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Conceptual Paper

Balanced Renovation Theory of Urban Deteriorated Fabrics and Its Smart Model

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ABSTRACT

The city is the most complex achievement of human civilization, and the most intricate aspect of the city is its development. This development must respond to various material and spiritual needs. It must be both this and that, rather than either this or that. One of the simplest yet most challenging urban issues and aspects of its development is the matter of deteriorated fabrics and their renovation. Much has been written on this subject, and numerous plans and programs have been designed and implemented based on it. However, the fundamental question has remained: "Which renovation?" This is the most significant question we have faced today and for many years. Which renovation will serve Iranian contexts the best, and what characteristics should this renovation possess? The present article aims to address the questions efficiently by examining the current conditions of deteriorated fabrics and their renovation in Iran. The response is presented as a model titled the "Smart Balanced Renovation Model," based on the "Balanced Renovation Theory of Urban Deteriorated Fabrics".

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Introduction

Human beings, through settlement, created their most complex civilizational achievement: the city. A city must simultaneously meet diverse material and spiritual needs. Focusing solely on one dimension leads to an incomplete understanding. For a nation that once possessed stunning and magnificent architectural and urban planning wisdom, enduring the current disarray in deteriorated urban fabrics and the continued exacerbation of their instability is both a straightforward and intricate issue. It is straightforward if, as per habits, we absolve ourselves of responsibility and blame external circumstances. However, it is intricate if we claim to uphold Iranian-Islamic culture, identity, and civilization.

Today, Tehran and other Iranian cities lack physical structures and functional systems compatible with their needs. These deficiencies create significant gaps between our cities and sustainability and standards. Physical and functional deteriorations disrupt daily operations and challenge the survival and existence of these cities in the future. Even with the full implementation of current comprehensive and detailed plans, existing conditions cannot improve because these plans lack the comprehensiveness and purposefulness required.

In Iran, renovation is neither structured, institutionalized, nor rich in experience. Limited experiences that do exist often fail due to weaknesses in upstream plans and the dominance of sectional approaches and fragmented functionalities. While Tehran and other cities in Iran face vast areas of deteriorated fabrics, they also possess an immense opportunity within these fabrics. On the one hand, the residents of these deteriorated fabrics are the primary victims of potential earthquakes, and on the other hand, urban development plans must and should pave their way through these areas. Recognizing these opportunities under titles like renovation or regeneration places these concepts at the forefront of attention for national governments and local authorities. The competition to prepare large cities for playing significant roles on national, regional, and even global scales has been ongoing for years and continues to accelerate. At this point, we must admit that we have been left behind in this race.

So, what should be done? This is the fundamental question addressed in this article: "Which renovation?" Various perspectives exist regarding the renovation of deteriorated fabrics: one focuses on housing construction, another emphasizes environmental improvement, while others advocate for the empowerment of local communities. These diverse viewpoints are collectively incomplete because they offer a one-sided and fragmented understanding of the issue. Unlike the mistaken path taken by the majority, which seeks to attract resources, technical solutions, or diverse projects, it seems that the problem of renovation is not rooted in resource and budget imbalances but rather in the imbalance of governance systems, urban management, and renovation administration. The main issue and the significant challenge in renovation is achieving a proper understanding of renovation. Empathy, unity, and alignment in renovation efforts have not yet formed a unified will. Consequently, fragmented, multi-faceted, and sometimes contradictory viewpoints act as major barriers to accelerating and facilitating renovation efforts. The effects of these obstacles are evident in the limited renovation achievements and slow progress after nearly two decades of the Renovation Law's enactment and two decades since the devastating Bam earthquake. Considering the points, we now address the primary question of this article: "Which renovation?"

Which Renovation?

To begin the discussion, we first refer to the definitions of renovation and deteriorated fabrics presented in the research article "Pathology of Revitalizing Deteriorated Urban Fabrics in Iran from the Perspective of Balanced Renovation theory" (Andalib, 2024). The essence of that discussion was that imbalances and inconsistencies in various urban dimensions cause disruptions or disconnections with urban development networks, leading to deterioration in vulnerable and susceptible areas. In other words, deteriorated fabrics or neglected zones can be considered the offspring of unjust urban planning and unbalanced urban development (Conway & Konvitz, 2000). Thus, renovation, as conceptualized by the author, is the process of compensating for the lagging urban zones within development networks and adapting them to changing and new conditions through a gradual, continuous, organized, coordinated, balanced, and synergistic approach.

From another perspective on the issue of renovation in Iran, it becomes evident that "today's deteriorated fabrics cannot be renovated for future generations with yesterday's knowledge and management." Therefore, there is a significant need to enhance knowledge in the field of renovation and its management. The next question arises: Where should we begin in advancing knowledge and management in renovation?

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Hoover states: "When tasked to execute a project without beginning with a theory, it is akin to running a train without a locomotive, imagining a mammal without a skeleton, or writing a love story without love" (Andalib, 2017, 111–115). Similarly, based on experiential development, implicit knowledge, and collective wisdom, we concluded (ibid.) that no action or initiative in renovation can succeed without a theoretical foundation. Thus, the framework for this model, aimed at providing solutions for the renovation of deteriorated fabrics, was named the "Balanced Neighborhood Renovation Theory in Urban Fabrics."

Fundamentally, a theory describes relationships between phenomena in a way that the desired situation becomes generalizable. Hence, the Balanced Neighborhood Renovation Theory in Urban Deteriorated Fabrics must be able to explain, analyze, and predict conditions. The main hypothesis of the Balanced Renovation Theory posits that restoring balance in cities and deteriorated fabrics is essential to achieving the goals of "livability" and "sustainability" within urban systems and balanced urban development. Livability focuses on improving the quality of life for the current generation, while sustainability emphasizes healthy living for future generations.

In other words, the core theory of balanced renovation relies on the law of balance and equilibrium and adopts a systemic approach with a network and flow perspective. It seeks balance by identifying and defining effective relationships and promoting renovation as an integrated system.

In essence, this theory aims to identify and interpret the relationships among the components of deteriorated fabrics to find the balancing factors that contribute to their renovation (Andalib et al., 2018).

Principles of Balanced Renovation Theory

The development of the principles of the Balanced Renovation Theory is based on three insights: "Justice-Based Renovation," "Community-Based Renovation," and "Neighborhood-Oriented Renovation" (Andalib, 2017; Andalib, 2024). These principles are as follows:

Principle 1; Comprehensive Perspective: A coordinated view of all aspects of renovation. For example, if housing construction is undertaken without providing the necessary services, renovation and development will not be comprehensive and balanced.

Principle 2; Balance: The existence of deterioration in any city reflects its deviation from the path of balanced urban development. Thus, if 60% of housing construction goals are achieved but only 10% of service provisions are realized, the renovation is not balanced.

Principle 3; Sustainability: Renovation actions should not only address present needs but also be suitable for the future. Sustainability means considering the long-term consequences of renovation decisions and actions in various dimensions. Renovation should emphasize the optimal use of resources, preserving local assets for future generations, fostering social sustainability through strengthening local ties and a sense of belonging, and enhancing economic sustainability by creating financial opportunities and supporting local entrepreneurship.

Principle 4; Intelligence: The use of intelligent tools, methods, and processes to develop, control, and manage the influential factors of neighborhood renovation. If decisions about needs, priorities, and actions are made arbitrarily, temporarily, or subjectively, the renovation will not be intelligent or balanced.

Based on two decades of experience in converting implicit knowledge into explicit knowledge in the field of renovation, it became evident that in addition to addressing fundamental barriers and theoretical frameworks to strengthen the foundation of renovation knowledge, there is a need for an operational model to enhance the management capabilities for implementing renovation actions. This model, called the "Smart Balanced Renovation Model," was developed.

An Overview of the Smart Balanced Renovation Model

The details of this model will soon be published in a book titled "The Smart Balanced Renovation Model," co-authored by the writer and Mohammad Reza Ebrahimi. This article provides a summary of its key elements.

In essence, the Smart Balanced Renovation Model can be summarized in two words: "Renovation Diagnosis." This model acts like a smart diagnostic system, relying on a defined and standardized algorithm, and delivers highly reliable results.

The visual representation of this model resembles spider-web or star diagrams but has fundamental differences. One of the most important distinctions lies in the "Fundamental Element of the Smart Balanced Renovation Model," which is based on the "Sequential Dualities" that underpin its radial or axial structure.

Sequential Dualities

The most critical reason for choosing the axes or

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sequential dualities stems from practical realities, field studies, planning, and the renovation actions undertaken. Everyone agrees that alongside defining new projects, previous projects must also be completed. Participation levels of residents need to be enhanced while preventing undue expectations. Residents must be informed and given roles, housing must be produced, and services must be provided. Both what should be done and what should not be done need to be recognized. As previously noted, there are dozens of other balancing dualities that cannot all be introduced here. These are referred to as sequential dualities, meaning two issues that effectively interact with and influence each other. Together, they create a new concept that is neither one nor the other while simultaneously being both.

Therefore, numerous sequential dualities can be identified and defined within each neighborhood or fabric. Some are specific to the conditions of a neighborhood, while others are generally deteriorated fabrics. The greater the number of defined dualities, the higher the accuracy and quality of the model. Hence, it can be said that dualities serve as the "quantitative and qualitative translation of renovation dos and don'ts." To facilitate identification and definition, they are categorized into seven networks: socio-cultural, economic-financial, visual-aesthetic, mobility-activity, legal-administrative, spatial-physical, and a composite network.

The concept of sequential dualities is akin to two distinct, independent, yet interconnected phenomena. The interaction between these phenomena produces a new entity that integrates aspects of both. For instance, maintaining balance between men and women ensures generational continuity; balance between day and night sustains ecological cycles; balance between cold and heat results in seasons; balance between past and future shapes the present; balance between science and wealth generates power; balance between income and expenses prevents bankruptcy; balance between grief and joy promotes psychological stability; balance between attraction and repulsion leads to social success; and balance between material and spiritual dimensions results in the attainment of a complete human being.

Thus, sequential dualities can be likened to a balancing or calming pill. When defined more precisely for a deteriorated neighborhood, they provide greater tranquility and balance within that fabric. This tranquility is not a temporary sedative but rather a cure. Accordingly, this model considers both daytime and nighttime perspectives, internal and external access networks, men and women, general and specific groups, quantity and quality, residents' interests, and developers' gains, among others.

For example, when a legal provision requires municipalities to facilitate, expedite, and discount construction permits in deteriorated fabrics, sequential dualities remind us that if the goal is to create balance in the renovation, the government must simultaneously facilitate, expedite, and discount utility connections. Delays and confusion cause residents to fall behind in renovation efforts, leading to frustration and a lack of motivation to act. Thus, the duality of government-municipality must also be addressed.

If the goal is to shorten the construction permit process, then property title issuance should proceed at the same pace. A participant in the renovation process should feel assured that they will receive a title, for instance, within two months, enabling them to obtain the permit. Many areas in Tehran and other cities remain excluded from the renovation cycle due to a lack of titles.

As mentioned earlier, balanced renovation requires defining dualities that align both sides in advancing the process and achieving practical, facilitating dualities to expedite and harmonize the path to balance. While municipalities expedite permits, the government should expedite utility connections. Municipalities waive permit fees; the government should waive utility fees.

Another example of such dualities in the renovation of deteriorated fabrics, which often fail due to an exclusive focus on one side of the duality, is recognizing residence alongside ownership. In places where generations have lived and continue to live, residence must be acknowledged. Renovation efforts should address the issues faced by both owners and residents.

The central premise of the Smart Balanced Renovation Model is a win-win approach for all parties. Both sides must be viewed equally within the framework of balance and equilibrium, as the essence of creation is based on pairs. However, the focus so far has often been on one side of duality. The Smart Balanced Renovation Model emphasizes the simultaneous consideration of both sides and defining their relationships to achieve balance. In essence, if we wish to compose a poem, we must write both lines of the couplet. Until now, only one line has been written, leaving the rhyme incomplete.

The shortcomings of detailed plans are evident in the lack of implemented services: how many educational, healthcare, law enforcement, and sports facilities have been built? Housing construction has been abundant, but where are the services?

Residents' complaints are justified because our efforts

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as city planners remain incomplete. Who will complete the second line of the neighborhood renovation poem? The renewal committees must involve everyone. The first line—housing—has been composed of incentives, consolidation, exemptions, and free permits. However, committees must also relocate conflicting utility poles, enabling roads to be fully renovated. For example, despite completed consolidation and setbacks on both sides of a street, conflicting utility poles in the middle of the road hinder accessibility. In emergencies, vehicles cannot pass, and even construction material transport is obstructed. Without addressing issues with water, sewage, gas, telecommunications, and other services, balanced renovation cannot be achieved.

Smart Balanced Renovation Model

The Smart Balanced Renovation Model assists in refining, optimizing, and organizing the trial-and-error approach, thereby preventing or minimizing the increase in risks associated with achieving goals. Clearly, the structural frameworks and rules required for the Smart Balanced Renovation Model have been designed and planned, and the following outlines its key elements:

1. Sequential Dualities: The most fundamental and essential components of the Smart Balanced Renovation Model are sequential dualities, which are utilized to identify, assess, and measure the balance in deteriorated fabrics. The criteria for recognizing and selecting these dualities, their application rules in the model, and their classification across thematic networks and composite networks ultimately result in a table called the "Table of Constructive Elements of the Model." This table defines and specifies all the characteristics of each duality.

2. Key Components, Symbols, and Graphs: The main elements, symbols, and graphical representations of the Smart Balanced Renovation Model are implemented and depicted through the systematic weighting and arrangement of dualities, calculation of balance coefficients, and ultimately the drawing of the model's graphical curve. This is followed by plotting the center of gravity (G) and its symmetrical point (G'), which enables the measurement of balance and the application of the Smart Balanced Renovation Model.

The most critical aspect of the model's balancing mechanism lies in its ability to measure balance. The primary utility of this model is to provide a tool for intelligent management of balanced renovation in deteriorated urban fabrics. In other words, all steps in the intelligent renovation process are analyzed and examined using this model, based on data derived from sequential dualities. Any flaws or errors can be identified by referring to the status of these dualities. Furthermore, the prediction of any mechanism for planning and action depends on interventions in the status of these dualities.

To achieve balance measurement, the following components are specified:

- **Balance Coefficient (Fb - Balance-Based Factor):** This coefficient serves as an index for evaluating the degree of balance. It represents the ratio of the entirety to a concept called complete balance (a number always positive and less than one).
- **Deviation from Balance (Db - Balance-Based Deviation):** Deviation from balance indicates the degree of imbalance, determined by measuring the distance from the center of gravity of the graph's curve to the center of the circle (OG).
- **Renewal Balance Unit (RBU):** This is a standard unit for measuring balance, expressed in quantitative terms. Like length in meters, weight in grams, or time in seconds, the quantitative amount of balance in the model's graph is also measured using this unit.
- **Balance Equation (Eb - Balance-Based Equation):** In mathematics, an equation represents the equality of two expressions, where one or both contain variables. Similarly, the balance equation in the model is expressed as the ratio of the balance coefficient to the balance deviation (Formula 1):

Formula 1. $E_b = \frac{F_b}{D_b}$

Different states of balance are evaluated through this equation, categorized into four levels: balanced, relatively balanced, relatively unbalanced, and unbalanced, with numerical ranges defined in terms of RBU.

Balance Variation Coefficient

The values of the balance equation over time form a sequence of numbers. Discovering the relationship among these numbers allows for the analysis of balance variations over time. To achieve this, the balance variation coefficient (CV) must be calculated (Formula 2):

Formula 2. CV = Standard Deviation / Mean

Implications of the Smart Balanced Renovation Model

The final stage in the process of measuring, analyzing, and determining actions involves the implications of the Smart Balanced Renovation Model. These applications include:

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1. Spatial Comparison of the Neighborhood Balance Equation: This assesses the current state of balance and provides a measure of the existing balance condition.
2. Temporal Comparison of the Neighborhood Balance Equation: This analyzes the strategic balance of the neighborhood over short- and medium-term time intervals.
3. Improvement Guide for the Balance Equation: This step identifies priorities for enhancing balance within neighborhood renovation efforts.

By completing this stage, the Smart Balanced Renovation Model establishes its role within the neighborhood renovation management system for deteriorated urban fabrics.

Conclusion

Every plan and program requires an implementation model as a tool for realizing its theory, plan, or program. Furthermore, achieving success in reaching goals requires a model to continuously assess trends and even introduce flexible changes to those theories, plans, or programs.

The "Smart Balanced Renovation Model" for deteriorated urban fabrics is a win-win model. It is crucial to accurately define and identify the conditions and status of achieving a win-win situation for both sides of any duality. A precise understanding of these sides guarantees the success of renovation plans and programs.

Any plan may be implemented at any cost to the parties involved, but the key is achieving maximum efficiency from the implementation. This model provides such capabilities to those involved in the renovation of deteriorated fabrics.

Among the most critical actions supporting this model are creating the conditions to fulfill and meet implementation requirements and carrying out foundational actions such as creating unified collective will among stakeholders, steering the management of deteriorated fabric renovations, establishing neighborhood renovation offices inspired by the approach of founding the first renovation office in the Martyr Khoobbakht neighborhood in 2005, preparing local development plans, forming neighborhood renovation study groups to identify and define sequential dualities, implementing model representations and diagrams, loading them into monitoring and steering systems, and ultimately creating a nationwide central dashboard and steering system.

Renovation not only requires scientific transformation but also demands a "revolution in renovation." A revolution based on "small, knowledgeable cores and large, capable networks," akin to the valuable experience of the Sacred Defense. Such a significant action requires national determination, as renovation inherently possesses strategic, supra-sectoral, and national characteristics, with local attributes interconnected meaningfully to other urban development plans. Renovation has now turned into a local issue. The practical outcome of this situation, which has shifted national responsibility to local management, inevitably brings difficulties accompanied by threats to the persistence of shortcomings.

Conflict of Interest

The author declare that there was no conflict for him in conducting this research.

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