Ancient Iranian Urban Structure and its Situation in Contemporary City

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Abstract:
The main topic of the following article is based on studying the structure of historical Iranian cities. Most of the ancient Iranian cities have had recognizable skeleton and structure, which have been expanded from the most public places of the city (such as Bazaars (market places) and Squares) to the most private parts (like neighborhoods). This type of unique organic structure organized the city form, and the development of the city had occurred within this framework. There are lots of examples of such cities that have maintained their main structure and their historical form can be easily identified even until the last fifty years. Some cases of these structures and constituents (such as their axes and joints) are mentioned in this article.

However, if we consider the current condition of Iranian cities, we will face the fact that the major growth of cities has occurred in the contemporary era- specifically in recent decades- and outside of the historical zone. Whilst the physical structure of ancient city is suffering from severe erosion and disintegration though it is coherently interwoven with the social structures and values. The disintegration and erosion of the townscape of the urban fabrics and diffusion of city landmarks, neither show the unified structure, nor transform the valuable ancient pattern into a major issue.

The main pattern of the city structural body and its basis, which had been constant through the life of the city, has been transformed due to diffused and unorganized development of the cities. As a result of the disorganized but continues urban growth, the pattern of city structure which had had its trend in the history of the city metamorphosed. The structure of ancient Iranian cities which have had unity, integrity and regulation are collapsing within this inconsecutive and irregular growth and are remaining as broken frames of the city.

Finding a suitable strategy for dealing with historical cities which are collapsing internally and expanding towards their suburbs, we have studied the definition of the main structure of a city and the perspective of the theorists in this aspect so that with concluding their concept, we can provide a framework for sustainable development for these cities to propose constant changes in urban cities today and in the future.

Additionally, this paper studies the ideas of structuralisms, and the definition of the structure of the urban city, structure of ancient Iranian cities and its component (joints and axes) and few examples of it. Afterwards, it refers to some examples of expanding ancient cities. Due to the conducted studies, it will present solutions and strategies to achieve sustainable development and returning the growth of the city to its structural regulations.

Key words: urban main structure, Iranian’s old city structure, joints and axes, sustainable development
Main structure of historical Iranian cities:

A city structure is comprised of a main part as a spine and a network of various land use in addition to elements which integrate the city as a unity, its order extends to the furthest urban fractions such as residential districts. The expression (urban main structure) is used regarding a certain part of the city, in which physical and behavioral centralization (density) take place, and other constructions throughout the city fill the gaps between these main sectors following its order as fillers. (Hamidi & others, 1997, p1) (Fig 1)

In Iranian cities, locations of various physical main factors and elements regarding the city, its functional characteristics, access organization to the city (internally/externally), and access to different urban main elements indicating a certain type of urban “main structure”.

Some Iranian theorists have rendered theories regarding this kind of structure and its rules. Herein, I mention the theories of Nader Ardalan, extracted from his book “The Sense of Unity”:

Ardalan especially regarding Iranian cities believes that the urban order is similar to crystal fractions, which have been polarized by means of a magnet. In traditional cities, this magnet is the Bazaar (old market) movability system, and fractions are stores, Karvansarays, schools, mosques and public baths. The market is begun by a gate and ended by another gate, or a canonic area such as a mosque. Different roots also are drawn from this main path. From his point of view, cities are similar to human skeleton and have certain structures.

This area is the center to the city but it’s not just a central point in space, rather it moves line wise as time goes therefore it produces the linear movement of the Bazaar. (Fig 2) This paradigm provides the possibility of development and growth. In a comparison between this paradigm and a living creature, one can say that Bazaar begins from a point which is presumed as the head, and grows cell like and based on a natural model, then continues to the heart of the city which is the Friday mosque, and then reaches the city’s gateway (Darvazeh). In this structure while the Bazaar grows as a spine for the city, pedestrian paths grow toward residential districts as ribs. inside this structure, crucial urban organs such
as public baths, schools, guest houses (karvansaray), warehouses, bakeries, water storage rooms (Abanbar), cafes, and merchants stores are situated and developed. (Ardalan & Bakhtiar, 1973, p93)

Among Iranian cities, Isfahan is one which its structure is recognized as the most elegant and beautiful. In this city, Bazaar, Naghsh-i-Jahan square and its quarter buildings, Charbaghstreet, Zayanderoood River and its historical bridges, form a main structure. It is interesting to know that this structure still holds complete adaptability and has been able to cope with all modern requirements therein. (Fig 3)

The main structure of the city broadly speaking maybe defined as a grid and axes, urban components and collections in which its fractions assume different certain roles in regard to each other, a role which they don’t assume individually:

1. Bazaar (Iranian traditional market): It’s as a spine of the city structure in which commercial, social, cultural, religious and political urban activities take place.

2. The city center complex: Includes the city square and Jame’ Mosque, in which social, cultural and religious urban activities take place. This collection is situated at the midst of the Bazaar.

3. Arg (The castle) collection: Includes the Arg, the Arg square and the governmental school and mosque, it’s the political center of the city and is situated at the end of the Bazaar line.

4. Urban main axes: These axes on one hand connect residential districts to Bazaar by means of indirect accesses; on the other hand, provide access to the outer area of the city. Through the urban gates. Public functionality is the most important usage of the buildings on the edges of these axes.

5. Residential districts: These districts as the main urban units by means of their main accesses connect to the main structure.

6. Darvazeh (City gateway): They are inlets which provide access to the city from outside, or out of the city from inside, by means of urban axes.

7. Baroo (The tower and enclosure of the city): This comprises the outer urban layout, encloses and integrates it. (Fig4)
Finally, it could be said that traditional structure of Iranian cities is comprised of various elements and axes which are interconnected by means of spaces called “joints”. There are some rules governing these joints which provide the certain especial integrity and order of Iranian urban structure. (Fig 5)

![Urban connections, “Joints”, in Iranian urban structure](image)

As it is mentioned, the urban structure is comprised of urban axes, elements and collections which through the passage of time have been developed on the basis of the urban scale hierarchy, and have been interconnected means of several joints, thus providing a coherent urban fabric. In this integrated structure, urban joints have supreme importance; these joints connect the urban spine, the market, to urban accesses, and from there to district’s spinal cores and finally to residential districts, even in residential units and vice versa (Fig6).

![Fig 6: The symbol sketch of the scale ranking mechanism between urban joints](image)

Also in the past the growth of the structure occurred with adding new joints to the old structure. The growth of the Isfahan main structure in EhA.C (Safavid period) occurred with constructing Naghsh-i-Jahan square as a new connection which jointed the old part of structure to new constructed parts (Fig7).

![Fig7: Expansion of Isfahan in 17th c. with Naghsh-i-Jahan square as a joint between old city parts and new expansion](image)

So joints have four main rules within the urban structure:

1. Connection of urban axes to each other and to the main part of the structure (the Bazaar)
2. Changing the functional character of urban accesses from one point to another
3. Linear development of urban axes
4. Reorientation of urban axes and the urban main structure (urban development)

Since the joints are urban nodes and connects streets and axes, it contains the main activities and usages of the city according to the level of importance of the streets.
Cases of urban joints in Iranian old cities:
Iranian cities structural change:

Old Square complex in Qom
Karimkhani complex in Shiraz
James' mosque entrance joint in Yazd
Tookpalvash joint in Semnan
After Rezakhan (a colonel who brought down the Qajar dynasty and became the king) and the beginning of Iranian modernization, vast measures were taken regarding the physical changes in cities. These activities mainly began from 1931 and continued till 1951. It was in this period which most Iranian cities underwent shortsighted changes and variations not programmed and foreseen. These changes included: widening narrow and old streets, applying a rectangular grid which its main structure was new streets network, and also changing old districts, constructing new squares and buildings emulating the West. In general, one must say that all these vast changes in that period are the very clear sign of moving towards modernity discarded with the historical concept of Iranian cities nevertheless. (Mashhadizadeh dehaghani, 1995, p388) (Fig8)

Streets at the beginning of the century, in addition to, imposing a new urban structure, entered into the Iranian urbanism in opposition to spatial and functional old structure of cities, and still continue to exist."The notion of rapid outward development of cities due to the declaration of the “Open Ports” Policy by the current government was another reason. These efforts were to discredit current structures, not starting any new”. (Izadi, spring 2001, p35)(Fig9)

Though by the arrival of the modern period crucifying old cities seemed unlikely, what's happening now in Iranian cities nevertheless is the continuous of the same thing. In addition, destructive development and fragmental restoration projects are at hand. So, a structure which has been frowned and developed through several centuries has undergone dramatic changes in recent decades, and urban development instead of going on by its traditional structure, is now destroying it.

The structure of the Iranian ancient cities which have had unity, integrity and regulation are collapsing within this inconsecutive and irregular development and are remaining as broken frames of the city.

Pursuant to what shall we do regarding cities which historically and structurally are significant but now are being destroyed and transformed internally, some theories offered by some theorists have been studied. So that a proper theoretical framework could be established using these theories. So that current and future urban changes and structural measures continue on that basis.

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Accordingly the hypotheses of this article are:

- A city as a growing whole (line an organ) must have a main structure of its important components and bases, supporting and strengthening the urban form.

- Due to today’s city complexity and their problems, total planning is ineffective but by planning according on the main structure of cities good planning could be achievable.

- The best way to face the present disintegrated and disjointed cities is to understand the structure features and its foundation.

- The main structure of cities as their organizer, in addition to make the city and its components coherent, by its adaptability, keeps its integrity in time.

- The most appropriate structure for present cities is their traditional structure and a development on that basis.

- A correct organizing of urban main joints and axes as the main parts of urban structure enhance the public life and activities.

- Achieving a successful urban planning maybe only come true by allocating the historical urban structure to the main and principal activities therein.

In this article, it has been tried to prove these hypotheses by using structurist scholar’s theories.

**Theoretical framework to face current condition of Iranian cities with historical structures:**

Nowadays cities are overly complicated so recognizing city’s ordering forces and the struggle to organize it in relation to the cities components would ease developments and promote control over the city changes. (Hamidi & others, 1997, p32)

In contrast to functionalists, structurists approach the city as a whole (in their word: Gestalt). (Bazrgar, 2003, p55)

Advocates of this opinion rejected efforts to ascertain the final form of the city (total design), and offered the theory which says planners and architectures must design main parts of a city, and the rest be left at the hand of people themselves.

Designers such as Christopher Alexander, B.V Doshi, Edmund Bacon, Fumihiko Maki, Aldo Rossi, David Crane, Roger Transik and ... have offered theories regarding urbanism, on which brief discussions will be presented in this chapter.

- **Edmund Bacon and the theory of “organizing the urban main structure” :**

  Bacon believes that any project for any part of the city must be consistent with the main urban structure furthermore it must be flexible enough as to provide developmental possibilities if necessary. So, a powerful strength of unity is provided within...
the organization and sole buildings will be brought into a unity context. According to Bacon the main structure is organizer power of city, and if the designer puts most of his efforts thereon, he'll be more successful. He introduces the abstract of his theories in one single phrase: "Though the leaves go and come each fall and spring, the trunk and branches of the tree remain, and it is they that determine the form of the tree." (Bacon, 1974, p306)

- **Christopher Alexander and the theory of “the growing whole”**: This theory is produced upon the concept of urban structure and structurism in design, and poses the feeling of vivaciousness in cities, a phenomenon which is a result of a certain way of designing and existed in historical cities. Alexander thinks about the growing whole and says that we feel this quality very strongly, in the towns which we experience as organic. To some degree we may know it as a fact about their history. To some degree we can simply feel it in the present structure, as a residue.

In each of these growing wholes, there are certain fundamental and essential features:

First, the whole is grows piecemeal, bit by bit.

Second, the whole is unpredictable. When it starts coming into being, it is not yet clear how it will continue, or where it will end, because only the interaction of the growth, with the wholes own laws, can suggest its continuation and its end.

Third, the whole is coherent. It is truly whole, not fragmented, and its parts are also whole, related like the parts of a dream to another, in surprising and complex ways.

Fourth, the whole is full of feeling, always. This happens because the wholeness itself touches us, reaches the deepest levels in us, has the power to move us, to bring us to tears, to make us happy.

All traditional towns have these features in their growth. But the modern practice of urban development does not have these features. It does not deal with growing wholes at all. (Alexander, 1987, p14) (Fig 10)

- **Kenzo Tange and the theory of “the revitalization of the current structure of city and linear structure”**: He believes that the boost in movements is not the reason for traffic problems in cities, but it is the urban structure which cannot afford to provide the needs regarding moving from point to point in cities is not responsible for the demand of transportation at times. This phenomenon is worse in cities with the street pattern of central-radius, and leads to immobilization of urban functions.
We’ve understood that in addition to functionality, we need some kind of a structure in the combination process of functional units. Nowadays, the combination of functional units is less inclined to unity, and more towards numerosness, and based on improvisation. We’ve learnt from our experiences that landmark and signs must be generated from, and within the process and measures regarding the organization of the structure.

He explains the necessity of this viewpoint as follows:

A large city with 10,000,000 people is a phenomenon occurring in the second half of the 20th century. And in order to survive, it requires a structure conformant, appropriate to this time. The medieval radius pattern of cities with a centralized traffic and a line of buildings is no more an appropriate structure however constructing a totally new city is not a solution, reconsidering the contemporary structure and revitalizing it could be one.(Tange,1966) (Fig 11)

- Aldo Rossi and the theory of "urban main structure":

He believes cities have a main structure through which they are connected to the history. And that is a collection of elements made by man, which has some sort of integrity. This is a man-made combination that its components are integrated. He views cities as a collection of totalities, each of which consists a complete entity on its own, and which are connected to one another through the main structure components that have their unique identity but are interwoven to each other by mean of the main structure. This main structure explains the historical urban evolution. Rossi believes that the main structure doesn't belong to a certain period and must be studied in the length of history. This main structure can adopt and make itself appropriate for each period. (Rossi, 1986)
Kevin Lynch and the theory of “landmarks organization network and the image of cities”:

He believes cities to be a physical unity which is perceived observed and perceived by people therein. Mental order is necessary to make a cognitive map out of cities. So, the final image of a city in the mind represents clear images, identifiable landmarks (from city blocks and spaces) and perceptual ability to depict it. Differences and similarities amongst influence the structure of a city. He believes that today urbanism must look for urban landmarks in each period, and identifying a value organization and system of landmarks through the history. (Lynch, 1960)

Conclusion and suggestions:
Mentioned theories could be integrated as a proposal way of approaching the current condition of historical Iranian cities in relation to their structure.

According to the theory of Organic growth (Alexander) it is preferred to locate the further development inside cities rather than investing on outer lands. Bacon’s theory proposes that organizing the structure of a city as the essence of city developments. Lynch emphasizes on the legibility of cities by considering the hierarchy of its perceptual elements as the most important step in designing cities. Rossi considers the historical structure of a city as its main structure. Tange points at conserving the current structure of cities as much as possibly in case it is not responsible for residential needs, he proposes reconsideration, which is adaptable to further developments.

In historical Iranian cities, as it was mentioned above, while there is a physical/functional efficient structure which after centuries is recognizable and functions, theories about structuralism are useful. Linear structure with the ability to grow (as it has been growing during centuries) works as an organic growing whole where its components enhance its integrity. This structure due to its especial physical, social, economic and cultural opportunities provides a context for sustainable development and it leads the trends of development towards internal lands.

As a conclusion, for completing city constructions among such cities the first and the most crucial step is to recognize the city’s structure and its role during the history. Understanding the structure and its features in different scale from the whole city to districts in addition to analyzing its components (axes and joints) would be the best leader in prioritizing renewal actions and urban revitalizing and it is the best catalyzer for the future developments orderly. Here joint (conjunctions) are most important because revitalization of urban centers is widely accepted way of leading developments.
To sum up the conclusions are:

- Internal urban development and investment and efforts to develop a city from within instead of its outer development by keeping its traditional structure.
- Revitalizing the main urban structure which has developed throughout the history.
- Planning for the main structure of the city, allocation of its main spaces to important functions as public territories, and leaving the neighborhood’s developments to urban codes and construction’s guidelines.
- Urban linear development continuance in order to provide coherence growth anytime.
- Providing a legible hierarchy of urban landmarks can clarify the growth path of cities and create a better perceptual image.

Cases of historical organizing urban fabrics project according to structural concepts:

Comprehensive plans for revitalizing historical/cultural path which were to consider the organic structures culturally/historically in order to regenerate them in addition to rehabilitation and renewal plans for historical fabrics are presented here as improvements plans based on designing according to the historical structures.

The Year 1990 was the beginning for a new era in approaching the historical urban fabrics in Iran. Since then urban Fabrics had been considered separated from the whole city in plans. From then multidimensional city structures and its context have been considered. (IZadi, spring 2001,p38)

Considering this new approach, the commission of urbanism and architecture began to revising the historical sites and plans based on following the structural order. Recognition the structures and proposing guidelines in order to cohere the historical structure to the modern fabrics was the essence of them. The result of their attempt was primitive guidelines for Urban Design projects but some unreasonable expectations caused the failure.

Among these cities those had a stronger structure gained better projects That's why among cultural and historical, revitalizing and improvement projects in cities such as: Isfahan, Shiraz, Tabriz, Yazd, Kerman, Hamedan, and... In the first two examples,
due to the better spinal cord structure they have, mostly since the Safavid period, the unity of physical structure is more evident. This is a principal reason approving the hypotheses of this article that the more coherent the structure of a city is the more successful functions and order it gives to further developments. As a result in cities that have lost their integrity with segregated spaces, plans especially regenerating plans should be concerned on the main structure of cities including axes and joints in
order to be more successful.

- Organizing cultural and historical main structure of Shiraz and revitalizing the Karimkhan complex:
  In this project revitalizing the spine of the historical city was intended which includes Bazar and Shahcheragh complex, as it is inscribed in the map these two complexes are not well connected, there are some cuts between them by machine based streets.
  Project suggestions which have been according to the structure situation within the city of Shiraz include:

  A. enhancing and organizing the Shahcheragh complex
  B. revitalizing (reviving) the Karimkhan complex
  C. improving the quality of the space between A and B
  D. developing the main structure

- reviving the Karimkhan complex:
  This project is inspired by the cultural and historical spaces of Shiraz, which has been offered by the engineer advisers of Naghsh-I-Jahan pars.
  Its objective has been reestablishing unity between the two complexes and revitalization the Toopkhaneh square of Shiraz. revitalization and recreating spaces of the Zand period such as the artillery square, BagheNazar, and the frontier of the Vakil mosque, and also depicting the arena of guest houses Roghani, Gomrok, and Ghasvam, and reconnecting to the market, have been suggested in the project, which says that the narrow Zand street which now crosses the complex would turn into a wide pedestrian walkway. Implication of the Zand access in the Karimkhan complex will result in recreation of the market and Karvansaray cut off thereby. The roadway between the Roghani Karvansaray to the munici-
pality square has been proposed to turn into a subway. This project is on construction and the subway of the Zand Street is already finished.

- Organizing cultural and historical main structure of Isfahanan revitalization the old square complex:

The main structure of Isfahan is the same cultural and social city’s spine which is a distinct example of structure in Iran. This path has always a structurally important role has been always structurally important, and even now the main structure of the city is based on it. This complex starts southward, from the old square and the AteeQ mosque, and ends to the HezarJarib gardens in the slope of the Saffeh mountain, this is the place where Isfahan university and also some branches of housing districts is located.

Now this question remains that has any Strategic planning had any role in construction of these places?
- Organizing cultural and historical main structure of Tabriz and reviving the Saheb-ol-amrand Bazaar’s bridges:
Conclusion and suggestions:

The results from this research show the historical fabrics of cities that now consist the main part of the centers of cities as structure of the city would find a new existence. Therefore connection between the old and the new structure of cities by following the principle of spatial organizing of its components in the holistic approach towards cities could be one the best strategies in regenerating cities. Rearranging the structure of city developments projects and defining the role of regeneration in this process would improve the outcome of plans.

For implementation of plans the first and the most crucial step is to recognize its structure during the history. A good perception and understanding of the main structure can be the best guide in prioritizing of the revitalization plans. Also recognizing the main structure and analyzing it and its components (joints and exes) and revitalizing it as the public realm in different scales could be the best catalyzer for the future developments, here joints are most important and revitalizing the city centers as city complexes and neighborhoods would lead the development to internal lands.

Finally, setting up an organization or an appropriate management system in the current chaotic condition and settling the organizations conflicts like the municipality and the cultural heritage organization conflict in managing the historical fabrics would prevent useless efforts and ends up in more successful implementations.

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