works, there are internal factors (from within) in the form of an awareness and practice of the ideal human mind and cultural concepts as a manifestation of the character of a place and history from physical to meta-physical and diverse cultural readings (Al-Alwan & Mahmood, 2020; Bharoto & Malik, 2009; Maulden, 1986; Semper et al., 1989; Wolf, 1997). The internal concept of tectonic works is also a dialogue between architectural and construction elements. This construction is a comprehensive system in the form of structural strength and physical manifestations from below the surface as well as values in construction technology and poetry (Al-Alwan & Mahmood, 2020; Ching & Eckler, 2013; Frampton, 1996; Gao, 2004; Koesmartadi, 2021; Mangunwijaya, 1988; Prijotomo, 2022; Schwartz, 2017b).

3.2.4. Other Aspects

As for synthesis 2, it is known that there are tectonic meanings that are outside the aspects of synthesis 1:

1. has the potential as a rationale for contemporary architecture where the theory of tectonics in architectural practice is in direct contact with copyrighted works or those that are not in direct contact, such as the profession and the science of architectural ethics, and in the development of architectural practice in the future (Bharoto & Malik, 2009; Mangunwijaya, 1988; Schwartz, 2017b; Wolf, 1997).
2. is not only an object but can also be seen from the side of the observer subject (the subjective nature of the observer's interpretation and the details of the depth of observation) so that it can also be used as a tool for architectural criticism (Bharoto & Malik, 2009; Koesmartadi, 2021; Maulden, 1986; Wolf, 1997).
3. related to culture, experience, history and human expertise as implementers of local/local development so that it is difficult to find in other places (Bharoto & Malik, 2009; Koesmartadi, 2021; Mangunwijaya, 1988).
4. can be divided according to the form of the product produced, which is divided into classical tectonics in traditional forms and digital tectonics in digital forms and can be understood by meaning associated with other terms, namely stereotomic (Al-Alwan & Mahmood, 2020; Mangunwijaya, 1988).

4. Conclusions

Some things that can be concluded from the discussion above, both from the discussion of the meaning of the dictionary and the tectonic theories that are verified in the architectural works in this study include the following:

1. The meaning of architectural tectonics can be analogous to the meaning of tectonics in geology. The analogy of meaning is explained into three aspects plus 1 other aspect,

namely: (1) aspects of the appearance on the surface, (2) aspects of tectonic processes, and (3) aspects of internal factors (aspects of encouragement from within) as well as factors outside these three aspects, namely (4) other factors.

2. The aspect of the appearance on the surface in architectural tectonics comes from construction arising from internal forces and there are other aspects that are inseparable from each other.
3. Details on the meaning of the fourth part of tectonics (other aspects), namely dealing with architectural practices (contemporary, institutional and professional) and architectural criticism; see tectonics from the observer's point of view (the subjective nature of observer interpretation); and tectonics is divided into classical tectonic in traditional form and digital tectonic in digital form and can be understood its meaning by being associated with atectonic and stereotomic.

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