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The Connection Between Western Mazandaran's Indigenous Music and Architecture-Focused on Cultural Identity and Sensory Experience

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Abstract

The intricate interplay between architectural space and indigenous music in Western Mazandaran profoundly reflects the region's cultural identity. This study aims to explore the defining characteristics of Mazandaran's indigenous music while assessing the role of architecture in enhancing and preserving this musical heritage. The central inquiry investigates how architectural designs can be inspired by the principles of indigenous music to create spaces that offer enriching and meaningful experiences aligned with the local culture. Employing a descriptive-analytical approach, this research integrates qualitative and quantitative methodologies to analyze the reciprocal influences of architecture and music in shaping cultural and social identity. The results indicate that architectural elements rooted in the rhythms and melodies of indigenous music can foster environments that promote cultural connectivity and community engagement. Moreover, the findings underscore the importance of preserving traditional architectural spaces while deriving inspiration for contemporary designs. By marrying architectural innovation with indigenous musicality, this research asserts the necessity of facilitating the transmission of cultural heritage to future generations. Ultimately, the study presents a blueprint for designing cultural and artistic spaces that resonate with the principles of indigenous music, emphasizing their potential to serve as vibrant centers for cultural education and social cohesion.

Keywords: Indigenous music of western Mazandaran, Cultural identity, Sensory experience, Eometric proportions, Aesthetics, Music and architecture.

1 | Introduction

The relationship between architectural space and indigenous music is one of the complex and multi-layered

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topics in cultural and artistic studies, which examines how the physical environment influences artistic and social experiences. Folk music, as one of the pillars of cultural identity, not only reflects the life, nature, and values of the people of each region but also significantly contributes to strengthening collective identity and preserving intangible heritage. Primarily, the indigenous music of Mazandaran, with its melodies, instruments, and local lyrics, represents the rich and historical culture of the people of this region.

With its dynamic history and culture, Western Mazandaran attracts special attention as one of the regions where its indigenous music is deeply intertwined with the natural environment and local rituals. With its unique climate and cultural diversity, this region is considered a suitable environment for preserving and promoting indigenous music [1].

However, contemporary cultural and social changes, including the expansion of urbanization and the diminishing role of traditions, have threatened the oblivion of this indigenous music. On the other hand, as a spatial art, architecture provides potential opportunities for preserving and reviving this musical heritage. The indigenous architecture of Mazandaran, rooted in the climate and local traditions, can be an effective tool for creating a space that not only preserves the native music but also offers a profound and multi-sensory experience.

Unfortunately, many contemporary cultural spaces in this region do not provide the opportunity to create such an experience due to their lack of alignment with the needs of indigenous music. The design of these spaces often contradicts the principles of design based on the needs of music and the climatic and cultural characteristics of the region. Therefore, the importance and necessity of this research are noteworthy from two perspectives: first, the preservation of Indigenous music as a cultural heritage, and second, utilizing architectural capacities to design spaces that provide a deeper and more authentic experience of Indigenous music.

This research examines the characteristics of Mazandaran's indigenous music and the role of architecture in supporting and strengthening this music. The main question is how to design a space inspired by indigenous music and architectural principles that provides an engaging, effective experience in line with the region's cultural identity. The results of this research can serve as a model for designing cultural and artistic spaces in Mazandaran and other regions with similar cultural heritages.

This research has both practical and theoretical approaches in terms of its objectives and is descriptive-analytical in terms of its methodology. This method allows the researcher to identify the relationships between architecture and indigenous music using quantitative and qualitative data and to conduct a deeper analysis of the reciprocal influences of these two elements in shaping the cultural and social identity of the region. This research believes that only by adequately integrating these two fields can the cultural and artistic richness of the people's way of life in this region be continued and kept alive in the contemporary world.

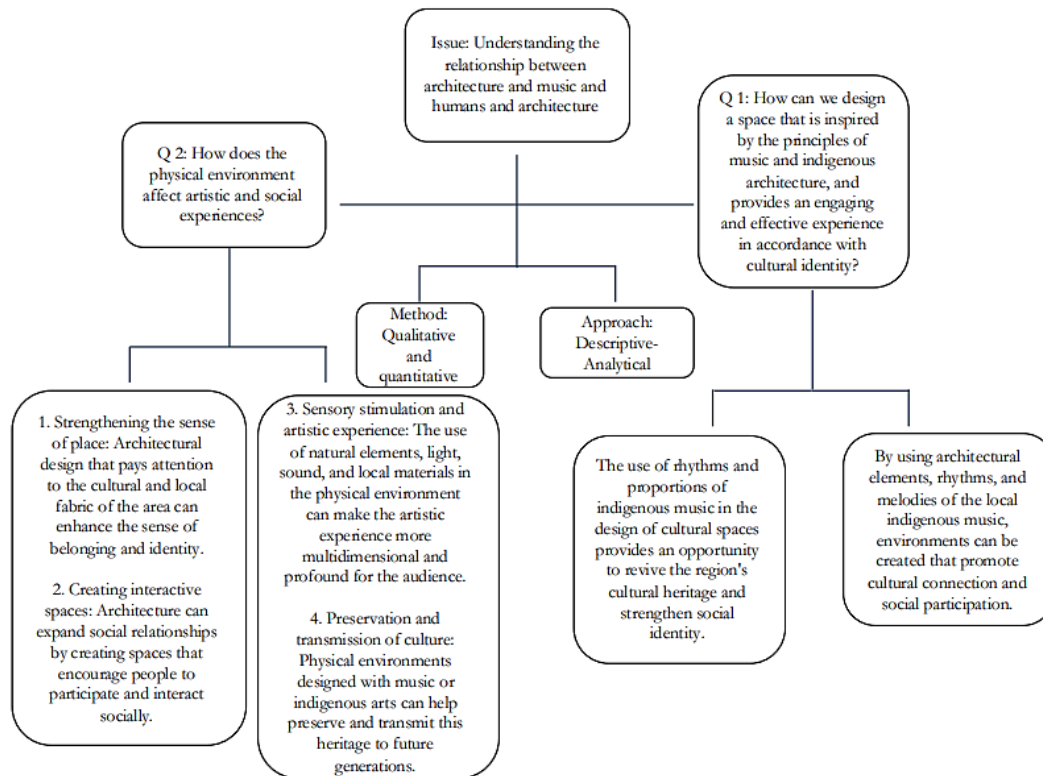


Fig. 1. Conceptual model of the relationship between architecture, indigenous music, and cultural identity.

2 | Fundamentals and Theoretical Framework

2.1 | Definition of Key Concepts

Architecture

Architecture, as the "spirit of place," is a concept that encompasses not only physical spaces but also the identity and sense of belonging of individuals to a place. This definition emphasizes the importance of the relationship between architecture and culture and climate, introducing architecture as an interdisciplinary art that enriches the human experience beyond its purely technical function. Regarding indigenous architecture, This type of architecture is the product of adapting culture and environment. These structures are naturally aligned with the climate, local materials, and the needs of a specific community. In western Mazandaran, indigenous architecture, especially wood and stone, has created structures that adapt to the humid and rainy climate and reflect the region's cultural values. Traditional patterns such as large verandas, sloped roofs, and lush courtyards are examples of this harmony between functionality and indigenous aesthetics. On the other hand, preserving and strengthening indigenous architecture in the face of modern architectural challenges is one of the topics repeatedly emphasized in contemporary research. Modern architecture sometimes creates structures that lack a connection to their surrounding environment by ignoring the cultural and identity context. This issue is also observed in western Mazandaran, where the expansion of urbanization and non-native architecture has affected the visual and cultural identity of the region. The indigenous architecture from west Mazandaran can provide a suitable platform for enhancing cultural and artistic experiences, especially local music. Designing spaces inspired by indigenous elements can help preserve cultural identity and create a unique and multi-sensory experience for the audience. This requires special attention to design details and coordination between form, material, and architectural function while respecting the region's culture and

nature. One of the most fundamental human arts has always played a key role in reflecting cultural and social identity.

3 | Indigenous Music

Indigenous music, as one of the most important components of a society's culture, reflects the customs, traditions, and lifestyles of the people in that region. This type of music not only shapes the cultural and historical identity of the community but also serves to transmit values, beliefs, and human emotions over time. Indigenous music strengthens social and cultural connections through its local instruments, modes, and specific lyrics and plays a significant role in preserving and continuing cultural identity [2].

In western Mazandaran, indigenous music is deeply connected to the region's culture, history, and environment. This music, using local instruments such as the dotar, kamanché, and lullaby, creates unique melodies and tunes adaptable to the region's climate and environmental conditions. For example, the dollar is used in many local festivals and ceremonies with its deep sound. It is also constructed from local natural materials, thus closely connecting with the region's nature. The kamāncheh and the laleh, other local instruments of this region, create a spiritual and cultural atmosphere with their acoustic characteristics used in many social and ceremonial occasions.

The modes and melodies of the indigenous music of western Mazandaran are also very diverse and rich. These modes, which are often transmitted orally to subsequent generations, not only recount the stories of the local people but also address the region's social, cultural, and ecological issues. In many local poems, descriptions of nature, forests, mountains, and rivers are seen, implicitly showing the relationship between humans and nature. These poems, especially in ritual ceremonies and social occasions, not only represent cultural values but also serve as tools to strengthen the sense of social belonging and cultural identity. Ultimately, the indigenous music of western Mazandaran, with its combination of local instruments, modes, and unique lyrics, not only plays an important role in preserving and transmitting culture and identity but also, as a cultural and sensory medium, provides capacities to influence architectural design and social spaces. This music can serve as an inspiration for creating spaces that provide a multi-sensory and spiritual experience for the audience [1].

4 | The Connection Between Architecture and Music

The relationship between architecture and music is one of the fascinating interdisciplinary topics examined from theoretical and practical perspectives. Although these two arts operate in different forms of time and space, they share many similarities in their fundamental principles. These commonalities include geometry, proportions, rhythm, and aesthetics, which connect both arts to a shared artistic language. Architecture and music are both based on mathematical and geometric principles. Golden ratios and numerical patterns are among the tools used in architecture to create balance and beauty, and in music, they are employed in the form of melodic and rhythmic structures. Iannis Xenakis, a prominent architect and musician, has addressed this issue in his works and presented innovative theories on the relationship between mathematical patterns and artistic creation. He states that music and architecture share a common language that can be expressed in numerical and geometric relationships. Rhythm in music is defined by the repetition of beats and temporal structure, while in architecture, rhythm is seen in the repetition of spatial elements such as columns, windows, and spatial proportions. Rhythm in both arts acts as a tool to guide human perception and helps create a sense of harmony and balance in space or time.

These correspondences help architects and musicians create a deeper sense of harmony and connection in their designs. As a universal language and cultural tool, music can evoke a sense of place. Indigenous music, especially in areas like western Mazandaran, by reflecting climatic and cultural characteristics, can influence the formation of a sense of place and strengthen cultural identity in architecture. For example, in many architectural traditions, auditory elements are used to define specific spaces, such as the design of central ponds in Iranian houses, which evoke tranquility and a connection with nature through the sound of water.

Examining the connections between architecture and music shows that these two arts not only share common principles but can also assist each other in creating richer human experiences. This connection becomes even more significant in preserving and strengthening cultural identities, especially in regions with a rich musical heritage.

5 | Theoretical Concepts

5.1 | The Theory of Proportions and Sacred Geometry

As a common concept between architecture and music, mathematical proportions and sacred geometry emphasize principles that play a fundamental role in both fields. In architecture, mathematical proportions and sacred geometry, especially in Iranian culture, manifest in creating magnificent and meaningful structures. Geometry in Iranian architecture is used to create order and beauty and convey spiritual and cultural messages. These principles, inspired by nature and in harmony with the environment, lead to structures that evoke a sense of balance and symmetry in the viewer. For example, the use of the golden ratio and numerical sequences such as the Fibonacci series in the design of architectural spaces are among the prominent features of this style [3]. These principles are also applied in music, creating rhythms and melodies that are structurally and aesthetically close to geometric proportions. Iannis Xenakis, recognized as one of the pioneers in studying the connections between architecture and music, presented theories in his book "Music and Architecture," demonstrating how geometric and mathematical patterns can be used in music composition. Xenakis believes that just as architecture creates harmonious and balanced spaces using geometric proportions, music can also create deep and lasting harmony and rhythms using these principles [4].

In the indigenous music of Iran, especially the music of western Mazandaran, the influence of these proportions is visible. This music, with its simple yet profound rhythms and melodies that reflect human emotions, is an example of the harmony between mathematics and art. Indigenous instruments such as the *dollar* and the *lava*, which produce natural and nature-like sounds, play an important role in creating this music. By producing harmonious and proportionate sounds, these instruments somewhat reflect the principles of sacred geometry in music. Mathematical proportions and sacred geometry demonstrate the deep connection between these two arts by creating a common language between architecture and music. These principles, emphasizing symmetry, balance, and repetition, not only help create beautiful and harmonious works but also instill a sense of coherence and depth in the audience. Such connections, observed throughout history in various cultures, can lead to a better understanding of the role of art in human life and its links with knowledge and nature.

5.2 | Aesthetic Theories

Aesthetics, as one of the main branches of philosophy, plays an important role in analyzing and interpreting various arts, including architecture and music. This field, focusing on the experience of beauty and human emotions, examines the common features and distinctions between these two arts. The theories of philosophers such as Immanuel Kant and Georg Wilhelm Friedrich Hegel have provided important frameworks for understanding aesthetics in art, which can be applied in the design of cultural and musical spaces. In his seminal work, "Critique of Judgment," Kant defines beauty as a judgment of taste that depends not only on sensory pleasure but also on the human mind's ability to perceive harmony and order. He believes that beauty in art is achieved through the combination of rational principles and human emotions. In this framework, architecture and music, as arts that emphasize proportions, symmetry, and harmony, are ideal examples of aesthetics. In the design of cultural spaces, these principles can create environments that evoke a sense of balance and tranquility and stimulate creativity in the audience.

On the other hand, Hegel believes that art's beauty should express spiritual and cultural ideas. In his lectures on aesthetics, he considers art a means for manifesting transcendent ideas beyond material limitations. From Hegel's perspective, architecture is considered "objective art" and music "subjective art," complementing each

other. Architecture, through tangible and material forms, and music, through sound and rhythm, showcase aesthetic concepts. This theory can inspire the design of spaces that reflect the interaction between architecture and music as part of a region's cultural identity [5]. In the design of cultural and musical spaces, these aesthetic concepts can lead to creating environments that enhance the sensory and spiritual experience of the audience. Spaces that utilize harmony and proportions reflect the deep connection between culture, art, and nature. In this regard, integrating indigenous architectural principles with local musical characteristics strengthens cultural identity and provides audiences with a unique and multi-sensory experience.

5.3 | The Theory of Empiricism and Spatial Perception

Sensualism, one of the key theories in understanding space and architectural experience, emphasizes the deep connection between the senses and perception. This approach, which is manifested in the works of prominent phenomenologists such as Christian Norberg-Schulz, defines space not merely as a physical element but as a lived and tangible experience. From Norberg-Schulz's perspective, the perception of space is shaped by the interaction between the characteristics of the environment and human senses, and this interaction provides a basis for the connection between the individual and their surroundings [6]. In architecture, sensuality, by utilizing elements such as light, color, sound, and texture, strives to create a rich and meaningful experience for users. Norberg-Schulz emphasizes in his book "Genius Loci" that each place has its unique "spirit" that must be preserved through sensitive and conscious design. This principle can be applied in the design of spaces dedicated to local music, as music, a sensory and temporal art, profoundly impacts spatial experience. The local music of western Mazandaran, rich in natural rhythms and melodies, serves as an ideal example for understanding the impact of sensory experience on space design due to its close connection with the region's environment and culture. The calm rhythms suited to agricultural activities or the lively melodies of traditional ceremonies can be translated into spatial elements such as geometric proportions, lighting patterns, or local materials. This adaptation not only enriches the spatial experience for users but also facilitates the creation of a deeper connection between culture, music, and architecture [7]. From the perspective of sensory perception, the design of architectural spaces integrated with local music should pay special attention to the multisensory experience. For example, visual perception through colors and patterns related to the region's nature, auditory perception through acoustics suited to the sounds of local instruments, and even tactile perception through the selection of natural materials can all contribute to creating a comprehensive and profound experience. This approach, as emphasized in phenomenological theories, harmoniously and integrally enhances the sense of place and reveals the region's cultural identity. Therefore, a deeper understanding of the relationship between music and architecture can be achieved by relying on the theory of sensualism and its impact on spatial perception. This relationship not only reflects the culture and identity of the local people but also brings a sensory and unique experience to the audience, creating a dynamic connection between art, nature, and society.

6 | Conceptual Model of the Research

6.1 | Conceptual Model

Indigenous music

The Indigenous music of western Mazandaran, using auditory elements such as rhythms that align with nature and agricultural activities, sensory melodies, and instruments like the *dollar*, *ney*, and *Delaware*, creates a unique auditory experience. This music emerges from the region's ecosystem and local culture, reflecting the lifestyle and values of the people in the area. The rhythms of this music, which are often calm and regular, align with the spatial structure of agricultural life and can be inspirational in architectural space design. The indigenous music of western Mazandaran reflects the region's cultural identity and plays a fundamental role in creating spaces that evoke a sense of place.

Indigenous architecture

The indigenous architecture of western Mazandaran, with its simple forms and proportions, natural materials such as wood and clay, and environmentally compatible patterns, provides a suitable foundation for integrating local music. Architectural forms such as rural houses with sloped roofs and wide verandas are inspired by the rhythm of nature and serve as symbols of the region's culture [8]. This architecture, considering the use of natural materials and their flexibility, can adapt to local music and can organize the spatial auditory and visual dimensions to create a cohesive cultural experience.

Sensory experience

Sensory experience in this conceptual model plays a fundamental role in deeply understanding the relationship between architecture and music. Auditory experience with acoustics suitable for local music, visual experience through forms and colors inspired by nature, and tactile experience through indigenous materials provide a basis for multisensory perception. This experience creates a closer connection between the individual and the space, creating an environment where indigenous music is directly intertwined with architecture. Designing such spaces can allow the audience to experience a profound connection between the environment and art [9].

Cultural Identity

Music and architecture play a central role in this conceptual model as key elements in defining and preserving cultural identity. Indigenous music, with its unique lyrics and rhythms, narrates the local stories and beliefs of the people in the region. Indigenous architecture also reflects cultural values in the living space through traditional forms and patterns. Ultimately, these two elements create a strong bond between identity, culture, and lived experience through their interaction.

6.2 | Common Ground

Architecture and music share many conceptual, spatial, formal, and aesthetic commonalities. On the other hand, they also share similarities in proportions, rhythm, harmony, and repetition. Some of the common concepts between architecture and the music of western Mazandaran can be summarized as follows:

Title	Architecture	Music
Rhythm	In the indigenous architecture of western Mazandaran, repetitive forms such as columns and windows create a sense of dynamism and movement, similar to the regular and repetitive rhythms in music.	In the indigenous music of western Mazandaran, gentle and repetitive rhythms naturally align with people's daily activities, creating a sense of movement and dynamism in the listener, akin to the effect of rhythm in architecture that fills the architectural space with movement and energy.
Idea	In the indigenous architecture of western Mazandaran, design ideas typically stem from nature, local culture, and the client's wishes.	In folk music, rhythmic and melodic ideas are inspired by the natural environment and the daily activities of people.
Diversity and Uniformity	In the indigenous architecture of western Mazandaran, diversity in design patterns, such as space divisions and the use of local materials, alongside uniformity in proportions and forms, creates a sense of balance and harmony.	In folk music, the use of melodic changes alongside a steady rhythm shapes a sense of continuity and harmony in the listener.
Stillness	In the indigenous architecture of western Mazandaran, stillness in spaces such as porches and courtyards creates tranquility and contemplation.	In folk music, calm rhythms and gentle melodies provide the listener with a sense of peace and rest.
Movement	In the indigenous architecture of western Mazandaran, movement in the design of open and closed spaces, such as varying ceiling heights and transitions from porches to inside houses, brings a sense of dynamism and flow to the space.	Movement in indigenous music creates a feeling of flow and transformation in the listener through rhythmic and melodic changes.
Harmonic Proportions	In the indigenous architecture of western Mazandaran, harmonic proportions in the dimensions of spaces and architectural forms, such as the size and arrangement of columns and windows, create visual harmony and beauty.	In folk music, proper tuning of sound intervals leads to harmony and auditory pleasure.

Fig. 2. Commonalities between architecture and music in the cultural identity of western Mazandaran.

7 | The Role of Architecture in Reviving Indigenous Music

Architecture and indigenous music, as two facets of culture and social identity, have a complex and profound relationship that can help revive indigenous arts. Indigenous music reflects the traditions, beliefs, and lifestyles of the people of a region. In contrast, architecture, by creating spaces that align with these beliefs and needs, provides a foundation for preserving and strengthening these arts. Designing architectural spaces that align with indigenous music's acoustic and content characteristics can help reproduce this music in authentic and meaningful environments. For example, the use of local materials such as wood and stone in the architecture of western Mazandaran, in addition to harmonizing with the region's nature, provides suitable acoustic conditions for performing music. The design of open and semi-open spaces, such as lush courtyards or enclosed areas with textured walls, can enhance the acoustic dynamics and resonance of indigenous music. In this context, designs inspired by indigenous forms and patterns allow audiences to experience music in a meaningful setting, creating a deeper connection with cultural identity [10].

On the other hand, the emotional and psychological connection between music and architectural spaces is also worth considering. Intelligently designed spaces can enhance the sense of coexistence between nature and music. For example, the sound of the Lalehva or Dotar, which is intertwined with the nature of Mazandaran, is heard in spaces designed based on local patterns in a deeper and more meaningful way. Such spaces can enhance the connection between the artist and the audience in the performance of indigenous music and create a sense of continuity of cultural traditions. Architecture can also play a key role in reviving ritualistic and traditional ceremonies related to indigenous music. Creating spaces for celebrations, wedding ceremonies, and other local rituals keeps Indigenous music alive, preserves social identity, and strengthens social bonds. In contemporary times, where rapid social and cultural changes threaten local traditions, architecture can be an important tool in preserving this cultural heritage. Designing multifunctional spaces capable of hosting Indigenous music performances while simultaneously addressing modern needs can be an effective step toward revitalizing Indigenous music and culture. Ultimately, combining architectural knowledge with a deep understanding of Indigenous music and cultural identity can create spaces that serve as platforms for showcasing Indigenous arts and catalysts for the revival of these arts. These spaces can play a role beyond physical locations and serve as cultural, educational, and experiential centers for future generations.

8 | Field Study

The field study conducted in this research aims to deeply analyze the relationship between architecture and indigenous music of western Mazandaran. This study collects first-hand data through direct observation, semi-structured interviews, and analysis of the region's cultural environments. The data have been collected and analyzed in such a way as to represent the connection between architectural and musical elements within the real-life context of local life and culture. As the first step in field study, direct observation focused on examining indigenous architectural spaces such as verandas, courtyards, and traditional halls. These spaces, which typically serve as venues for social and ritual gatherings, play an essential role in the experience of indigenous music. At this stage, features such as spatial proportions, the type of materials used, and the design approach for optimizing natural acoustics were considered.

Additionally, examining how the spaces interact with the surrounding natural environment and its impact on the auditory experience of indigenous music were among the key points analyzed. Semi-structured interviews were conducted with local musicians, traditional architects, and community members. Musicians provided valuable information about the acoustic and environmental needs for performing indigenous music. Local architects described traditional design methods and how the form and materials of architecture harmonize with the region's culture and music. Local community members also shared their views on the role of architectural spaces in preserving indigenous music and its impact on social and cultural experiences. The analysis of historical documents and evidence related to indigenous architecture and music was also conducted as a complementary part of this field study. Historical documents, maps, and old photographs of architectural

spaces provided valuable information about the evolution of the design of these spaces and their connection to musical rituals. These documents showed how architectural design patterns, inspired by the nature and cultural needs of the region, harmonize with the rhythms and melodies of local music. The findings of this field study showed that indigenous architectural spaces are designed to provide a multisensory experience of indigenous music. For example, large, open verandas, usually made of local wood and stone, enrich musical performances with natural sound reflection. Lush courtyards and semi-open spaces also provide a setting for collective musical experiences, where social and cultural interactions are enhanced in an environment harmonious with nature and music. The data analysis from the field study showed that the relationship between architecture and indigenous music goes beyond functional aspects and has elevated to a cultural and sensory level. By utilizing natural rhythms and patterns, Indigenous architectural designs provide a suitable space for performing indigenous music and help preserve and strengthen the cultural and social identity of the region. This study emphasizes the importance of preserving these spaces and drawing inspiration from their principles in contemporary designs.

Aspect	Description	Methods Used	Key Findings
Aim of Study	Analyze the relationship between architecture and indigenous music	Field study using direct observation, semi-structured interviews, and cultural environment analysis	Architectural and musical elements are interconnected within the local cultural context
Direct Observation	Examine indigenous architectural spaces	Focus on verandas, courtyards, and traditional halls	Important for social and ritual gatherings, optimizing natural acoustics, and interaction with the environment
Semi-Structured Interviews	Gather insights from local musicians and architects	Conducted with musicians, traditional architects, and community members	Musicians shared acoustic needs; architects described traditional design methods; community views on preservation
Historical Document Analysis	Study historical documents related to architecture and music	Analyzed maps and old photographs	Showed the evolution of architectural designs and their connections to musical rituals
Multisensory Experience	Design of spaces enhances musical experiences	Large open verandas and lush courtyards are conducive to collective musical experiences	Architecture enriches performances through natural sound reflection and fosters social interactions
Cultural Implications	Architecture and music impact on cultural identity	Highlighting the need to preserve traditional spaces and draw inspiration for contemporary designs	Indigenous architectural designs help strengthen the cultural and social identity of the region

Fig. 3. Summary of the field study.

9 | Research Finding

The findings of this research showed that western Mazandaran's architecture and indigenous music play a complementary role in representing the cultural identity and sensory experience of the region's people. Indigenous music, with rhythms and melodies that reflect the region's nature and social life, has established a deep connection between culture, nature, and local rituals. In this context, indigenous architecture has served as a platform for performing music and preserving cultural values. This research emphasizes that architectural spaces, especially verandas, courtyards, and traditional halls, directly impact the quality of indigenous music's auditory and sensory experiences. The design of these spaces, using natural materials and patterns that are harmonious with nature, provides a deeper music experience. One of the key findings of the research is the impact of rhythms and proportions of indigenous music on architectural space design. This influence is particularly evident in using repetitive patterns and harmony at spatial scales [11].

Additionally, open and semi-open spaces in indigenous architecture, designed according to the climatic and cultural principles of the region, not only provide a suitable environment for the resonance and acoustics of music but also strengthen the connection between people and the natural environment. These spaces, by creating a sense of place and inducing tranquility, enrich the auditory experience of music. The findings also showed that indigenous music can be an inspiring source in designing contemporary architectural spaces. The

rhythms and melodies of local music can serve as the basis for designing spatial patterns that enhance a sense of harmony and cultural identity. For example, the use of mathematical and geometric proportions found in indigenous music can create aesthetically pleasing and harmonious spaces with the local culture. Ultimately, this research showed that integrating architecture and indigenous music can help preserve and strengthen the cultural identity of western Mazandaran. Designing cultural and artistic spaces inspired by these two fields not only helps transfer social and cultural values to future generations but can also provide a multi-sensory and meaningful experience for the audience. The research findings provide a model for contemporary designs based on indigenous principles that respond to modern needs. This model can also be applied in other regions with similar cultural heritage.

Aspect	Traditional Architecture	Folk Music	Impact on Cultural Identity
Key Features	Porches, courtyards, traditional halls	Local rhythms and melodies	Reviving cultural and environmental values
Sensory Experience	Creating open and semi-open spaces	Creating a sense of resonance and acoustics	A deeper experience of music
Spatial Design	Use of natural materials, patterns harmonious with nature	Inspired by rhythmic patterns and proportions in music	Contemporary space design with a sense of harmony
Connection to Nature	Direct connection with the natural environment	Reflecting nature and social life	Strengthening sense of place and connection to nature
Cultural Identity Preservation	A platform for musical performance and cultural values	A source of inspiration for contemporary space design	Transmitting social and cultural values to future generations
Design Patterns	Design based on climatic and cultural principles	Using mathematical and geometric proportions	Creating a multi-sensory and meaningful experience

Fig. 4. The influence of traditional architecture and folk music on cultural identity through design, rhythm, and heritage.

10 | Discussion

The relationship between architecture and indigenous music of western Mazandaran goes beyond practical and functional aspects and is intertwined with deeper dimensions of sensory experience and cultural identity. This mutual connection is manifested not only in architecture's forms and patterns but also in indigenous music's rhythms and melodies. Indigenous music, inspired by nature, rituals, and the daily activities of the local people, plays a key role in strengthening collective identity and transmitting cultural values. In contrast, by designing spaces suitable for the region's climate and culture, indigenous architecture provides an appropriate setting for experiencing this music. Research analyses showed that spatial patterns and indigenous architectural forms, such as verandas, central courtyards, and sloped roofs, play an important role in enhancing the resonance and acoustics of indigenous music. These spaces, using natural materials and designs harmonious with nature, enhance the sense of place and create a multisensory user experience. For example, natural elements such as flowing water, trees, and wooden textures directly and tangibly strengthen the connection between humans and the environment [1].

These features not only affect the auditory quality of the music but also strengthen social connections and a sense of community. The role of indigenous music as a source of inspiration in the design of contemporary architectural spaces is another notable aspect of this research. The rhythmic patterns of indigenous music, which reflect the order and harmony of nature, can help create forms and spatial patterns that harmonize with the region's culture and aesthetic principles. Similarly, using mathematical and geometric proportions found in indigenous music can create spaces that evoke a sense of harmony and balance. The challenges of

modernity and its impact on indigenous music and architecture were also examined in this research. The development of urbanization and the use of non-local materials and forms have affected many indigenous spaces designed for experiencing local music and have weakened their functionality. However, the present research believes that by utilizing the principles of indigenous architecture in contemporary designs, these threats can be turned into opportunities. Designing spaces inspired by indigenous music and architecture can help preserve and revive the region's cultural identity and create a multi-sensory and meaningful experience for future generations. Ultimately, this research emphasizes that the connection between architecture and indigenous music of western Mazandaran can help design authentic and meaningful cultural spaces and provide a model for other regions with similar cultural heritage. The integration of these two artistic domains provides an opportunity to strengthen social bonds and preserve local values, and it can serve as a sustainable solution in facing modern challenges.

11 | Conclusion

This research showed that the connection between architecture and indigenous music of western Mazandaran is intertwined with deep aspects of cultural identity, sensory experience, and social interactions. The indigenous architecture of this region, utilizing natural forms and materials, has provided a foundation for the enhancement and transmission of local music. On the other hand, indigenous music, as an artistic and cultural tool, has inspired the design of architectural spaces and strengthened the sense of place. Analyses showed that Indigenous architectural spaces such as verandas, courtyards, and semi-open spaces, with designs harmonized with nature and emphasizing appropriate acoustics, create a multi-sensory experience and facilitate social and cultural interactions.

These spaces directly contribute to preserving indigenous music's auditory and visual quality and strengthen the bond between humans and the natural environment. Despite challenges such as urbanization and the diminishing role of traditional spaces, the findings of this research emphasize the importance of utilizing indigenous principles in contemporary designs. The use of rhythms and proportions of indigenous music in the design of cultural spaces provides an opportunity to revive the region's cultural heritage and strengthen social identity. This approach helps preserve indigenous values and provides a sustainable model for designing cultural spaces in other regions with similar heritage. The present research provides a theoretical framework for integrating architecture and indigenous music and highlights the importance of passing this heritage on to future generations. By designing spaces inspired by these principles, a deeper connection can be created between art, culture, and nature, which fundamentally strengthens identity and social cohesion.

Aspect	Findings	Implications	Challenges
Connection to Cultural Identity	The relationship between architecture and folk music is tied to cultural identity, sensory experiences, and social interactions.	Indigenous architecture enhances and transfers folk music through natural forms and materials.	Urbanization: Traditional spaces are gradually disappearing, putting cultural identity at risk.
Multisensory Experience	Indigenous architectural spaces (porches, courtyards, semi-open spaces) create a multisensory experience.	These spaces facilitate social and cultural interactions, preserving the auditory and visual quality of folk music.	Climatic Changes: May impact the design quality of spaces and sensory experiences.
Role of Folk Music	Folk music serves as an artistic and cultural tool, inspiring architectural designs and enhancing the sense of place.	Utilizing folk music rhythms and proportions in cultural space design revitalizes cultural heritage.	Social Changes: Shifts in how people interact and the diminishing of social connections can have impacts.
Contemporary Design Principles	Emphasis on the importance of incorporating indigenous principles into modern designs.	Helps preserve indigenous values and offers a sustainable model for cultural space design in areas with similar heritage.	Economic Issues: There may not be sufficient financial resources to maintain and design new spaces.
Theoretical Framework	A theoretical framework for integrating architecture and folk music is proposed.	Highlights the importance of transferring this heritage to future generations to strengthen social cohesion.	Lack of Public Awareness: There is insufficient information and awareness about the importance of this integration.

Fig. 5. Linking architecture and folk music: insights on cultural identity, design principles, and challenges.

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Data Availability

All the data are available in this paper.

Conflicts of Interest

The authors affirm that there are no conflicts of interest to disclose.

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