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Investigating Effective Management Factors in the Improvement and Renovation of Old City Textures (Case Study: Langarud City)

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Abstract

The purpose of the research was to "investigate effective management factors in the improvement and renovation of old city textures (case study: Langarud city)." The present study is applied in nature, and given its purpose, a mixed-methods research design was used. And in terms of data collection, it is descriptive and contextual. Given the mixed-methods research design, the study was conducted in two phases: qualitative (interviews) and quantitative (questionnaires). The study's statistical population comprises managers, deputies, engineers, and municipal employees, as well as the engineering system of Langarud city and eastern Gilan, totaling 650 people. Given that this study has two statistical populations (qualitative and quantitative phases), two types of sampling were used. Given that the statistical population in the qualitative section comprises experts in improving dilapidated structures, the sampling method used was the available sampling method, considering the characteristics of the individuals. A total of 7 managers, assistant managers, and engineers who had more work experience than the other managers and assistant managers were selected. In the quantitative phase of the research, the population included all municipal personnel and the engineering system of Langarud city, totaling 650 people. The sampling method used the Cochran formula, in which 335 people were selected, and questionnaires were distributed among them. The research tools were semi-structured interviews and a questionnaire, the validity and reliability of which were established according to existing standards, and distributed to the sample. In this study, factor analysis, fuzzy AHP method, and structural equation modeling were used to analyze the data. The results show that the highest ranking among the effective management criteria and indicators in the improvement and renovation of old city textures (case study: Langarud city) is related to resources, followed by attention to education, commitment to environmental assessment, idea generation, planning, management, technical experience, attention to legal requirements, and finally attention to external factors.

Keywords: Effective management factors, Improvement, Renovation, Old texture of Langarud city.

1 | Introduction

In recent years, due to rapid scientific and technical developments, the consequent changes in cities' social, economic, and physical structures, and the emergence of the theory of sustainable urban development, the importance of urban improvement and renovation has doubled. In the twenty-first century, urban development and renovation are important topics attracting the attention of researchers and experts across

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various scientific fields. Dilapidated urban fabric refers to areas within the legal boundaries of cities that are vulnerable due to physical deterioration, inadequate access to vehicles, facilities, services, and urban infrastructure, and have low spatial, environmental, and economic value [1].

Due to the poverty of their residents and owners, these areas lack the potential for spontaneous renovation, and investors lack the incentive to invest in them [2].

Due to their age and physical and functional deterioration, dilapidated urban areas have become inefficient in meeting the needs of today's life. For this reason, the indigenous population of these areas migrates to the outskirts of cities, where they are replaced by rural migrants and low-income groups [3].

Intervening in the old fabric requires scientific knowledge of it within the city's geographical space and its distinction from the middle and new urban fabrics surrounding it. So far, many experts have presented different theories regarding the urban improvement and renovation of historical and ancient urban textures; each has approached the problem from different perspectives and proposed distinct solutions. However, in all these theories, the emphasis is on preserving the old fabric and the values inherent in it. Since the mid-18th century, people in various countries have begun presenting theories on the restoration and improvement of old, worn-out fabrics.

Since examining and analyzing different theories, ideas, methods, styles, and patterns can provide a suitable solution for improving and renovating these textures, we will now examine the opinions of many experts in this field:

Eugène Viollet-Léon (1814-1879), a French architect, began his professional career at a time when society was in dire need of reconstruction and restoration after the French Revolution. Ledoux believed that it was permissible to restore a ruined or crumbling building. Even if a building was built in a historical period but remains unfinished, it can be completed provided the work is done with respect for the period's architecture.

This theory concerns the dynamics of matter within a building. All elements added to it after its construction must be removed, and the building returned to its original form. And whenever buildings lose part of their structure due to human factors or desires, and even when they are not completed in their physical unity and the original structure of the building is incomplete, the restorer must complete the building and restore it to its original form [4]. In other words, under the pretext of removing unnecessary additions, it allows the restorer to destroy many historical monuments that are, in any case, part of the building's history and to carry out a kind of reconstruction or cleaning.

Today, the Ludo method is approved in restoration. He has a great right to the history of restoration and architecture. Viole Ludo's view is as follows: the restorer is obliged to reconstruct the building exactly in its original form by putting himself in the place of the original architect and recognizing what he could have built, using the documents. It was by employing this mindset that many of the valuable buildings of that era, such as Notre Dame Cathedral in Paris, have survived to our days [5].

John Ruskin (1818-1900), an English scholar and critic, is considered one of the rare architects who played a fundamental role in transforming his environment during his lifetime. His personality and cultural position in Europe represent the ideas that are considered the main theme of restoration (Romantic) works. When commenting on ancient buildings, she expressed her preference for minimal interference with their physical existence, out of respect for the perishable values they contain.

Regarding how to deal with historical monuments, he expressed the idea of minimal interference with the physical existence of old buildings, out of respect for the perishable values that lie within them. He considered an old building a historical document that should be avoided at all costs [6].

Ruskin was opposed to any reconstruction, renovation, or even restoration. He considered the restoration of a building disrespectful to the values of the past. He believed that even the grass and vegetation that grew on a historical building, along with the dirt, dust, and spider webs woven on it, belonged to that building. No

one had the right to remove it because it gave the building the spirit of restoration and the grandeur of being historic [7].

Camillo Sit (1843-1904), in presenting the theory of historical identity in cities, argues that a city's identity depends on the history in which it is located, manifested not only in buildings but also in the entire city [8]. Camillo Sitte is the first person to discuss the use of art in beautifying the city and in urban improvement and renovation.

He was fascinated by the beauty and harmony of architectural spaces and volumes in historical cities, especially medieval and Renaissance cities. He believed that historical monuments did not have much value on their own, but rather gained value and identity through spatial harmony and connections with other buildings. In other words, he values the building apart from its environment and considers removing later additions that dilute the building's identity, and therefore criticizes the creation of networks with **no** connection to the old fabric. Another issue he considers is the lack of formal and immoral imitation of the organic forms of old complexes. He believes that the restoration of old environments should be guided by today's society's needs [9].

Camillo Boi To (1836-1914), Italian researcher and architect, founded the new thinking of urban restoration in the 20th century. He is called the father of urban restoration. He is the first figure to, in revitalization, pay attention to architectural concepts rather than to the formal-stylistic characteristics of the buildings under repair. His suggestions on urban restoration had a significant influence on the formulation of the first architectural charter. The theories related to restoration from Bouy-To's perspective can be presented in the two major theories.

Several principles are emphasized in her theories:

- I. Creating a new function in the old structure: based on this principle, new functions can be incorporated into the structure of buildings or old texture complexes, keeping them alive.
- II. Determining the intervention period in each period: by specifying the date of each restoration action, the action and intervention periods can be distinguished.
- III. Formulating the principles of action: in addition to describing the intervention, emphasize stating the reasons for the intervention and specifying the actions in each light in detail.
- IV. Not imitating past architectural styles: Bouyou considers it impermissible to imitate past architectural styles [10].

So, the purpose of intervention in historical buildings or complexes can be considered, from Bouy Tu's perspective, to improve their physical function. The proposed uses of this architect are modernization, and his preferred method of action is improvement and renovation. He also does not pay attention to reconstruction, and his intervention method is mostly topical and thematic.

In Luca Beltrami's (1854-1933) theory, the principle of the building's belonging to the urban environment is raised, and it is stated that the restoration of the building should be carried out by studying its historical development. The belief in the method of historical restoration of the city, based on historical documents and evidence, to achieve the building's original form, is the basis of this theory.

Lucca's restoration principles can be put forward, namely, restoration by the hair and the right to intervene in a building, a complex, or an urban fabric, provided that there is sufficient evidence of its original existence. His goal in intervening in ancient buildings, complexes, or textures is to cautiously improve the structures or complexes, provided that there are sufficient historical documents and evidence. His proposed use is for a museum, and the method of improvement and reconstruction. Beltrami's intervention method is also mainly in the form of urban regeneration.

Ludovico Quaroni (1911-1987), the theories of this Italian architect are categorized into two categories: 1) the multifaceted nature of urban restoration: in his view, this category encompasses all economic, physical, and ... aspects, and 2) revival of historical textures from various aspects.

The principles considered by Quaroni in the field of urban restoration are:

- I. Coordination between comprehensive urban plans and restoration plans.
- II. Dynamics in the historical context, especially in economic terms.

In general, his goal in intervening in old structures is to improve performance while respecting the living, dynamic body. His approach to historical structures is improvement and renovation in urban planning, and his intervention method is urban reconstruction and a comprehensive urban restoration.

Gustavo Giovanni (1873-1947) was an Italian architect and theorist who proposed the following principles in the field of urban restoration:

- I. Urban segregation: separation between old and new cities
- II. Spatial separation: separation between living and active urban textures and dead and inactive textures.

Giovanni's goal in intervening in the old fabric is to improve the city's performance and function while respecting the living, dynamic bodies. His proposed use of historical buildings and collections is based on separating buildings into two categories: dead and living, with the old fabrics intended for museum use and the living fabrics for the revitalization and restoration of the urban fabric.

Her method of action is improvement and renovation, and her intervention method is urban reconstruction and comprehensive urban restoration.

Patrice Geddes (1854-1932) is one of the theorists of improvement, renovation, and the development of cities. He believed that in urban improvement and renovation, buildings or urban complexes should adapt and coordinate with spatial and temporal conditions. Improvement and renovation should not be a repetition of yesterday, but rather its evolution and continuity [2].

Charles Edouard Jeanneret, known as Le Corbusier (1887-1965 AD), Le Corbusier's principles in the process of urban improvement and renovation are:

- I. Geometric tricism: according to Le Corbusier, the street should be straight. Therefore, by following the principles of geometry, we can now respond to the needs of the times.
- II. Mass production: to meet housing needs, mass production must be pursued.
- III. Standardization: standard indicators must be adhered to when building urban spaces.
- IV. Separation of pedestrian and equestrian traffic: Le Corbusier considered it necessary to demolish old buildings, build new ones on top of them, and allow vehicles to enter the old structures.

The ideal city, in terms of luxury, is a renovated city with apartment-style buildings and a green setting. In this city, the buildings, built like columns, provide a place where the entire land surface is considered for the passage of vehicles and pedestrians.

For Le Corbusier, the systematic use of tall buildings was justified for several reasons. The most important of these was to increase land value and its optimal use, thereby enabling the implementation of bold, expensive projects for which planners and municipal officials had previously purchased the necessary land.

The most important theories of urban improvement and renovation from Le Corbusier's perspective are:

- I. High-rise construction and apartment buildings are used to exploit urban land
- II. Connecting the city with nature and enjoying natural gifts
- III. The possibility of enjoying more green space in the city environment

- IV. Rejecting past urban planning methods and patterns
- V. Proportion of the placement of buildings with respect to the axis of solar radiation
- VI. Pay attention to traffic and the separation between pedestrians and cyclists
- VII. Zoning is the only tool to meet the goals of new urban development
- VIII. Optimal use of urban land
- IX. Urban planning and architecture cannot be limited to buildings that were built in the past.
- X. The compliance of the city's shape and appearance with its function is important in the process of city improvement and renovation.

Kevin Lynch (1918-1984), Lynch's thought is known as the theory of "visual perception and urban appearance". Lynch considers all perception to be legibility, the establishment of a logical and principled connection between the city and the citizen. The legibility of the city does not rely solely on elements or functions; it also includes form and content. This theory of spatial-physical description of the urban environment relies on its structural pattern. The shape of any habitat depends on the spatial arrangement of its constituent components, namely people, activities, and urban facilities and equipment, the continuity and integration of each part with the other, and the internal continuity of the components from every direction and at every level. The characteristics of the theory of the laws of visual perception can be stated as follows:

- I. Creating legibility and a mental image of the city that is imprinted in the minds of people, whether pedestrians or cyclists.
- II. Structure and identity are recognizable and continuous patterns of spaces, buildings, and urban blocks.
- III. The ability to imagine and visualize through the perception of urban spaces and their analysis.

According to Lynch, the process of urban improvement and renovation should involve planning with public participation, consultation with experts, and coordination with city officials and residents. Exhibiting historical and cultural values from each historical period in urban spaces and collections, and supporting open-air museums, should be considered.

Kenzo Tange (1913) considers preserving historical monuments in relation to ancient textures and seeks to make them appear more magnificent and grand. He believes that the complexity of pedestrians and vehicles prevents reflection and thought in ancient texts. Kenzo Tange's theories can be categorized into three main theories:

- I. Contemporaryization: the connection between tradition and new living conditions is essential for living in today's cities.
- II. The grandeur of history-making: by making historical monuments magnificent, we can make them even more grandiose and also revive their past.
- III. c) Balancing the environment: the balance between cities and their surrounding environment is a necessary condition in urban restoration plans.

His goal in intervening in old structures is to preserve tradition by responding to new needs. Accordingly, his proposed use is contemporary because he aims to preserve the structure to respond to new needs, and the method of action is improvement and renovation. His intervention method is primarily a topical-thematic approach.

Edmund Bacon (1910-2005) developed a theory known as the theory of organizing the city's main skeleton. He considers the improvement and renovation of the city's physical structure, with a clear idea of the city's skeleton. He believes that the transportation networks of each part of the city can expand and continue on a large scale in connection with the main skeleton, and can change and adapt as needed.

Bacon considers it essential to adapt and coordinate the city's transportation system and facilities to the region's geography, especially its topography and climate, and considers this action an appropriate tool for emphasizing and enhancing the new visual and conceptual appearance of the city's public buildings and historical monuments.

The most important approaches to organizing the skeleton of the city from Bacon's perspective are:

- I. The basic skeletal design of the city consists of two main elements: movement routes and building masses.
- II. To understand the impact of city growth on the city's landscape, a clear definition of the city's core must first be provided.
- III. In the skeletal design of the city center, urban elements are organized in a multidimensional system. Therefore, a strong concentration of activities and movement systems at different levels, both vehicular and pedestrian, must be planned.
- IV. The city's main skeleton is designed with the help of traffic system design.
- V. The design of the city's main skeleton is empowered by a directional movement system that revitalizes the skeleton and influences the minds and senses of users and passersby.
- VI. The form of the city derives from its main skeletal plan and does not impose itself on it.
- VII. The complexities of the combination of physical-spatial elements in an urban area can express a single whole.

2 | Capability of Improvement Project Managers

Expertise, commitment, and sound management are the hallmarks of successful improvement project managers. A poor project manager does not see the contractor as his executive arm, but rather as a claimant who is entitled to many benefits.

These managers consider it part of their management skills to delay project completion and create a loophole in the contractor's claims. They cause the project not to be completed within the specified time frame

3 | Correcting Negative Thoughts about the Contractor for Improvement Projects

Currently, the prevailing view among executive bodies is that contractors are at fault unless proven otherwise. This attitude has no effect other than increasing tension between employers and contractors and, at the macro level, reducing the efficiency and success of construction project implementation.

4 | Compliance with the Rules Governing the Improvement Contract

Adhering to the principles and rules of contract award procedures and demonstrating follow-up in accordance with the usual process are particularly important to ensure contractors' exclusive and continuous access to high-yield contracts.

Timely information about the project's quality and actual conditions, competitive behavior and possible offers from other contractors, and relationships between government employees and other contractors are considered strengths and areas of influence in contractual matters.

On the other hand, abandoning formalities or legal and official rents delegated to managers and departments in general can lead to the easy acquisition of a project by influential contractors without regard for the law, violations, and competitive pressure from other contractors.

The expression of opinions by influential individuals and legal entities, even with impersonal motives and in pursuit of charitable and beneficial goals, has affected the normal process of selecting a contractor. More

importantly, it is a suitable excuse for considering the procedure reasonable and for serving as a cover-up for past illegal actions favored by the offender.

5 | Architectural-Urban Restoration Method for Limited Spaces

Since the growth and strengthening of modern democratic systems for governing cities made it impossible to renew experiences such as Paris (Haussmann), and the phenomenon of deterioration of old urban structures intensified, reflecting the need for a decisive solution every day, a new form of design for old urban structures emerged, and the bandridge became popular.

In this method, an attempt is made to comprehensively and logically address local issues affecting a limited part of the city's old fabric through an urban architectural plan.

6 | Data Collection Tool

In the mixed approach, questionnaires and interviews are the main data collection tools. In this study, our research method is mixed and combined research, so a researcher-made questionnaire was used to collect data.

It is worth noting that the questionnaire was designed with a hierarchical structure and, at the target level, it is "Effective management factors in the improvement and renovation of old city textures (Case study: Langarud city)".

Reliability is a technical characteristic of a measuring instrument. The concept deals with the extent to which a measuring instrument produces the same results under the same conditions.

The reliability coefficient is actually the correlation coefficient between the results of repeated measurements under the same conditions as the specific test. The reliability coefficient, as measured by Cronbach's alpha, must be greater than 0.7 for the questionnaire to have sufficient reliability to examine the desired variables.

Therefore, in this study, the questionnaire will be evaluated by professors and experts. Its validity will be calculated based on their opinions, and its reliability will be calculated based on the questionnaire's distribution and the Cronbach's alpha coefficient in the Amos structural equation output.

7 | Conclusion

The high importance and special position of improving and renovating worn-out textures in every city make the need for using various models and research in this field more evident than ever before.

So far, some researchers have worked on improving and renovating dilapidated structures in different cities. In general, in research aimed at identifying factors and effective management factors to improve the project's level, one should seek to select one or a specific number of potentially effective factors to improve the management style, considering the target criteria and the limitations in the field in question. Given the multitude and variety of these factors, it is essential that the attention and focus of managers and officials in the field of improvement, especially in the area of old urban areas of a city, which is considered a vital branch in the country's economy and development, be drawn specifically to the effective management factor that improves the level of management in construction, completion, and project management.

In this research, we sought to identify a set of appropriate and effective factors by focusing on the management of improvement and renovation of the old city textures (case study: Langarud city) that can positively impact the desired management of the project. In this regard, the factors obtained included the following:

- 1) Management, 2) Technical, 3) Experience factor, 4) Resources, 5) Attention to skill-based education and technician training, 6) Commitment to environmental assessment, 7) Attention to legal requirements, 8) Attention to external factors, 9) Idea generation, and 10) Planning.

The highest ranking among the effective management criteria and indicators in the improvement and renovation of old city textures (case study: Langarud city) is related to resources, followed by attention to education, commitment to environmental assessment, idea generation, planning, management, technical experience, attention to legal requirements, and finally attention to external factors.

References

- [1] Shen, L., Tang, L., & Mu, Y. (2024). Critical success factors and collaborative governance mechanism for the transformation of existing residential buildings in urban renewal: From a social network perspective. *Helijon*, 10(6), e27672. <https://doi.org/10.1016/j.helijon.2024.e27672>
- [2] Chou, J. S., Chang, Y. H., Molla, A., & Chong, W. O. (2023). Determining critical success factors for residential reconstruction in the urban city from the perspective of developers. *Sustainable cities and society*, 99, 104977. <https://doi.org/10.1016/j.scs.2023.104977>
- [3] Cao, Y., Fu, F., Nejati, F., Chabok, S., & Edalatpanah, S. A. (2022). Identifying effective managerial factors in improving and renovating old urban tissues: A case study approach. *Buildings*, 12, 2055. <https://doi.org/10.3390/buildings12122055>
- [4] Pulles, K., Conti, I. A. M., De Kleijn, M. B., Kusters, B., Rous, T., Havinga, L. C., & Ikiz Kaya, D. (2023). Emerging strategies for regeneration of historic urban sites: A systematic literature review. *City, culture and society*, 35, 100539. <https://doi.org/10.1016/j.ccs.2023.100539>
- [5] Li, W., Li, Q., Liu, Y., Wang, S., & Jia, L. (2023). Decision-making factors for renovation of old residential areas in Chinese cities under the concept of sustainable development. *Environmental science and pollution research*, 30(14), 39695–39707. <https://doi.org/10.1007/s11356-022-25043-9>
- [6] Wang, W., Yang, H., & Jing, S. (2024). The development of priority decision model for old urban community renovation in China. *Scientific reports*, 14(1), 4434. <https://doi.org/10.1038/s41598-024-54883-3>
- [7] Huang, Y., Wei, W., & Ferreira, F. A. F. (2023). How to make urban renewal sustainable? pathway analysis based on fuzzy-set qualitative comparative analysis (fsQCA). *International journal of strategic property management*, 27(3), 146–158. <https://doi.org/10.3846/ijspm.2023.19352>
- [8] Savoie, É., Sapinski, J. P., & Laroche, A. M. (2025). Key factors for revitalising heritage buildings through adaptive reuse. *Buildings & cities*, 6(1), 103–120. <https://doi.org/10.5334/bc.495>
- [9] Lang, W., Fu, D., Chen, T., & Hui, E. (2025). Optimizing community regeneration planning through a functionalism perspective. *Discover sustainability*, 6, 1–23. <https://doi.org/10.1007/s43621-025-02255-w>
- [10] URBACT. (2017). *Improving the social dimension in the process of urban regeneration*. <https://urbact.eu/good-practices/improving-social-dimension-process-urban-regeneration>