

Original Research Article

## Reading the Configuration of Saad al-Saltaneh Historical Complex of Qazvin with an Emphasis on the Shape and Position of Spatial Physical Elements

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**Abstract** Historical places, as important and attractive parts of the city, always have importance, identity, and personality as tourist destinations. One of the results of the optimal organization of such spaces is the mental permanence of the spatial experience, which shapes the location of social interactions and repeats the audience's visit. The current research aims to analyze the physical and spatial components of urban complexes to improve their readability and increase the number of visits and use. This research was conducted with a combination of analytical and descriptive methods, logical reasoning, and a case study, and the data collection tools were field observations and library studies. To analyze the data regarding the spatial relations of the case study, the specialized software Depthmap has been used. The restoration efforts of Saad al-Saltaneh complex in recent years have turned the search for concepts of its spatial structure as a dynamic space in an original format due to the continuous presence of citizens into a subject worthy of reflection. The results of the research show that the physical and spatial components affecting readability and, as a result, increasing visits to historical places include selectivity of space, visibility, and visual and movement permeability. These factors have been effective in increasing the number of visits by creating wide and multi-directional fields of view in the focal parts, creating the shortest connecting routes between important internal destinations, and paying attention to the proper organization of the entrances in historical context.

**Keywords** | Spatial Structure, Readability, Readability, Space Syntax, Saad al-Saltaneh, Qazvin.

**Introduction** Legibility is a quality that is taken into consideration to read the environment and positioning, which will make the urban space clear and the observers will remember the image of the city. This component provides the ability to understand the place at the two levels of physical form and activity pattern (Bentley, 2018, 113). A readable environment is an environment that responds to the needs of safety and orientation, which is shaped by factors such as the simplicity of spatial organization through two-dimensional information and the presence of signs through three-dimensional

information in way-finding. Therefore, legibility depends on the geometry of the space. In Lynch's viewpoint, legibility depends on easy recognition of the environment components and their connection in the mind in a coherent format. In fact, the shape and form of any place is a complex combination of physical and non-physical characteristics such as the flow of movement and activity (Lynch, 2016, 457). By clarifying this statement that the criterion for recognizing the spatial structure is the existence of a relationship resulting from the connection between its parts and elements, Godoy believes in the existence of a hierarchical structure between the

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elements based on the relationship between the part and the whole until the formation of a coherent whole from the physical form (Godoy-Shimizu; Steadman & Evans, 2021, 94). In other words, physical coherence makes it easier to understand the structure of the space, and the analysis of the elements in the configuration and the role of the shape and position of the structural components will be effective in improving readability. Considering the importance of the visit-ability of historical places and its role in the functional quality and enhancing the identity and credibility of each city, in the present research, the structural components affecting readability have been investigated to evaluate them and create a suitable platform for the purposeful physical organization of existing historical contexts. Therefore, the historical complex of Saad al-Saltaneh of Qazvin was chosen as a sample to be studied to investigate the role of physical components and various factors such as the shape and location of spaces and elements in facilitating or making it difficult for urban tourists to read and recognize this complex. This research aims to search and analyze the physical and spatial influencing factors on the number of visits to historical places by relying on the theory of environment readability. In other words, to obtain the physical and spatial components of the studied complex and urban tourism complexes in general on improving readability and as a result increasing the number of visits and use of them, existing theories and definitions and the results of previous researches were used to achieve the research purpose that is the analysis of these components in line with the ease of readability. The research question is what is the relationship between the shape and position of the physical and spatial elements of the configuration and the improvement of readability in the historical complex of Saad al-Saltaneh of Qazvin? As mentioned in the abstract, the research purpose is to analyze the physical and spatial influencing components of urban tourism complexes on improving readability. Therefore, the relationship between the question and the purpose is established in the order that after obtaining the readability components extracted from the theoretical framework, the effect of changes in figural and positional factors in the study sample on reducing or increasing the values of the readability components is analyzed. And in this regard, space syntax indicators related to research components will be used.

## Methodology

A combination of descriptive-analytical method, case study, and logical reasoning method was used to conduct the present research. The data collection tools were field observation and library studies, and the specialized

software Depthmap was used to analyze the data. The case study of the research was the Saad al-Saltaneh historical complex in the old context of Qazvin city, which was chosen to analyze the relationship between the shape and position of the physical and spatial elements of the configuration and the readability of the historical building. Field studies were carried out using photography and note-taking and sketching in the studied place. After that, the analysis of the data obtained from the field observations and library studies about admitting functions by historical contexts was completed through software analysis. The studied sample map, after being drawn in AutoCAD, was imported and analyzed in Depthmap software. According to the research approach which is spatial structures evaluation, the emphasized components in the number and ability to visit architectural complexes were measured using space syntax theory. Thus, spatial mean depth and harmonic mean depth tests were used to measure movement permeability and a choice test was used to simulate the selectivity of space during tourist visits. The analysis of visual permeability was performed by measuring the area of the view field utilizing Isovist tool in 10 spatial stages, including 6 entrance stages and 4 internal thresholds stages of the building complex. Also, the Line Length indicator of the movement was measured to check mobility, and the visibility indicator was to check the ability to visit the complex spaces. The analyzes were done in two stages. The first step includes the analysis of the general configuration map and the second step includes the examination of the northern and southern parts of the complex separately, by which the role of the location and shape of the spaces can be investigated as a result of the research.

## Theoretical Framework

### • Relation between configuration and readability

The reading of the physical environment that is investigated in this research is related to many physical and spatial factors and is affected by the relationships between components and elements, the order of the spatial hierarchy, and in general, the shape and configuration of the human-made environment. In this configuration, the movement path quality is defined by the way spaces are arranged and connections between architectural and urban functional areas and is directly related to efficiency and function. And this characteristic “has a direct effect on legibility, physical permeability, visibility of spaces, and coherence and continuity of architectural or urban space” (Madanipour, 2012, 98-102). In this way, the configuration method, by defining the limits of readability, is effective on the number of

entering into the space and its use, and as a result, the space efficiency and function. Also, the shape and quality of circulation and movement in space, the activities distribution, and the spatial absorbers distribution are considered configuration effects (Sajadzadeh & Sohrabi, 2021, 178). Examining the theoretical framework of the research shows three components of spatial configuration including selectivity of space, visibility, and permeability (visual and motor) in relation to legibility. These components were obtained through the review and classification of the discussed indicators in previous research and are briefly presented in Table 1.

#### • Selectivity of space

In relation to the visitability of each place, humans naturally prefer to move in a direction that has a wider range of movement available at the same time. Gibson calls this aspect of human-environment interaction natural visual vision (Gibson, 1986). In this definition, as long as there is no requirement in the visual system, the observer moves towards an attractive subject by looking around, walks around it, and after seeing it from all directions, passes to another perspective and view. According to the theory of natural movement, the people's movement in space, if the environment does not change, is done by the way the space is arranged and configured (Hillier & Iida, 2005). Observers generally select prominent areas that provide a degree of privacy while providing adequate visibility. Thiel (1961) presented the concept of representing personal experience, described some architectural markings as visual curtains in the use of space, and suggested that the details of these experiences can be recorded in the movement network between buildings and passing through the environment (Shakibamanesh & Hakimi, 2018, 102). Moving without getting lost is one of the basic desires of every citizen. Traveling through the city requires knowing the location and how to reach the destination at any moment. The pedestrian should be aware of the signs and indicators in the environment and know how to orient so as not to get confused (Varmaghani, 2021, 128). These cases show that factors such as the arrangement and configuration of the space, key elements and areas, the vastness of vision, and visual capability are effective in the "selectivity of the space". Therefore, the mentioned component depends on space visibility.

#### • Visibility

Visiting any architectural or urban space by users can be guided and way-fined by the amount of visibility and visual data available in the environment (Soltanifard & Ghasemi, 2018, 30). This indicator analyzes the relationship between spatial structure and human visual experiences and will lead to understanding the mutual

relationships between individual and collective behaviors and physical forms. In the discussion of the good shape indicators of the city, Lynch pointed out the importance of visibility and factors related to it, such as visual attraction, visual corridor, and visual permeability (Lynch, 2016, 97) and Cullen, by defining the theory of successive views, has emphasized on the role of observer movement and displacement in environment perception (Cullen, 1995). Gibson, while emphasizing this issue's importance (the movement importance in visual perception), states that every moment the observer moves in the environment, his visible visual field will change, and as a result, the mutual effects of blocking and expanding the vision will be achieved successively (Gibson, 1986, 274). In Sun's opinion, the functioning and use of spaces depend on the area of the visual field and the level of visibility is an important indicator of human perception of the urban context (Sun, Webster & Chiaradia, 2017). Therefore, the dependence of the visibility component to the reading of the urban complex spaces is because the observer's guidance and way-finding into the space will be facilitated by visual experiences, the sequence of visible fields, and the visual attraction of the path. The possibility of observation and visual perception is an important factor in the experience, performance, and admiration of the environment by visitors and is considered the main component in environmental design. Attending urban complexes is the experience of observable events resulting from the arrangement of elements and movement passages between them; Therefore, the ability of visual perception is a tool to analyze the contexts efficiency and communication elements between them and achieve their optimal design and organization. In other words, the structure of each building complex is a system of micro spaces that determines the change and transformation platform of observable events and the visibility limits of the environmental elements (Ghasemi & Soltanifard, 2019, 173). While explaining the idea of the visual array, Gibson emphasizes the movement importance in the observers' perception and a more realistic interpretation of the environmental relationships and states that the visual context of the users' movement is visible in the form of variable visual curtains caused by visual confinement and opening (Gibson, 1986, 151). These discussions show that the ability to see the sights through the passages and the predicted urban tourism routes during the users' movement is directed and guided, and on this basis, it is related to the component of visual and movement permeability or wayfinding among spatial masses. In other words, legibility factors will increase circulation and visits, and the use of urban complexes.

Table 1. Components of readability and indicators related to it in previous studies and research. Source: Author.

	Researcher	Readability components	Analysis indicators in research	Results: influencing on environment reading
1	Khodadadi Agh Ghal'e & Asgari, (2021)	_Visibility Permeability_	_Visual accessibility Spatial integrity_	Improving the space readability
2	Nikkar, Sadeghi & Shams (2020)	_Selectivity & Permeability	_Access	Perceptibility of environmental qualities
3	Biniaz & Hanaee, (2017)	_Permeability Visibility & Selectivity_	_Sequential order Route, node, and marker elements	perceptibility
4	Zarghami, Qambaran, Saadati Vaqar & Zamani (2017)	_Visibility & Selectivity _Selectivity & Permeability Permeability_ Visibility & permeability_	_Identification of visualizing elements Accessibility_ Structural composition_ Spatial configuration_	Improving the space readability
5	Mahmoodi Bakhtiyari & Rabbani (2017)	_Visibility	_Experience in visual clarity	Knowing the space while belonging to the place
6	Rahmani Firoz Gaei & Mohammadi (2019)	_Selectivity & Permeability Visibility_ _Selectivity & Permeability _Visibility & Selectivity	_Correlation of spatial domains Visibility_ Access_ Settlement on the passageway_	to be marked
7	Shakibamanesh & Hakimi (2018)	_Visibility	_visibility	Pause, presence, and activity in space
8	Fakouhi & Dodangeh, (2018)	_Visibility Selectivity Visibility_ _Selectivity & Permeability _Selectivity & Permeability	_Semiotic ambiguity Uniformity of space_ Relying solely on written signs_ Separation of space components_ _Lack of consistent communication	Illegibility of urban spaces
9	Memariyan & Zamani, (2019)	_Selectivity _Permeability Selectivity & Permeability Selectivity	_Order and contrast in the structure smallness physical unity _Adaptation of spatial structure to mental structure	The physical layer of readability and imaginability

#### • Permeability (visual and motor)

Permeability depends on the number of potential ways of communication between two points of the place, which is related to the spatial arrangement of urban buildings from two physical and visual dimensions (Bentley, 2018). Visual permeability means the ability to see paths or elements, which is related to the enclosure concept. Also, motor permeability is the concept of physical mobility and passing through space, which

is related to the category of security (Nasiri Hendeh Khaleh, Hekmatnia, Esmaeili, Rezaali & Jamali Henji, 2022, 108). Permeability is also considered one of the criteria for evaluating circulation and visits within urban complexes. Therefore, its application in organizing historical contexts is important. Permeable space is a space that allows multiple choices to find the way to places (Khodadadi Ag Ghal'e & Asgari, 2021, 36). In this way, the permeability is also related to the selectivity



of the space. The limits of the choice power offered by the environment to people to reach from one place to another, both for familiar and unfamiliar observers with the environment, is a key indicator of evaluating the selectivity of space. It will be possible to strengthen it by increasing the number of entrances and routes in the communication network, continuity and spatial sequence, the ability of the access system to supply absorbing events at the edges of the path, the observation and spatial circulation ability in the environment and security control and enclosure.

### Readability Analysis in Space Syntax Theory

According to the ideas and definitions raised regarding the factors related to readability that were stated in the theoretical framework, three major indicators were determined to increase the visit and use of urban tourism complexes, which are permeability, visibility, and selectivity. The analysis of readability through the indices of space syntax theory is argued in this way the spaces' permeability level can be weighed by measuring "spatial depth" which means the number of spaces necessary to pass through to reach the defined position. Selectivity is measured by the "choice" indicator, which is a general scale for measuring the flow of movement in space. So that the

high level of selection means passing a large number of the shortest connecting paths through space. Visibility is also checked by measuring the surface and angles of the visual field. Fig. 1 introduces the variables and factors affecting the improvement of readability according to the theories and definitions in this field, as well as measurement tools in terms of space syntax.

### Introduction of the Case Study

Saad al-Saltaneh complex (built 1894), the largest and most complete inner-city caravanserai of Iran, is located in the east of the historical market and Imam Khomeini Street in Qazvin city. This complex with an area of 26,000 square meters was built at the end of the reign of Naser al-Din Shah by the order of that time's ruler, Mohammad Baqer Khan Saad al-Saltaneh, and with the efforts of two architects pertaining to Isfahan and two architects pertaining to Qazvin. This building included many Serais, street markets, Charsouk, Shotorkhan, warehouses, stores, and public bathhouses (Sekhavat Doust & Alborzi, 2019, 53 & Qazvin Municipality Portal, 2022). The most important part of the complex is Saad al-Saltaneh Serai (the main building with the largest courtyard) with an area of 3073 square meters, to which different parts are

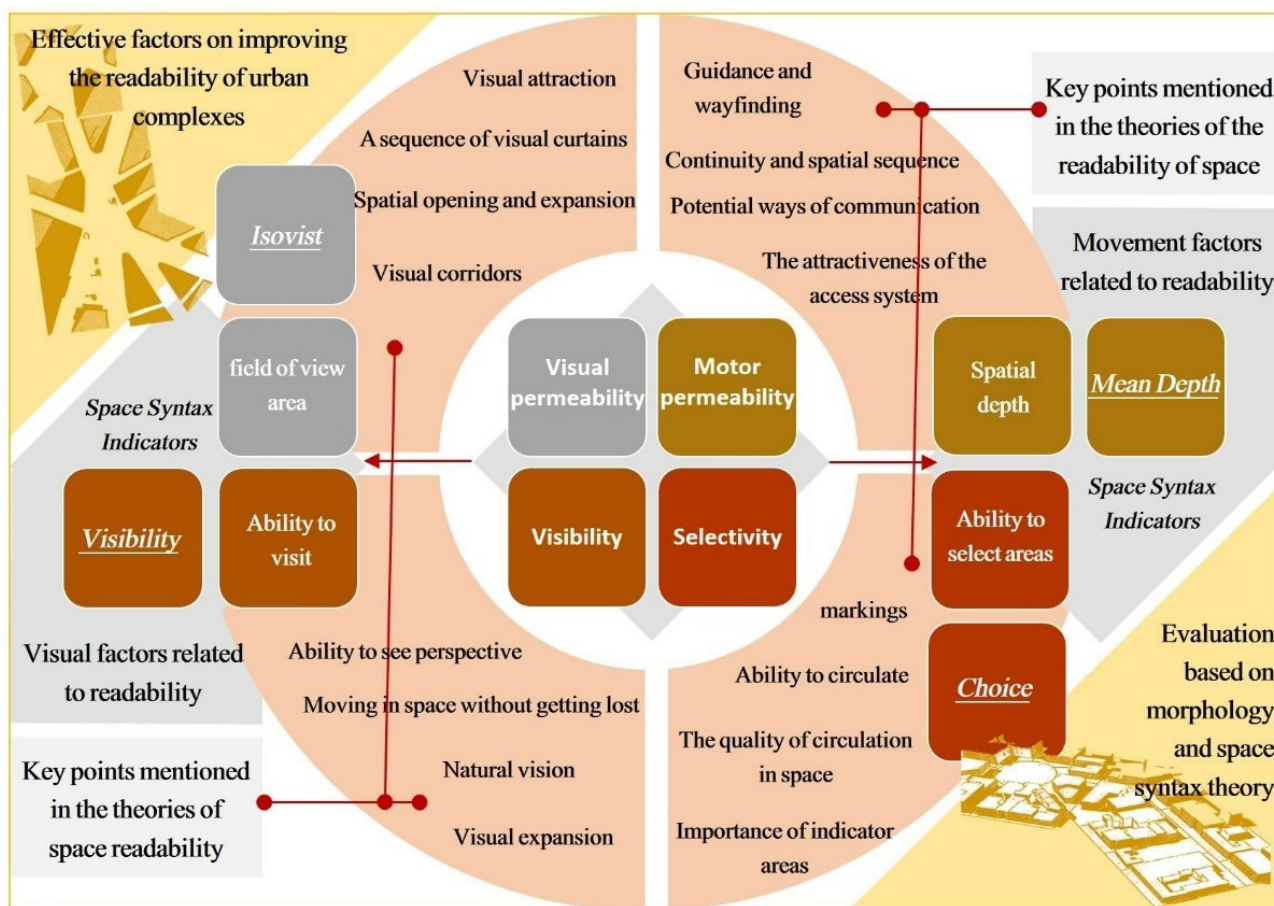


Fig. 1. Variables and effective factors on improving the readability of urban complexes. Source: Author.

directly or indirectly connected (Mojabi, 2008). In the eastern part, there is Saadiyeh Serai, and in the west, Negar al-Saltaneh Serai, and in the southern side, there is Qeysarieh Charsouk, which is the most magnificent space of the complex and the intersection of two important and busy covered street markets. Saad al-Saltaneh complex has multiple entrances and 6 courtyards, including Saad al-Saltaneh, Negar al-Saltaneh, Saadiyeh, Shotorkhan, Ghahremani, and Beheshtian. This work is located in the form of a wide and labyrinthine complex with numerous cells, magnificent vestibules, and long corridors in the middle of other historical monuments such as Al-Nabi Mosque and Vazir Serai in the old context of the city. Figure 2 introduces the studied case.

## Results

To investigate movement permeability in the case study, “spatial depth” and “line length” indicators were used. Also, the selectivity of the space was evaluated through the “choice” indicator. Fig. 3 presents the output values and simulation map of spatial depth, space choice, and line length.

Examining the figural simulation of the spatial depth

indicator shows that the mean depth average on the main communication axes, including the street markets and the middle axis of the complex, has the minimum value. On the other hand, the peripheral spaces of the complex, which are located at the maximum distance from the aforementioned axes, have the greatest depth and, as a result, the least motor permeability. Among the existing courtyards, Saad al-Saltaneh and after that Negar al-Saltaneh, have the lowest depth. But other yards have similar values and almost the middle limit of depth. Therefore, the two mentioned courtyards have the highest probability of spatial visits and the other four courtyards have a lower probability of visits. Numerical values show that, in general, the spatial depth average of the complex (4.35119) is little and the number of spaces that are in the high depth ranges is small (depth more than 8.  $54 = 6$  spaces). Also, the ranges of the depth value average have a larger number of spaces. In other words, most of the spaces in the plan are located in the middle of the depth value. These results reveal the relatively favorable visitability of the complex despite the fineness of the historical context, which is due to the appropriate location of the communication axes and their unifying role to the 6

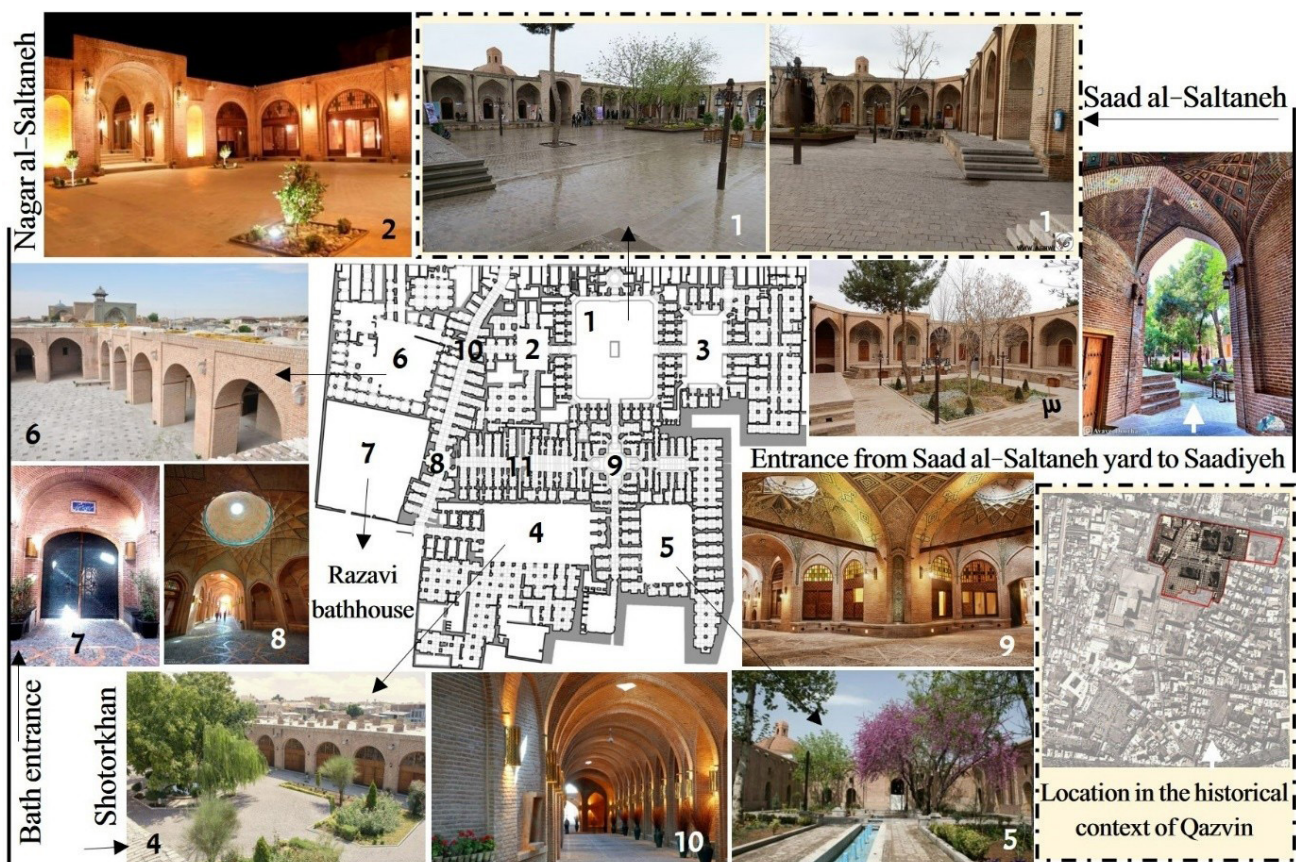


Fig. 2. Introduction of the plan and pictures of Saad al-Saltaneh complex spaces: 1. Saad al-Saltaneh Serai 2. Negar al-Saltaneh Serai 3. Saadiyeh Serai 4. Shotorkhan Serai 5. Ghahremani Serai 6. Beheshtian Serai 7. Razavi bathhouse 8. Small Charsouk 9. Qeysarieh Charsouk 10. Vazir street market 11. Qeysarieh street market. Source: Author.



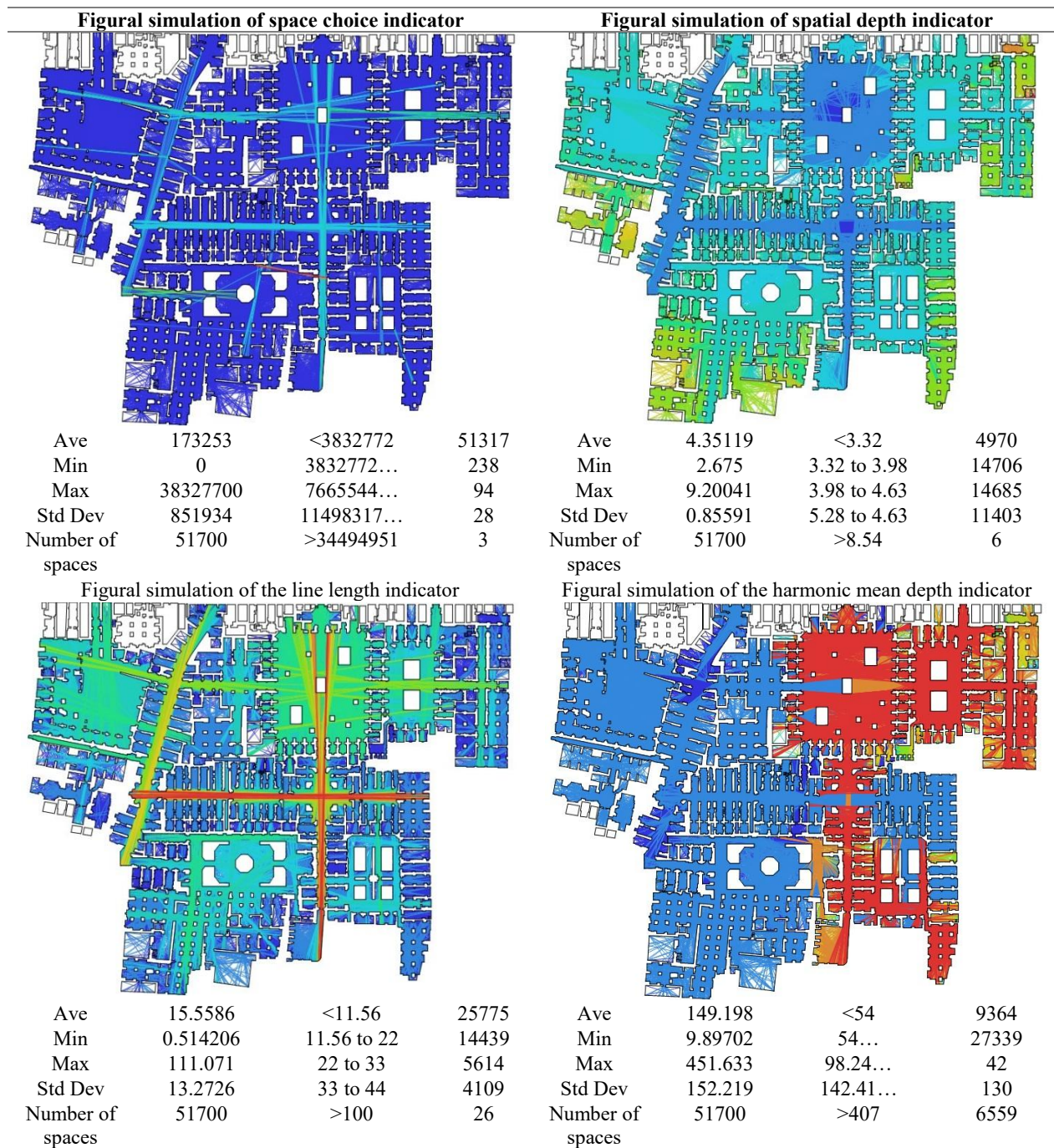


Fig. 3. Output values and simulation map of spatial depth, space choice and line length. Source: Author.

Seraices and the areas immediately connected to them. On the other hand, the harmonic mean depth simulation map assigns a lower depth to the western spaces and a greater depth to the eastern spaces. Also, the lowest harmonic mean depth limit is at the southern entrance of the Vazir street market and also the connecting axis between the two western and middle Seraies (Beheshtian & Negar al-Saltaneh) in the Vazir street market. According to the output figures of this indicator, the number of spaces in different ranges of harmonic mean depth has a relatively balanced distribution and coordinated visitability. The

figural simulation of the choice indicator reveals that most spaces do not have high selectivity. So that even the points with the most possibility of selection do not show a high value. These places include street markets, four-way crossings branching off Qeysarieh Charsouk, and the direct connecting axis of the four Seraies on the north side of Qeysarieh Bazaar, which connects a long chain of open and closed internal arenas in a hierarchy with an invisible spatial axis. The line length values show that there is a balanced distribution in the ratio between the number of spaces and indicator values. However, due to the smallness

of the domains, more spaces have the minimum value of line length indicator (values less than 11.56 = 25775 spatial points). Also, the diversity of the color spectrum indicator in the simulation map is also the reason for confirming the mentioned result. The most important spatial elements in increasing line length values and consequently the context permeability is Qeysarieh Charsouk, small Charsouk, and the intersection of the four passages at the north of Vazir Bazaar. Axial lines branching from the mentioned spatial elements in connection with open and unobstructed motor areas or with man-maid and natural elements in the courtyards will lead to the expansion of internal motor points with the ability to walk and visit. Fig. 4 examines the visibility indicator as well as the area of the visual field in 10 spatial steps through the Isovist tool in the Depthmap software.

Examining the level of domains visibility shows that Saad al-Saltaneh courtyard and then the immediate eastern and western courtyards (Saadiyeh and then Negar al-Saltaneh courtyards) have the most spatial value and the cells located in the secondary territories connected to the Seraies have the least spatial value in terms of visual accessibility in the course of tourists' visits. The comparison of the average value (1959.7) and the minimum value (3) shows the presence of internal blind areas and the comparison of the ranges of values indicates a large number of closed and hidden areas compared to transparent and accessible spaces (more than half of the spaces have a value less than 1230). In addition, the location of visible motor points and lines and their distribution way in the whole plan increase the number of visits to the street markets and caravanserai yards, as well as the cells in front of them in the entire complex, while decreasing the number of visits to the back cells and the Razavi bathhouse building. Examining the visual field in 10 selected spatial stages and comparing the peripheral penetration areas into the context as well as internal thresholds, shows the lowest visual field at the entrance from Razavi bathhouse alley and the highest value in Qeysarieh Charsouk. In general, among the 6 existing entrances, Saad al-Saltaneh entrance (707.404) and the southern entrance of Vazir Bazaar (357.341) have the highest values. The southern entrance (S1) plays an important role in increasing the number of visits and the visual permeability of the context due to its connection with the landmark historic buildings (Al-Nabi mosque and Vazir Serai). Also, Saad al-Saltaneh entrance (S3) is important in terms of inviting roles by creating a wide and long visual field. Among the inner thresholds, small Charsouk has the lowest indicator value (522.741) due to the three-way visual field. This condition is due to the adjacency of the western side with the Razavi bathhouse, which has led to the reduction of the functional role of Charsouk in the context of visibility. In addition to the elements' shape and position in the complex plan, symbolic elements and orientation in the body and

inner space, including natural elements of water and trees in the focal points and the distinctive spatial and geometric identity of the yards and the type of orientation or change in the angle of movement in the communication axes (Fig. 5) in increasing the readability of the complex is effective.

The field survey shows that the way man-maid and natural elements, including ponds, fountains, trees, and statues, have an effective role in improving the domains' readability, despite the reduction of syntactic indicators of accessibility and readability, due to marking in terms of position and form. In addition to that, height distinctions increase the readability of domains. For example, in addition to being evaluated as effective in the analysis of syntactic indicators of space, Charsouks, due to the multiplicity of viewing angles in horizontal and vertical directions, help to improve readability through the prominent points' position of the complex. Thus, the most important factors of readability in the syntactic analysis of the plan and the spatial body are the shapes and positions of street markets and Charsouks. Fig. 6 analyzes the complex readability in the northern and southern parts of the complex regardless of the mentioned elements to infer other factors affecting the research indicators.

The comparison of the shape values shows that the reason for the increase in the amount of axial movement and visibility and the decrease in the depth of the northern part compared to the south of the complex is the size of the middle yard and also the straightness of the connecting chain of the three yards of the northern part; While the southern part with the detailed hierarchy of access between the eastern and western yards and the small area of micro-spaces has visual and movement capabilities and as a result is much less accessible for tourists. In this section, due to the mentioned factors, more micro spaces are located at a lot depth and it is difficult to access them. These hierarchical movements and multiple direction changes of the routes reduce the average length of the axial lines of the southern part and as a result, its permeability and readability are weak. The serial position of the spatial openings in the connection between the triple Seraies of the northern part and the scattered positions of the openings in the southern part has increased the visibility in the north of the complex by 3.06 times. Shape analysis shows that the geometry of the spaces in coordination with the length of communication passages has an effect on the visibility and axial movement; So that the aligned orientation of the geometry of the spaces and the axes leading to them, by increasing the length of the visual and physical movement lines, increases the values of the indicators and is effective on the visitability of the space. Also, the geometry of the space will have a greater impact if the area increases.

## Discussion

The research aims to analyze the physical and spatial



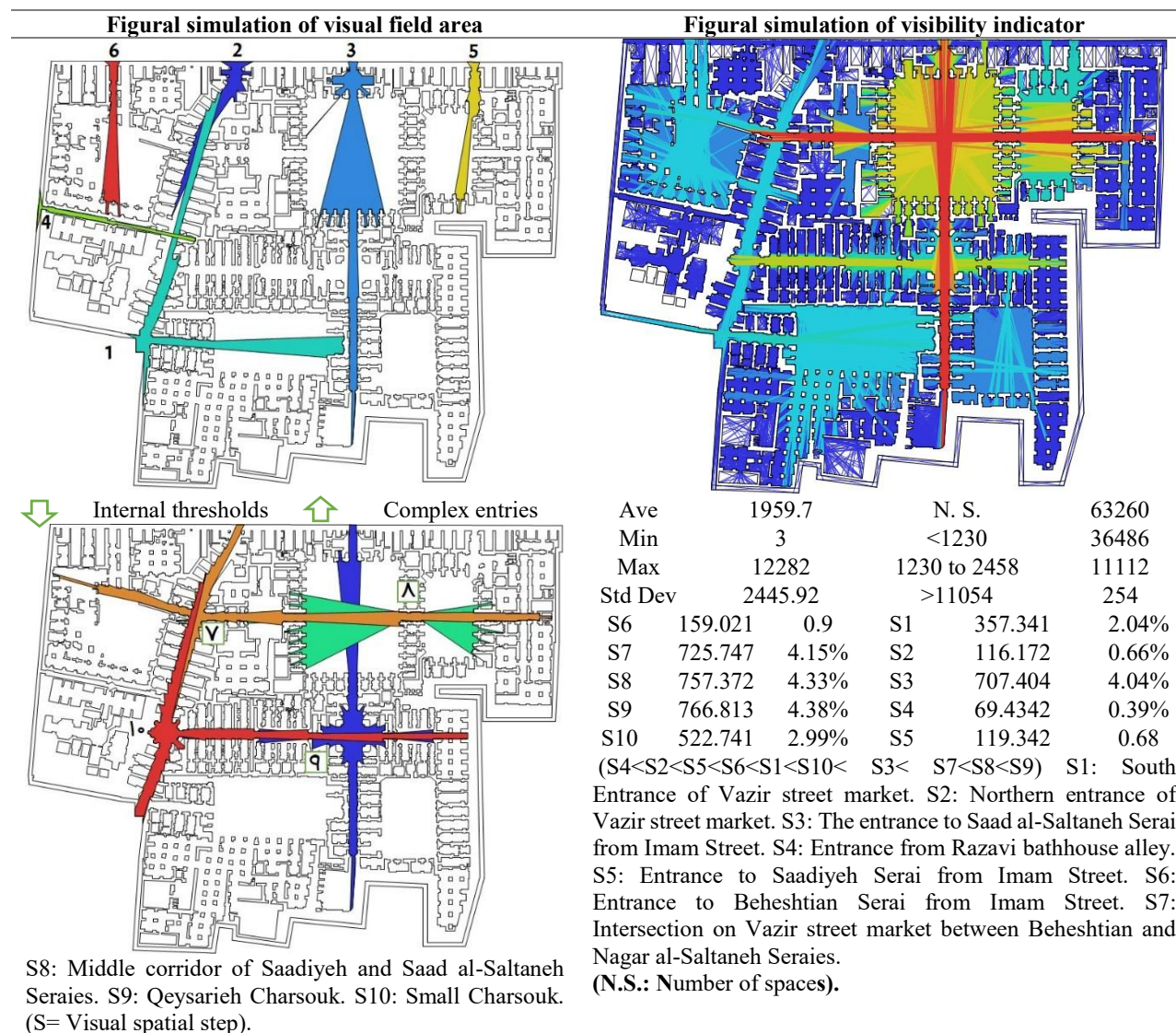


Fig. 4. Output values and simulation map of visibility and visual field area in selected spatial stages. Source: Author.

components of the Saad al-Saltaneh historical complex on improving its readability and, as a result, increase the number of visitors and its use. To achieve this goal, first, the results of theoretical studies and previous studies were categorized and the three components of permeability (visual and motor), selectivity, and visibility were identified through the categorization of indicators as having the most relationship with the readability variable, which will affect the increase of visits to the space. Then, these categories and their relationship with the reading of space were analyzed. The results of the findings in the analysis of the visibility indicator reveal the importance of the multiplicity of wide internal domains connected to the main movement skeleton. For this reason, Ghahremani yard and then Beheshtian yard, and Shotorkhan yard have little possibility of traffic and visits due to their low connectivity with visible axes. Knowledge of the capabilities of spaces in terms of the number of visits and their attractiveness to tourists makes

planning and decision-making about how to use them in restoration and reconstruction projects more targeted. In the complex plan, the lateral position of Razavi bathhouse and the minimum visibility of the entrance passage connected to it (S4=69.4342) is effective in reducing the visibility of this part from the western front of contexts. The renovation of the bathhouse for women in the existing reconstruction plan is in line with the current research results on the location of the visitable area. The findings related to the analysis of visual permeability show that, in general, this indicator value is low in the entry places from the surrounding context into the Saad al-Saltaneh complex. In other words, despite the many inputs, only 2 cases (S1, S3) have a wide visual influence area; But the inner thresholds including the big and small Charsouks (S9, S10) and the corridors between the courtyards (S8) and the intersection of passages (S7) have 3- or 4-way viewing angles with the maximum length of the viewing axis. In other words, the

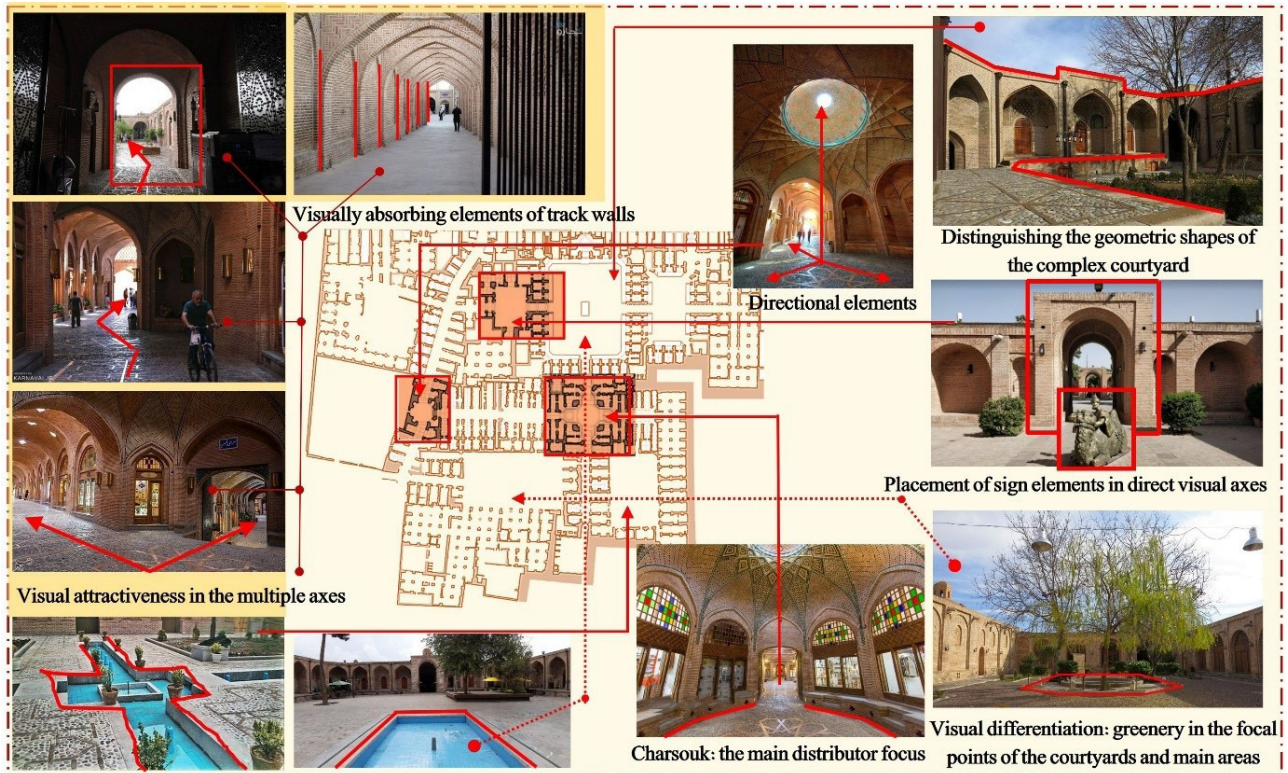


Fig. 5. Physical factors affecting readability in the studied case's spaces. Source: Author.

inner layers more than the peripheral edges provide mobility and the ability to circulate and visit the space observers. Although the low visual permeability (116.172) at the main entrance (Vazir street market's northern entrance) due to the rotation of the entrance axis path (Fig. 3-left) can lead to visual attractiveness and the desire to continue the path by the observer, it has reduced the readability of the entrance area for the unfamiliar visitor. The presence of numerous and inviting entrances, despite the low visual permeability, increases the possibility of increasing the tourists' visit to the historical context. The analysis of selectivity findings and space selection indicator shows that the interrupted axes resulting from compactness and smallness have reduced the number of selectable axes. The separate examination of this index in the northern and southern parts shows a much lower value due to the removal of the existing long axes influence, which is proof of the position importance of the street markets in spatial choices within the complex. Also, the data indicates that there is a clear relationship between the shape and position of the elements and their readability (answering the research question). For example, a large number of the shortest connecting routes pass from the southwest entrance to Shotorkhan courtyard and along the communication axis from Saad al-Saltaneh to Saadiyeh, which indicates the high probability of choosing these areas for visiting, and the reason for this is the location of the gates and entrance thresholds to the areas under study. Locating such axes in high-traffic prominent points and historical

context entrances will have a greater effect on increasing visitability. Also, the relationship between shape and position in the complex entrances has affected the visual permeability degree. So that the limited visual influence area of the peripheral entrances reduces this indicator value, and on the other hand, the spaces' shape between the arenas and the internal thresholds makes a better situation in terms of this indicator.

## Conclusion

The results of the research show that the physical-spatial influencing components of improving readability and as a result increasing visits to historical places include the selectivity of space, visibility, and visual and motor permeability. These components were obtained through the examination and classification of indicators extracted from the theoretical framework and the research background. Then, to analyze these components, which was the research purpose, the three mentioned components (selectability, visibility, and visual and motor permeability) in the physical and spatial configuration of the historical complex of Saad al-Saltaneh Qazvin were examined in the field and software. And it was concluded that these components will be effective in increasing the number of visits by creating wide and multi-directional visual fields in the focal parts, creating the shortest connecting paths between important internal destinations, and paying attention to the proper organization of the entrances of the historical context. Also, in response



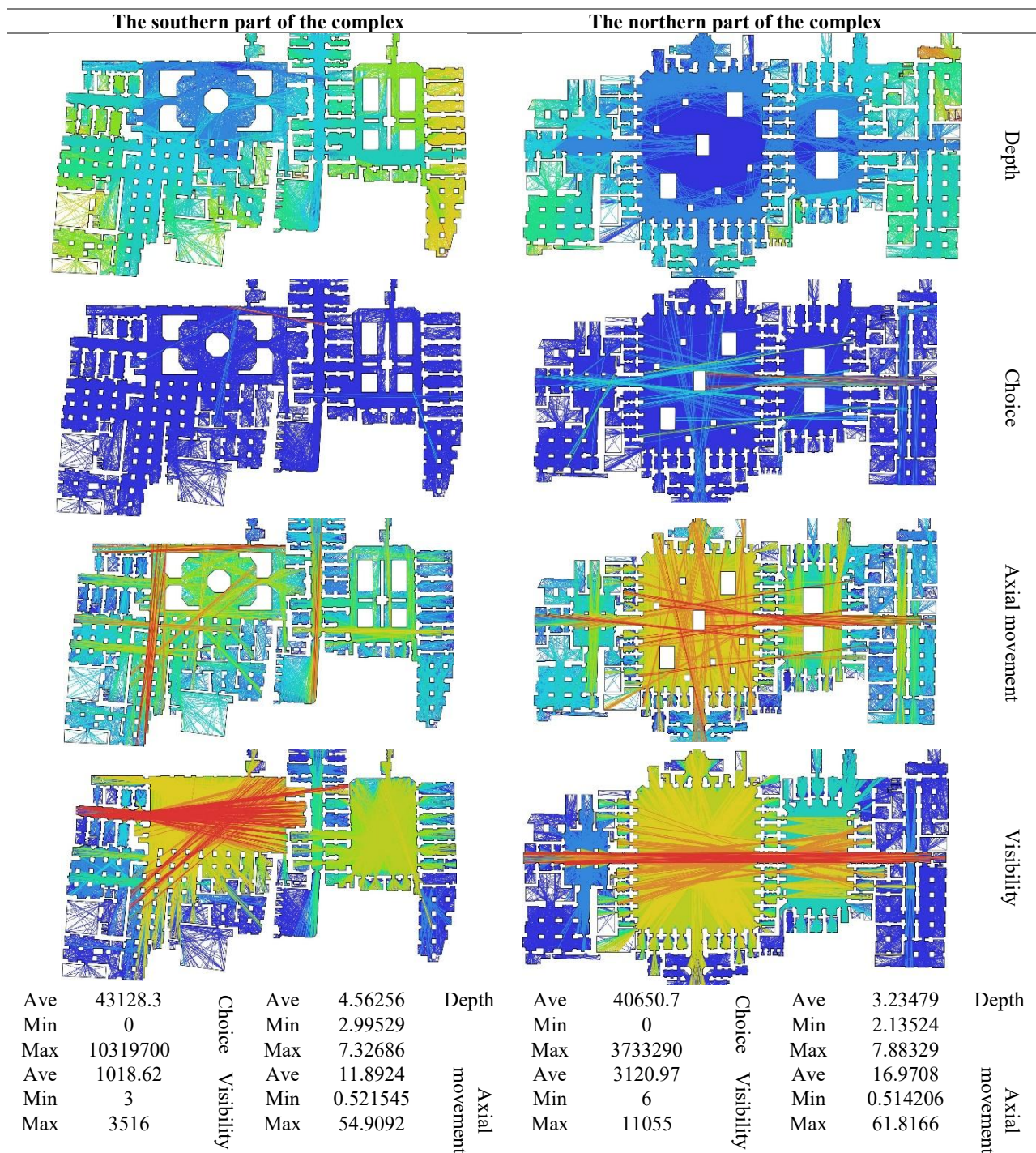


Fig. 6. Comparison of numerical values and figural simulation of research syntactic indicators in the northern and southern parts of the complex. Source: Author.

to the research question (what is the relationship between the shape and position of the physical and spatial elements of the configuration and the improvement of readability in the Saad al-Saltaneh historical complex of Qazvin?), the results showed that the most important readability factors include intersections with the most directions of space selection and then long straight street markets or with a slight bend, which is effective in increasing the connectivity of axes and as a result, readability. The findings show the high importance of the main spaces'

geometry and position of the configuration in changing the research results. Also, keeping in mind the correct combination of the three variables of geometry, position, and area, will have the greatest effect on improving readability; So that the more area of the spaces in the axial position in the case of extension of the geometric shape in the direction of the passages leading to them has a greater effect on the readability and visitability, both for marking and for increasing visibility and choosing the space and reducing the depth.



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