

Barriers to the design of construction projects containing national cultural values: A Study in Vietnam

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ABSTRACT

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The construction industry plays a vital role in preserving national cultural values toward the sustainable development of a nation. While previous studies often emphasize preserving national cultural values by maintaining historic buildings, more research must be done on protecting these values in designing new projects. This study aims to investigate the barriers impeding the design and construction of new projects containing national cultural values in Vietnam. A list of 13 obstacles to the design of construction projects containing national cultural values was established. A questionnaire survey was then developed and delivered to the respondents who worked in Vietnamese construction firms. A total of 115 responses were collected for Exploratory Factor Analysis (EFA). The results of EFA showed that these barriers were categorized into three groups: market, construction companies, and educational institutes. This study indicates that the development of construction projects incorporating national cultural values encounters various challenges, underscoring the need to engage diverse stakeholders, including governmental bodies, construction firms, and educational institutes.

Keywords: barriers; construction projects; national cultural values; sustainable development

Introduction

Preserving national cultural values is crucial for the sustainable development of a nation [1, 2]. Cultural heritage is the foundation of a society's identity, providing a sense of continuity and shared history [3]. When safeguarded, these values contribute to social cohesion, fostering citizens' strong sense of belonging. Additionally, cultural preservation enhances tourism, attracting visitors interested in experiencing a nation's authentic traditions and architecture [4]. A country's sustainable development is intertwined with preserving its unique cultural identity, ensuring that future generations inherit a rich and diverse legacy. Therefore, efforts to protect and promote national cultural values are pivotal in nurturing a thriving and resilient society [5].

The construction industry plays a vital role in preserving national cultural values by maintaining historic buildings with significant cultural importance and incorporating these values into new construction projects [2]. Through the restoration and upkeep of heritage structures, the industry actively conserves national identity, ensuring that architectural treasures endure for future generations. Moreover, when designing and constructing new projects, integrating national cultural values reflects a commitment to honoring and perpetuating the unique heritage



of a nation. By harmonizing modern construction techniques with artistic sensitivity, the construction industry becomes essential to a country's cultural legacy, fostering a built environment that tells the story of its people and traditions [6].

Designing construction projects containing national cultural values is a complex endeavor, demanding more than just structural expertise—it necessitates a deep understanding of culture [7, 8]. Architects must be equipped with technical knowledge and a profound appreciation for the cultural nuances embedded in their designs. Achieving this synergy requires collaboration from construction firms and educational institutions responsible for shaping future architects and engineers. The curriculum must encompass cultural studies, ensuring graduates possess the interdisciplinary skills to integrate national cultural values into their designs seamlessly [9]. A collective effort between construction firms and educational institutions is essential for nurturing professionals who can craft structures that resonate with the cultural identity of a nation.

While previous studies often emphasize preserving national cultural values through the maintenance of historical buildings [10-12], there needs to be more research regarding protecting these values in the design and construction of new projects. Understanding the cultural significance embedded in contemporary structures is equally crucial for sustaining a nation's identity [13]. Investigating national cultural values into new constructions ensures heritage preservation and contributes to the evolution of artistic expressions in the built environment [14]. Bridging this research gap is essential for holistic cultural preservation, encouraging innovative design practices that reflect a dynamic interplay between tradition and modernity in constructing a nation's architectural identity.

Vietnam, a nation with a history spanning 4000 years, boasts a plethora of construction projects embodying its national cultural values. Unfortunately, numerous

historical structures were lost during wars, prompting a contemporary effort to infuse cultural significance into new construction projects [15, 16]. While some construction projects have undertaken this endeavor, the numbers still need to be improved [17, 18]. Several barriers impede the widespread design and construction of projects containing national cultural values in Vietnam. These barriers may include regulatory challenges, limited awareness, financial constraints, and a need for more skilled professionals adept at harmonizing modern construction with traditional cultural elements. Understanding and overcoming these obstacles is pivotal for preserving Vietnam's cultural identity and ensuring a resilient architectural landscape that seamlessly blends heritage with progress, reflecting the essence of a nation that has withstood the test of time. Therefore, this study explores the barriers impeding the designing and construction of new projects containing national cultural values in Vietnam.

Literature review

Construction Projects Containing National Cultural Values

Construction projects containing national cultural values refer to building initiatives that intentionally incorporate and express a particular nation or community's cultural heritage, traditions, and identity [2, 19]. These projects go beyond mere structural functionality, aiming to reflect and preserve the unique cultural elements that hold historical, artistic, or symbolic significance. Such projects' design and construction processes prioritize integrating architectural features, materials, and aesthetics that are emblematic of the national or regional culture. This could involve incorporating traditional motifs, architectural styles, historical references, or indigenous materials to create a built environment that resonates with and contributes to preserving the cultural identity and heritage of the

community or nation [18]. Construction projects containing national cultural values include historical construction projects, reconstruction of historical projects, and new construction projects containing national cultural values.

First, historical construction projects refer to structures built in the past that have endured over time, carrying historical, architectural, or cultural significance [5, 19]. These tangible projects reflect the craftsmanship, technology, and societal values prevalent during construction. Examples include iconic landmarks like the Great Wall of China, the Colosseum in Rome, and the Pyramids of Giza. These structures serve practical functions and hold immense historical importance, offering insights into the civilizations that conceived them [13]. Preservation efforts ensure these constructions remain accessible, allowing contemporary generations to connect with their heritage. Studying and conservating these historical construction projects contribute to a broader understanding of human history and architectural evolution [3, 20].

Second, reconstruction of historical construction projects involves meticulously rebuilding structures that have been demolished, collapsed, or significantly damaged over time [21]. This process aims to revive and restore these historical projects' original architectural and cultural essence [22]. Notable examples include the meticulous reconstruction of the Frauenkirche in Dresden, Germany, which was reduced to rubble during World War II and later rebuilt using original plans and salvaged materials. Similarly, the Bamiyan Buddhas in Afghanistan, destroyed by the Taliban, witnessed ongoing efforts to reconstruct or replicate the colossal statues that once adorned the region. Reconstruction endeavors blend modern engineering techniques with historical research to recreate structures that carry intrinsic cultural, historical, or religious importance, ensuring that their legacy endures and continues to contribute to the collective heritage of

humanity.

Finally, new construction projects containing national cultural values are contemporary architectural endeavors that intentionally incorporate historical architectural aspects and styles reflective of a nation's cultural heritage [12, 18]. These projects seek to seamlessly blend modern construction techniques with traditional design elements, preserving and promoting a particular culture's unique identity and aesthetics. Examples include the Louvre Abu Dhabi, where contemporary architecture intersects with Arabic architectural traditions, and the National Museum of African American History and Culture in the United States, showcasing an innovative design inspired by African motifs. These constructions symbolize a conscious effort to celebrate and transmit national cultural values, fostering a sense of continuity and identity within evolving urban landscapes [17]. Drawing inspiration from the past, these projects contribute to a harmonious coexistence of tradition and innovation, shaping contemporary architectural expressions rooted in the cultural narratives of their respective nations.

In the contemporary era, nations globally have intensified their commitment to preserving historical construction projects, investing substantial efforts in retaining these structures for as long as possible [19]. The emphasis extends beyond mere preservation, with widespread initiatives focusing on meticulously reconstructing historical projects to restore and safeguard national cultural values [3, 20]. Simultaneously, there is a growing encouragement for implementing new construction projects that intentionally incorporate and promote national cultural values [12, 18]. However, realizing such endeavors faces limitations, with factors such as regulatory challenges, financial constraints, and a shortage of expertise often constraining the number of these projects. Despite these obstacles, the ongoing dedication to preserving, reconstructing, and integrating national cultural values in construction

projects underscores a collective commitment to maintaining the cultural tapestry and architectural legacy that defines a nation's identity.

Vietnamese National Cultural Values through Construction Projects

Vietnam's rich cultural tapestry finds expression in its architectural treasures, spanning the Feudal [17] and Colonial periods [19, 23]. The Feudal era boasts unique constructions reflecting the spirit and cultural values of the time. Communal Houses and Temples, marked by intricate designs, host spiritual ceremonies and express reverence for deities. Castles and Fortresses are formidable symbols of protection, featuring complex structures and water defenses.

Residential architecture during the Feudal era, epitomized by structures like Nhà Rông and traditional rural houses, showcases a commitment to cultural values [10]. Wooden materials like lim, cẳm xe, and dỏi were prevalent, and sloping roofs made from leaves or fired bricks contributed to a distinctive aesthetic [24]. Interior designs often included lofts for storage and sleeping, embodying a connection to ancestral heritage. Wood carvings with traditional motifs and natural color choices highlighted the cultural significance of each dwelling.

The Colonial era synthesized European and local styles, which are evident in Gothic, Baroque, Rococo, and Neoclassical influences [20]. European architectural dominance was notable in structures like churches and administrative buildings. Castles and fortresses, reflecting a military architectural evolution, blended European features with local characteristics [19, 23]. Schools and educational institutions underwent modernization, embracing European architectural trends and contemporary teaching facilities.

City centers transformed into hubs of governance and commerce, adopting European city planning con-

cepts [25]. The hybrid architecture of the colonial period often featured a European frontage coupled with alterations at the rear to incorporate local cultural nuances [25]. Through these architectural narratives, Vietnam's cultural values shine, telling stories of resilience, adaptation, and the enduring spirit of a people determined to preserve their identity amidst changing times. Each structure, whether from the Feudal or Colonial era, stands as a testament to Vietnam's enduring cultural legacy, inviting the world to witness its rich tapestry through the lens of architectural treasures [20].

Barriers to the Design of Construction Projects Containing National Cultural Values

While the promotion of incorporating national cultural values into the design of construction projects has been emphasized, the implementation of such projects still needs to be improved. Various obstacles hinder the integration of national cultural values into construction project designs. First, market barriers can significantly impact incorporating culturally significant design features into construction projects. One such barrier is the limited budget or financial resources of the owners, which may restrict the implementation of design elements that hold cultural significance [3]. With adequate funding, it becomes easier to incorporate traditional materials, techniques, and craftsmanship to capture a specific culture's essence [26].

Moreover, more access to materials traditionally associated with a particular culture can help the design and construction process [27]. When specific materials are scarce or available in the market, it becomes easier to represent the cultural heritage in architectural designs accurately [28]. Stringent building codes and regulations also need to improve national cultural values in construction projects [27]. Compliance with strict standards may restrict the freedom to include

architectural elements that reflect cultural traditions and values [21]. Additionally, prevailing social trends prioritizing modern aesthetics over traditional designs can influence architectural choices [11]. If the market demands contemporary styles, it may discourage the integration of culturally significant design features [27].

Secondly, numerous barriers arise within construction firms, impeding the seamless integration of national cultural values into projects. One critical challenge is the need for more skilled architects and builders who are well-versed in incorporating cultural elements into contemporary designs [29]. The absence of expertise in this niche area hampers projects prioritizing cultural values, highlighting the need for specialized knowledge within the industry [30]. Furthermore, construction firms with limited practical experience in implementing cultural designs face obstacles from unfamiliarity with diverse architectural styles and cultural elements [29]. This lack of exposure impedes their capacity to effectively integrate these values, showcasing the importance of hands-on experience in navigating the complexities of cultural design [30]. Another significant barrier is the potential need for more awareness or understanding among construction firms regarding the cultural significance of specific architectural elements [29]. This knowledge gap may result in designs that do not align with the intended national cultural values, emphasizing the importance of cultural literacy within the construction sector [3].

Moreover, resistance to adopting innovative design approaches within construction firms poses a formidable challenge [4]. When such approaches deviate from conventional construction practices, firms may need help incorporating cultural values into their projects. Overcoming these internal barriers necessitates a paradigm shift towards openness to innovation and a deepened understanding of the cultural contexts informing design decisions [31].

Thirdly, educational institutions encounter numerous barriers to fostering the integration of national cultural values into the design of construction projects [3]. The intricate nature of cultural architecture demands structural and architectural knowledge and a profound understanding of cultural contexts. Despite the crucial role played by educational institutes in equipping future engineers and architects with this knowledge, various challenges impede the seamless integration of cultural values into the academic framework [32]. One significant hurdle is the difficulty educational institutions must improve in keeping teaching materials up-to-date with the latest trends and research in cultural architecture [33]. The rapidly evolving nature of cultural design necessitates continuous updates to ensure students receive the most relevant and current information.

More funding or resources must be allocated to programs focusing on cultural architecture, hindering the development of comprehensive educational initiatives in this field [34]. Adequate resources are essential for creating robust curricula and providing students with diverse learning opportunities. Moreover, limited collaborations with architects, construction firms, and cultural experts present challenges in offering practical exposure for students [34, 35]. This lack of real-world engagement can impede their ability to apply theoretical knowledge to complex, practical scenarios [34]. Furthermore, students may need to be fully aware of the importance of cultural values in architectural design, especially if these values are not emphasized within the curriculum or through outreach programs [36]. Addressing this awareness gap requires a concerted effort to integrate cultural considerations into educational initiatives and promote the significance of cultural values in shaping the future of architectural design.

Research methodology

Based on previous studies, the author summarized a list of 13 critical barriers to the design of construction projects containing national cultural values in Vietnam. Table 1 presents the list of obstacles to the design of construction projects containing national cultural values.

After that, a questionnaire survey was constructed to collect data for further analysis. A questionnaire was developed to ask respondents to present their judgments regarding their perceptions of the significance of the barriers based on the 5-point Likert scale (1 = not significant and 5 = very significant). Finally, 115 responses were collected and used for further analysis. Detailed information of the respondents involved in this study is presented in Table 2.

Half of the 115 participants occupied junior positions, while 36 percent held senior roles, and managers comprised 14 percent. A substantial 89 percent of respondents possessed bachelor's degrees. The prevalent trend in work experience indicated that the majority (53%) had less than five years, 30% had 6 to 10 years, and 17% had over ten years of experience.

Table 1. Barriers to the design of construction projects containing national cultural values

Code	Barriers	References
B1	Limited budget of the owners	[3], [26]
B2	Unreadiness of materials supply chain	[27], [28]
B3	Lack of supporting policies	[21], [27]
B4	Lack of social support	[11], [27]
B5	Lack of skilled personnel	[29], [30]
B6	Limited practical experience	[29], [30]
B7	Lack of knowledge	[3], [29]
B8	Resistance to change	[4], [33]
B9	Limited training	[33], [37]
B10	Outdated teaching materials	[33], [37]
B11	Insufficient teaching resources	[35]
B12	Inadequate educational institutes - Industry connections	[35]
B13	Lack of student awareness	[36]

Table 2. Respondents' demographics

Respondent information	Number	%
Years of work experience		
> 10 years	19	17%
6-10 years	35	30%
< 5 years	61	53%
Job positions		
Junior	58	50%
Senior	41	36%
Manager	16	14%
Educational backgrounds		
Bachelor	102	89%
Master or higher	13	11%
Total	115	100%

This study employed Exploratory Factor Analysis (EFA) with a varimax rotation to unveil the intricate structure of the variables in question [38]. EFA, a statistical technique, aids in identifying intricate patterns and relationships among interrelated variables, offering a more precise grasp of the research problem. The Kaiser-Meyer-Olkin (KMO) value and Bartlett's test of Sphericity played pivotal roles in gauging the overall significance of the correlation and its factorability [39]. KMO scrutinizes the suitability of factor analysis by comparing partial correlation coefficients with observed correlation coefficients, typically adhering to a threshold value of 0.6 [40]. Meanwhile, Bartlett's test assesses the correlation matrices' adequacy for factor analysis through the distribution of χ^2 values, with a high χ^2 value indicating the dataset's suitability for factor analysis [41].

Principal factor extraction and Kaiser normalization were chosen for their efficacy in simplifying interpretation with fewer variables. The eigenvalues of the principal factors were evaluated against a threshold value of 1.0, and factor loadings were deemed satisfactory if their absolute values surpassed 0.5 [42]. These rigorous statistical techniques were implemented to ensure a robust and dependable exploration of the intricate structures and relationships within the dataset.

Results and Discussions

The dataset's internal consistency and reliability were assessed by computing Cronbach's alpha. The 13-item scale demonstrated a Cronbach's alpha of 0.799, surpassing the threshold of 0.70, thereby establishing reliability [41]. Additionally, Bartlett's test of Sphericity produced a Chi-Square value of 1960.1413, with a significant level of 0.000, indicating statistical significance [42]. The Kaiser-Meyer-Olkin (KMO) value, standing at 0.877, exceeded the accepted threshold of 0.60, affirming the dataset's suitability for factor analysis [40]. Consequently, factor analysis was

Table 3. Results of EFA

Barriers	Components		
	1	2	3
<i>Cronbach's alpha coefficient</i>	0.973	0.955	0.929
Market barrier			
Limited budget of the owners	0.893		
Unreadiness of materials supply chain	0.890		
Lack of supporting policies	0.871		
Lack of social support	0.786		
Construction company barrier			
Lack of skilled personnel		0.868	
Limited practical experience		0.904	
Lack of knowledge		0.868	
Resistance to change		0.877	
Limited training		0.717	
Educational institute barrier			
Outdated teaching materials			0.905
Insufficient teaching resources			0.899
Inadequate educational institutes - industry connections			0.879
Lack of student awareness			0.917
<i>Eigenvalue</i>	4.377	3.650	3.344
<i>Percentage of variance explained (%)</i>	33.670	28.075	25.722
<i>Cumulative percentage (%)</i>	33.670	61.744	87.466

Note(s): Kaiser-Meyer-Olkin (KMO) value = 0.877
Bartlett tests of Sphericity = 1960.413
Significance = 0.000

conducted, revealing the classification of the 13 barriers to the design of construction projects containing national cultural values into three distinct factors. These statistical measures collectively attest to the robustness and appropriateness of the dataset. Table 3 illustrates the findings of EFA.

Market barriers present significant challenges in the Vietnamese construction market, hindering the infusion of national cultural values into project designs. These obstacles are particularly pronounced in the Vietnamese setting and demand nuanced solutions. Firstly, the restricted budgetary resources in the Vietnamese construction landscape have become a formidable impediment [3]. Limited financial capabilities may severely curtail incorporating culturally significant design features, necessitating resourceful strategies to navigate this constraint [26]. Secondly, the accessibility of materials deeply rooted in Vietnamese culture becomes pivotal [28]. The scarcity or unavailability of these culturally significant materials poses a unique challenge, requiring inventive solutions to represent Vietnam's rich cultural heritage in construction projects authentically [27].

Navigating stringent building codes and regulations, a commonality in Vietnam's regulatory framework introduces another layer of complexity. Incorporating national cultural values with compliance with these regulations demands a thorough understanding of the local regulatory landscape [21]. Furthermore, in the context of Vietnam, societal preferences influenced by contemporary trends play a crucial role. The influence of modern aesthetics may create resistance to embracing traditional architectural choices in line with Vietnam's cultural values [27]. Addressing these market barriers in the Vietnamese construction market necessitates creative solutions and advocacy for policies that support cultural preservation, increased awareness, and a strategic approach to regulatory compliance within the unique conditions of Vietnam's construction industry.

The impediments from construction companies present formidable challenges in the Vietnam construction market, demanding nuanced solutions tailored to local conditions [29]. In Vietnam, these hurdles gain distinct prominence and necessitate strategic approaches that align with the country's unique aspects of the construction industry. To begin with, the need for more skilled architects and builders adept at incorporating cultural elements into modern designs is a particularly pressing issue in Vietnam's construction market. This shortage of specialized expertise calls for targeted training initiatives explicitly designed to cultivate professionals capable of seamlessly integrating national cultural values into contemporary construction practices [30]. The development of technical courses, workshops, and collaborative platforms can effectively nurture a pool of skilled individuals equipped to navigate the intersection of cultural heritage and modern architectural demands in the Vietnamese context.

Furthermore, the limited practical experience of construction firms in implementing cultural designs is a noteworthy challenge in the Vietnamese context. The lack of exposure to diverse architectural styles and cultural elements underscores the importance of initiatives promoting collaboration, cross-training, and knowledge-sharing within the local construction industry [30]. Partnerships between construction firms and cultural heritage organizations can facilitate a mutually beneficial exchange of insights, enriching the industry's collective understanding of culturally sensitive design [34]. By fostering an environment that encourages innovation while respecting cultural values, Vietnam's construction market can surmount these barriers and embark on a path toward sustainable, culturally resonant development.

The barriers stemming from educational institutions pose significant challenges in the specific context of the Vietnam construction market, demanding a nuanced approach tailored to the country's unique

conditions. These barriers shed light on the imperative for targeted interventions and collaborative initiatives to align architectural education with the cultural intricacies inherent in Vietnam's built environment. A critical issue lies in the need for more emphasis on cultural architecture within educational curricula, a factor closely tied to the shortage of professionals with expertise in this realm within Vietnam [33]. The inadequacy of coverage in academic programs underscores the necessity for tailored reforms within the Vietnamese education system [34]. Enhancements in the form of specialized courses and workshops can be introduced to cultivate a profound understanding of the symbiotic relationship between cultural values and architectural design. Collaborative ventures between educational institutions and Vietnamese cultural heritage organizations can further enrich the learning experience, fostering a new generation of architects attuned to the cultural nuances specific to Vietnam [34].

Moreover, challenges related to outdated teaching materials and limited resources underscore the crucial need for targeted investments in educational initiatives focused on cultural architecture [37]. Allocating sufficient funding and resources to these programs can empower educational institutions in Vietnam to stay current with the latest trends and research, equipping students with pertinent and up-to-date knowledge [36]. Collaborations with local industry professionals and cultural experts become essential, providing students with practical exposure that aligns with the unique cultural fabric of Vietnam [34]. In navigating these educational barriers, Vietnam can develop a skilled workforce capable of seamlessly integrating cultural values into architectural designs within the distinctive context of the Vietnamese construction market.

Conclusions

This study identified 13 barriers to the design of

construction projects containing national cultural values. The results of EFA showed that these barriers were categorized into three groups: market barriers, construction companies barriers, and educational institute barriers.

This study has significant practical implications that extend to policy-making and industry practices. Government bodies can use these insights to formulate supportive policies that address market-related challenges and incentivize the incorporation of cultural values in construction projects. Armed with an awareness of their unique barriers, construction firms can develop targeted training programs and strategic initiatives to overcome challenges related to skilled labor shortages and resistance to innovative designs. Educational institutes, on the other hand, can use these findings to reform curricula, enhance resources, and establish industry partnerships that better equip students with the knowledge and skills needed to navigate the intersection of architecture and culture. Overall, the research implications underscore the transformative potential of informed interventions in reshaping the landscape of construction projects aligned with national cultural values.

While this study provides valuable insights into the barriers to designing construction projects containing national cultural values, several limitations should be acknowledged. Firstly, the research was conducted exclusively in Vietnam, which might limit the generalizability of the findings to different cultural and socio-economic contexts. Future research endeavors should aim for a more diverse sample across various regions and cultural landscapes to enhance the study's external validity. Secondly, the study adopts a cross-sectional design, offering a snapshot of the barriers at a specific point in time. A longitudinal approach could provide a more dynamic understanding of how these barriers evolve, offering a deeper insight into the factors influencing the integration of cultural values in

construction projects.

Additionally, the study suggests increasing the sample size to bolster the robustness of the findings. A larger and more representative sample would contribute to the reliability of the study's conclusions, providing a more comprehensive understanding of the complexities involved. Future research directions could explore the temporal dynamics of these barriers, investigate cross-cultural comparisons, and delve into specific strategies to overcome these challenges in diverse settings.

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