



RESEARCH ARTICLE

Research on Visual Art Characteristics and Sustainable Development of Naxi Traditional Architecture

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ABSTRACT

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This study delves into the visual art characteristics and sustainable development of Naxi traditional architecture, and takes representative traditional villages in Lijiang, China, as the research object. By examining visual aesthetics, cultural preservation and inheritance, normative construction, and repair and reconstruction of buildings, the study aims to provide theoretical and practical support for the sustainable development of Naxi traditional architecture. The study firstly focuses on the visual aesthetic norms of Naxi architecture, explores what aesthetic elements are in line with its cultural characteristics, and proposes methods for integrating traditional aesthetics into modern design. Secondly, it establishes a preservation and assessment system for architectural culture, and promotes the inheritance of Naxi architectural culture through various channels such as documentation and research, education and training, community participation, policies and regulations. Finally, it is committed to promoting the standardization of Naxi architecture, balancing its uniqueness with the need for modern standards. Through the study of the three main objectives, a comprehensive model for the sustainable development of traditional Naxi architecture is proposed, including a unified aesthetic model, conservation and utilization strategies, standardized construction methods and the design of user-friendly modules. This model, through multiple stages of proof-of-concept, seeks to preserve traditional culture while better adapting the architecture to the needs of modern society.

INTRODUCTION: RESEARCH BACKGROUND AND PROBLEM STATEMENT

Background

As an important heritage with rich cultural resources, traditional villages, especially the Naxi "Four Harmonies and Five Patio" houses, form a "museum" of natural heritage in Lijiang City. The aim of this study is to explore the traditional architectural culture of the Naxi people in order to achieve its inheritance, protection and standardisation in modern society. We choose the well-protected traditional villages in Lijiang City as the research object, and will focus on the visual aesthetic norms of Naxi architecture, the protection and evaluation system of architectural culture, and the promotion of the standardization of Naxi architecture.

Research Motivation

In the current social context of rapid urbanisation and modernisation, traditional culture faces the threat of disappearance. Naxi traditional architecture, as one of the rich and diverse cultures in

China, has a profound history and unique cultural tradition. The study of its cultural background and connotation helps to enhance the understanding and respect of Naxi traditional culture, and provides useful ideas and practical methods for cultural inheritance.

In addition, the study of Naxi traditional architecture also provides an opportunity for the application of sustainable development concepts in contemporary architectural design. By integrating the design concepts of traditional architecture into modern practice, it can not only meet the housing needs of contemporary people, but also reduce the impact on the environment and realise the integrated development of urban and rural areas. This is of positive significance to the current rural revitalisation strategy and sustainable development goals.

Problem Statement

This study will explore the following issues:

1. visual aesthetic issues: what visual aesthetic guidelines in Naxi architecture are in line with its cultural characteristics, and how to integrate traditional aesthetic elements into modern design?
2. Cultural preservation: how to establish a preservation and assessment system for Naxi architectural culture, and what strategies can be used to ensure its inheritance and development, so that it can be revitalised in contemporary architectural practice?
3. Normative construction: In the process of normative construction, how to balance the preservation of the uniqueness of Naxi architecture with the need to meet modern standards? What methods can achieve standardisation while maintaining traditional characteristics?

Naxi traditional architecture carries rich cultural values and architectural skills. This study aims to deeply explore the cultural characteristics of Naxi traditional architecture and to find feasible paths for its inheritance, protection and standardisation in modern society.

Research aims and objectives:

Through three main objectives, this study will firstly focus on exploring the visual aesthetics of Naxi architecture and culture, secondly establish a conservation model based on the visual aesthetics of Naxi architecture and culture, and finally verify the applicability of the proposed model. This set of objectives will provide theoretical and practical support for the sustainability of Naxi traditional architecture.

Research Scope:

Within Lijiang City, Yunnan Province, representative traditional Naxi villages, including different geographical, cultural and historical contexts, will be selected in order to explore their architectural characteristics and development in a comprehensive and in-depth manner. The study will cover various aspects such as visual aesthetic guidelines, cultural protection and inheritance strategies, and normative construction.

Significance of the study:

The significance of this study is to deepen the knowledge of the cultural value and aesthetic characteristics of Naxi traditional architecture, and to promote cultural inheritance and identity. At the same time, it provides practical guidance for rural revitalisation and sustainable development through the protection of traditional architectural skills and the integration of architectural design and culture. This study fills the research gaps in related fields, promotes academic research, raises social awareness of traditional culture and its preservation, and creates rich values for local communities and society as a whole.

Expected results:

The research is expected to produce practical guidance, proven models on visual aesthetic elements, conservation and inheritance strategies and normative construction through in-depth research on traditional Naxi architecture. This will be presented in the form of comprehensive research reports and academic papers, and presented to the public through practical examples and display activities.

We look at three core aspects of traditional Naxi architecture: visual aesthetic characteristics, cultural preservation and inheritance, and building repair and reconstruction. These aspects are crucial to understanding Naxi architectural culture and its role in contemporary society. The literature review will reveal what is already known and indicate what remains to be researched by summarising the results of domestic and international research.

Objective	Method	Outcome
To explore the visual aesthetic of Naxi architecture and culture	Literature Review Case Studies	Elements of visual aesthetics
To establish a conservation model based on visual aesthetics of Naxi architecture and culture	Interview with Experts	a conservation model
To validate the proposed model in term of its suitability	Validate with experts	A validated model

Figure 1: Research objectives methodology and results

LITERATURE REVIEW STUDY ON NAXI TRADITIONAL ARCHITECTURE

Aesthetic Characteristics and Cultural Embodiment of Naxi Traditional Architecture

The traditional Naxi architecture has attracted much attention for its unique wooden structure, large volume and harmonious layout, exquisite decorative style and integration with the natural environment. By synthesising a number of research papers on Naxi architecture, this paper discusses in depth the characteristics and cultural connotations of wooden structure architecture, building volume and layout, decorative style, the use of traditional materials, and the embodiment of religion and belief.

(1) Uniqueness of Wooden Structure Architecture

Naxi architecture is marked by the inverted roof, a unique wooden structure that not only adapts to the local rainy climate, but also has a profound symbolic meaning. The use of mortise and tenon structure not only improves the seismic performance, but also maintains good ventilation and lighting, and at the same time has an important symbolic significance in culture.

(2) Cultural Interpretation of Building Volume and Layout

Naxi architecture reflects the respect for family and social status through its large and harmonious volume. The pattern of "three houses, one wall, four houses and five patios" not only shows the understanding of the past, present and future, but also reflects the deep knowledge of family and social relations. The use of mortise and tenon structure not only improves the seismic performance of the building, but also maintains ventilation and lighting, providing substantial support for its cultural connotation.

(3) Integration of architecture and natural environment

Through the orientation and layout of the buildings and the clever use of local materials, the Naxi architecture integrates with the surrounding landscape, achieving symbiosis with nature. This integration not only has a unique value in terms of aesthetics, but also has a positive impact on adaptation to climate change and natural disasters.

(4) Exquisite Decoration Style

Naxi architecture is known for its exquisite exterior decoration, covering all aspects of the building. Exterior carvings, colourful paintings and decorative elements display unique patterns and symbols, conveying rich information about religious beliefs, historical stories and natural elements.

(5) Clever application of traditional materials

Naxi architecture mainly uses local natural materials, such as wood, stone and clay, preserving traditional production techniques and local characteristics. This choice not only gives the buildings a unique texture, but also highlights the Naxi people's close connection with the natural environment. The use of wood carvings, murals and coloured paintings enriches the artistic atmosphere of the building, while the use of traditional materials such as wood, stone and clay highlights the harmonious symbiosis with the environment.

(6) Embodiment of Religion and Beliefs

Naxi architecture deeply integrates religious beliefs, from the orientation and layout of buildings to traditional festivals and celebrations, all of which reflect the reverence for the religious worldview. The setting of shrines inside the buildings and the conduct of various religious ceremonies further emphasise the close connection between religion and architecture.

Naxi traditional architecture, with its unique aesthetic features, deeply reflects the culture, beliefs and harmonious coexistence with nature of this ethnic group. Through a deeper understanding of these characteristics, we can better understand and appreciate the importance of Naxi traditional architecture in terms of cultural heritage and sustainable development.

Protection and inheritance of Naxi architectural culture

As a treasure of traditional Chinese architecture, the protection and inheritance of Naxi architectural culture is crucial. Through record and research, education and training, community participation, conservation policies and regulations, as well as cultural activities and displays, scholars have provided insights and effective measures for the sustainable inheritance of Naxi architectural culture in academic research and practice.

(1) Importance of Records and Research

Through in-depth documentation and field investigation, scholars such as Wang Bei have elaborated the history and characteristics of Naxi architecture and its close relationship with society and religion. These studies provide substantial support for further analyses of cultural connotations and values.

(2) Innovative Approaches to Education and Training

Researchers such as Luo Xiaoxia have focused on the field of education and training, training a group of young inheritors who love Naxi architectural culture through workshops, practical courses and other innovative approaches. These trainings not only imparted knowledge and skills, but also stimulated a strong interest in this culture.

(3) Community Participation and Cultural Inheritance

The inheritance of Nazi architectural culture cannot be separated from the active participation of the community. Research by scholars such as Chen Dechun emphasises the importance of community participation in the preservation, maintenance and inheritance activities of architecture. Such participation not only promotes the transfer of skills, but also enhances community cohesion and cultural identity.

(4) Legal Support from Policies and Regulations

The protection of Nazi architectural culture is supported by a series of governmental protection policies and regulations. The implementation of regulations such as the Law of the People's Republic of China on the Protection of Cultural Heritage has provided legal support for traditional architecture, and the conservation plan for the Lijiang Ancient City has delineated a clear direction for its inheritance.

(5) Modern dissemination of cultural activities and displays

By organising cultural activities such as architectural and cultural exhibitions and folklore festivals, Nazi architecture has been successfully integrated into modern society. These display activities have drawn public attention to the value of traditional architecture and prompted concern and support for cultural heritage.

The protection and inheritance of Nazi architectural culture requires the joint efforts of academics and all sectors of society. Through a multifaceted and comprehensive approach of documentation and research, education and training, community participation, policies and regulations, and cultural activities and displays, we can better understand, pass on and carry forward this rich and colourful cultural heritage.

Research on the construction method of Nazi traditional buildings

(1) Diversity of Nazi traditional architecture

The study of Nazi traditional architecture covers many aspects such as regional characteristics, architectural forms and styles, social status and functions, and cultural inheritance and innovation, presenting rich and diverse connotations. In terms of regional characteristics, the study focuses on the uniqueness of Nazi traditional architecture under the influence of geography, climate, humanities and other factors, revealing its adaptability and characteristics. In terms of architectural forms and styles, Nazi traditional architecture in different regions shows diversity in appearance forms and decorative styles, forming a rich architectural culture.

(2) Regional Characteristics

In the multidimensional analysis of architectural culture, the research focuses on the diversity of traditional architectural forms, the evolution of the social function of architecture, the architectural influence of religion and beliefs, the use of material diversity, and cultural inheritance and innovation. These studies show the multiple roles of architecture in Nazi society, from a symbol of power to a practical residence to a place for religious ceremonies, presenting multi-level cultural connotations.

(3) Architectural Form and Style

The cultural interpretation of spatial organisation highlights aspects such as the layout of the courtyard, the spatial design of the front and back yards, and the cultural elements of the house layout. These elements reflect the Nazi people's fine knowledge of social structure, family concepts, religious beliefs, etc., showing the cultural significance incorporated in the architecture.

(4) Architectural Influence of Religion and Beliefs

Religious and cultural spaces play a key role in the traditional architectural features and cultural connotations of the Naxi people. The layout and decoration of courtyards and living rooms in the buildings reflect the social status and cultural traditions of the family. The fire pit space not only has functional significance, but also plays an important role in social and religious aspects. It is not only a place for cooking, heating and family gatherings, but also symbolises the warmth and cohesion of the family. Religious beliefs give deeper meaning to the fire pit as a place for rituals and religious ceremonies.

(5) Technical Methods of Naxi Traditional Building Construction

In the study of the technical methods of Naxi traditional building construction, field investigation, construction preparation, house construction process and woodwork construction process receive attention. The field survey provides an in-depth understanding of the characteristics and cultural background of Naxi architecture through field observation, data collection and communication with local residents. The construction preparation stage takes into account the aspects of resource collection and preparation, design scheme development, engineering organisation and technical methodology, technical inheritance and innovation, and cultural inheritance, in order to balance the traditional skills inheritance and innovation, and to ensure sustainable development and cultural inheritance. In the house construction process, site selection and planning, foundation construction, structure erection, wall construction, roof erection, and interior decoration are all subject to detailed study.

The studies of Naxi traditional architecture cover a wide range of aspects from regional characteristics to architectural forms, cultural connotations to construction techniques, providing an in-depth and comprehensive perspective for us to better understand and protect this unique architectural culture. These studies provide useful insights into the inheritance and innovation of traditional architectural culture and its connection with contemporary society.

Woodwork construction process of Naxi architecture

The woodwork construction process of Naxi architecture is the core of traditional architectural culture, covering a number of key aspects such as timber selection and preparation, timber processing and carving, mortise and tenon making and installation, assembly of wooden components, reinforcement and adjustment of wooden components, as well as surface treatment and decoration. This process reflects respect for natural materials, commitment to cultural heritage, and the pursuit of architectural solidity and aesthetics.

(1) Timber selection and preparation

In the timber selection and preparation stage, the Naxi focus on using locally grown pine, cedar and cypress, considering the strength, durability and stability of the wood. This choice is not only in line with the concept of environmental protection, but also gives full consideration to the applicability of local resources. During the preparation of the wood, it is sawn, planed, preserved and dried to ensure adequate strength and stability. Cultural considerations are also very important in this process, which is reflected in the rituals and religious sacrifices for the "life" of the wood, emphasising the gratitude to nature.

(2) Wood processing and carving

The processing and carving of wood is a highly skilled part of the construction process. Planing, sawing, trimming and sanding the wood to suit the needs of the building requires craftsmen to have a deep understanding of the properties and structure of wood. At the same time, unique wood

carving techniques are used to decorate the building's pillars, beams, doors and windows, passing on cultural and religious symbols that have been passed down from generation to generation.

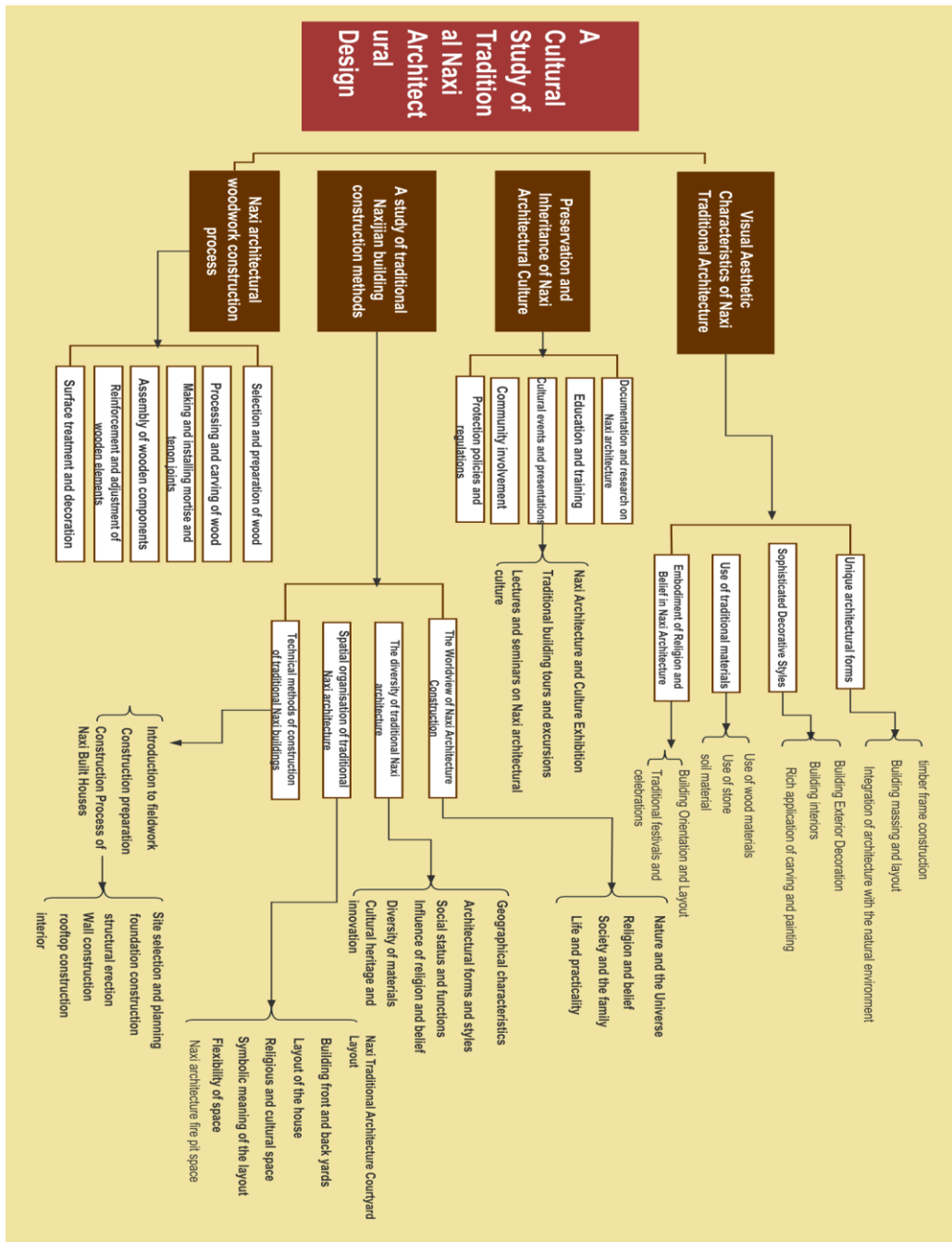


Figure 2: Literature Review Study on Naxi Traditional Architecture

(3) Mortise and tenon making and installation

The production and installation of mortise and tenon is the key connecting link in the building structure. The selection of hard and durable wood for shape design and carving highlights the Naxi's emphasis on the decorative nature of wooden components. The falcon mortise is usually installed at the end of the eaves of a building, which not only has a practical connecting function, but also has a symbolic significance, reflecting the cultural spirit of the building.

(4) Assembly and reinforcement of wooden components

The assembly process of wooden components requires precise processing and preparation of wood to ensure compliance with the requirements of architectural design. The use of mortise and tenon joint technology ensures the stability of the structure. This stage of the process is demanding and requires a high degree of skill and precision on the part of the craftsman. Subsequently, the reinforcement and adjustment of the timber components becomes a part of ensuring the structural health of the building. The intertwined steps of structural assessment, structural design, material selection and construction implementation aim to ensure the stability and safety of the wood structure. This also includes the skilful integration of traditional and modern materials to suit the requirements of modern society for building structures.

(5) Surface treatment and decoration

Finally, surface treatment and decoration is the aspect of the building that best reflects cultural and aesthetic values. In the design and planning, patterns, themes and colours for decoration are determined, taking into account cultural and religious beliefs. Preparation of the surfaces of wooden elements includes steps such as sanding, cleaning and priming. Techniques such as painting, carving, colouring and lacquering enhance the visual appeal of the wooden components while protecting the wood and making it more durable. This woodwork construction process embodies the deep connotation of traditional Naxi architectural culture, which focuses on reverence and gratitude for nature, while expressing the spirit of culture and religion through skill transmission and decoration. The study of this architectural tradition not only contributes to a better understanding of the cultural traditions of the Naxi people, but also provides useful insights into the preservation and inheritance of traditional architectural culture.

SUSTAINABLE DEVELOPMENT MODEL AND VALIDATION STRATEGY FOR NAXI TRADITIONAL ARCHITECTURE

This section aims to explore the preservation and inheritance of traditional Naxi architectural culture, and proposes a series of solutions to ensure that this valuable cultural heritage is maintained and developed in modern society. Through the integrated use of a unified aesthetic model, conservation and utilisation strategies, standardised construction methods and user-friendly design, we can balance the inheritance of traditional culture with the practicality of architecture in contemporary society.

Unified Aesthetic Model

Introducing a unified aesthetic model in new and maintained buildings emphasises the conformity with tradition in terms of appearance, materials, structure and decoration. Through clear aesthetic standards, ensure that the buildings are visually consistent with tradition, thus maintaining their unique cultural appeal.

Protection and Utilisation Strategies

Delineate the protection scope of traditional buildings and set up cultural heritage protection zones and historical building protection lists. Convert some traditional buildings into cultural heritage museums or cultural centres to give full play to the role of architecture in education and tourism. At the same time, encourage the use of traditional buildings for practical lodgings, art studios, etc. to increase their economic value. Introduce modern infrastructure to improve the practicality of buildings. Make the buildings more adaptable to modern living needs by improving the interior layout. Focus on multi-functional design to ensure that buildings are adaptable to different uses. Encourage community co-construction and enhance community participation in building maintenance and improvement. Ensure the inheritance of traditional building techniques through

education and training, and cultivate a sense of identity and protection of traditional Naxi architecture.

Standardise construction methods

Establish clear aesthetic standards and norms, including the appearance, colour, materials and structure of buildings. Encourage the integration of traditional elements through architectural design competitions. Formulate detailed construction and maintenance standards to ensure that skills are passed on and buildings meet cultural traditions and technical requirements.

Model Module Design Strategy

Through these comprehensive solutions, the study can maintain traditional culture while making Naxi traditional architecture better adapt to the needs of modern society, and achieve a win-win situation for cultural heritage and social development. Through comprehensive considerations in the areas of cultural protection and inheritance, normative construction and aesthetics, conservation and maintenance management, ease of use and publicity, community participation and cooperation, as well as governmental management and policy support, the model seeks to comprehensively safeguard the durability, integrity, and cultural value of Naxi traditional architecture in contemporary society. The following are the main modules of the model:

(1) Cultural Protection and Inheritance Module:

Cultural Heritage Database: collects and manages detailed information on traditional architecture.

Education and Training Platform: Provide online education resources to pass on traditional architectural skills.

Cultural festival management system: planning, organising and recording various cultural activities.

(2) Normative construction and aesthetic module:

Aesthetic standard library: ensure that new and maintained buildings are in line with tradition.

Design competition platform: stimulate innovation and incorporate traditional elements.

Approval process management: streamline the approval process to ensure compliance with aesthetic and code requirements.

(3) Ease of Use and Promotion Module:

Infrastructure Improvement Programme: Improve the practicality of traditional buildings and adapt to modern needs.

Publicity and promotion platform: disseminate the cultural value of architecture through various means.

Cultural and educational resources: online resources to educate the younger generation to understand and identify with traditional culture.

(4) Community participation and cooperation module:

Community cooperation platform: encourage community residents to actively participate in the protection and inheritance of traditional architecture.

Partner network: establish partnerships with government, NGOs, travel agencies, etc.

(5) Protection and Maintenance Management Module:

Delineation of architectural protection scope: Define the protection scope and area of traditional architecture.

Maintenance and restoration plan: Develop a detailed maintenance plan, considering special materials and techniques for traditional buildings.

Historical building archives: store historical building archives to record the evolution and maintenance history of the building.

(6) Government management and policy support module:

Government management system: assist the government in the effective management of building permits, cultural preservation policies and resource allocation.

Policy Database: Provides information on cultural preservation policies, building management regulations, etc. to improve the transparency of government policies.

By integrating these modules, the Naxi Traditional Architecture Sustainability Model aims to provide comprehensive support for the future of traditional architecture to ensure its preservation, development and transmission in modern society. Implementing the model requires the cooperation of various stakeholders, including the government, communities, professionals, and cultural preservation organisations, working together to promote the sustainable development of Naxi traditional architecture.

Validation of the model research results

A sustainable development model is proposed and validated through research on Naxi traditional architecture. The research includes the stages of proof of concept, construction of a sample conceptual model and a conceptual model of digital scenarios of Naxi traditional architecture. By describing in detail the methodology and practice of each stage, this study not only aims to preserve and pass on the culture of Naxi traditional architecture, but also to promote its sustainable development. The following are the main results and conclusion validation of each stage:

(1) Proof of Concept Phase

Module integration validation: modules work together to ensure information synchronisation and interface functionality.

Process testing: The approval process is efficient and meets standards.

Community feedback: actively collect community residents' opinions and adjust the community participation module.

Policy implementation: Government management module effectively supervises policy implementation.

(2) Construction Sample Conceptual Model Phase

Building site selection: Consider the scope of protection, cultural background and community participation.

Building design: Encourage innovation through the competition platform and meet aesthetic standards.

Building construction: Inherit traditional skills and quality control in accordance with standards.

Building Maintenance: Establish a maintenance team to regularly inspect and record maintenance history.

(3) Naxi traditional architecture digital scene conceptual model stage

Cultural heritage database: including architectural information, historical background, construction techniques, material information, images and photographs.

Historical building archive: records the history of building changes and maintenance, and preserves related images and documents.

Digital modelling: creating accurate 3D representations using laser scanning, BIM and virtual reality technologies.

Virtual exhibitions: online platforms to showcase architectural culture, including virtual tours, historical stories and interactive elements.

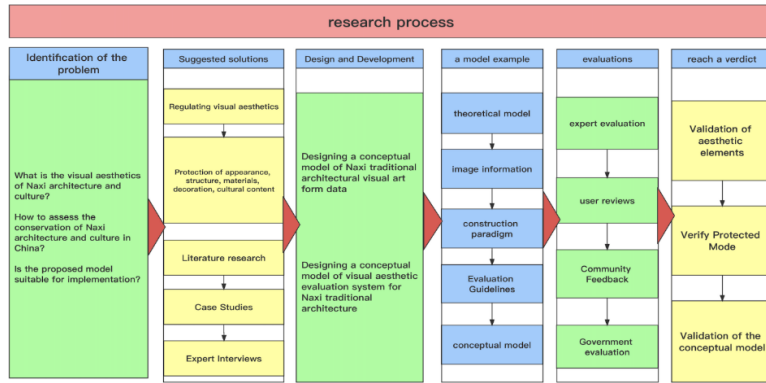


Figure 3: Research process of Naxi traditional architecture sustainable development modelling

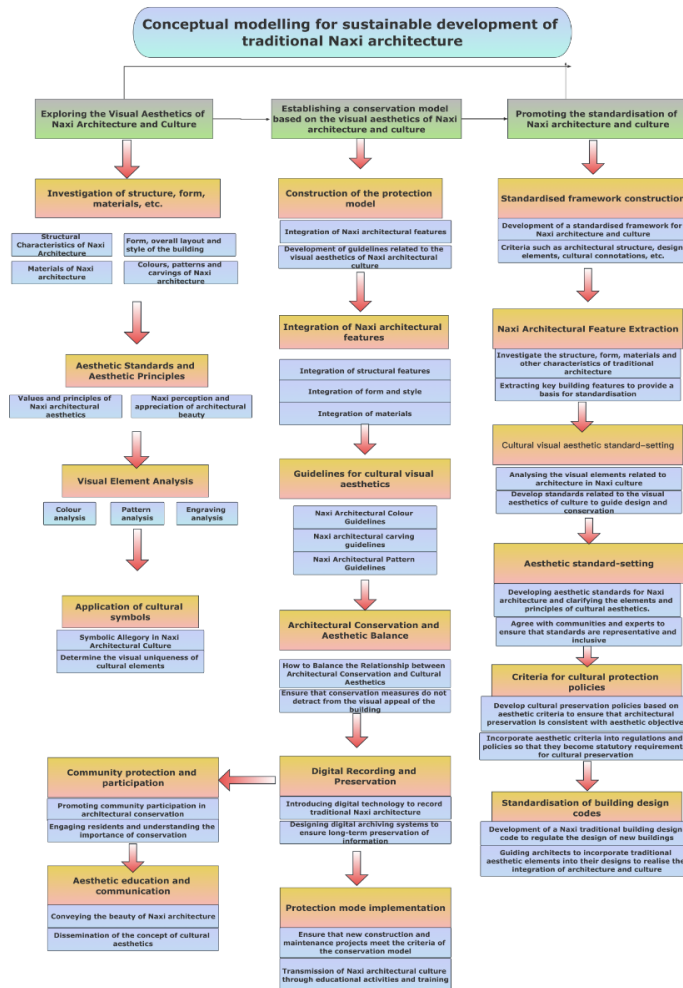


Figure 4: Naxi traditional architecture sustainability model

(4) Evaluation and Conclusion Phase

Data analysis: validation of models and hypotheses through cultural heritage databases, historical building archives, digital modelling and virtual exhibitions.

Research report: detailed description of the practical application and results of each module.

Communication of results: Communicate research results through multiple channels such as academic papers, government reports, and social media.

Public outreach: creating websites, organising seminars and exhibitions to raise public awareness of traditional architectural culture.

Through qualitative research methods, the Nazi traditional architecture sustainability model demonstrates strong practicality and cultural preservation value. This comprehensive approach is expected to have a positive impact on academics, government agencies and communities, promoting the sustainable development and cultural heritage of Nazi traditional architecture.

CONCLUSION

This study delves into the visual aesthetic characteristics, cultural preservation and inheritance, and architectural repair and reconstruction of traditional Nazi architecture. Through the literature review, we learnt about the unique features of Nazi architecture, including wooden structure architecture, building volume and layout, integration with the natural environment, exquisite decorative styles, the use of traditional materials, and the embodiment of religion and beliefs. At the same time, we study the conservation and inheritance strategies of Nazi architectural culture, including various approaches such as documentation and research, education and training, community participation, policies and regulations, and cultural activities and displays. In addition, we study in depth the construction methods of Nazi traditional architecture, including regional characteristics, architectural forms and styles, architectural influences of religions and beliefs, and methods of construction techniques.

On this basis, this study proposes a model for the sustainable development of Nazi traditional architecture, including a unified aesthetic model, conservation and utilisation strategies, normative construction methods and modular design strategies. These comprehensive solutions aim to balance the heritage of traditional culture and the practicality of architecture in contemporary society. Through comprehensive consideration of the areas of cultural preservation and inheritance, regulated construction and aesthetics, conservation and maintenance management, ease of use and publicity, community participation and cooperation, as well as government management and policy support, the model comprehensively safeguards the durability, integrity, and cultural value of Nazi traditional architecture in contemporary society. The validation phases of the study included a proof of concept, a constructed prototype conceptual model phase and a conceptual model phase of a digital scenario of a traditional Nazi building. These validation phases aim to ensure the feasibility and practicality of the model. Finally, through evaluation and validation of conclusions, the study produced practical guidance on the sustainable development of Nazi traditional architecture and looked forward to future research directions.

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