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Combining Contemporary Design Principles with the Craftsmanship of Ancient Chinese Architecture

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Abstract. This study delves into the area of traditional Chinese architecture, evaluating its historical, cultural, and artistic relevance as well as its integration into contemporary design methods. This research seeks to build a link between the traditions of the past and the innovations of the present in architectural design by a thorough examination of architectural features, craftsmanship, and symbolic representations. This study analyzes the rich heritage of traditional Chinese architecture using qualitative research approaches such as 16 semi-structured interviews with experienced architects and an exhaustive survey of current literature. The interview data was subjected to a rigorous three-step coding analysis, which included open coding, axial coding, and selective coding, made possible by the use of the MAXQDA-2020 software for efficient data administration and analysis. The research findings shed light on several prominent themes, including the intricate craftsmanship and design principles inherent in traditional Chinese architecture, the historical and archaeological significance embedded within architectural elements, the innovative adaptation of traditional techniques within contemporary design practices, and the challenges and opportunities associated with preservation and revitalization efforts. This research emphasizes the need of reinterpreting traditional workmanship by seamlessly incorporating historical and archaeological significance into modern design techniques. It also emphasizes the essential need of preserving traditional Chinese architecture in the face of rising urbanization and cultural globalization. The findings obtained from this research are useful for many stakeholders like architects, designers, politicians, and scholars involved in the protection, rehabilitation, and long-term development of architectural cultural heritage.

Keywords. Traditional Chinese Architecture, Craftsmanship Design, Archaeological Significance, Innovation, Adaptation, Preservation, Revitalization, Bridging Tradition, Modernity.

1. Introduction

Architecture reflects a society's cultural character powerfully, capturing its values, beliefs, and goals inside physical buildings (Sagiv & Schwartz, 2022). Traditional Chinese architecture, recognized for its rich past and deep significance, shows the country's historical culture and creative talent (Xu & Wang, 2021). Its meticulous workmanship, harmonious design principles, and historical importance have earned it worldwide acclaim and adoration, making it an enthralling study topic (Feng, 2020).

The goal of this research is to dig into the area of traditional Chinese architecture and investigate its many facets. We want to obtain a better knowledge of the historical, cultural, and aesthetic dimensions of this architectural legacy by investigating its application in modern design approaches. A substantial amount of research has been devoted to traditional Chinese architecture, giving insight on its architectural components, cultural meaning, and historical history. These studies have produced vital insights into the delicate link between architectural form, cultural values, and society ideas via painstaking research of historical documents, architectural drawings, and cultural references.

Furthermore, investigated the symbolic value of traditional Chinese architectural components such as the dougong system and the usage of fortunate motifs. These research have shown the deep-rooted symbolism contained within each design decision, highlighting the cultural and spiritual components of ancient building techniques.

While prior study has greatly contributed to our knowledge of traditional Chinese architecture, there are still certain gaps and research prospects. This project intends to fill these gaps and contribute to current knowledge by concentrating on the important research issues listed below: To begin, there is a need to investigate the reinterpretation of historic workmanship in traditional Chinese architecture, as well as its impact on current design processes.

Traditional architecture in China acts as a physical connection to the past, signifying the continuation of cultural practices through generations. It embodies the knowledge, skill, and aesthetic expressions of ancient builders while also reflecting the nation's historical progress and cultural evolution. Furthermore, traditional Chinese architecture is firmly ingrained in the Chinese people's cultural memory and awareness. It fosters a deep link between people and their cultural heritage by evoking feelings of pride, cultural identification, and belonging. Thus, preserving and renewing traditional architecture is critical for sustaining cultural continuity and instilling a feeling of cultural pride and identity in the Chinese populace. Furthermore, the significance of traditional Chinese architecture goes beyond its cultural worth. Traditional architectural preservation and promotion are so important for the tourist sector, contributing to local economies and cultural exchange. Therefore, the key objectives of this study was to explore the following knowledge areas:

- To investigate traditional Chinese architecture in depth, taking into account its historical, cultural, and artistic components.
- To investigate the reinterpretation of traditional Chinese architecture's historic craftsmanship and its influence on current design techniques.
- To incorporate the historical and archaeological relevance of traditional Chinese architectural features into modern design approaches.
- To address the challenges and opportunities related with traditional Chinese architectural preservation and revival.
- Contribute to the larger area of architectural studies by offering insights and recommendations for the long-term development and adaptation of traditional architectural heritage.
- The aim of this research is to equip architects, designers, policymakers, and scholars with the necessary knowledge and tools to safeguard, rejuvenate, and sustainably develop architectural cultural heritage.

2.Literature Review

Craftsmanship has always been seen as a sacred component of human history, and the study of past techniques has enormous importance in inspiring contemporary design. The dovetail joint structure and the dougong system have piqued the interest of designers and scholars in the context of traditional Chinese architecture. These architectural features not only display excellent craftsmanship, but they also have historical and archaeological significance. For generations, woodworkers have used the dovetail joint to attach pieces of wood flawlessly. Its unique interlocking architecture gives the created things extraordinary strength and endurance. The dovetail junction has been widely used in traditional Chinese architecture, contributing to the structural integrity of structures such as temples, pagodas, and ancestral halls . Exploring the origins, history, and variants of this joint offers light not only on the workmanship of ancient Chinese artisans, but also on the engineering principles and cultural importance linked with these constructions.

The dougong system is another fascinating component of traditional Chinese architecture (Pei et al., 2023). This one-of-a-kind architectural element consists of interlocking wooden brackets that sustain the roof's weight and distribute it equally to the pillars below (Yan, 2020). The dougong system not only demonstrates extraordinary precision and engineering prowess, but it also represents the balance of nature and human innovation. Its ornate and graceful design has become a symbol of traditional Chinese architecture, and it may be found gracing palaces, temples, and other massive monuments . Designers can incorporate historical and cultural value into their creations by reinterpreting the craftsmanship hidden within these ancient architectural features . This investigation has the potential to result in the development of unique goods that bridge the gap between tradition and modernity, paying attention to the legacy of craftsmanship while embracing current aesthetics and functionalities.

This study is significant because it has the potential to encourage designers and architects to delve further into the rich heritage of traditional Chinese craftsmanship. Practitioners can embrace the essence of traditional approaches and adapt them to the demands of today's design landscape by getting a full understanding of the dovetail joint structure and the dougong system. This project not only fosters a deep respect for traditional workmanship, but it also promotes the preservation and revitalization of cultural heritage. Finally, the study of the dovetail joint structure and the dougong system in traditional Chinese architecture opens the door to the unsurpassed workmanship of ancient artists. We may honor our cultural history while encouraging creativity by reinterpreting and merging these components into contemporary design. This study opens the way for a peaceful synthesis of heritage and modernity, expanding the creative landscape and motivating future designers.

3.Methods

This study used a qualitative method to look into "Reinterpreting Ancient Craftsmanship: Designing Creative Products Inspired by the Historical and Archaeological Significance of Dovetail Joint Structure and Dougong in Traditional Chinese Architecture." The main way that information was gathered was through 16 semi-structured conversations (see table 1). The builders who were chosen to take part in the talks were professionals who had worked on projects related to the study's topic, as the title says.

Respondent	Gender	Age	Years of	Expertise	Relevant Projects
R1	Male	45	20	Architectural	Renovation of ancient
KI	Wate	45	20	Alemeetulai	temples
R2	Male	38	12	Interior	Restoration of historical
				Design	palaces
R3	Male	52	25	Structural	Preservation of traditional courtyard houses
R4	Male	42	18	Landscape	Integration of traditional
R5	Male	41	15	Architectural	Repurposing historic buildings for cultural centers
R6	Female	37	10	Urban Planning	Revitalization of traditional
R7	Male	49	22	Architectural	Conservation of ancient city walls
R8	Female	36	8	Interior Design	Adaptive reuse of traditional residences
R9	Male	47	17	Structural	Preservation of ancient pagodas
R10	Female	39	11	Landscape	Redesign of historical parks
R11	Male	44	19	Architectural	Restoration of traditional teahouses
R12	Female	43	16	Urban Planning	Renovation of historic city squares
R13	Male	50	23	Architectural	Conservation of traditional wooden structures
R14	Female	35	7	Interior Design	Modernization of traditional guesthouses
R15	Female	48	21	Structural	Preservation of ancient bridges
R16	Female	40	13	Landscape	Incorporation of traditional elements in modern parks

Table 1. Background Information of Participants

In order to get useful information from the collected data, the analysis process consisted of three steps of code analysis. Open coding, axial coding, and selected coding were all parts of the coding study. During the open-coding stage, the data were carefully looked at, and applicable concepts, ideas, and themes were found and named (see figure 1).



Figure 1. Codes Selections and Generation

During the axial coding process, links and relationships between the discovered codes were set up (see figure 2). This made it possible to create a complete coding system. In the last step, selective coding, the most important and relevant codes were chosen to make a story that makes sense and pull out the key results. MAXQDA-2020 software was used to make the process of analyzing data easier. This program had useful tools and features for gathering, recording, and analyzing the interview data. This made sure that the analysis process was accurate and quick.



Figure 2. Relationships among Generated Codes

The survey respondents were selected through a technique known as purposive convenience sampling. Architects who had worked on projects connected to the topic of the study were picked on purpose to make sure that the data collected would be very useful and informative (see table 2). In short, this qualitative research study asked 16 architects who had worked on projects related to the research topic to take part in semi-structured interviews. Coding analysis was done on the collected data in three steps: open coding, axial coding, and selected coding. MAXQDA-2020 software was used to organize and analyze data in an effective way.

 Table 2. Interview Questions to Study Participants

 Interview Ouestions

1. Can you provide an overview of your experience and expertise in traditional Chinese architecture?

- 2. How have you incorporated traditional Chinese architectural elements in your past projects?
- 3. What are your thoughts on the significance of craftsmanship and design in traditional Chinese architecture?
- 4. Can you discuss any specific examples where you have utilized the dovetail joint structure or dougong system?
- 5. In your opinion, how can traditional Chinese architecture be adapted and innovated for modern designs?
- 6. What are the challenges and opportunities in preserving and revitalizing traditional Chinese architecture?
- 7. Have you encountered any unique situations where you had to balance tradition with modern requirements?
- 8. How do you envision traditional Chinese architecture's future and its impact on innovative product design?
- 9. Do you have any particular ideas or thoughts to give about this study topic?

4. Statistical Analysis and Findings

In this part, the results and analysis are based on the answers from 16 semi-structured interviews with architects who have worked on projects connected to the study topic. The interviewers and other people who have written about traditional Chinese building have given appropriate examples to back up these answers.

4.1. Traditional Chinese Architecture

Upon reviewing the interview responses, it became evident that the architects shared a consensus regarding the distinctive features of traditional Chinese architecture and its significance to Chinese culture (see table 3). According to Interviewee 1, traditional Chinese architecture demonstrates a great reverence for the natural environment. The structures are intended to fit in with their environment without standing out. It is consistent with the traditional Chinese style of building, which emphasizes "feng shui" and uses natural materials to create a tranquil atmosphere. Zhang (2019) talks about how close traditional Chinese architecture and nature are. In traditional Chinese architecture, houses are seen as extensions of the natural environment.

Step 1: Open Coding	Step 2: Axial Coding	Step 3: Selective Coding
Seamless integration	Feng shui	Harmonizing architecture with nature
Symbolic motifs	Dragons, phoenixes	Representation of power and good fortune
Nature-inspired	Integration of natural elements	Creating a harmonious environment

Table 3. Traditional Chinese Architecture Analysis

Also, Interviewee 3 brought up the symbolic importance of traditional themes and fortunate symbols in Chinese architectural design by saying, "Traditional Chinese architecture includes symbolic elements like dragons and phoenixes, which represent power, prosperity, and good fortune." Literature from the past (see table 4) that looks at the symbolic meanings of the detailed carvings and artistic patterns on traditional Chinese buildings backs up this finding. Zhang and Lee (2022) talks about what these patterns mean symbolically and how they show national beliefs and values.

Table 4. Traditional Chinese Architecture

Interview Responses	Literature Support
There is a profound regard for the natural environment in traditional Chinese architecture, and structures are built to blend with the natural	Guo et al. (2020) focuses attention on the tight link that exists between traditional Chinese architecture and environment. In this kind of architecture.
setting in which they are located.	structures are seen as extensions of the natural landscape.
"Traditional Chinese architecture incorporates symbolic elements like dragons and phoenixes, which represent power, prosperity, and good fortune."	describes the symbolic significance of these motifs and their representation of cultural beliefs and values in traditional Chinese architecture.

4.2. Craftsmanship and Design

The builders were always impressed by the high level of handiwork in traditional Chinese buildings (see table 5). Interviewee 7 talked about the complex construction methods used in traditional wooden structures. He said, "The dovetail joint structure used in traditional Chinese architecture is a testament to the careful craftsmanship of the craftsmen who made them." This fits with what is written about traditional Chinese architecture, which says that it takes a lot of skill and accuracy to make the joints and links in these buildings look smooth and fit together well. Pan and Zhang (2021) talks about the technical skills of traditional Chinese workers and how they were able to make building systems that were very complicated.

Step 1: Open Coding	Step 2: Axial Coding	Step 3: Selective Coding
Intricate joinery	Dovetail joint structure	Meticulous craftsmanship
Attention to detail	Carvings, paintings	Artistic expression and mastery
Exquisite craftsmanship	Precision and skill	Ornate decorations and details

Table 5. Craftsmanship and Design Analysis

Also, Interviewee 12 liked how traditional Chinese architecture paid attention to detail, especially in the cutting and painting methods. They said, "The intricate carvings and brightly colored paintings in traditional Chinese architecture are proof of the craftsmen's creativity and skill." This finding fits with what has been written in the past (see table 6) about how traditional Chinese buildings are decorated with elaborate decorations and small, detailed details. Xu et al. (2020) looks at the artistic parts of traditional Chinese building. He points out how the carvings, paints, and decorations show skill and artistic expression.

Table 6. Craftsmanship and Design

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Interview Responses	Literature Support
"The dovetail joint structure used in traditional Chinese architecture is a testament to the meticulous craftsmanship of the craftsmen who created them."	Xingbo and Peijun (2023) discusses the technical prowess of traditional Chinese craftsmen and their ability to create complex joinery systems.
"The intricate carvings and vibrant paintings found in traditional Chinese architecture are a testament to the artistic expression and mastery of the craftsmen."	In his article "Exploring the Artistic Aspects of Traditional Chinese Architecture," examines the workmanship and creative expression that are evident in the carvings, paintings, and decoration of traditional Chinese buildings.

By combining the information from the interviews with what is already known about traditional Chinese architecture, this research study gives a full picture of the themes (see figure 3) it looks at: Traditional Chinese Architecture, Craftsmanship and Design. The study shows how important traditional Chinese architecture is in terms of culture, art, and history. It also shows how important it is to change and keep these architectural practices in a modern setting.

5. Discussion

Traditional Chinese architecture has long been admired for its distinctive characteristics and cultural importance. The interview results verified the significance of seamless integration with nature, which has been continuously stressed in previous studies. The respondents emphasized the harmonious link between traditional Chinese architecture and nature, highlighting the usage of feng shui principles and the use of natural materials in design. This is consistent with the current body of research that acknowledges the close relationship between traditional Chinese architecture and nature.



Figure 3: Codes Relation Model derived through Analysis

Furthermore, both the interview answers and previous research emphasized the symbolic elements utilized in traditional Chinese architecture, such as dragons and phoenixes, which symbolise strength, wealth, and good fortune. The relevance of these symbolic aspects in transmitting cultural ideas and values via architectural design was stressed by the respondents. This conclusion is consistent with previous research on the symbolic meaning of motifs in traditional Chinese architecture.

The interview results reinforced the praise for the great skill demonstrated in traditional Chinese architecture in terms of craftsmanship and design. Interviewees commended the sophisticated woodworking skills, particularly the dovetail joint structure.

Several major observations arise from comparing the findings of this study to other investigations. The findings of the interviews support and expand on the existing body of knowledge on traditional Chinese architecture, highlighting the seamless integration with nature, the symbolism embedded in architectural design, the exceptional craftsmanship displayed in joinery and artistic expression, the historical and archaeological significance of architectural elements, the potential for innovation and adaptation, and the importance of preservation and revitalization. The correspondence between interview answers and previous literature improves the validity and dependability of the results, emphasizing the continuity of the issues investigated in this study.

6. Conclusion

Finally, this research looked at the reinterpretation of historic workmanship in traditional Chinese architecture and its effect on the design of creative items. The study examined key themes such as traditional Chinese architecture, craftsmanship and design, historical

and archaeological significance, innovation and adaptation, preservation and revitalization, and the bridging of tradition and modernity through qualitative interviews with 16 experienced architects and designers.

The study's results demonstrated the lasting relevance of traditional Chinese architecture and its ability to effortlessly interact with the natural surroundings. Symbolic motifs used in architectural design, like as dragons and phoenixes, were recognized as potent expressions of cultural ideas and values. It also showed the possibilities for invention and adaptation, illustrating how these old processes may be blended into current designs to produce useful and aesthetically beautiful buildings and furnishings.

The study stressed the need of maintaining and reviving traditional Chinese architecture in the face of contemporary challenges. This study, through linking tradition and modernity, sheds light on how traditional Chinese architecture may inspire and influence the design of innovative items. The study adds to the current body of knowledge by verifying and building on previous research, showing the relevance and importance of traditional craftsmanship in a continuously changing society.

It is anticipated that the conclusions of this study would motivate architects, designers, and politicians to respect and embrace the rich history of traditional Chinese architecture. The sample size of 16 respondents, although varied in their knowledge, may not reflect the whole range of viewpoints within the subject. Future study should include increasing the sample size and integrating different approaches to increase our grasp of the issue.

This research emphasizes the lasting significance of historic craftsmanship in traditional Chinese architecture, demonstrating its capacity for creativity, adaptation, and the construction of inspired and culturally meaningful designs. By understanding and embracing these ideas, we can bridge the gap between tradition and modernity, assuring the preservation and revival of traditional Chinese architectural legacy for future generations to enjoy and take inspiration from.

Future research might add user opinions and impressions of traditional Chinese architecture to supplement the results of this study. Researchers may acquire insights on the influence of traditional architecture on people's experiences, cultural identity, and sense of place by integrating the perspectives of inhabitants, tourists, and other stakeholders.

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