

# Revisiting the concept of contentment with the aim of optimizing space in the architecture (Case study: the contemporary and old architecture of Isfahan)

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**ABSTRACT:** Optimization is a prevalent topic in today's scientific forums, and the field of architecture is no exception. Optimization in architecture aims to optimize available resources and reduce construction costs. What makes it necessary to address this issue in the current situation is the widespread use of inefficient patterns in the design, implementation, or operation of modern buildings, which leads to waste resources. The present study examines architectural samples in Isfahan, referring to the Iranian-Islamic concept of "Ghana'at," which conveys the concept of "satisfaction with less." By extracting instances of contentment in the use of space, the research aims to define effective strategies for optimization in the architectural process. So, this research has been conducted in three steps: Brainstorming sessions to identify instances of optimization in architectural samples, categorization of similar topics to explain effective strategies for optimization using Maxqda software, and finally, prioritization of the solutions based on the opinions of 30 experts in architecture and urban planning who are active in the construction industry in Isfahan through pairwise comparison of criteria. As a result, 15 solutions for optimal use of space in the architectural process were introduced in the form of 5 strategies: "efficiency," "multifunctionality," "environmental friendliness," "self-sufficiency," and "recyclability." The most effective solutions under each strategy were identified as "build as required," "dimensional adaptability of architectural spaces," "preventing ground destruction in the construction process," "fixing Unfavorable dimensions and angles with the help of architectural elements," and "developability of the building."

**Keywords:** *Architecture. Optimization. Optimize space. Architecture with the approach of contentment.*

## INTRODUCTION

On the one hand, The limitations of space, materials, and energy resources and the cost of providing them are why builders and designers strive to optimize the architectural process. Although the topic of optimization has received more attention in recent years, the ancient culture of Iran is no stranger to this approach. In this regard, "contentment" can be noted as one of the specific concepts in Iranian and Islamic culture that has always been praised in religious and literary texts. Referring to Persian and Arabic dictionaries, "satisfaction with less" is the key phrase for explaining this concept. This research aimed to examine the details of Iran's architectural samples to identify examples of optimization and define practical solutions for the optimal use of space in creating new buildings. Therefore, this research seeks

to answer the question, what strategies have Iranian architects used for optimal use of space in the design and construction process? And what solutions can be used to achieve this goal in new buildings? The presence of magnificent architectural examples in Isfahan, whether old or modern and access to these buildings were the motivations behind choosing Isfahan's architectural works as a case study for the present research. Research on the optimal use of space in architecture is important because it helps to preserve the environment and reduce costs in construction. In addition, due to the expansion of the urban areas of Isfahan (such as urban areas reaching Soffeh and Donbeh mountains in the south and southwest of this city), this study is necessary to ensure the optimal use of remaining lands suitable for construction.

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### Research background

The discourse of optimization and efficiency has been raised as prominent topics in contemporary scientific societies. Architecture and urban planning researchers have studied this issue, especially recently.

Previous research about optimization in architecture and urban planning mainly directs the discourse toward building energy consumption. [Table \(1\)](#) briefly overviews some research done in this field.

Table 1 - examples of recent research about energy consumption optimization in building

	Researchers	Publication	Research Topic
1	Pillay & Saha	2024	a review of optimization techniques for effective energy efficiency in building consumption
2	Han et al.	2024	renovation of historic buildings in China with solar systems as an optimization exercise
3	Xie	2022	optimizing topology or geographical location for architectural design
4	Wortmann et al.	2022	investigation of various aspects of simulation-based optimization in architecture and civil engineering
5	Ahmadi Soleymani et al.	2022	investigating architectural, HVAC, and managerial solutions in optimizing building energy consumption
6	Shayanian & Mozafari	2022	investigating the benefits of using atriums and traditional vaulted ceilings in optimizing building energy consumption
7	Liu & Rodriquez	2021	optimizing renewable energy systems in a residential building
8	Ameur et al.	2020	optimizing thermal and lighting energy performance of a residential building in northern Morocco
9	Taleb et al.	2020	optimizing building form to reduce received solar radiation
10	Wortmann & Fischer	2020	investigating whether architectural design optimization requires multiple objectives
11	Ansarimanesh et al.	2019	determining the optimal orientation of buildings in cold climates to reduce energy consumption
12	Fallah	2019	determining the optimal window-to-wall ratio for optimal utilization of sunlight
13	Molaei et al.	2019	determining the optimal ratio of openings for energy consumption reduction in buildings
14	Mirmasoumi et al.	2018	investigating the impact of energy consumption optimization in buildings on quality of life
15	Houd et al.	2018	optimizing double skin facades to achieve thermal comfort
16	Zahri et al.	2017	determining the location of building placement in a residential complex with the aim of optimal use of solar and wind energy
17	Sokhandan et al.	2017	optimizing the geometry of architectural spaces to achieve better thermal performance
18	Sokhandan & Khanmohammadi	2015	optimizing fixed walls on sun-exposed facades to reduce building energy consumption

About the concept of "contentment," valuable research has also been conducted in recent years. For a better understanding of this concept, you can refer to the study of [Mahvash & Saadvandi \(2019\)](#). However, the authors of the mentioned article have refused to pursue examples of contentment in architecture. Saadvandi and Mahvash investigated the characteristics of influential people, design, and implementation process on contentment in the architectural process. They identified "awareness about limits of discretion," "avoidance of excessiveness," "acceptance of limitations," and "avoidance of bias" as features of influential people in avoiding greed in architecture. [Heydari & Ghasemian \(2019\)](#) investigated the results of the concept of contentment in traditional Iranian houses, specifically the house of Mortaz in Yazd; they depicted it in four principles: "avoidance of extravagance," "self-sufficiency," "moderation,"

and "the principle of harmlessness." [Peyvastegar et al. \(2017\)](#) also mentioned the principle of avoiding wastefulness in their recognition of the five-fold principles of Pirnia in the architecture of traditional Iranian houses, attributing it to the ideological foundations of Islam. [Saadvandi \(1999\)](#), in his doctoral thesis titled "Architecture with Contentment," after examining the meaning of contentment, defined the practical criteria of this concept in architecture. Related to contentment, research has also been conducted on economic stability. For example, the architectural and economical approach to low-rise housing to achieve economic stability and sustainable development ([Yashchenko et al., 2023](#)) is an example of the research done in this field.

[Table \(2\)](#) provides a brief overview of the research conducted on contentment.

Table 2 – examples of recent research about the concept of contentment in architecture

	Researchers	Publication	Research Topic
1	Khasm Afkan Nezam & Tahbaz	2023	recognition and conceptualization of the expression of contentment culture in Guilan rural society and architecture
2	Yashchenko et al.	2023	Architectural and economic approach to low-rise housing to achieve economic stability
3	Heydari & Ghasemian	2019	examining the feasibility of the concept of contentment in the pattern of traditional Iranian houses
4	Saadvandi & Mahvash	2019	investigating the characteristics of influential people, design and implementation process in contentment in the architectural process
5	Peyvastegar et al.	2017	recognition of the fivefold principles of Pirnia in the architecture of traditional Iranian houses
6	Seryani	2002	master's thesis: investigation of the effects and results of the contentment approach in residential architecture
7	Saadvandi	1999	doctoral thesis: examine the meaning of contentment and elaboration of practical architectural criteria derived from this concept

### Research innovations

The new and innovative aspect of the current research is that this research will complete the previous research and fill the gap of previous studies on the optimization of architecture or contentment in architecture, which has especially dealt with design solutions. Also, looking at traditional architecture from the point of view of contentment and economy and analyzing its physical structure is a subject that has been less considered in previous research. Also, the current research is innovative because it focuses on space optimization in creating architectural works.

### Theoretical foundations of the research

#### Space as an essential element in creating an architectural work

In the process of creating an architectural work, the space is needed to include the building, the idea is needed to be the source of plans, the materials are needed to form the mass, and the experts are needed to carry out the construction process. Each of these elements has a unique role in this process; the absence of any of them will prevent the creation of the final product. Space, as the foundation for shaping the design, is the focus of this research. Initially, it may seem that there is no limitation in this regard due to the vastness of Earth, But a closer look and attention to the necessity of construction in lands that are unsuitable for agriculture and the significant costs of providing new infrastructure in urban areas shows that it can be a serious subject. In other words, the available land for construction is limited, and their expansion can bring economic or environmental costs; also, this limited amount is not fully available to the current generation. Like any other resources, suitable lands for construction must be utilized so that future generations can use them.

#### Optimization

The concept of optimization means planning for the best result under certain conditions, especially in architecture and civil engineering; it is related to all processes, including design, construction, operation,

and even maintenance (Mei & Wang, 2021). While several pieces of research have been done regarding optimization and architecture, daylight, structure, and geometry are the three top features architects are interested in optimizing. Robust optimization processes could significantly reduce carbon footprint and material use and increase the energy efficiency of future architecture (Cichocka & Browne, 2017). One of the meanings of "contentment" in Persian dictionaries is frugality (Moein, 1997). Saadvandi believes that while many may equate contentment with frugality (Saadvandi, 2009), contentment is an intrinsic trait, and frugality is just one of the tangible aspects of an individual's behavior. Frugality refers to the appropriate use of resources (Arghavani Targhdari, 2020). Because the process of creating architectural works includes many complex processes that may be aligned or in conflict with each other, the goal of optimization in architecture is to find the optimal point.

#### Contentment

The increased consumerism and stress caused by excessive consumption have caused some to seek alternatives to achieve more meaningful and balanced lives. Contentment or Qana'ah (in Arabia) is a central tenet in Islam teaching. It refers to satisfaction and gratitude for what one has, regardless of the amount or quality of possessions. This concept is deeply rooted in the belief that true wealth and happiness come not from material abundance but from a sense of spiritual fulfillment and gratitude toward Allah's provisions. According to Islamic teachings, contentment reduces greed and strengthens faith. Quran And hadiths are full of references that encourage Muslims to be satisfied with what they have and trust in the wisdom of God (Ahmad & Waheed, 2024). Simplicity, effectiveness, and productivity in doing the job are Qana'ah or contentment (Haron et al2020 ,). As the Caliph of Allah, humans are allowed to exploit nature, but according to the principle of contentment, they should be guardians of nature and natural beauty. If humans do not understand the principle of contentment, using nature destroys nature. As a result of damage to nature, no trace of nature will remain (Syefriyeni & Nasrudin, 2023).

Contentment marks happiness, richness, and peace of mind (Al-Shalabi, 2017). contentment denotes the condition where one is satisfied with something and has sufficiency for one's needs (Ali, 2014). In the Persian dictionary of Dehkhoda (1931) and the Persian dictionary of Moein (1997), the word contentment is defined as satisfaction, acceptance, and frugality (Dehkhoda, 1931). Although a search for this concept in Arabic and English dictionaries reveals a variety of meanings, the general scope of definition remains the same. Contentment is a holistic and multi-dimensional concept that includes the concepts of minimalism, economic sustainability, economic saving, and optimization, and this research has tried to examine these concepts as well. The key phrase in the definition of "contentment" is "satisfaction with less," which is the basis of the current research approach.

In summary, since contentment is a human act, people should use the minimum number of resources and facilities to create conditions that lead to satisfaction. Saadvandi believes that while, according to the general opinion, a satisfied person settles for less, contentment requires satisfaction. A person who settles for less while being unhappy has surrendered to his weakness and cannot do more (Saadvandi, 2009). Planning and budgeting are important techniques to achieve contentment; having a clear and regular schedule helps people use resources best. A rational plan helps to identify and eliminate unnecessary expenses so that credit can be spent on necessary items. (Hosseinzadeh, 2010).

#### Contentment in architecture

Just as humans influence their environment based on their wisdom and philosophy of life, the environment also affects human behavior and thoughts (Mahvash & Saadvandi, 2019). Iranian architecture isn't stranger to this concept; contentment can be considered one of the principles and foundations of traditional Iranian architecture (Naghizadeh, 2000). Unfortunately, rarely there is evidence of it in contemporary architectural works. Contentment as a cultural factor in Iranian architecture allows optimal use of natural resources and fosters human dignity (Naghizadeh, 2000). Tahbaz & Jalilian emphasize the importance of contentment in architecture and consider it one of the ten reasons for the sanctity of Islamic architecture, which has given a sublime quality to Iranian Islamic architecture (Tahbaz & Jalilian, 2016).

#### MATERIALS AND METHODS

The present research was conducted in three consecutive phases. In the first stage, prominent architectural works of Isfahan province and library documents were examined in brainstorming sessions in groups of two or more; in this case, examples of optimization in design and construction were identified and extracted. The findings of each session were presented as an introduction to the subsequent sessions, and in each session, items were added to the previous data until theoretical persuasion was formed. Despite the efforts of the session members, no new indicators or criteria were added to the subject. Brainstorming is one of the techniques for fostering group creativity by which ideas and thoughts are shared among members spontaneously to reach solutions to practical problems. Brainstorming was introduced in 1957 for the first time to increase creativity in corporate settings.

Later, its application expanded to various areas and settings, including higher education, where it was commonly used to generate ideas, clarifications, and solutions. As a result, the brainstorming sessions became more appropriate for increasing productivity in a learning-specific situation (Al-Samarraei & Hurmuzan, 2018). Selecting Isfahan as the case study for this research was first due to the richness of this geographical area in terms of architecture and second to the researcher's access to these works to enhance the quality of field studies. The extracted examples were categorized based on existing similarities using Maxqda software in the second phase. In the third phase, to explain the priority of optimization strategies, 20 architecture and urban planning experts with master's or PhD degrees in the construction industry in Isfahan were asked to prioritize the introduced strategies by pairwise comparison method. Finally, the priority of the strategies was determined based on the entropy method.

#### RESULTS AND DISCUSSIONS

##### Build as much as needed

One of the characteristics of studied works in this research was the architect's attention to the inhabitants' needs and providing an appropriate response to these needs in the form of architectural design. For example, in the "Tak-Tagh house" (Fig.1), based on the architect's precision in determining sizes, all necessary spaces for a residential house have been provided on a piece of land smaller than 90 square meters in Najaf Abad. In this building, the bedrooms' height has been considered shorter than the living room so that residents could use its roof as a complementary space to the small courtyard of the house. "Build as much as needed" or, as Seryani (2002) calls it, "the ability to understand sizes" is a solution for the optimization of space in architecture. This subject is so important from the perspective of Islam, so in the Quran, as the main source of Islamic thought, the physical form of the universe is called "Qadr," which means "measure" (Bukhari, 2011; Ziaenia & Hashemi Zarjabad, 2016, 91), also in the interpretation of verse 3 of Al-A'la it is stated that God has created everything with a specific size and defined limits (Ziaenia & Hashemi Zarjabad, 2016). Mahvash and Saadvandi listed the correct recognition of the user's needs and appropriate response to them through the architectural space with the necessary and sufficient number and size as one of the indicators of contentment in architecture (Mahvash & Saadvandi, 2019). Mortaz Hejri et al., after examining the remaining houses from the Pahlavi era in Rasht, pointed out large rooms that were used for banquets and small spaces similar to basements, which are very low in height due to their function for storing tools and firewood (Mortaz Hejri et al., 2022).

##### Reducing Underutilized Spaces

Another feature observed in examining the samples was the architect's effort to reduce the underutilized and secondary spaces. The result of saving space in the allocation of secondary uses is to leave more space for primary spaces of the building. Fig.2 shows the terrace stairs of the Tabatabaei house in Kashan. Because this space is categorized in the secondary spaces of the mansion, the architect aimed to reduce the volume occupied by this architectural element, reduce the width and

depth of each step, and add to its height. Since houses have become smaller, the need to reduce underutilized spaces in buildings is felt more than ever (Yousefinezhad & Mahmoudi Zarandi, 2018).

#### Allocation of space based on expectations

Another feature observed in the examined architectural works is the placement of each space based on the expected desirability. Generally, the spatial organization of residential units is influenced by three main

factors: lighting, proportions, and entry location (Mohajer Milani & Einifar, 2019). Therefore, the utilization of natural light, appropriate dimensions and angles, spatial connections, and privacy are among the most important qualities that determine the desirability of space. Architects prefer positive features such as using natural light to be assigned to primary spaces. In Fig.3, related to the "Mahale-Jolfa house" in Isfahan, the living room is located on the south side to use the natural light and pleasant views of the yard.



Fig.1 - Tak-Taagh house in Najafabad  
(Source: CAOI Website)



Fig.2 - Tabatabaei house in Kashan  
(Source: Researcher)

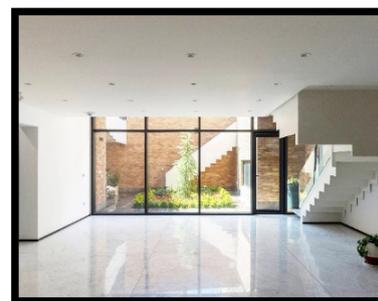


Fig.3 - Mahale-Jolfa house in Isfahan  
(Source: CAOI Website)

#### Utilizing flexible spaces in terms of functionality

Herzberger believed that what makes old houses a better environment for living is the ability to use their rooms for various activities (Mardomi & Zandave, 2015, 99). Numerous examples of multi-functional spaces were observed in the studies of this research. For example, in Fig.4, the triple-door room beside the "Kahkeshan house" 's main courtyard can be used as a bedroom, workroom, guestroom, children's playroom, study room, or storage. Mortaz Hejri et al. mentioned equivalent rooms in Qajar houses in Rasht that can serve as a place for rest, dining, and hosting guests at different times of the day (Mortaz Hejri et al., 2022). Meanwhile, contemporary architecture has shifted towards turning rooms into private spaces, and rooms have lost their former functional flexibility. In old Persian houses, rooms were named based on their location, such as upper rooms facing the Qibla, or their physical layout, such as triple-door and five-door rooms. However, in contemporary homes, naming rooms like bedrooms, workrooms, living rooms, and dining rooms implies their exclusive function for specific and limited activities (Motaghedi et al., 2021). Flexibility of functional roles in architectural spaces, especially in new small apartments, has become even more crucial.

#### Utilizing flexible spaces in terms of dimension

Dimensional flexibility was another form of spatial flexibility observed in the field studies of the present research. This feature allows for creating spaces with varying dimensions according to the needs of the house occupants. This strategy has been implemented in two different ways around the central courtyard of Tabatabaei house. There are five consecutive rooms on the eastern side of the main courtyard of the mansion. Each room is connected to the adjacent room via a two-wing wooden door, as shown in Fig.5. The arrangement of the rooms in a straight line and their interconnection

through intermediate doors allows occupants to create five separate small rooms by closing the intermediate doors, or open each door and merge two rooms to create a larger space for hosting special events. Another method to achieve dimensional flexibility in the Tabatabaei house is integrating a room with the adjacent semi-open space by opening the intermediate door and creating a larger semi-open space or separating the room and the terrace by closing the same door. Motaghedi, in a study on the impact of architectural differences between old and new houses in Abadan on the occupant's lifestyle, emphasized the potential of old houses to expand and combine component spaces to create diverse spaces and host larger gatherings (Motaghedi et al., 2021).

#### Allocating new roles to underutilized spaces

"Tak-tagh house" is a contemporary architectural work in Isfahan. This house has been placed on a piece of land smaller than 90 square meters and used about eighty percent of its area for the building, so it has a very small courtyard. In response to this limitation, the architecture designer added a part of the rooftop to the courtyard, as shown in Fig.6, and expanded the house courtyard to the rooftop. This example presents new roles for underutilized spaces in the case study of this research. Just as the main rooms of a house with minor changes in arrangement can host various activities such as reading, resting, dining, and sleeping, underutilized spaces like the rooftop, lobby, and staircase can also host new activities with proper planning. The courtyard in a traditional Iranian house relies on its privacy, and it could host many indoor activities if the weather conditions were suitable. This space could be used for sleeping, family gatherings, children playing, and hosting guests (Motaghedi et al., 2021). Using the rooftop space to sleep on summer nights is another example of this solution for creating multi-purpose spaces in traditional Iranian houses.



Fig.4 - Kahkeshan house in Isfahan  
( Source: Researcher)



Fig.5 - Tabatabaei house in Kashan  
(Source: Researcher)



Fig.6 - Tak-Taagh house in Najafabad  
(Source: CAOI Website)

**Avoiding land destruction in the construction process**

During this research, many examples were found of architects trying to avoid land destruction in the construction process. Niavaran Residential Complex (Fig.7) is one of the outstanding contemporary architectural works whose initial idea was to preserve the old trees on the site. According to the information reflected on the website of the Zandigan Architecture Office, this zone included approximately 120 trees around 60 years old, and the municipality issued a permit to cut down 45 trees within the sixty percent construction boundary. However, the design team decided to preserve all the trees on the site by reducing the construction by nearly 2000 square meters. Unfortunately, illegal villa constructions in the agricultural lands on the outskirts of Isfahan are common due to the low price of agricultural lands in this area. In the long term, this process will cause damage to nature, bringing irreparable costs to a large population of occupants. Generally, in recent decades, rapid urbanization has expanded the boundaries of cities, often fertile agricultural lands and orchards, into the urban area. Changing land function from agricultural causes environmental problems and reduces cultivated lands for food supply (Meshkini & Teimouri, 2016).

**Integration with nature**

Integration with nature is another prominent feature among the case studies of this research. Today, with the continuous development of cities and the expansion of urban boundaries away from their core, the construction area often reaches natural elements such as mountains, forests, and rivers. However, the central core of Isfahan City was formed near the Zayandeh-Rud River; nowadays, the city boundaries on the south and southwest of the city reach the mounts. The transformation of the natural landscape of Mount Soffeh in the south of Isfahan for road construction, as well as the construction of high-height apartments near Mount Qaemiyeh and Mount Donbe in

the southwest of this city, are examples of urban projects in the last two decades where parts of the natural environment including trees and vegetation cover have been removed for their implementation. However, among contemporary architectural works, there are many examples where the solution of integration between the architectural structure and its surrounding nature has been pursued. "Shahrasb farm and villa" is an example that follows the path of integration with the surrounding nature. As seen in Fig.8, the Shahrasb is a short, brick-built structure established in an untouched plain where agriculture and livestock farming are predominant.

**Development under the ground and reducing the effective height of the building**

In some existing buildings like "Villa 131" in "Zeytoon Village," the architect has managed to reduce the effective height of the building on the ground by developing horizontal layers below ground level. This solution is also seen in buildings like "Rasoulia House" in Yazd or "Agha-Bozorg Mosque" in Kashan, which not only provides the opportunity to utilize the coolness of the ground in hot and dry areas but also effectively reduces the building height on the ground, resulting in better integration of the architectural form with the surrounding natural environment. Increasing the number of high towers in industrial cities and developed countries hides elements of nature from urban areas; for example, in some areas of New York, including Manhattan, even watching a small portion of the sky has become difficult. Although the idea of creating a lower level than the ground floor in "Villa 131" was shaped by the height restrictions in the building regulations of the area, the result was respect to nature due to the creation of an appropriate skyline and a wide view of the sky in the captured images of the building. A cross-section of the building is presented in Fig.9 to illustrate its expansion below the ground line better.



Fig.7 - Niavaran complex in Tehran  
(Source: Zandigan Office Website)



Fig.8 - Shahrasb farm & villa in Ziyar  
(Source: CAOI Website)

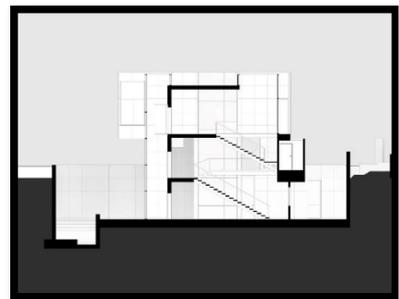


Fig.9 - Villa 131 in Zeytoon Village  
(Source: CAOI Website)

### Self-designed

means that the design's main features influence the structure's details. Eliminating redundant spaces or unsuitable angles in the interior spaces of a building is a valuable outcome of this approach. The "Fara Tahghigh Sepahan Company" office building is a contemporary architectural work where the overall form and interior spaces are entirely influenced by the dimensions and angles of the land allocated for its construction. This building is situated in a triangular position adjacent to a curved road, so the architect utilized fluid lines to shape the building, creating harmony between the form of the building and the shape of the land. This approach optimizes all spatial potential on the site with minimal space wastage without imposing sharp or unsuitable angles for interior spaces, as shown in Fig.10.

### Covering the undesirable features of the space with architectural elements

On the east side of "Hakim Mosque" in Isfahan, the land is integrated through varying-depth porches (Fig.11), also in some buildings like the "Constitution House" in Isfahan that one of the edges is not in a straight line, a wall with variable thickness along its length can hide this issue. Another correction method for the dimension of construction land is using secondary spaces at the point that needs correction. In this way, the quality of secondary spaces would be sacrificed to provide and

guarantee the desired dimensions and angles for the main spaces. This technique aims to reduce the impact of unsuitable angles of the land on the main spaces of the building and avoid creating wasted spaces.

### The principle of contextualism

The principle of contextualism has been observed across many cases examined in this study. Contextualism is an approach that focuses on the specific characteristics of the site and its influences on architectural design. The principle of contextualism emphasizes that every building will be part of context and influences subsequent constructions. Contextualism in architecture refers to compatibility with the environment's physical, historical, social, and cultural context. Contextualism in architecture refers to subjects such as distance from other buildings, the combination of building forms, the shape of the skyline, facade proportions, the shape of doors and windows, size and proportion of openings, materials, colors, and small-scale elements (Golshan & Mahmoudi Kamelabadi, 2019). Adhering to contextualism ensures that most of the structure's physical characteristics and visual details are derived from the surrounding environment. The low height of "Tak-tagh House" and using white facade materials (Fig.12) are examples of attention to the principle of contextualism in the construction of this contemporary building.

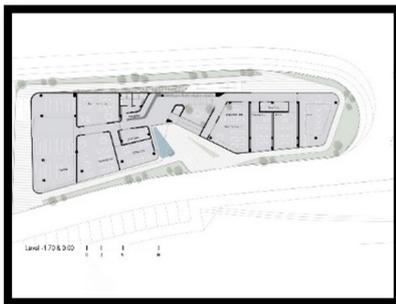


Fig.10 - Fara Tahghigh office in Isfahan  
(Source: CAOI Website)

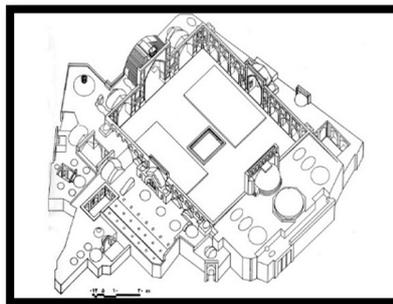


Fig.11 - Hakim Mosque in Isfahan  
(Source: Heritage organization docs)



Fig.12 - Tak-Taagh house in Najafabad  
(Source: CAOI Website)

### The possibility of reviving over time

If architectural works are designed to meet the evolving needs of humans and society over time, the possibility of reviving the building and extending its effective life after a period of operation can be achieved through minor changes in the renovation process. Ignoring this aspect in the architectural design process may create buildings that are excluded from the cycle of use when encountering potential changes in the community's lifestyle. Most of the old houses, which were originally built to host a large family, have been abandoned due to the reduction in family size, the desire to purchase independent housing, and the increase in maintenance costs, and renovating them for reoccupation is unfeasible based on the needs of today's families. The "Ghaeli House" was one of the buildings on the brink of demolition due to years of lack of maintenance. This building was renovated at a low cost about 10 years ago, considering its valuable spatial qualities

and continuing to be a place for hosting gatherings. Fig.13 shows the building's condition after its revival, showing the preservation of the structure's originality during renovation.

### The possibility of reviving by changing the functions

This feature refers to a potential in the structure that provides the possibility of using it as a new function to increase the effective life of the building. Some of the old Iranian houses, having lost their original function due to changes in people's lifestyles, nowadays host various functions such as educational centers, ecotourism centers, cultural centers, and more. Currently, the "Hovanes House" in the Jolfa neighborhood in Isfahan transformed into a food complex, the "Safavi House" in Khaghani Street in Isfahan has been converted into a cultural and artistic complex, the "Qazvini House" on Ibn-Sina Street in Isfahan repurposed into an office for the Cultural Heritage Organization and

the "Ameri House" in Kashan turned into a motel. Fig.14 provides an interior view of the "Pink Platform Building" on Chaharbagh-Bala Street in Isfahan, which, through a renovation process, transformed 17 square meters of an abandoned warehouse into an innovative workspace.

**The potential for horizontal or vertical scalability:** A house that provides enough space for a young couple may no longer be enough to host their activities after their first child's birth. Similarly, an office that currently meets the needs of operating a small company may not

be able to respond after the expansion of the company's operations and the appearance of new departments. In these situations, the capability of horizontal or vertical expansion of the building becomes valuable to adapting the structure to the new requirements of its occupants. Fig.15 illustrates the Mohammad restaurant garden project in Dorche, which aims to add service spaces such as sanitary facilities, prayer rooms, and rest areas in the corner of the restaurant garden. The possibility of creating new spaces in this project has been indebted to the horizontal scalability of the architectural design.



Fig.13 - Ghaeli house in Isfahan  
(Source: CAOI Website)



Fig.14 - Pink platform in Isfahan  
(Source: CAOI Website)



Fig.15 - Mohammad's garden in Dorche  
(Source: CAOI Website)

According to the findings, in realizing architecture stems from contentment, the architecture of buildings must be recyclable, scalable, and able to recover over time and with changes in performance. Also, it should be self-sufficient and shaped according to the formal potential and the ability of materials to create diverse designs. The spatial distribution and spatial organization of buildings should be adjusted following the capabilities of the land in terms of shape, geometry, and functional characteristics in achieving climatic comfort or appropriate views and landscapes. They should also be formed with respect for the context and be nature-friendly. This type of architecture should prevent land degradation, lead to the principle of development on land, and reduce the effects of congestion. Be in tune with nature and use nature as a design opportunity. Be multi-purpose. It should be able to change in dimensions and size to suit the space's type of use and function at different times and conditions. Spaces should be adaptable and designed for functional change and acceptance of new functions. They should also be flexible in performance, which requires attention. Also, the buildings' architecture should follow the principle of thrift. Building to the size of the need, reducing underused spaces, and locating functions inside the building based on locational desirability are among the factors affecting its realization.

## CONCLUSION

In recent years, the downsizing and mass construction strategy has been the dominant policy in providing housing for low-income groups. Although mass construction is a solution to control the cost of construction from a technical and operational perspective, the miniaturization and reduction of human living space have adversely affected the security and safety of societies. Architecture that stems from the concept of contentment does not consider reducing living space and downsizing as a reasonable approach to overcoming the housing crisis. Contentment does

not mean minimalist thinking; it is a process that tries to maximize the capabilities of a phenomenon.

After that, prominent architectural works of Isfahan province and library documents aimed at finding contentment samples were examined in brainstorming sessions in groups of two or more, and 15 strategies for space optimization in the architectural process were extracted. These strategies were categorized into five main strategies: "efficiency," "multifunctionality," "environmental friendliness," "self-sufficiency," and "recyclability," based on their similarities and differences, Table (3) was obtained. Then, to explain the priority of optimization strategies, 20 architecture and urban planning experts with master's or PhD degrees who were involved in the construction industry in Isfahan were asked to prioritize the introduced strategies by pairwise comparison method. The value of each strategy under the five-fold strategies is also reflected in Table (3).

Based on current research, five main strategies of efficiency, multifunctionally, environmental friendliness, self-sufficiency, and recyclability have been defined for optimizing the space as one of the fundamental components of architectural works. For each of the mentioned strategies, three fundamental solutions were extracted from the heart of the research case studies. According to the opinions received from 20 architecture and urban planning experts with master's or PhD degrees who were involved in the construction industry in Isfahan, "build as much as need," "utilizing flexible spaces in terms of dimension," "avoiding land destruction in the construction process," "covering the undesirable features of the space with architectural elements" and "the potential for horizontal or vertical scalability" were identified as the most effective solutions under each strategy to achieve a convincing approach aim to optimization use of space utilization during the construction process of architectural work. Table (4) includes guidelines for implementing the mentioned solutions in architectural works' design and construction process.

Table 3 - Comparison of the weights of extracted solutions for each strategy based on expert opinions

Strategies	Solutions	Weight
Efficiency	Build as much as needed	0.447
	Reducing Underutilized Spaces	0.364
	Allocation of space based on expectations	0.189
Multifunctionally	Utilizing flexible spaces in terms of dimension	0.357
	Allocating new roles to underutilized spaces	0.326
	Utilizing flexible spaces in terms of functionality	0.317
Environmental Friendliness	Avoiding land destruction in the construction process	0.407
	Development under the ground and reducing the effective height of the building	0.341
	Integration with nature	0.252
Self-Sufficiency	Covering the undesirable features of the space with architectural elements	0.367
	The principle of contextualism	0.347
	Self-designed	0.286
Recyclability	The potential for horizontal or vertical scalability	0.36
	The possibility of reviving over time	0.332
	The possibility to revive by changing the functions	0.308

Table 4 - guidelines aim to implement the mentioned solutions in the design and construction process of architectural works

Efficiency
Determining the dimensions of each microspace based on the standards
Removing unnecessary microspaces from the list of spaces
Avoiding the unnecessary increase of communication spaces
Avoiding creating unusable spaces in landscaping
Allocation of light and natural ventilation to the main uses
Attention to access for service spaces
Multifunctionally
The possibility of merging internal spaces to increase dimensions
The possibility of expanding the interior space to open and semi-open space
Using the rooftop space for outdoor dining
Hosting events in backyards
Prediction of nameless spaces within the building
Designing rooms with the ability to host various activities
Environmental Friendliness
Use of inappropriate land for agriculture in construction
Attention to the value of trees in soil stability during construction
A sampling of garden pit patterns in a hot climate
Starting construction from below the ground level and reducing the height
Attention to the importance of the skyline in the quality of the city's appearance
Use of materials compatible with the environment
Self-Sufficiency
Placing sub-spaces in the place of sharp and inappropriate angles of the plot of land
Placing equivalent spaces with different depths at inappropriate angles of the plot of land
The influence of the condition of adjacent buildings on the proportions of the façade
Repetition of decorations and architectural elements used in nearby buildings
The effect of the overall shape of the plot on the shape of the interior spaces
The effect of the overall shape of the plot on the layout of the interior spaces
Recyclability
The possibility of increasing the number of rooms in the house
The possibility of dividing spaces into smaller spaces
The possibility of converting large and old houses into smaller units
Reconstruction of some parts of old houses for temporary accommodation
Converting vast traditional buildings into ecotourism centers
Transforming abandoned factories into art and cultural centers

## AUTHOR CONTRIBUTIONS

Ehsan Abbasie categorized and analyzed the research data. He was responsible for preparing the written version of the article and the images and tables related to the text and making corrections according to the comments of the editor and reviewers. Islam Karami managed the research literature, continuously reviewed and revised the research method, and was responsible for the accuracy of the research process and results.

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## CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the authors have witnessed ethical issues, including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy.

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