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THE ROLE OF ARCHITECTS IN BUILDING CONSERVATION

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ABSTRACT

The conservation of heritage buildings is a crucial topic in architectural practice because it focuses on both physical protection and the interpretation of the values they embody. In this context, architects play a vital role in integrating the principles of the Vitruvian Triad: firmitas (strength), utilitas (utility), and venustas (beauty). Indonesian conservation policies encompass protection, development, and utilization, involving multidisciplinary roles including architects, although their implementation still faces various challenges. This study aims to examine the role of architects in the conservation of heritage buildings by emphasizing a comprehensive understanding of architectural values. The method used is a qualitative approach involving direct observation as well as a theoretical review of conservation and regulations in Indonesia. The research findings reveal that building conservation is not merely a physical process but must also consider the value systems embedded in the building's massing, interior and exterior spatial layout, elements, and ornamentation. Additionally, the integration of Performance-Based Design (PBD) and Evidence-Based Design (EBD) approaches is necessary to bridge the demands of contemporary functionality while maintaining the building's historical authenticity. In addition, it is necessary to integrate Performance-Based Design (PBD) and Evidence-Based Design (EBD) approaches to reconcile contemporary functional requirements while preserving the building's historical authenticity. Architects play a strategic role in interpreting the significant value of heritage buildings and translating that value into design interventions through the principles of maintenance, repair, replacement, and addition.

KEYWORDS: architect, conservation, heritage, role

1. INTRODUCTION

Architecture is a discipline focused on three aspects: beauty (art), strength (structure), and utility (function). Vitruvius, in his book *De Architectura*—which has been widely translated into various works—articulated the Vitruvian triad of firmitas, utilitas, and venustas, a framework later reinforced

in 1624 by Henry Wotton in his book *The Elements of Architecture* using the terms *commoditie* (function); *delight* (*venustas*); and *firmness* (*firmitas*). In the 20th century, Walter Gropius emphasized these principles in his designs through three terms: function, expression, and technique.

Table 1. Triad Vitruvius for Architecture

Triad Vitruvius		
VITRUVIUS	WOTTON	GROPIUS
<i>Firmitas</i>	<i>Firmness</i>	<i>Technique</i>
<i>Utilitas</i>	<i>Commoditie</i>	<i>Function</i>
<i>Venustas</i>	<i>Delight</i>	<i>Expression</i>

All three must be balanced to achieve a functionally optimal design. An imbalance will occur if the proportion of any one of them is reduced. This principle should serve as the foundation when architects engage in conservation practices that involve assessing a building's attributes. Efforts to adapt existing buildings must still adhere to these three elements, including during the conservation phase. Therefore, this paper will focus on the architect's role in conservation practice while prioritizing the three key aspects of architectural design [1], [2].

In reality, many architects still treat beauty, strength, and functionality as separate entities. Architects often adopt their own approaches, driven by personal biases, when dealing with long-standing buildings of high historical value. These issues ultimately lead to either demolition or excessive intervention, while on the other hand, there are binding regulations.

Using a qualitative ethical approach, this paper outlines the architect's role in conservation practice based on the author's field observations. Architects must be able to interpret the form and elements of a building as a value—not merely its physical form and history—in order to preserve the building's physical integrity.

2. THE CONSERVATION OF HERITAGE BUILDING IN ARCHITECTURE

2.1 Theoretical Foundation of Conservation

Architectural works are creations that not only convey beauty but must also achieve optimal functionality through analytically sound structural integrity. When considering the key aspects that architecture students must master on their journey to becoming architecture graduates and architects, one of the foundational fields they must understand is engineering mechanics and building physics, in addition to an understanding of rhythm, proportion, and context.

Architects must possess a strong grasp of proportionality and contextuality, as well as structural integrity and thermal comfort, to ensure building safety and physiological comfort. Proportions are not only determined by the building's inherent elements but also by how the building relates to surrounding structures and the elements in its environment. On the one hand, function cannot be separated from the

fields of psychology and socio-anthropology to achieve optimal functionality within existing proportions and context.

As articulated by Vitruvius in his book **De Architectura**, architectural works are closely tied to the art of beauty, which makes them visually appealing; the engineering science of structural integrity, which ensures that beautiful architectural works possess safe structures; and the social and cultural sciences, which transform the building into a space suited to the activities within it—commonly known as the setting system and the activity system [3], [4]. The comfort of the user space is a key aspect of design [5], as it is expected to foster a positive working environment [5], [6].

As Vitruvius emphasized, an architect must consider beautiful and unique aesthetics, supported by the optimization of spatial function and structural precision—neither falling short of nor exceeding the specified structural calculations.



Figure 1. Triad Vitruvius

Value [5], as a cultural product [6], [7], is incorporated into architectural design during the programming phase [6], [8]. Highly specific choices are made to achieve an optimal design at the time of design, as emphasized by Sullivan in his principle that “form follows function.”

Generally, the five physical elements of a building’s architecture are evident in:

1. building mass
2. interior spatial layout
3. exterior spatial layout
4. building elements
5. building ornamentation

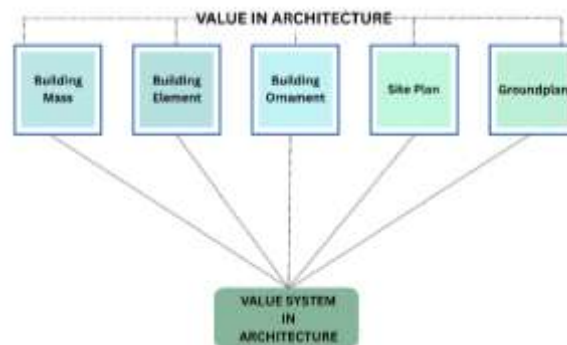


Figure 2. Value in Architecture

These five elements merge into a value system that continues to highlight the significance of each. Physically, form and space converge as a spatial system and an activity system [9], [10], each of which will be assigned a distinct value.

When developing a design, an architect, supported by a team of experts in their respective fields, will prioritize precision to achieve high artistic quality, paired with appropriate structural integrity and comfortable functionality for future users. Generally, for simple buildings, the program development is carried out concurrently with the design phase by the architects. However, for complex buildings, the program is developed by architects with specific specializations or other parties possessing expertise commensurate with the complexity of the functions to be designed. This is because design is a multidisciplinary product. Acher specifically developed William Pena's theory because the complexity of functions is not always straightforward, necessitating collaboration among all parties to create new buildings that demand expertise across multiple disciplines. This includes designs that incorporate existing building structures as part of the new design to be created or developed. There are considerations resulting from the analysis of various design principles [5], [6], [8]. There are advancements in thinking that impact the use of materials, structural systems, and creative approaches. There are considerations regarding the evolution of ideas that influence the use of materials, structural systems, and creative thinking. There are design trends shaped by evolving structures and technologies. All of these are dynamic considerations because they are influenced by the conditions prevailing at the time the design is created. Conditions related to architectural design concepts, technology, and socio-cultural factors will eventually be viewed differently from the approaches that will prevail in the future.

The phrase "will be viewed differently"—which carries significant weight in the context of the time of construction—is referred to as "value" in the context of conservation.

2.2 Architectural Design and Functional Optimization of Historic Building

Buildings in a development plan are categorized into four types:

1. Demolished because they are incompatible with the new function, a process known as "demolition"

2. Demolished because they are incompatible with the evolving dynamics of the same function, a process known as “redesign”
3. Developed using the existing building, even with the addition of new elements or building sections, which is then referred to as “development”
4. Conserve using the existing building, even with development of new elements or building sections subject to applicable regulations regarding significance or value, which is then referred to as “design adaptation”

Drawing on Sullivan, a modern architect who reminded architects of the Vitruvian triad that an imbalance in the use of firmitas-utilitas-venustas would result in a decline in architectural function; beauty must stem from the required function—a concept famously known as “form follows function.” Form and function as the foundation for creating the beauty of a building. Although in future conservation efforts, this may shift toward “form follows function.” Building design—whether starting from scratch or through renovation—must consider performance both within and outside the building. Performance within the building is realized through precise structural calculations and appropriate thermal comfort calculations tailored to the building’s functional needs, whether at the micro-scale or the meso-scale of the site.

The performance of a building’s exterior is supported by factors that cannot be analytically quantified but must be considered during the design process. An approach focused on building performance is known as Performance-Based Design (PBD), which incorporates structural analysis, thermal comfort, and similar considerations to achieve optimal building performance. PBD has primarily been used in the design of new buildings and has not yet been widely adopted in the renovation of existing structures. Meanwhile, on the one hand, the Performance-Based Design (PBD) approach for new building design—aimed at achieving appropriate structural strength and optimal functionality—must in practice be combined with the Evidence-Based Design (EBD) approach for design cases on sites containing heritage buildings or for the renovation of heritage buildings [11]. EBD is an approach that uses documented evidence as a basis for design decisions [12]. To date, EBD has been widely applied in hospital buildings [12], [13], where evidence derived from medical research is incorporated into the design process. Architects must be able to maintain the PBD approach in heritage buildings by utilizing EBD. EBD is an evolution of the POE (Post-Occupancy Evaluation) concept, which emphasizes that a building cannot be optimally utilized due to functional gaps that existed at the time of construction and persist in the present or future [14], [15].

2.3 Conservation Policy in Indonesia

Heritage conservation in Indonesia, based on established regulations, began in the early 20th century, coinciding with the 1931 Athens Charter. Through the 1932 Monumenten Ordonantie, the Indonesian territories—which were then under Dutch colonial rule—began to address the numerous archaeological sites discovered, particularly temples. Additionally, there were archaeological remains dating back thousands of years. These regulations clearly outlined key provisions for protecting

existing artifacts, including efforts to search for and discover additional artifacts. In principle, the government at that time had the authority to manage collections of archaeological objects found scattered across various regions and to handle them in accordance with the policies in effect at the time.

Sixty years later, the government, through Law of the Republic of Indonesia No. 5 of 1992, reaffirmed efforts to protect heritage objects and buildings. Buildings from the era of the kingdoms and the Portuguese, British, and Dutch colonial periods began to be designated as heritage sites through local government decrees. Yogyakarta, Bandung, Semarang, and Jakarta began discussing the existence of unique buildings over 50 years old, coinciding with the growing number of architecture scholars who had completed master's and doctoral studies on conservation both domestically and abroad.

Academics who have completed their studies have disseminated their knowledge of conservation to the general public, leading to the emergence of several communities of heritage conservation advocates. This includes the adoption of a charter established by the conservation community that aligns with international standards.

However, a weakness in Indonesian Law No. 5 of 1992 is that it remains largely focused solely on protection, as its provisions still heavily reference the 1932 Monumenten Ordonantie. Meanwhile, international standards have implemented more advanced regulations in line with scientific developments, including the 1975 Architectural Heritage Charter, the 1964 Venice Charter, and the 1975 Washington Charter, among many others. Referring to international standards established in the mid-20th century, it is stated that behind the protection of architectural forms of buildings and archaeological traces—which pertain to structures, buildings, and spatial areas—there is a consideration regarding the dynamic needs for space in line with the times.

Discrepancies began to arise during lengthy discussions on conservation principles. The debate between the preservation and utilization of buildings became the primary focus, along with the role of the community in determining heritage sites, in addition to the government. Government regulations, as well as regulations from the Minister of Culture and the Minister of Public Works and Housing, serve as the foundation for conservation efforts.

This debate began to be addressed with the enactment of Law of the Republic of Indonesia No. 11 of 2010, which began to define heritage sites, structures, and areas based on three main principles: protection, development, and utilization. Although generally not yet fully implemented, there is a fundamental difference between Law No. 5 of 1992 on Heritage and Law No. 11 of 2010 on Heritage. Additionally, provisions have been included that involve the community in actively participating in conservation efforts—from the initial discovery or search phase through to the conservation stage—with the assistance of Conservation Experts and the Heritage Conservation Expert Team at the government level. Through Ministry of Public Works and Public Housing Regulation No. 16 of 2021,

the technical implementation of conservation is further elaborated, supported by regulations from the Minister of Culture and government regulations addressing heritage sites.

Under Law of the Republic of Indonesia No. 11 of 2010, architects—as a profession possessing the ability to analyze buildings in terms of form, space, or layout while considering the optimization of function and structure—are actively involved at both the government and private or non-governmental levels. Support from the Architect Law, Government Regulation No. 1 of 2022, along with regulations from the Minister of Culture and the Ministry of Public Works and Public Housing (PUPR), complements the understanding of conservation practices, although there are many shortcomings within them.

2.4 Practices in The Conservation of Heritage Building in Indonesia

Based on certification exams conducted by the competent authority, once an individual is deemed competent and receives a Heritage Conservation Expert Team (TACB-Tim Ahli Cagar Budaya) certificate, that person is entitled to vote on recommendations for designation or delisting, regardless of their specific field of expertise. This status can often be a trap, as the expertise available does not always provide sufficient weight in the decision-making process regarding the designation of a building as a heritage site. Meanwhile, referring to Articles 1 and 5–11, it is stated that a heritage site is designated because it possesses significant value, one of which is cultural value, with architecture being one of the products of culture [11], [14].

Similarly, the Conservation Expert (TAP-Tenaga Ahli Pelestarian), which is open to all academic disciplines, presents its own challenges during conservation practices. Based on the realities of designation and conservation, heritage sites are always linked to the academic fields of history, archaeology, architecture, and anthropology, which have since expanded to include civil engineering, urban planning, and so on, with support from the legal field as government-sanctioned regulations.

Specifically, in the practice of designating and preserving heritage sites, every person holding a certificate has a voting right as stipulated in the regulations. Specifically, in the practice of designating and preserving heritage sites, every certified individual has the right to vote, as stipulated in the regulations. However, what is often overlooked is that a lack of alignment across disciplines can lead to weaknesses in the designation process and field practices, even though these individuals legally possess the necessary expertise in the field of conservation.

Field practice reveals the following classifications of how Heritage Conservation Expert Team (TACB-Tenaga Ahli Cagar Budaya) and Conservation Expert (TAP-Tenaga Ahli Pelestarian) operate:

1. applying their own field of expertise when assessing a heritage building while allowing other disciplines to contribute to the analysis of its designation or conservation

2. positioning their discipline as the sole field of expertise for the conservation of heritage buildings without allowing other disciplines to collaborate in the analysis of designation or conservation
3. equating all disciplines within a single framework for designation and/or conservation based on the perspective of the competency certificates held

The three classifications above must be viewed from an academic perspective, each of which employs distinct methods for analyzing data. Every piece of data can be examined through various approaches, each possessing a degree of validity within its respective method, yet yielding differing perspectives depending on the discipline.

A heritage building can be evaluated not only—as is obvious—based on the history of its use for specific functions deemed significant, through historical research of preserved records and authentic evidence of its authenticity (historical aspect), but also from the perspective of its form and architectural elements that hold significant value, by examining the significance of its form or spatial layout (architectural aspect). The use of architectural elements and building forms varies across different time periods, reflecting the evolving knowledge and creative vision of the architects. Naturally, these factors must serve as benchmarks for assessing the architectural significance of the structure. There are three principles that must be considered: Beauty, Strength, and Utility; therefore, the conservation of heritage sites should also be understood through the lens of these three principles. Beauty in conservation is interpreted in two ways: beauty derived from uniqueness or significance, and beauty as pure aesthetic value. This beauty encompasses patterns, rhythm, and theories of form, integrated with the functional aspects of those forms within the building's overall structure and thermal performance. Beauty is often interpreted solely as form by other disciplines without acknowledging the specific reasons behind its selection.

3. Architect in The Practice of Conservation of Heritage Building in Indonesia

Depending on their area of expertise, an architect will design a building using specific methods—methods that take into account principles such as those outlined in the Vitruvian triad. Referring to various international standards on design and conservation, as well as regulations established by the Indonesian government as set forth in the Building Act and the Architect Act, an architect is someone who designs and/or develops designs.

In the context of preservation, an architect must be able to maintain and develop designs while understanding the significance of the original design. The goal is to ensure that this significance is preserved and that its preservation is carried forward into the design development, treating new and existing buildings as a unified whole.

The primary principles for an architect in building conservation are to maintain, repair, replace, and add. The following are common conservation scenarios architects often handle:

1. Constructing a new, separate building on the same site as a building that must be conserved

2. Constructing a new building within an area that must be conserved
3. Constructing a new building attached to a building that must be conserved
4. Creating new buildings or spaces within a building that must be conserved
5. Maintaining elements or ornamentation on a building that must be conserved
6. Repairing elements or ornamentation on a building that must be conserved
7. Replacing elements or ornamentation on a building that must be conserved

Table 2. Cases in Conservation

Case	Conserve	Preserve	Construct	Adding
Maintaining structural elements				
Maintaining decorative elements				
Repairing structural elements				
Repairing decorative elements				
Reinforcing the structure				
Attaching structures				
Attaching structural elements				
Replacing structural elements				
Replacing decorative elements				
Adding interior space				
Adding structures within the site				
Constructing new buildings (in a heritage area)				

According to Law No. 11 of 2010 on Conservation of Heritage, conservation comprises three efforts: protection, development, and utilization; with protection encompassing restoration and development

encompassing adaptation. Therefore, architects must be able to understand their role in each of these approaches, namely protection and adaptation.

In the context of protection, architects must be able to discern the significance of what is to be preserved. In this phase, architects must safeguard the significance inherent in the building's mass; the interior spatial layout; the exterior spatial layout; and the building's structural elements and/or ornamentation. A common mistake is interpreting conservation solely in terms of the building materials used, rather than their architectural value.

For example, in the case of colonial buildings, there has been a shift in architects' thinking influenced by the Amsterdam School, driven by a more mature approach to local values—both cultural and natural. This shift ultimately altered the building's overall appearance, changing structural concepts as well as the use of elements and ornamentation.

However, in the case of colonial and traditional buildings, the key value often lies in the building materials themselves—such as the use of stained glass in openings or specific types of wood that were structurally considered during construction.

Technological innovations incorporated into the building can also hold significant value, with conservation efforts focusing on the conservation of these technologies.

4. CONCLUSION

A building is not merely a collection of stones combined with other materials. A building is a work of architectural design that embodies the architect's vision—a human being created by God—through his work and creativity. An understanding of the meaning or value of a building as a product of architectural study must serve as a guide in conservation efforts, taking into account the three main principles of architecture: strength, functionality, and beauty. Architects must be able to interpret the value of a building's mass, its interior and exterior spatial layout, as well as its structural and ornamental elements, in order to determine the appropriate conservation approach.

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Author Profile

Wahyu Utami earned a Ph.D. in Architecture—cultural landscape conservation. Since completing her thesis which was finalized in 2001, she has established her academic focus in the field of urban heritage conservation, conducting research and publishing in various journals. She has been involved in various heritage communities in Indonesia since 2003 to the present. She has participated in drafting local-level conservation regulations on several occasions and has been part of the team drafting national regulations. Since 2014, she has served as a Heritage Conservation Expert Team (TACB-Tenaga Ahli Cagar Budaya) in one of Indonesia's cities.

Istiana Adianti is an architect and a lecturer in Architecture who specializes in historic buildings and urban areas. Her expertise is reflected in her active research and publications across several academic journals. She is currently pursuing her doctoral studies, focusing her research on historic architectural settlement in the Historic area. In addition to her academic pursuits, she is actively involved in heritage

conservation communities and serves as a certification assessor for historic building conservation in the Yogyakarta Kraton

Tutun Seliari is a lecturer in the field of Architecture, specializing in tourism architecture planning. Her research interests and focus are reflected in various studies and scholarly publications related to the development of tourist areas, built environment planning, and sustainability issues in architecture and tourism. Currently, she is pursuing doctoral studies with a focus on the human-place relationship, particularly in the context of spatial experience and the built environment. In addition to being active in academic and research activities, she is also involved in various study projects and the development of area plans.

Nurina Vidya Ayuningtyas is a lecturer with a passion for architectural education and research. Her interest and expertise in building science, particularly in energy-efficient buildings and architectural ecology. In her academic and scientific development activities, she focuses on the application of sustainable design principles that integrate energy efficiency, thermal comfort, and responsiveness to climate and environmental conditions. She has earned the Greenship Associate certification, demonstrating her competence in understanding and implementing green building concepts.