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The Role of Architects as Intermediaries in the Revival of Iranian-Islamic Identity

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Abstract

The challenges in the renovation of historical monuments are controversial issues in architecture. One of the main factors of these challenges is the difference in perspectives in this field. The two main perspectives on this topic that create differences of opinion and explain the necessity of the present study are the exclusive view of architects and the view of structural engineers. The architect's special view of the renovation of historical monuments and the necessity of improving the stability of these monuments has weakened the common view and led to the growth of exclusive views. The main question of the research is whether there is a relationship between the view of structural engineers and restorers and architects on the renovation of historical monuments. Are renovation with technical and restoration considerations considered two opposing or complementary approaches? These two approaches are two important aspects of preparing renovation plans for historical monuments, so it is necessary to pay attention to both perspectives and, through the visionary perspective of architects, the process of transferring the life of a historical monument from the past to the future will gain more credibility. This article achieved a deeper and more accurate understanding of the problem through library studies and by separating the existing perspectives. Then, technical and architectural restoration considerations were extracted from an analytical perspective, and with the help of a descriptive-analytical method, the restoration of several prominent monuments was examined, and the differences in the views of restoration experts, structural engineers, and architects about the obtained indicators were collected and evaluated. Numerous historical monument renovation examples in Iran and the world were studied, including historical identity considerations and structures. Finally, with a convergent approach, a visionary perspective focusing on preserving and revitalizing the heritage of Iranian-Islamic identity was achieved by renovating historical monuments. The results obtained show that the role of education in raising the level of awareness of specialists and officials has an important impact on the approximation of existing perspectives, and the role of architects as interdisciplinary experts and guardians of the Iranian-Islamic identity is an effective response to existing issues in achieving desirable solutions for improvement and also approximation of the perspectives of specialists.

Keywords: Renovation, Structural engineers, Restorer, Iranian-islamic identity.

1 | Introduction

More than four decades have passed since the Athens Charter was formulated as the first charter of the architectural and urban planning professional society in preserving valuable cultural and historical buildings and textures. During this period, numerous treaties and charters were prepared and regulated, which became

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the criteria for action in renovating historical monuments. On a closer look, the selection of the implementation strategy for renovation includes various components and variables that naturally affect the effectiveness of each final solution. For this reason, none of these documents can be a comprehensive guideline for renovating historical monuments. In addition to the ineffectiveness of comprehensive guidelines, the plurality of experts' perspectives adds to the existing challenges, so the diversity of experts' perspectives has led to deepening executive differences. Renovators, relying on their comprehensive expertise in the preservation field, have clearly understood the value and aesthetic dimensions of historical monuments and have made preserving this important matter their primary concern in this field. The fundamentally technical approach of structural specialists is often focused on its static and sustainability dimensions. Therefore, for the continuation of its cultural life, improving the safety of these buildings is important not only because of purely cultural requirements but also because of the necessity of preserving human life. Here, the challenging issues are how and based on what criteria the protection of the cultural identity of historical monuments should be considered alongside safety and durability considerations. Can restoration and technical experts' views be fundamentally unanimous in achieving a workable solution in this regard? The role of architects in this field is that the gap between these two areas causes obvious damage to both aspects. How can this be? With a study of the literature on the subject, these issues are raised that first of all, these two views are considered as two important poles of the rehabilitation of historical monuments because only addressing the durability dimension of this matter and without paying attention to the identity issues and cultural values of any historical monument can ultimately lead to its destruction of value, which is nothing short of the critical destruction of the building due to an earthquake. Similarly, a purely historical view also disrupts rehabilitation by not achieving the desired stability.

Therefore, the success of improvement projects depends on paying attention to both perspectives. Second, architects, as the intersection of expertise in both fields, can create practical and intellectual coherence between these two fields. In this study, preliminary issues such as the causes and degrees of erosion that bring the work into the abyss of "improvement" are first raised. It is worth mentioning that the term improvement chosen by the authors and used in this article refers to a wide range of interventions in the condition of the work, its components and elements, both structural and non-structural, the purpose of which is to create the ability to perform a task or tasks that the building in its current state is unable to perform thoroughly. Next, by introducing the factors affecting the renovation plan of the historical monument, the considerations of the two mentioned areas were explained, and the reason for the difference in priorities of each group of experts in choosing the renovation solution was revealed. Then, with an analytical-comparative look, common and intermediate solutions for renovating historical monuments were combined with the results of evaluating successful domestic and foreign examples to obtain practical solutions concerning traditional and local architecture [1].

2 | Research Background

The concept of restoration of historical monuments is a topic that is contrary to the topic of architectural aesthetics and encompasses a diverse set of measures. The restoration of historical monuments to improve the quality of life of historical monuments includes two different parts. The first part concerns restoration activities and the value protection of historical monuments and sites, compiled as an international charter. The first conservation charters were written in the twentieth century following two significant developments in Western Europe: the change in human attitudes towards the surrounding environment and the formation of the concept of a historical monument in the Renaissance period, as well as the reaction of human society to the destruction of cities and historical monuments. The compilation of various charters and treaties has continued until recent years and indicates the rewriting of these regulations to improve existing laws in this field.

The second part is the activities of strengthening and retrofitting historical monuments, which became an undeniable necessity following the destruction of these monuments against natural and unnatural disasters. The earthquake experience in Iran and the world, and especially the earthquake experience in East Azerbaijan

and Bam, drew the attention of experts to the retrofitting of defenseless historical monuments against earthquakes. Now, the category of historical monument improvement as a combination of these measures requires a comprehensive look, which, unfortunately, executive protection measures in the country are often carried out with a one-dimensional tendency towards one of the above dimensions. In our current society, the concepts of cultural and historical heritage are not in line with the existing culture of strengthening, and the view of purely value protection and the fundamentally time-based view has caused the failure of many improvement projects.

In his article titled "The Ratio of Authenticity and Integrity in the Restoration of Architectural Heritage," Pirouz Hanachi [2] seeks to explain the position and ratio of authenticity and integrity in the process of preserving architectural heritage and how to apply the two concepts in the process of preserving this category of works. He first defined the two words using a qualitative method, a content analysis strategy, and logical reasoning. He introduced their components in the form of architectural heritage by reviewing and analyzing international documents and the views of experts. Finally, he concluded that in the second stage, the relationship and ratio of authenticity and integrity were examined from different perspectives, and multiple approaches were presented to deal with these works. Considering the unique characteristics of each piece of architectural heritage, the assessment of authenticity and integrity in their case is presented as a comprehensive and barrier-free framework based on seven components: design, materials and supplies, construction technology, context, function, traditions and intangible aspects, and the spirit of place.

Mehdizadeh [3], in her article "The Role of Western architects and archaeologists in the restoration of historical monuments in iran during the first and second pahlavi periods (1978-1985)," uses an interpretative-historical method and through a review of primary data collected, including: unpublished government documents, statutes of the National Monuments Association, historical texts, speeches and memoirs of members of the National Monuments Association, newspapers and library resources, to examine the role of Western architects and archaeologists in the restoration of historical monuments during the Pahlavi period (1978-1985). She states that the scope of activities and effects of these foreign experts on the policies implemented by the Pahlavi government regarding the protection and restoration of historical monuments in Iran is very high and significant.

In an article titled: "Promoting the Improvement of Physical Heritage in the Field of Technical and Architectural Restoration with an Approach to Understanding Two Perspectives," Maziar Asefi (2014) examined the relationship between the views of structural engineers, restorers, and architects on the topic of improving historical monuments with the help of library studies and perspective separation. He says that the training program has an important impact on raising the level of awareness of specialists and officials in bringing together existing perspectives and that the role of architects as interdisciplinary experts and guardians of Iranian-Islamic identity is an effective response to existing issues in achieving desirable solutions in improvement and bringing together the perspectives of specialists.

Arjmand and Aminpour [4], in his article: "The Role of the Restorer in the Restoration of Buildings in the Field of Islamic Culture and Civilization: A Reflection on the Fundamentals of Restoration Approaches in Restoration Science Based on the Human Factor of Restoration," aims to extract the characteristics of the human factor of restoration (restorer) from the midst of restoration theories with the help of text analysis and content interpretation. He tries to answer the question of the restorer's role from the perspective of restoration theorists and what characteristics the restorer has in each of those approaches. He says that an approach is based on the characteristics of the human factor of restoration or the restorer and targets the "competence" of the restorer with specific characteristics.

Mohammad Moradi [5], in an article titled: "Repair and revival of old buildings as a step towards the protection and restoration of the historic city," examines the existing documents and records with the help of the collection and analysis of buildings, and addresses the issue that the study of construction periods and changes occurring in individual units is, therefore, a small part of the urban restoration stages, which consists of

identifying valuable units with a restoration perspective. In this article, only this part of urban restoration is considered and its aspects are evaluated and analyzed.

Naeini and Soheili [6], in her article: "Preferred Strategy for Designing Infill Buildings in Historical Contexts from the Perspective of Architecture, Urban Planning, and Restoration Specialists," is a survey method carried out in two stages. Information was also collected through documentary and field studies (questionnaires). The statistical population of this study consists of 120 specialists from these three disciplines. She examined the preferred strategy of urban planning and restoration specialists for designing infill buildings in historical contexts from among the four strategies proposed by Sams and says that architects choose the strategy of deliberate opposition to the context. Urban planners and restoration specialists choose the strategy of exact repetition of the context as the preferred strategy for designing infill buildings in historical contexts. Also, the most important design feature from the perspective of architecture specialists is creating innovation and complexity in the context, and from the perspective of urban planning and restoration specialists, it is pleasant and agreeable.

Mozaffar et al. [7], in the article: "Quantitative analysis of restoration articles in the country's promotional and specialized journals from 2001 to 2011," used a statistical-analytical method in a survey context. Experts' opinions were recorded by completing a questionnaire to consolidate the research results. The published articles are divided into three subgroups: 1) Theoretical foundations of restoration, 2) Restoration experiences, and 3) Introduction of works of restoration value in Iran and other parts of the world. In addition, all articles are classified into two areas: authored and translated. He also analyzed the quantitative analysis of restoration articles. He said that the articles on the theoretical foundations of restoration should be among the most published articles in restoration. Launching electronic journals and encouraging the private sector to publish periodicals are part of the suggestions of the authors of this article, and experts have also confirmed its implementation.

3 | Research Method

This article uses a descriptive-analytical research method. Using this method, the researcher seeks to understand the nature of the subject under study and collects information from various sources. This research includes library research, text review, and content analysis. The practical purpose of this research, along with the descriptive-analytical approach, gives it depth and precision. Theoretically, this research analyzes the works with a semiotics approach, which makes it a rich and meaningful study.

4 | Theoretical foundations

Eroding factors and the necessity of renovation in historical monuments

Wear and tear reduces the lifespan of the work and causes it to move towards the end point of the work at a more or less rapid pace. From the perspective of architectural restoration, historical monuments of cities are reminders of the past urban culture and civilization. The protection of single buildings or important building complexes is vital for maintaining the visual and social continuity of the city. From a technical perspective, the insufficient resistance of historical monuments to lateral loads causes the collapse of these cultural monuments. These monuments are built with materials and techniques resistant to layered forces and naturally do not have adequate resistance to shear and bending stresses. Often, these monuments are in poor condition due to wear and tear. Or past non-burning repairs have disrupted their nature. Therefore, measures to protect historical heritage are on the agenda to eliminate the deterioration of monuments. Conceptually, protection encompasses a wide range of interventions and programs aimed at preserving cultural heritage, restoring life to historical monuments, promoting their safety and protecting the values of the source of materials and materials, and ensuring Its integrity is for future generations.

By determining the level of deterioration and referring its calculation to the scope of the function and structure of the building, the improvement of the historical monument is achieved by removing the deterioration from the structure or activity of the monument. In this context, one must understand the secrets

of the building well, gain full awareness and knowledge of the alphabet and the goals hidden in it, and analyze its relationship with the city well. Then, considering the intermediate analysis and its social and cultural issues at different stages with constructive and coordinated movements, give it logical and constructive functions and beware of any hasty action. To recognize the indications for adopting an executive solution for the improvement of the historical monument and evaluate the existing challenging views, which is part of the objectives of the present article. The components affecting the improvement plan and the considerations of experts are presented.

Investigating general factors affecting the limits of historical monument improvement interventions

In a comprehensive study, the factors affecting the renovation of historical monuments are presented with library studies and a review of the renovation plans of numerous domestic and foreign examples, as shown in *Table 1*.

By recognizing the factors affecting the renovation plan of a historical monument, the applicable measures for the renovation of these monuments are introduced in a seven-tiered spectrum in *Table 2*. This spectrum of intervention ranges from minimal intervention to partial or complete reconstruction of the building [8], which, in terms of the scope of changes, has a significant impact on the historical and identity components of the building as a guarantor of its authenticity, and from this perspective, it creates numerous challenges in renovation plans.

To understand the sequence of selecting a solution for improving a historical monument, it is essential to understand the reasons for the differences in the views of conservation and structural experts on improving a historical monument to achieve this article's final goals. To understand the reasons for the differences between the two views, the following are each group's specialized considerations for improving a historical monument.

Table 1. Comparative study of factors affecting the renovation plan of historical monuments and its components.

Row	Components Affecting the Improvement Plan	Description of the Factors Affecting the Improvement Plan	Components that Make up the Components that Affect the Improvement Plan
1	Physical conditions	The quality of the existing building	A- Physical quality of the building B- Functional quality of the building
2	Causes of erosion	The degree of deterioration of the building The quality of the building components	A. Internal disruptive factors B. External disruptive factors
3	Future conditions of the building	Predicting future environmental conditions Emotional impact	A- Future conditions of the building from an environmental perspective B- Future conditions of the building from a physical and functional perspective
4	Values of historical monuments	Emotional	A. Identity B. Continuity and survival C. Spiritual and symbolic
		Architecture	A. Historical, B. Typological, C. Archaeological, D. Landscape and Environmental, Aesthetics and Construction Method, G. Materials
		Practical	A.Functional B.economic C.social D. political

Table 2. Comparative study of types of interventions, objectives of interventions, and limits of interventions in the rehabilitation of historical monuments.

Row	Improvement Solution	The Extent of Intervention in the Work's Structure and Activity Depends on The Results of the Assessment of Factors Affecting the Improvement Plan.
1	Prevent erosion (indirect protection)	A- Preventing erosive and irritating factors
2	Protection	A. Maintaining the components' original shape, appearance, integrity, and unity. B. Maintaining the construction method and quality of materials and supplies.
3	Reinforcement (direct protection)	A. Make changes and add cases while maintaining the materials of the exterior appearance, spatial relationships, and building integrity. B. Strengthen the structure with a local and traditional method or a contemporary solution.
4	Revival	A. Restoring the integrity and legibility of the building
5	Rehabilitation	A. Injecting new activity into the building B. Preventing the deterioration of urban space
6	Re-creation	A- Reconstruction and replacement with the original B- Prevention of destruction of elements at risk
7	Reconstruction	A. reconstruction or simulation of the historical landscape based on evidence B. preservation of remaining parts, materials, and judicial relations

Considerations for the renovation of historical monuments from an engineering perspective

In the view of experts in the improvement process, existing reinforcement elements or new elements are added to the system to increase the lateral resistance and ductility of the members. Considerations of structural experts in choosing an improvement solution that affects the priority of their decisions are as follows.

Table 3. Considerations for the improvement of historical monuments from the perspective of structural experts.

Row	Technical Considerations for Renovating a Historical Monument	Row	Technical Considerations for Renovating a Historical Monument
1	Increase lateral strength	4	Member integration
2	Reduce structural weight	5	Strengthening member connections
3	Improve material quality	6	Increasing flexibility

Considerations for the improvement of historical monuments from the perspective of architectural restoration

The primary considerations of the Murqat Group in improving historical monuments include various dimensions, which, in the opinion of its experts, are as follows: The sustainability of buildings is not possible only through their resistance. To protect the work, it is necessary to pay attention to culture and protect the values inherent in the work. Conservation refers to measures taken to maintain a work's or historical site's stability or to keep it safe from changes. The goal of conservation is to reveal and protect cultural values and characteristics. The main goals of conservation are to preserve the work's originality, integrity, continuity, and completeness. The conservation of historical works requires a deep understanding of the value of the place, and cultural heritage does not only include the material aspect, but also oral literature, including poems, stories, dances, etc. are also considered part of it. Elizabeth Pye [9] also identified three principles of modern conservation, including not damaging the dignity and characteristics of the work by carrying out conservation interventions, minimal intervention, and legibility of intervention, distinguishing it from the original parts. Nickel Dunn and Timothy Cannell introduce minimal intervention, using similar materials and methods as much as possible, reversibility, integrity (distinguishability), and attention to documentation during the intervention. Qorsis introduces the principles of conservation work as minimal intervention, reversibility, and the use of similar methods and materials [10]. David Look considers reversibility, preservation of the historical nature and integrity of the building, and compatibility of conservation interventions with the main parts as three important principles of building conservation [11]. Wong and Augustus, considering the restoration

experts' contributions to the improvement of historical monuments, the relevant indicators are in a general division, as described in *Table 4*.

Table 4. Considerations for the improvement of historical monuments from the perspective of architectural restoration specialists.

Row	Principles of Modern Intervention from the Perspective of Architectural Restoration	Row	Principles of Modern Intervention from the Perspective of Architectural Restoration
1	Preservation of historical nature and integrity	4	Similarity of materials and conservation techniques with the original part
2	Minimal intervention	5	Distinction between interventions carried out
3	Reversibility in interventions made	6	and original parts Preservation of historical identity in the exterior and internal and hidden structure

What is certain is that interventions in the physical body and structure of the monument for its improvement are very diverse and are in harmony with the outcome of the components affecting the improvement plan and the measures taken. However, the different analyses of restorers and structural engineers on the necessity of improving the monument and the contribution of each influencing component challenge the improvement plan and create the obligation of criticism. By examining and comparing *Tables 3* and *4*, the reason for the difference in the attitude of engineers and restorers towards the issue of improving historical monuments is shown in *Fig. 1*.

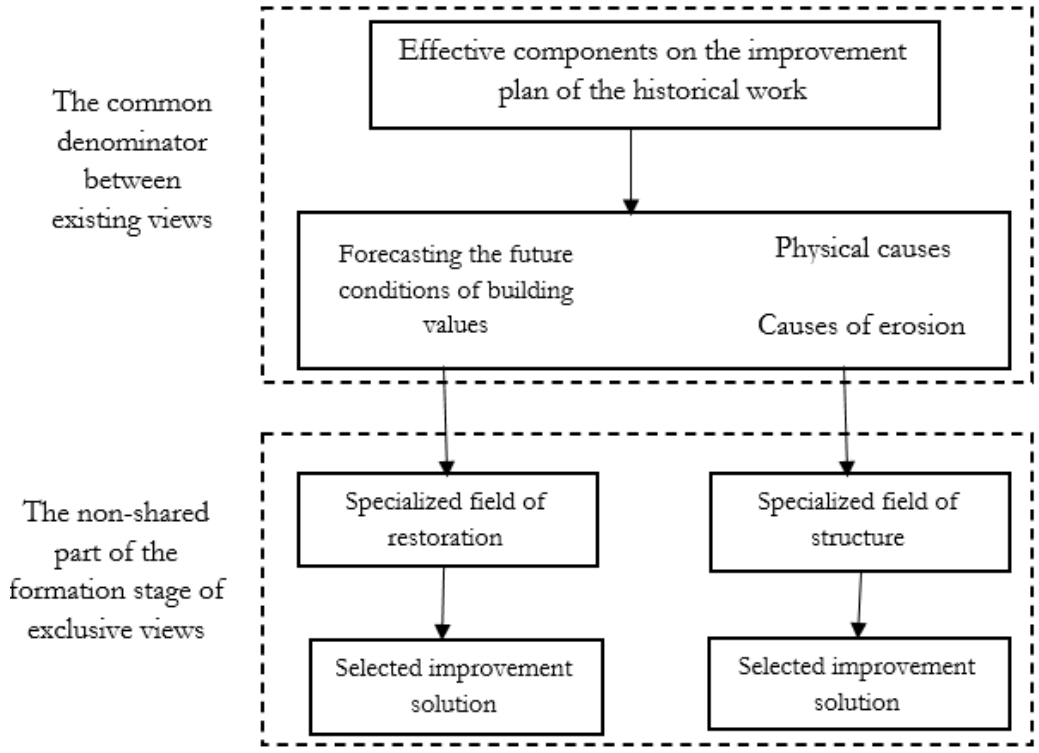

Fig. 1. The process of selecting a historic monument improvement plan, separating the perspectives of the two fields of architecture and engineering.

Studies on the number of physical interventions in historical monuments show a wide range of physical interventions in old buildings to give them the desired efficiency level. The number of physical interventions in the structure of monuments to improve their structural performance, depending on the structural and repair factors affecting the final design, which are mentioned in *Table 1*, is divided into six levels, from the minimum level of intervention to the maximum level of intervention (*Fig. 2*).

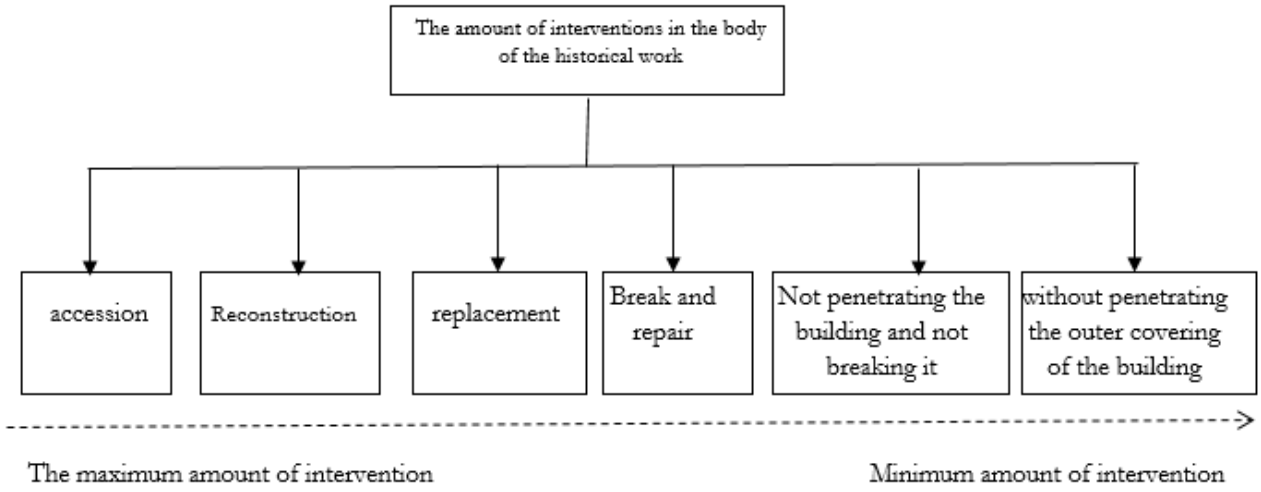

Fig. 2. Range of physical interventions in the rehabilitation process to improve the performance of the historic monument structure.

Without penetrating the external covering of the building:

In this method, the historical monument is renovated without destroying it. FRP sheets are used to reinforce the components at this level. This method is used in the renovation of buildings containing exquisite architecture and original works of art, which is emphasized more than almost any other method in preserving artistic and historical works [12].

Penetrating the building and not breaking it

In this method, the structural components that are being renovated are available, and only holes are created to strengthen them. For example, epoxy injection and post-tensioning. In this case, the injection material fills the holes and gaps between the building materials, causes a more uniform distribution of stresses between different components, and increases the compressive and shear resistance of the building [13].

Despite the differences in implementation, structural experts are aware of the preference for solutions with minimal intervention when dealing with historical monuments, and the group of architects, by criticizing the country's implementation projects, has assessed the use of this type of approach as possible to some extent. The dispersion of structural experts' opinions between high and low levels indicates this approach's conditional nature. Thus, and the approach above responds to other physical components, these approaches can be put on the agenda; otherwise, using approaches with a variable level of intervention will be more effective. The response of the restoration team to this question shows that this group did not consider a middle ground for intervention in the monument's structure and that the inability to use the solution above often means that the solutions above are not considered.

Failure and repair

In many cases, destructive methods are adopted to access and strengthen the structural components of the building (for example, installing seismic isolators).

Replacement

In some cases, the structural components of a historical monument cannot be retrofitted, improved to an acceptable level, and repaired, so the structural components are replaced. It is worth noting that the reinforcement and maintenance of a historical monument requires special attention during the replacement process [14].

Reconstruction

In cases where a feasible solution for strengthening does not exist, the whole or part of the historical monument is reconstructed. This process, in addition to its enormous cost, lacks historical authenticity.

Annexation

In cases where there is no feasible way to strengthen the structure, an annexation structure is used to improve the structural performance of the monument. Due to the challenging nature of this type of measure, the desirability of this solution was evaluated from the perspective of specialists. An important result, the difference between the existing documentation and the implementation reality, is the understanding of the three groups in the success of the new structure combined with the traditional structure. This response, as the top priority from the perspective of architects and restorers and the second priority of structural specialists, indicates the acceptability of this approach in the improvement of the historical monument, which will be accepted and understood by all three groups by implementing the conditions of the desirability of the combination, which will be discussed below.

The moderate response of the architects indicates the conditional use of new structures. The critical view of the restorers towards the use of new structures indicates the concern of these specialists about the destruction of the historical identity and authenticity of the monument, which is revealed by referring to the positive response rate of this group to the third option, and the change in the purely protective position of the restoration specialists. The rate of use of new structures in combination with traditional structures is the basis of the difference of opinion between the restoration and construction groups, so the restoration and architect groups basically agree with the use of new structures in combination with the historical monument and have even welcomed it.

In evaluating the relevance of the type of additional structure, architects, as a moderate group with an understanding of the monument's historical values and a positive intellectual background towards modern technology, can protect and strengthen the monument's historical value by using technology as the person in charge of the renovation plan. Adding removable and reversible structures is considered preferable in the renovation, which indicates an awareness of the requirements of interventions in historical contexts.

Using each of the six measures will undeniably impact the monuments' appearance; therefore, the interventions carried out should not distort the historical monument's originality, uniqueness, and original nature as much as possible and should not detract from its value. On the other hand, they play a role in making the building more legible. Based on these results, if a new structure needs to be added, the extent to which new structures are used in combination with traditional structures, which is a qualitative category and requires expert evaluation by the architectural team, will determine the position of the project. The use of modern technology in the renovation of historical monuments should be carried out by observing the three main components of reversibility, coordination with the nature of the historical monument, and minimal intervention so that the historical identity of the building is not weaker than the added parts. They are in equal proportion to each other.

A study of the technical and restoration considerations of the restoration of historical monuments indicates that although restoration considerations limit the application of traditional restoration measures to preserve cultural and historical value, modern technologies often produce significant improvements in structural behavior with minimal intervention in the structure of the building and can be a common solution between the two fields of engineering and architectural restoration.

Findings

Based on the technical and restoration considerations extracted, a study was conducted to gain a deeper insight into the issue of successful and unsuccessful examples of the renovation of historic monuments in Iran and the world. Initial proposed solutions were presented. Finally, by re-examining the solutions obtained, the author tries to localize the proposed solutions and provide appropriate guidelines to preserve the identity of this landscape.

5|Case studies

5.1|The National Assembly of Iran building

One of the examples revived by changing the function of the building is a successful renovation experience within the country. It is the National Assembly building. The National Assembly building is in the hearts and souls of the Iranian people and reminds us of various historical memories. Therefore, this great symbol of Iranian civil justice had to find a dignified and organized form. As stated in the consultant's reports. The National Assembly building, which has Qajar origins, reached its formal, functional, and structural perfection during the first Pahlavi era. Therefore, what was preserved from that era became the basis for all renovation and reinforcement work on the correct scales and by the history of the building (Flamaki, 2008: 192).

Fig. 3. Longitudinal section of the former National Assembly building showing its structural condition and vulnerability.

The extent and manner of response of the work methods and measures taken with structural and aesthetic considerations are examined to evaluate the improvement plan for this work.

According to the points raised in *Table 5*, the reinforcement and restoration operations of the parliament building can be considered one of the most successful examples in the country. While preserving the work's historical identity, they have enabled coordination with its use and revival.

Table 5. Evaluation of the national assembly building renovation process based on structural and repair considerations.

Solution for Improvement		Scope of Application	Structural Considerations	Structural Considerations	Description
1	Renovation	Columns Ceilings Exterior and interior walls	Choosing a Steel and Concrete Structure to Increase the Strength of a Building	Using Materials Similar to Existing Materials	Using similar materials and elements to preserve authenticity has ensured the building's physical integrity while strengthening it.
2	Strengthening	Exterior wall	Increasing the Strength and Ductility of Components by Using the Attachment of a Guard Structure	Using Materials Similar to Original Materials	Strengthening the existing structure, failure, and repair
3	Rehabilitation	New function injection	A New Performance-Responsive Concrete and Steel Structure	Designing New Spaces Appropriate to New Functions	Converting the National Assembly into a museum

5.2 | Los Arenas Sports Arena

The Los Arenas Sports Arena in Barcelona, Spain, was built in the late 19th century and lost its original function in the 1970s. However, this place's strong civic and cultural role during a century in Barcelona's history led the city council to decide to renovate the building. Therefore, the renovation of this unique monument with the aim of public use began.

This is a successful example of the renovation of a cultural-historical monument, which had suffered complete deterioration in function and structure. Rehabilitation and strengthening solutions were used in the renovation. By incorporating guardrail structures behind the historical facade and strengthening the original facade of the building with reinforced concrete cladding, injection, and post-tensioning of the load-bearing components, the resistance of the monument to withstand the loads resulting from the new function and responding to the physical components was improved. While achieving desirable structural resistance, the result has a special place in representing historical identity and has brought a new form of coexistence between modern and traditional technology.

Fig. 4. a. Reconstruction of the historic shell with new sections, b. Attachment and repair of the façade, c. Reinforcement of the facade and foundations, separation of additions.

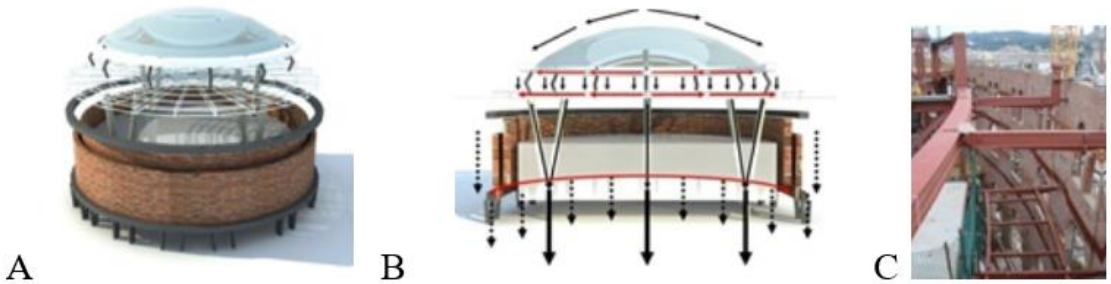

Fig. 5. a. Structure with circular beams and angled columns; main load supported by a circular beam and metal lattice frame, b. Load transfer and distribution diagram, c. Added guard structure for exterior facade reinforcement.

The measures used in this work are based on the division of the number of physical interventions in the body of the work at the failure and repair levels, which is an acceptable level of intervention when looking at restoration considerations. In this example, using modern technology while improving the safety of the historical monument to the desired level and minimal intervention in the remaining original parts resulted in maintaining the integrity of the historical monument. The similarity of the materials used in the roof reconstruction and reinforcement has been.

Table 6. Evaluation of the los arenas sports field improvement solution based on structural and repair considerations.

	Improvement Solution	Scope of Implementation	Structural Considerations	Structural Considerations	Description
1	Renovation	Roof	Selection of a responsive steel structure for structural calculations	Using materials similar to the original materials as a metal structure covering	To preserve the authenticity, measures such as revealing part of the underlying structure have been taken
2	Fortificatin	Exterior wall	Increasing the strength and ductility of components using the addition of a guard structure	Using materials similar to the original materials as an external wall covering	Adding a new structure, contrasting with the existing parts Reinforcing the existing structure, breaking and repairing
3	Rehabilitati on	New performance injection	Concrete and steel structure responsive to new performance	Designing a new space in line with the new function	Converting the function of the sports field (bullfighting) into a commercial complex

In addition to preserving the spirit of the historical site, the wall has become more evident due to its obvious difference from the additional parts of the space and completely new details of the execution. It is worth noting that the appropriate use of modern renovation measures against the classical sense and traditional context of the historical monument is a successful tool in strengthening and intensifying the historical messages of the building. Also, combining modern technology with traditional architecture is a democratic solution due to the possibility of the coexistence of past and contemporary architecture. The advantages of this approach include the possibility of creating an architectural space appropriate to the new function and preserving the physical heritage for future generations [15].

Regarding assessing the desired level of intervention in the various components of the monument, the results of the study show that the restoration team considered the preservation and restoration of the four elements mentioned as essential. At the same time, in-person interviews were conducted with architects to achieve effective solutions. As a result, the architects considered preserving each of these elements in a specific section or level to convey its message and value to the future. They summarized the renovation's mission in preserving and transmitting the message. These specialists, with their knowledge of the technical components and the necessity of changing the monument's structural elements and spatial relationships to coordinate with the new function and respond to new calculations, have made it possible to create architectural structures and space needs. Therefore, the presence and expert opinion of architects in this section also have an effective and interdisciplinary role in helping to understand existing views.

5.3|Tiriz Pashmina Factory Building, Iran

The Tabriz Pashmina Factory is one of the first textile factories in Tabriz, built-in 1939 with the participation of German engineers. One of the prominent features of this building is the use of reinforced concrete elements in its construction, which is most likely one of the first concrete buildings in Iran and Tabriz with this style. The plan of this factory was implemented as a large hall covered with concrete trusses placed on 30 x 30 cm concrete columns. The implementation of its concrete elements, including the components of the trusses, is in the form of molding and concreting on site, which is why the precision in the implementation and the elegance of the components of the concrete trusses of this building arouse the admiration of every Qoni resident and can be considered as the main structural and aesthetic characteristic of this building.

Primarily, these windows, in addition to their structural function, also provide daylight to the building with their south-facing orientation.

After the closure of the Pashmina factory, this building was transferred to Tabriz University of Medical Sciences and is currently used as a strategic research center for this university. With the implementation of the seismic retrofitting plan for this building, elements were added to its original structure, and its entire plan was changed to meet its current needs.

Although the retrofitting technique used in this building has increased the lateral load-bearing capacity of the structure to some extent, currently, in the face of this retrofitted and changed-use building, there is no sign of its unique structure, which was its main feature. If the historical name of this building is forgotten, few viewers will be able to imagine that this building was one of the first textile factories in Tabriz.

Preserving the structure and historical perfection of the building during renovations is one of the project's fundamental considerations. This work has been disturbed, and no trace of the historical identity of its original elements and components that were representative of its era and encompassed the architectural heritage of Iran is visible. The historical identity of the building has been shaken in its internal and external components and is not a desirable representative of Iranian history and culture.

Fig. 6. The Pashmina building before renovation, the structural system, and the precision of execution were the aesthetic and identity characteristics of the work.

Fig. 7. A view of the Pashmina building after its renovation; its unique structural system has remained out of sight as its aesthetic and identity characteristics.

Structural considerations Use of horizontal and vertical steel cross elements for reinforcement Use of rigid elements to integrate the new and existing structure Increase in strength and ductility lack of attention to the identity elements of the components by adding a metal structure is a structure.

Table 7. Evaluation of the renovation method of the Pashmina building in Tabriz based on structural and repair considerations (Source: Author).

Solution for improvement		Scope of application	Structural Considerations	Structural Considerations	Description
1	Renovation	Roof	Use of horizontal and vertical steel cross members for reinforcement, use of rigid elements to integrate new and existing structures	Failure to use materials similar to the original materials, covering the existing structure (truss) with new and solid materials	Despite ensuring the stability of the structures, the renovation process did not pay enough attention to the work's identifying characteristics, intentionally disrupting the building's historical value and identity.
2	Fortification	Exterior wall	Increase the strength and ductility of components by incorporating metal structures	Failure to pay attention to the structural identity elements	Strengthening the existing structure, failure, and repair
3	Rehabilitation	New function injection	Concrete and metal structures responsive to new performance	Designing a new space in proportion to the new function and failure to pay attention to the building's capacity	Converting the operation of a textile factory into a research center of Tabriz University of Medical Sciences

5.4 | Bursan House of Music and Art

In introducing another example of a modern renovation solution, we can mention the renovation of the Bursan House of Music and Art building in Turkey, which was selected to preserve the historical identity of Istanbul. In this project, the historical shell was restored as a defining element that contains its identity elements, and the core of the building was completely removed to create a global VOID. Then, in a smart choice, the project executive team placed a box in the center of the building that contrasted with the historical structure. This metal box was designed using a lightweight metal Dia-Grid network around it.

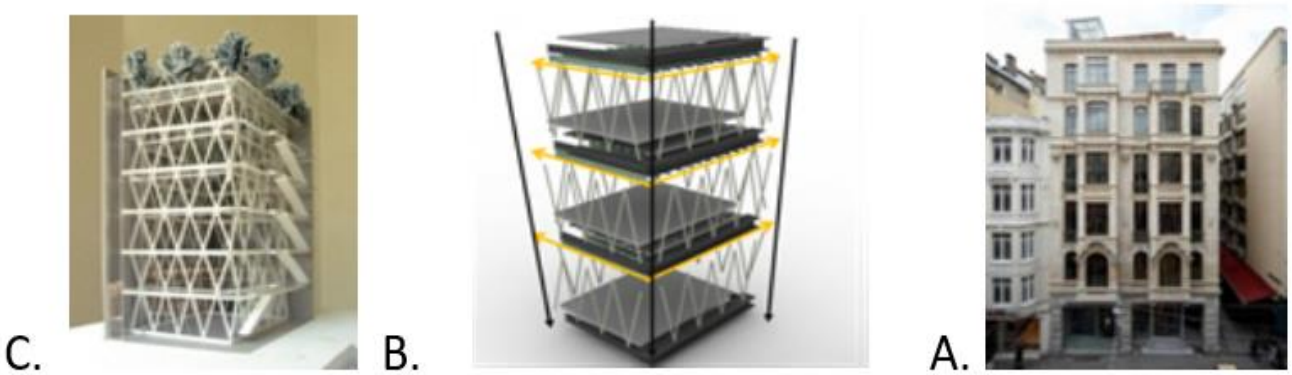

Fig. 8. A. Historical shell of the Bursan Music and Art House (2010 As), b. Project structural model C. Project structural component model.

Table 9. Evaluation of the Borsan Culture House renovation solution based on structural and repair considerations.

Solution for improvement		Scope of application	Structural Considerations	Structural Considerations	Description
1	Strengthening	Instrument Components	Increasing the strength and formability of components using Dia-Grid metal frames	Placing the new structure behind the historic facade	Structural reinforcement and strengthening of the building using contemporary technology
2	Rehabilitating	New Performance Injection	The dia-grid structural system responds to new performance	Designing the new space to suit the new function	Conversion of the function of an apartment block into a cultural and artistic center

5.5 | Khosravi Leather Factory, Tabriz, Iran

The Khosravi Leather Factory building in Tabriz is one of the city's historic industrial buildings, a valuable reminder of the period when modern industries entered Iran. In addition to its main function, this factory supplied part of Tabriz's electricity. In recent years, with the establishment of the Tabriz Islamic Arts University, the abandoned leather factory building was renovated, and its use changed, and eventually, the university's buildings were added. Building number two of this complex, evaluated in this section, is dedicated to the central library, computer sites, and training workshops.

The renovation plan for this building is one of the successful examples of the renovation of historical monuments Because by considering the effective components from the structural and renovation perspective and taking a balanced view of these two categories, the relevant additions and interventions have been made, as a result of which the integrity of the building, the historical and cultural life of the work has been revitalized, which will be examined in the following.

Fig. 9. Renovation of Tabriz Islamic Art University library, reinforcing brick columns with metal and concrete elements.

Table 10. Evaluation of the renovation method of the Tabriz Khosravi Leather Factory building based on structural and renovation considerations.

Solution for improvement		Scope of application	Structural Considerations	Structural Considerations	Description
1	Renovation	Roof	Joining concrete slab and composite system, connecting it to the existing structure, using wooden truss structure and steel profiles to cover the second floor	Integrating new and traditional structures, observing the principle of minimal intervention, and the distinctiveness of new additions	Limited use of new structural elements combined with the existing structure and the possibility of its recognition. Addition of a new structure. Reinforcement of the existing structure, failure, and repair.
2	Fortification	Exterior wall	Joining vertical and horizontal coil, using metal grid and cement sand mortar, joining concrete shear wall, strengthening openings, reducing the roof, completing the load path	Preserving the historic facade against structural elements and strengthening existing structural elements	Conversion of factory operation.
3	Rehabilitation	New function injection	Using a new functional responsive attachment structure	Designing new spaces in line with new functions	Leather factory into a university library and studio.

6 | Discussion

By recognizing and evaluating the mentioned case examples, the indications for improving these works were evaluated to reveal the extent of interventions. In all four works, the National Assembly, the former sports field in Spain, the Turkish House of Art and Music, and the Khosravi Leather Factory, which are mentioned as specific examples, an attempt has been made to revive the historical monument by making changes to the structural system and internal components. In these works, while paying attention to the existing historical and traditional context and the place of these works in the audience's collective memory, the preservation of this important matter is placed alongside the structural requirements, and a specific and interesting result has been achieved with a dual approach. Therefore, moderate and intermediate views are more fruitful for achieving renewed life and prosperity of the historical monument than the exclusive views observed in the example of the Pashmina Textile Factory. This work is examined and implemented with this type of exclusive view. At the cost of protecting one part, another part is constantly exposed to damage, and the historical and cultural identity is disrupted. It can be acknowledged that paying attention to traditional and indigenous culture and architecture, taking a careful look at past experiences, trying to understand the considerations of the groups involved in decision-making processes, going a step towards educating the fields and developing interdisciplinary perspectives, and ultimately trying to achieve an intermediate solution, is an effective and timely policy for decision-making in this field that is not impossible to achieve.

7 | Conclusion

The improvement of historical monuments, along with the various goals related to each society, had a common mission: the protection of the tangible and intangible values in the work. The challenges in choosing a renovation solution arise from the growth of exclusive specializations and perspectives as an achievement of the present era. Unsuccessful renovation projects, whether damaging the cultural heritage or low building security, are examples of the separation of fields. The dominance of the value component of the historical monument from the perspective of the conservators affects the renovation solution and, of course, the measures taken. On the other hand, the preference for physical characteristics and the priority of improving the security of the building in the eyes of structural engineers, as well as the lack of attention to the local and

traditional context of the work, leads to the final improvement plan to a direction where the dimensions involved are not in the desired balance. The final product is a work far from its environment's cultural and historical heritage. At the same time, improving a historical monument is the context of the coexistence of diverse ideas on preserving this heritage. Diversity of ideas shapes the diversity of solutions and what makes it possible. The coexistence of the views of experts in this field is possible. Research has shown that contrary to the general assumption, structural experts have primary awareness of the identity components of historical monuments, and what has caused the growth of the challenge is the inability of this group to ensure the quality of execution and take into account other considerations involved. Therefore, the relative theoretical understanding of experts in improving a historical monument has turned into practical differences due to the lack of effective executive factors in advancing the plans. What leads historical monument restoration projects to failure is not simply a lack of awareness but rather the lack of role of the restoration and architecture team in the restoration decision-making process. The lack of effective presence of architects and conservators as correctors of executive projects has exacerbated the current problems. In these circumstances, the lack of structural specialists' awareness of the method and quality of observing mutual considerations has increased the vulnerability of executive projects.

To respond to existing issues, in addition to teaching mutual sciences at the university and organizational levels, architects must, as experts in the matter and aware of the necessities of both aspects and with interdisciplinary knowledge, take an understanding approach in this area and change existing perspectives by participating in historical monument restoration projects. To develop implementation solutions. Architects' conscious look at the integration of modern and traditional technology to strengthen the historical message of the work, their recognition of the broad foundations of Qarhangi architecture, and the identity components of the works form the basis for the growth of balanced perspectives. In addition to eliminating the significant gaps between the quality of different executive plans, the mutual communication between experts and the architectural team will help change, improve, and develop executive perspectives on improving historical monuments at the national level.

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Author Contribution

The author solely contributed to the conceptualization, research design, data collection, analysis, and manuscript writing of this study.

References

[1] Tomaževič, M. (2010). Heritage masonry buildings and reduction of seismic risk: The case of Slovenia. In *Materials, technologies and practice in historic heritage structures* (pp. 327–350). Springer. https://doi.org/10.1007/978-90-481-2684-2_17

[2] Hanachi, P., Diba, D., & Mahdavinezhad, M. (2007). Conservation and Development in Iran (Analysis of Restoration Experiences in Valuable Textures of Historic Cities in Iran), beautiful arts. *Fine arts*, (32), 51-60. (**In Persian**). https://www.sid.ir/paper/5697/fa

[3] Mehdizadeh, S., & Hanachi, P. (2016). The role of Western architects and archaeologists in the restoration of Iranian historical monuments during the first and second Pahlavi periods (1304-1357). *Journal of fine arts -*

architecture and urban planning, *21*(3), 5-14. (**In Persian**). https://jfaup.ut.ac.ir/article_61098_cd41e221883dc50dc38d97aef688dc40.pdf

[4] Arjmand, M., & Aminpour, A. (2016). The role of the restorer in the restoration of buildings in the field of Islamic culture and civilization: A reflection on the foundations of restoration approaches in restoration science based on the human factor of restoration. *Islamic architecture research*, *4*(3), 98-112. (**In Persian**). https://www.sid.ir/paper/248369/fa

[5] mohammad moradi, A. (2005). Restoration and revitalization of old buildings as a step towards the preservation and restoration of the historical city . *International journal of industrial engineering and production management (persian) (international journal of engineering sciences)*, 85-92. (**In Persian**). https://www.sid.ir/paper/65601/fa

[6] Naeini, S. S., & Soheili, J. (2019). Preferred design strategy for infill buildings in historic contexts from the perspective of architecture, urban planning, and restoration experts. *Arman shahr architecture and urbanism*, *12*(27), 111-118. (**In Persian**). https://www.armanshahrjournal.com/article_92453.html

[7] Mozaffar, F., Ahmadi, F., & Asadpour, A. (2014). Quantitative analysis of restoration articles in the country's promotional and specialized journals from 2001 to 2011. *The portal of the humanities society*, *3*(4), 37-58. in.

[8] Feilden, B. (2007). *Conservation of historic buildings*. Routledge.

[9] Pye, E. (2001). *Caring for the past: issues in conservation for archaeology and museums*. James & James (Science Publishers). https://cir.nii.ac.jp/crid/1130000796333243776

[10] Forsyth, M. (2013). *Understanding historic building conservation*. John Wiley & Sons.

[11] Look, D. W. (1997). *The seismic retrofit of historic buildings: keeping preservation in the forefront* (Vol. 41). US Department of the Interior, National Park Service, Cultural Resources, Heritage Preservation Services. https://books.google.com/books

[12] Vafamehr, M. (2008). Seismic repair and improvement solutions for brick buildings in Iran. *The second national conference on rehabilitation and retrofit of iran*, Civilica. (**In Persian**). https://civilica.com/doc/32186/

[13] Zaribafian, O. (2006). Solutions for protecting historical monuments against earthquakes. *Regional desert architecture conference*. Civilica. (**In Persian**). https://civilica.com/doc/57376/

[14] Penelis, G., & Penelis, G. (2020). *Structural restoration of masonry monuments: arches, domes and walls*. CRC Press. https://www.taylorfrancis.com/books/mono/10.1201/9780429024030/structural-restoration-masonry-monuments-george-penelis-gregory-penelis

[15] Dimitrokali, E., Hartungi, R., & Howe, J. M. (2010). Sustainable conservation and façade retention developments in historic cities. https://clok.uclan.ac.uk/1592/?template=default_internal