

# A Novel Approach to Perceiving Aesthetic in Traditional Houses and Bazars in Isfahan

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## Abstract:

Crises have always caused many, and sometimes irreparable, damages and injuries to human nations having had adverse impacts on indices of society, economy and environment. Therefore analysis and optimum management of these crises are the priorities in the states around the world. Access to valid and up-to-date information plays the pivotal role in proper and timely programming and performance on managers' and responsible organizations' side in various phases of the crisis management cycle. While more than 80% of the required information in crises actually have a local and geographical nature, utilizing the modern technology of GIS with special capabilities in modeling, combining and analyzing the data can be effective and impasse-breaking while analyzing vast layers of information in both phases of prediction and strike of crises. A good knowledge of the crisis-causing factors before their strike or prediction of the essential arrangements to prevent or reduce their affects or aftermaths to the least is one of the base procedures in the management of unexpected events. In this direction, precision in properly locating the installations and passages of the pipes and canals would be immensely important; bearing in mind the key role of continuation of serving essential arteries; particularly water and sewage installations, in controlling and preventing the expansion of crises, and preserving public health and hygiene on the one hand, and the significant expenses of construction or reconstruction of these systems on the other. Thus, through this study, we have discussed how to exploit the creation and production procedures in purposefully locating water and sewage installations and also their other usages in designing, management, programming and development of these installations, in addition to introducing the geographical information systems and clarifications of the creation and production procedures. The location of urban water and sewage facilities is very effective in increasing the resilience of natural disasters through the use of the geographical information system.

**Key words:** water and sewage installations, crisis, crisis management, geographic information system, GIS

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## Introduction

Today the economy conditions is suppressed by the global needs to meet the needs of larger communities or the minority all over the world. The engineer communities, thus, aim to find the related successful complexes. Engineers are greatly defending the traditional structures. However, the complicated structures fail and generally developing such complexes bring about huge costs and delay in plans and programs (Honour, 2004, Terry Bahil, 2004, Schwennal, 2011). Regarding the effectiveness of engineering community, Forooch (1069) stated that “if I am asked to describe an inappropriate engineering complex, I would say I have rarely seen other types of engineering” (Frosch, 1969). In other words, new methods are only poor alternatives for the real engineering. Not only they do not do what they advertise, but also they make the problems even worse.

Such a necessity was introduced to improve the engineering complexes around 40 years later by NASA head, Michel Griffin. He believed that any required action for success must be done and it seems that failure or success in most cities are voluntary. Considering his analysis, one important reason for this voluntariness is having or not having aesthetics in designing a complex (Griffin, 2010). Aesthetic is a mixture of effectiveness, strength, efficiency, and a minimum unwanted results. According to this description, the present study is designed based on aesthetic in design and physic of the architecture and it also proposed a structural definition of aesthetics based on Maslow’s hierarchy of needs to make given evaluation feasible to rank the aesthetic.

## Methodology

The present study used a case study and mixed method. That is descriptive, analytical, and logical reasoning methods were applied. To explain the steps, instruments such as field studies, observation and comparing and contrasting were applied.

## Literature review

Oxford dictionary of English defines aesthetic as

“Concerned with beauty or the appreciation of beauty” and in its second definition it is defined as “Giving or designed to give pleasure through beauty”) Oxford Dictionaries, 2012 (Different field of studies consider aesthetic as a conspicuous feature. In different references aesthetic is defined as:

1. A time-mathematical solution is considered beautiful if it simple as well as effective and constructive such as factorization and algebra.
2. In statistics, aesthetic is the whole value that is considered as the degree of effect (the least value to the most effect) that is simplicity, efficiency, effectiveness.
3. In chemistry aesthetic is defined as a creative economic, simplicity and adaptation in using resources (flexibility and effectiveness of resources in using the material, the effective and flexible process, and effectiveness in the decomposition and analysis). For example the Periodic Table introduced by Mendeleev has been using for a long time because it observed the economic, creativeness, simplicity, adaptation and effectiveness in the synthesis and analysis and discovering new elements will not disturb the table arrangement.
4. An engineering method is observing the aesthetic if it owns the most simplicity and effectiveness as well as meeting different problems even if problems that are not so called related and the result would be a flexible, adoptable and scalable engineering (Salado, 2013).

## Research background

Madni called for the necessity to have a one-word definition to make special method based on this foundation) Madni, ( 2012 He claims that most of the scholars are in agreement with defining aesthetic as a combination of simplicity, power and attraction) Maier,2009, Rehtin,1991, Gell-Man,1994, Rubinstein,1994). Others claim that aesthetic is a creative process in solving difficult problems and in its definition simplicity is one of the secondary elements. Accordingly Anton.... States that a designer considered his work complete when it has nothing left to

be removed or added. Belayer Smith describes the aesthetic from the visual aspects; when he is discussing about a successful Apollo he states that “it is not logical to say if the thrust could be better or no when on one has created a better one yet” (Blair-Smith, 2011).

Aknord is the first author who pointed to satisfaction and efficiency when providing a proper definition for aesthetic. He refers the features of a pleasant works to the primary definition which rely on delicacy and beauty in aesthetic. As an unavoidable concept, ( O’Connor, 1990 ) Griffin defines aesthetic as “ it has an instantaneous appearance when it exists, while its measuring is very difficult and thinking about it is also demanding”. Following Aknord work (Griffin, 2010). Bilous considered aesthetic as a complex that works based on expected concepts (Billow, 1999). Madni introduced an interesting difference between

design and aesthetic. He believes that design focused mostly on elements of the operation but aesthetic is in elements, process, and the whole operation (Madni, 2012). May be one of the filed of studies that is closely bond to aesthetic is the software engineering. Accordingly, the present study aims to examine the aesthetic elements in the software engineering. Summit compared aesthetic structure and another structure that is used commonly. Table 1 shows this comparison. Greifin as system engineering expert states that “the fundamental problem with adopting design and aesthetic is lack of unit definition of aesthetic by which the success is met or failure is detected in a comprehensive engineering framework. He believes that aesthetic and a design on its base is defined as comprehensive utilization and effectiveness based on the minimums (Griffin, 2010).

The structure of aesthetic software	The current software structure
Brief, useful and effective	Expansive and slow.
It has the characteristics that people need and use	Features that are good on paper, but in practice unusable.
Allows the user to do what they request	Allows you to do what you request, but according to the method.
It performs a task well.	It can do two or more things together, but without precision.
Any user can understand the structure of the data.	Only one programmer can understand its data structure.
It does things that programmers can never imagine.	You can do things that the programmer predicts.
Set up by the user.	Only developers can set it up.
It prevents mistakes.	Under the influence of the mistakes of individuals.
It is automatic and easy to install and remove.	It requires different components for the changes.
It works with your collection.	Requires larger collections of regular collections.
The power of compatibility with your work environment.	You need to set the work environment with it.
The power of compatibility with the amount of data you have.	There is a limit on the amount of data.
The power of flexibility is against the limitations.	Flexibility is not against the limitations.
In accordance with open standards.	A package is closed.
Compatible with past and future versions.	Only compatible with some previous limited versions.
It’s almost free.	It is constantly getting into trouble.
Protecting data in case of bug.	In the event of a bug, data can not be protected.
The code works cleverly.	It works exclusively with itself.

Table1. Characteristics of the structure of aesthetic software based on Summit (Source: Salado,2013)

According to his thoughts and having new perspective and insight searching designers could define indicators and methods to determine aesthetic levels. According to his findings, madni first present the first definition on aesthetic based on the principle (the in-

dustrial law). All of the previous indicators and definitions are mostly on emotional and applied feelings. However, he could introduced two distinguished type of aesthetic which has never been stated: first, a regulated aesthetic that is in fact an easy advance and

technology based on intelligent skills and increasing the utilization. And the second is gaining aesthetic based on a complicated structure and organization by which the user can have appropriate recognition toward aesthetic (Madni, 2012).

Systematic aesthetic can measure the aesthetic reali-

ties by applying elements such as simplicity, efficiency, and effectiveness; but the perceptual aesthetic is more in line with elements such as beauty and variety and it can convey the feelings. This suggests that there is a clear difference between systematic and perceptual aesthetic (Table 2) (Madni, 2012).

Feature	Indicator
Purposefulness	.Achieve the target, the number of side effects, the number of unwanted results, the time period
Simplicity and	Numerous components of constituent, used resources, structural interactions, structural complexity, complexity-behavior
	cost-effectiveness
Transparency	Visibility of the components of the assembly and the execution status
Scalability	Percentage of implementation costs and percentage of increase in production costs by increasing the number of interactions of components
Sustainability	(Ability to adapt to changes in the environment (competition, regulations, technology
Continuity	Base user size / Growth rate of user base
Efficiency	Time period, resource productivity
Inference	Conclusion time, Conclusion cost
cost	Total cost, design cost, production costs, repair and maintenance costs
Usability	Usage time without mistake, Learning time, Cognitive complexity
Effectiveness Utility	Life saved and increase in quantity of life and value of quality
Predictability	The ability to predict a set of behaviors under different conditions

Table 2. Characteristics and aesthetic indicators based on basic ideas (Source: Madni, 2012 )

By adopting the systematic and perceptual aesthetic a simple definition of aesthetic with effective, emotionalism, and comprehensive aesthetic is stated for a specific observer. Madni provided a comprehensive complex of main aesthetic features in the field studies that he had conducted. It is worth mentioning that aesthetic is a combination of aesthetic which is beyond the need of a collection. To understand this definition one should consider two separate complex's that meet the similar needs while one of them is better or more efficient than the other.

3. The structural definition of Maslow based on the Maslow's hierarchy of needs: Maslow is an American psychologist who introduced the hierarchy of needs for the first time in 1954. This hierarchy starts

from the basic needs from the bottom of a pyramids and it ends with the perfection on the top. To enter to the next level one should first meet the needs of the previous level and moving through this hierarchy provid people with human perfection. However, Maslow's Hierarch of Needs has faced many critics and many believe that the basic needs of human are not linear nor in a hierarchy order but they are unchangeable elements of the human nature)shcarcan,2003).

Based on Maslow's opinion, one should pay attention to material or spiritual motivations to satisfy their needs, and by changing these motivations the capabilities of the environment is found meaningful, lose their meaning or become destroyed. This

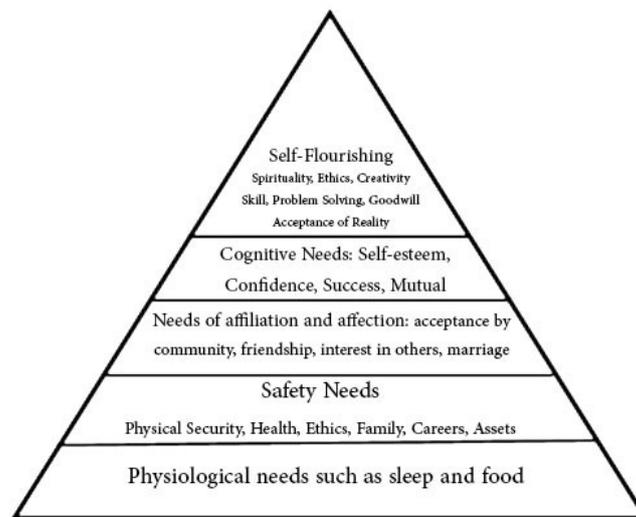


fig 2 . Hierarchical pyramid of the needs of Maslow

model in the Maslow's humanism psychology and its generalization on human behavior in the urban or architectural spaces can bring about appropriate mechanism to analyze the human and environment

relationship. The Maslow's hierarchy of needs helps the urban designers and architects to pay attention to the reason why living complexes and architectural spaces formed based on human needs

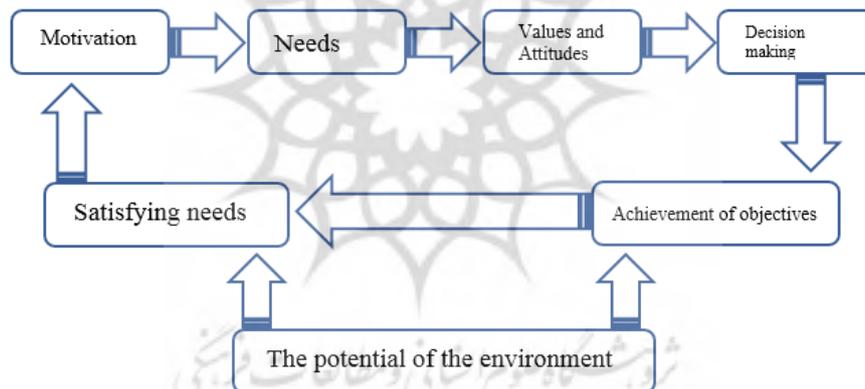


Figure 3 model of behavior in which human motivation is presented as a dynamic process (Source: Writer)

From the architectural perspective this Maslow's hierarchy of needs is adoptable as well (Figure 4):

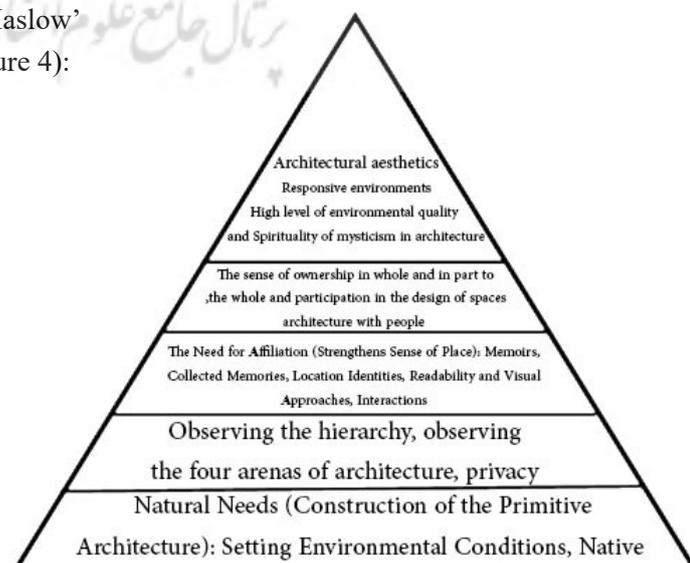


Fig 4: Pyramid of Different Requirements (Drawing: Writer)

As it is shown in figure 4, the aesthetic is in the most perfection place in the architectural objectives. The Maslow's hierarchy of needs expresses the human needs that are generalizable according to users' needs and can be extended in different time and includes other structural needs. Different classifications have already been designed but by reviewing and recognizing human needs a more comprehensive plan for the upcoming needs and can be served as a guideline. The valued needs can grantee our required organized needs to satisfy different related levels. The present study aims to introduce a harmonic definition of aesthetic on designs and different human environment sets. By employing systematic intellectualism, it also aims to present a structural definition for the aesthetic appropriate to design needs. Such a description for aesthetic is completely extendable because

it has special features that are always developable while having no effect on the definition. Aesthetic is defined as performance satisfaction, availability, and efficiency toward the present and future needs of human in designs without significant intervention or change. Future needs are mainly unknown needs and can be stated in different functions. Since this definition is as an indicator it is constantly on going based on the future needs. The comprehensive concept of aesthetic is in fact satisfaction in different times. Satisfactory complexes have their own especial requirements such as flexibility and utility. By combining the mentioned definitions by Madni obtained from Maslow's hierarchy and the mentioned trust one comprehensive structural definition can be presented for aesthetic.

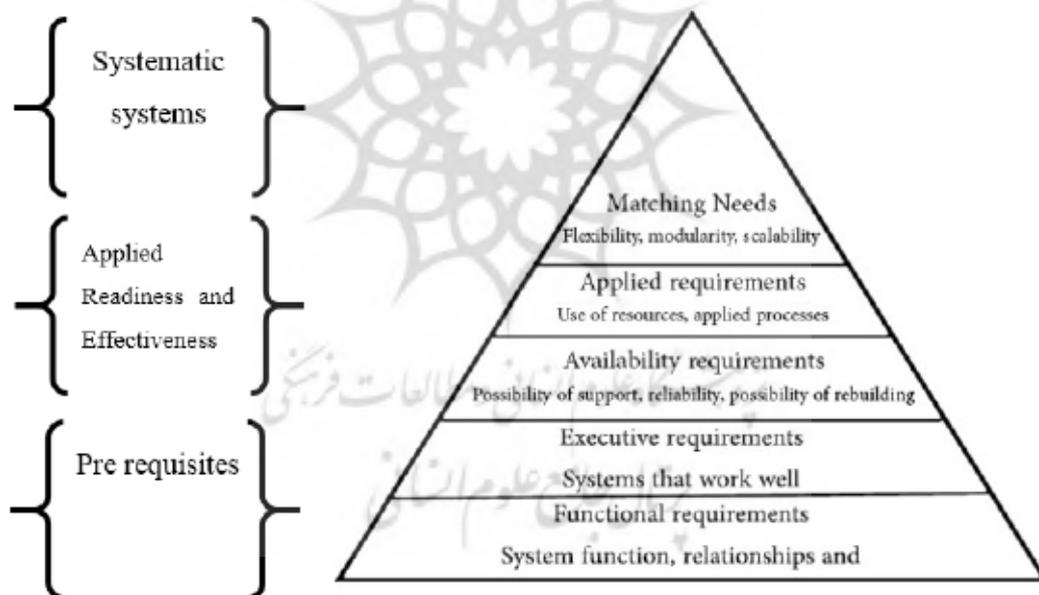


Fig 5: Proposed definition for aesthetics based on theoretical views (Source: Salado, 2013 )

The new hierarchy (fig5) creates some classification which shows that aesthetic level has increased and let us compare the two complexes with different designs. Satisfaction in higher levels of aesthetic is created if first the satisfaction in lower levels be met. For example, in a personal computer set efficiency (consuming less energy) is the basic need and stands at the bottom while quality display of movie is in

higher levels and lack of interruption while running programs stands in the middle of the hierarchy. The basic needs need to be satisfied so that the needs in next level can become the determining factors. Thus meeting the hierarchical needs plays an important role to improve a complex. These needs can be defined in three groups:

1. Prerequisites: the needs that must be met so

that the whole complex is acceptable. If these needs do not meet the complex would be defected. This level arranges the acceptable basis for the complex.

2. Main needs (operational preparation and efficiency): the needs that make us able to have more advantages and profits, sometime more than our expectation, while we are using the complex. This complex includes some of the elements of a satisfactory complex but it still can not satisfy all our needs

to follow a comprehensive goal. In other words, we must seek for an efficient complex not a complex to meet some particular target.

3. Metaphysical needs: the needs that change a complex into a dynamic and alive one. These needs that are consistent to new circumstances and conditions while being developed or used.

For example, in a computer, five ranks for aesthetic properties can be defined (Table 3):

Aesthetic Features	Collection features
Functional needs	Set to work
Executive needs	Now that the collection works, it will perform more powerful processes
Availability requirements	Rarely, its program is interrupted
Functional requirements	The system is not tedious when used
Matching Needs	.The system is such that over time we only have to upgrade it and do not need to replace it

Table 3. Categories of Aesthetic Features in a Computer (Source: Writer)

The present study aims to evaluate the aesthetic from a complex of design by combining particular criteria. This evaluation make us able to provide an aesthetic-based ranking.

**Statement of the Problem:**

**Examining the Architecture of Bazar Based on Levels of Aesthetic Hierarchy**

The word bazar is an enceinte word and it had been used in some of the Persian ancient languages (the list of World Heritage, Bazaar of Tabriz, 2010:47). The world bazaar in mid-Persian first was as “vazar” and was used in combination with “ozarg”( related to bazar) and “vazargan”(trademan). In some cases it was used as “vazhar” (Perochani, 1375: 315).. Inside the cities Bazar was served as a main communication axe and it had been served as the centers of the cities. Main urban spaces such as masques, schools of theology, and many other symbols and urban spaces were in the edge or closes to the bazars and when stretched linearly. In many of big cities the main squares were in line with or next to the bazars. Many Raste (market order) connected the residential neighborhoods

to the bazar and accordingly bazars were accessible to all or most regions in the city. Three main parts are distinguishable in the architecture of bazar with the traditional architecture: a) the secondary alleys or main or secondary passages (Raste). b) The commercial complexes with warehouses and places for trade men for temporary settlement (Khan, Sara or Carevansara, Fandog, Vakaleh, raba). c) The commercial complexes without places for settlements (gheisarie, Timche,bedestan)(Esmaeili & Amrani, 2008: 13). The word “Tim” means caravansary (naserkhosro,1985,13) and Timche means a small caravansary (Fig. 9) (Rafei Sarkeshi and others, 2003: 167). However, in the contemporary century small arched Saray are sometimes called Timche. Timche is sometimes mean a commercial buildings with a garden in the middle and different stores around in one or two floors (Anvari, 2003: 20-22). Both Bazar and Timche were designed for similar needs so that they meet the business functional and performative needs at the same level (Figures 17 and 18). Both have some units and have quite the same developmental costs. The only obvious difference is

that different stores are independent from one another in the bazar while keeping in touch with the ongoing rout of bazar which is used to supply different needs. However, in Timche the stores are centralized and are away from the main route and the relation is indirect. As it was mentioned earlier, the functional

and performative needs in both places are met in a similar fashion that is the quantity and satisfaction are the same. Despite all the similarities in the first and second levels of the hierarchy of needs, they are significantly different in the higher levels.



Figure 9 Picture of the right side of the slot and the left-hand photo of the market (Source: Ganjname, 2004)

**The Needs of Accessibility:** compared to Timche more stores are in direct relation in bazar; this means that in Timche the stores have lesser direct relations and connections to the outsides and this make the complex complicated. Disorder in the function of one unit in the Timche will not disturb the whole complex but any disturbance to bazar disturbs the bazar function. However, economic prosperity or depression has less effect in bazar but this is not the same for Timche. Bazar has different entrances and exits and maintaining and supporting the destroyed units

is easier (easier access to ambulances, firefighters, loading transfer,...). The units' functions are easily distinguishable in bazars. In addition, linear structure of bazar makes it a perfect place for units positioning, the same is more complicated in Timche because it has a more complicated or centralized structure; in the centralized form, some secondary forms like a cluster are around a dominant and central mother form while in the linear structure the forms are arranged as one unite linear form (Figures 10, 11, 12, and 13) (Di ki Ching, 2009, 59).

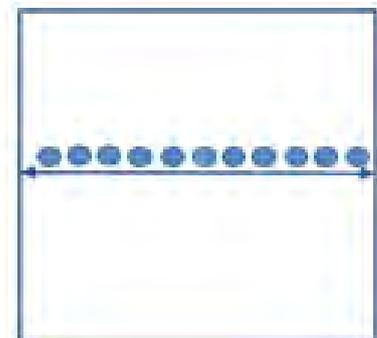
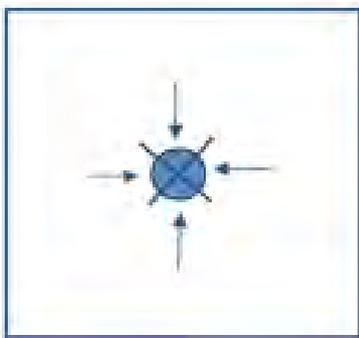


Fig10. Center-Oriented Structure (References: Dic Ching, 2009). Fig11 Linear Structure (References: Dic Ching, 2009).

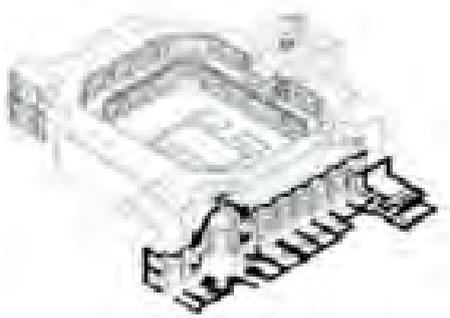


Fig. 12. Central structural unit (Source: Ganjnameh, 2004)

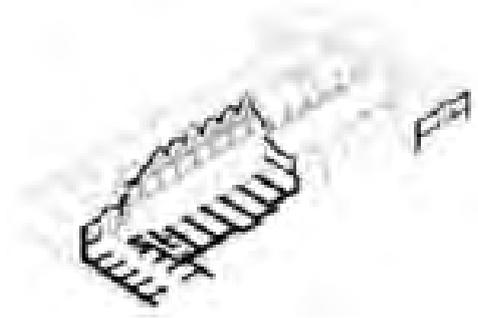


Figure 13 Market with linear structure (Source: Ganjmanet, 2004)

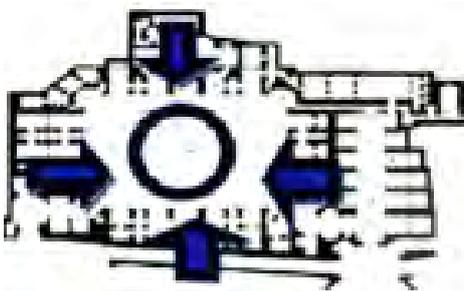


Figure 14. Communications in the plan and section of the municipality (Source: Ganjnameh, 2004)



Figure 15. Communication in the plan and market segment of the Sarajs (Source: Ganjnameh, 2004)

**The Efficiency Needs:** since the units in Timche are indirectly connected with the main axe, this communicative complexity is kind of dysfunction and deficiency compared to bazar (Figure 14).

**Flexibility:** placing space for other functions such as schools, mosques, and even Timche is feasible in bazar architecture (Figure 15). However, Timche has some advantages that cannot be found in bazar; like there are some spaces and platforms for downloading and having more focus on buying and selling. Some times in the past, Timche were served as indoor and

proper spaces for supplying expensive goods as an artistic masterpiece (Amirkhani, 2008). In some of them there was a good visual relation with the nature; particularly the ones with a central garden and spaces for resting and settling. Both physically and visually the platforms were designed to be in the center to relate with the nature but they lack important functions such as high adoptability, availability, and efficiencies. Thus, bazar architecture is superior to Timche regarding aesthetic issues, and having such features made the main bazars in big cities be still alive compared to Timche.

Needs	Architecture bazar	Architecture Timche
Functional needs	+	+
Executive needs	+	+
Availability requirements	+	-
Performance Needs	+	-
Matching Needs	+	-

Table 6. Summarizing the Aesthetic Evaluation (Source: Writer)



Figure 16. Aesthetic Needs Study in Different Market Units (Source: Writer)

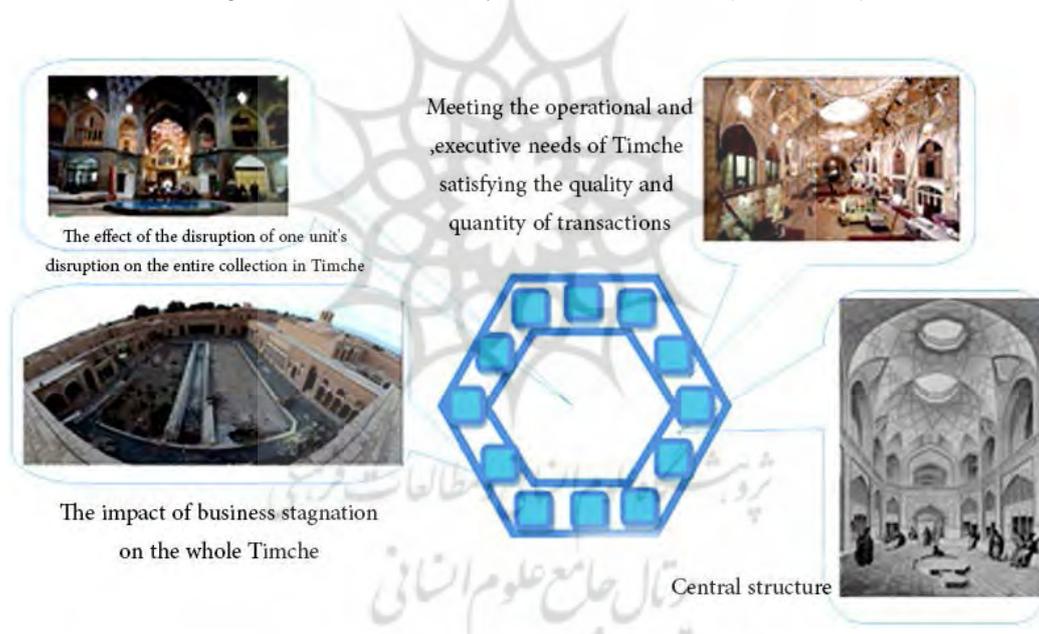


Figure 17. Aesthetic needs assessment in different units of the trench (Source: Writer)

By comparing and contrasting the aesthetic in the Safavid and Ghajar house significant results would be achieved. The traditional houses' entrances had inside-to-outside hierarchy to preserve the safety and privacy as well as providing a gorgeous shade after burst of light and opening space while entering the garden and house. This physical and visual beauty can be classified by the aesthetic hierarchy of needs. The need of access: in houses in Safavid dynasty in Isfahan most of which are for the Armenian settlers in jolfa, Isfahan, the structure is introvert and the ele-

ment of privacy is less clear, perhaps due to religious issues; and that is why the entrance has less twists. While in houses in Ghajar dynasty the entrances have more twists and complications. This shows that houses in the Safavid dynasty were more accessible in principle (Figure 18).

**The need of efficiency:**

the entrance in the traditional houses are mostly served as warehouses for storing foods, or as stables, or platforms for downloading or sitting. One

of the entrance elements in these houses are vestibules served as a waiting room where strangers did not have to be welcomed inside. Sometimes attics which is a room above the cornice of the entrance used to be served as keeping an eye of controlling people entering and leaving the house; suggesting the high efficiency of physical design of the entrances in the traditional architectures. Most of the mentioned elements however, were manifested in the Ghajat houses (Figure 18).

**Flexibility:**

in traditional houses in Isfahan there are some elements like tabestan neshin, Zemestan Neshin, Nar-enjestan, hozekhaneh, and badgir that show they are completely adoptable with the desert climate of Iran and these elements are conspicuous in both Safavid

and Ghajar houses. The mentioned elements were beautiful, functional, and performative. The houses had usually several gardens to meet the more functional needs. The main elements of the houses were divided based on their functions as the following:

- The exterior part that is for the serving the guests and other different visitors and the father is usually sitting there to deal with the routine life.
- The interior part that is for the daily and routine life and usually served for the closer friends and family.
- The Khalvat part for the servicing affairs and used to be a living place for the servants and storage. The separation of the functions in each part created the beauty and despite all different religions in Isfahan, these beautiful designs are completely in line with the principles of the aesthetic.

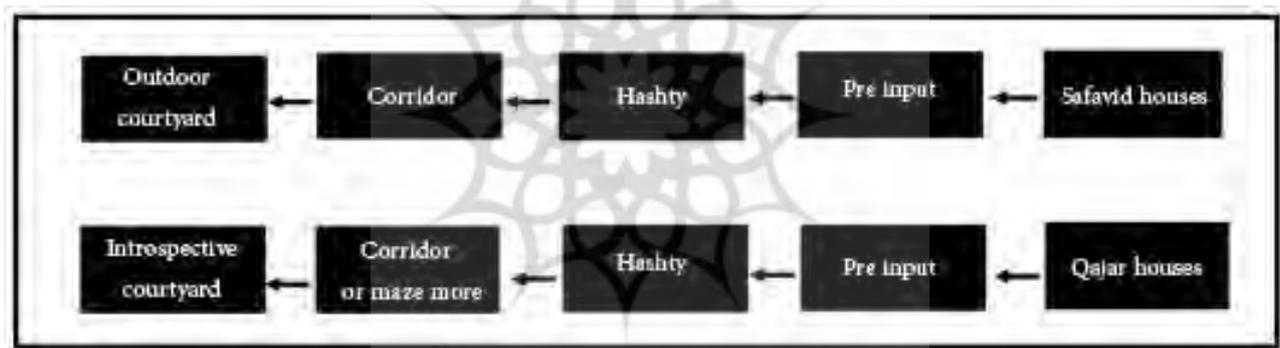


Figure 18. Diagram of the division of inputs into Qajar and Safavid houses (Source: Writer)



Figure 19 Entrance space at Shaykh al-Islam's house (Source: Writer)

Needs	Principles of Safavid Houses Architecture	Principles of Qajar House Architecture
Functional needs	+	+
Executive needs	+	+
Availability requirements	-	-
Performance Needs	+	+
Matching Needs	+	+

Table 6. Summarizing the Aesthetic Evaluation (Source: Writer)

The fundamental needs of architecture were described in the Maslow's hierarchy of needs in a adoptable manner. At the top of the hierarchy, aesthetic is considered as a metaphysical need. The present study aimed to introduce the aesthetic needs based on the Maslow's hierarchy of needs to provide comparison and ranking of two architectural design from the aesthetic perspective. The present study employed the architectural aesthetic hierarchy of needs and compared the architecture of Bazar and Timche in Iran and ranked the estimating degree for the functional needs, efficiency, availability and adaptation in both Bazar and Timche. Table 6 shows the superiority of the architecture of Bazar to Timche. The key factor in this superiority is meeting more needs, access, efficiency, and adoptability in the architecture of bazar. About houses and considering Table 7 almost both Safavid and Ghajar houses have the same aesthetic observation. Regarding the above mentioned points the followings are some suggestions for further studies:

- Validating the positions of hierarchy regarding the aesthetic principles.
- Placing an analytical framework to measure the aesthetic results
- Employing the hierarchy of needs to rank the similar architecture such as stores and shopping complexes comparing to Bazar and Timche
- Using the hierarchy of needs to examine different architecture with local architectural approach such as caravansary.

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