

## Typological Approach of Vernacular House in Ardabil Based on Physical and Space Architecture Analyzing

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**Abstract:** Iranian architecture history is based on common features and characteristics of vernacular culture. For this reason Iran's architecture components has been developed during different centuries as well as development and variations of Iranian culture. Investigated case in this study is Ardabil's vernacular houses. In Ardabil the used pattern in houses is the same in terms of shape and space but has unique characteristics in each case. These patterns that are derived from life style and social personality of individuals and relation of structure and architecture have unique features in terms of shape and form that are investigated. The research method is descriptive and analytical that in the descriptive part qualitatively by studying and analyzing the related basic theories and identifying physical and space elements of vernacular houses, the correlation relation of components is investigated. Data of this study was obtained through field observations and was argued. Regarding that no special classification is done in this research so it is tried to achieve a framework for the Ardabil's houses architectural classification by studying the history of typology and classification of types.

**Key words:** Type, house, architectural physical, architectural space, Iran

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### INTRODUCTION

Attention to the typology and classification of buildings based on the characteristics of construction, period, decorating and spatial composition of the early 50's entered a new phase with the formation of the Association of Iranian architecture. This issue in three recent decades is among the issues discussed by the Faculty of Architecture. Since, the early 50s, climatic view to architecture was raised as one of the most important issues. Governmental organizations since the early 60s were entered the debate about building and housing that in this regard, classifications of building various types was one of the goals of their research. The strong presence of educated people in the architecture major in west and specially, graduated people of Architecture school that the principles of typology were as one of their main topics had a direct impact on the process of identifying types. According to what was said, different interpretations and indicators of the typology are raised that each of these indicators leads to different interpretations and narratives of building features. One of these interpretations is historical and evolution interpretation and other is climatic interpretation that each considers various indicators of building and another interpretation is physical and form interpretation that according to the importance of the subject and its scientific interpretation will be considered.

**Research questions:** Housing is considered as one of the most important architectural issues during history, so identifying and classifying its physical and spatial elements can play a decisive role in the development and continuation of the architecture of each region. The study also aimed to answer the following questions: by what indicator can classify physical and spatial elements of house? How can identify the factors shaping the architecture of Ardabil's vernacular houses? In fact, the purpose of answering to this question is to provide a model for help in the form of house with the use of physical and spatial elements Ardabil's vernacular houses.

### MATERIALS AND METHODS

The present study in the theoretical study with qualitative approach and library study tool and using analytical and descriptive method provides a theoretical framework. In the part related to study of houses as case, Ardabil's vernacular houses is investigated in this regard by presence observations and field method with interview of residents of the house and describe it this assessment is completed.

**Background of typology:** There are many different ways to recognize the architecture, typology and classification based on the different characteristics of a very long

time have been considered by scholars from various disciplines. In the eighteenth and nineteenth centuries, biologists have struggled to categorize organisms scientifically. Type is placed after class in biological division. Type includes a group of organisms that can reproduce with each other and have the same race that based on the following category are criticized in the typology of biology:

Organism range → ruler → branch → order → family → class → type

In Persian language, type can be attributed to a particular group with a particular feature or mark. In English translation, pattern is taken from the root of type word that is derived from the greek root of taps in Latin. Model, sample, form, symbol and feature are among Persian equivalent of pattern that due to different interpretations that obtained of the translations are used. Understanding and application of the typology in different branches of science from ancient times until now indicates its prime importance. From the mid 18th century in architecture and archeology was used as a tool for identifying and classifying.

For nearly 2,500 years the typology is started in botanical science and entered other fields scientifically. In sciences such as psychology, economics, mathematics and other sciences, typology has a specific place. In psychology, category of human behaviors is used based on a specific mental state. In economics science, classification according to their source of income is a symbol of typology.

But, architectural typology started since Lazhy time. Lazhy in the 18th century investigates the roots of architecture. He studied the simple shelters. Doran in the early 19th century used shape typology for classifying different buildings. Di Kansi in culture of architectural history which was published in 1884 discusses about the type and model he considers type as a design or repeatable scheme that has the ability to affect in the mind of the artist. Utilizing typology in understanding architecture continued till the early of 20th century, Sydney Eddie in the book of evolution of the English house has utilized typology. He believed that art is based on standard forms and types that is always appeared again and makes infinite variety. In the 19th century, John Ruskin did research on the types. Le Corbusie believed to classification, he writes in the book of town of tomorrow: "Culture" emerges itself in full realization of equipment in our own facilities or through election and scope and evolution". Lo Corbusie also uses the term of object type, body type and human type. His effort is reflected to find the essence of object in the writings of Walter Girpiyus and Mohuli Nagy. But modern architects not accepted it because its use and type cannot have an impact on the

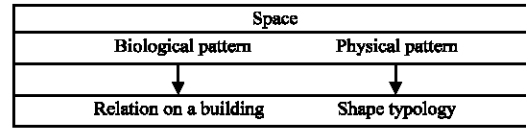


Fig. 1: Space factor-Michael Raf

creativity of architect and architecture student. (Memarian, 1992) This is the same concept that John (2001) called it stereo type or type of barrier or type of freezing. The first who criticized this idea can be pointed to Walter Grypos that criticized insist and urge of the critics in the classification of the contemporary movement. "Trying to sort and freeze art and the live architecture and converting them into a name is likely to turn off the creative activities and not irritating and correct it". Mohuli Nagy was willing to convert architecture along the route of Vitroyos to the economy, technology and form or implementation of social, technical and aesthetic.

Alan Kolkohen in 1969 in an study entitled "Typology and method of design" said: without closer tools and analysis, designers naturally according to his previous examples to solve new problems acts on typology solutions (Albrow, 2009). Two different locations for application of type and typology in architecture can be considered. South of Europe and Italy and France (architecture school, according to theory aspect). North of Europe and Anglo-Saxons (Steadman with theory of how space and Michael Raf and attention to purely shape aspects).

For example, Michael Raf has provided a shape analysis of Persepolis motifs. He differences and similarities by setting tables by placing different shapes and with components of them or users of method of how space in the architecture name two types of biological and physical pattern that its first shows the space relation on a building that is replicable in other buildings and the latter intends to object with physical of building which can be named as a form type. In general, it can be said type and typology is an issue with global expansion. Many scholars such as Aldorsi, Argan-Aymonino Cryer have dealt with it (Schulz, 2008) (Fig. 1). Islamic scholars in different fields such as zoology, mathematics have taken advantage of the concept of typology.

**Spatial and physical structure of traditional houses of Ardabil:** To understand and identify the architecture of Iran, traditional buildings are the best sample. In fact, understanding the theoretical foundations and exist Iranian architecture is dependent on the study of traditional Iranian architecture. In examining the factors affecting the formation of traditional architecture, attention to culture, religion and way of life of the people is very important. Lifestyle of people is derived from

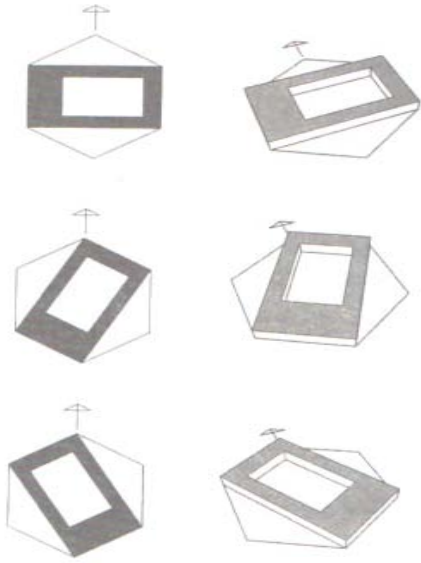


Fig. 2: Plan categories in Iran

culture and religion. All the features that will be appointed for Iranian and Islamic architecture are originated of these three thoughts. Of course lifestyle of people eventually “leads to the formation of traditional architecture that should be taken into consideration precisely”. Lifestyle means a way that people choose how to behave or how to operate” (Roland, 1977). In other words, lifestyle is an intensive term that included all human behaviors. Behavior with self, behavior with family and community, house, district and city is the space product of lifestyle of family and the community. From this perspective it can be said that impact of this factor on the house form should be sought on how the spatial organization of houses. In other words lifestyle of interplay of individual, family, group and community with space is included. Another factor that besides three mentioned cases in traditional Iranian architecture has been important is climatic factor. According to survey carried out by experimental architects in building a house paid attention to climate features on this basis, orientation of houses according to the study of Pirmia will be divided into 3 categories. (Fig. 2):

- Raste direction
- Esfahani direction
- Kermani direction (Memarian, 1992)

In Azerbaijan and Ardabil region, Raste direction was used to place building. Raste direction is the northeast and southwest. In terms of architecture of Ardabil in the book of Ardabil the historical passage, less concepts has been said that is more generalities in such a way that the architecture of Ardabil is considered in continuation of Azerbaijan regional architecture and



Fig. 3: Ebrahimi house Ardabil-writer

religious sites, bathrooms and the inn based on the principles of climate and houses for wealthy people with a certain style is designed and implemented (Baba, 1983a) (Fig. 3). The houses style is based on symmetrical design it means that in the middle of the building made a large hall as rectangular and behind it as length of the hall, kitchen that called Matbakh was built. Hall was the place of reception and its largeness depended on landlord’s financial and social status (Baba, 1983a-c). According to a survey conducted in this book, big and small houses and rooms was measured based on the number of window and in some cases instead of window used mirror (For example, “7,9,11 Mirror) (Baba, 1983b). According to the research conducted in Ardabil’s vernacular houses, attention to climate characteristics and need of users, spaces and users appropriate with this need is designed for example, underground has almost existed “in all the houses and this was in the bottom of hall and in part of it, a pond with water wells and hand pumps can be seen. It was for that reason that in cold winter of Ardabil that the pool froze, cleaning hands and feet and face and taking ablution for household was possible. Other spaces as underground were designed and built in such a way that is according to needs, building materials were also often “brick and limestone but polyimides were always with rubble and lime and building view to plinth up to the windows with stone carvings and made it to the top with brick and pier of bricks was taken with plaster and the years after that the building view due to wind, rain, sun and dust changed its color with oil paint painted with brick red and over the sling with white color.

Ardabil’s houses as something that can be seen has central courtyard. A large courtyard in front of the building that stone pond is in the middle of it. The pond was filled by a well that was along it. Gardens and trees were on both sides of the pond. The area between the house and the garden was also paver. This style of houses as mentioned above was for the nobility but



Fig. 4: Entrance of vakil

smaller houses were built for the middle classes. These houses are usually “consists of two rooms and upstairs and a kitchen and in other side, a stair took the man to the upstairs (Fig. 4). In the middle of two rooms there was corridor. At the end of the hallway, a door was opened to the kitchen and in the other side, a step reached the man to the upstairs that was built on corridor, Kitchen and yard were appropriate to the area of house and its pond was built smaller than the upper house. Materials used in these buildings were with brick and just brick was used in the in view of them (Baba, 1983c). In ancient times, especially during the Safavid era, porch in front of the house was common and according to the book (Shah Ismail Safavi) not only mansion of monasteries had multiple porches but also in Ardabil most houses had porch and porch was considered the country of household and in summer passed days in porch and at night slept there (Saverio, 1980). According to what was said primary types of materials and moist air of Ardabil caused that the life of buildings of second form has less durable but buildings of first form according to the type of material and the use of brick has been higher. Ardabil has been also at risk of invasion and many lootings has happened there, so to protect the houses their outer walls were built long and urban alleys and streets have been narrow and winding (Baba, 1983a-c). Given the above mentioned in Ardabil about 18 old and vernacular houses are recorded by the cultural heritage organization that each of these houses tailored to the needs of users has special features that due to the lack of scientific and valid study can only be viewed spatial and physical appearance of them. In Ardabil, the most important feature of spatial organization of traditional houses is central courtyard as outdoor and floors of the building as indoor, each of these spaces was used by residents according to its application, yard was placed as a connecting space in the center of traditional houses of Ardabil the space for the most times is designed and built as rectangular plan with specific geometry that its examples are below. In categories of plans of Ardabil's houses there are patterns that one of these patterns is linear pattern in this pattern,

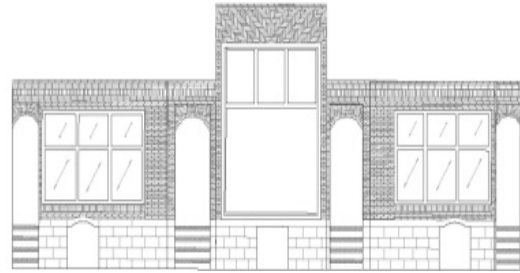


Fig. 5: View of Ebrahimi house, the archives of the cultural heritage

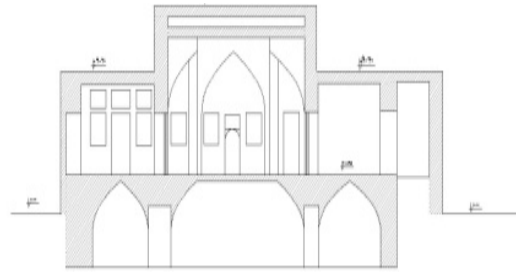


Fig. 6: Section of Ebrahimi house, the archives of the cultural heritage

house is placed on one side of the land and yard on the other side for example house of lawyer is placed in the district of Towa that a large porch is placed a in front of the house. In this model, the majority of vernacular houses were built on this basis the relationship between indoor and outdoor space is available through porch. In this compound, corridor is not used at the entrance of the building. This type of linear plans exists in all regions of Iran. Another pattern that is used in traditional houses of Ardabil is U-shaped pattern that can be seen in Ebrahimi's house (Fig. 5 and 6). The main building consists of two ground floors and basement which has a relatively large and beautiful and with a small vestibule space from crossing of alley enters into a rectangular courtyard. The building has brick view that on the walls to the height of one meter stone plinth is based, hall that is formed an important part of the building includes two porches and a small dais that with latticed windows were decorated with glass colored as beautiful Orsi. Among the decorations used in the hall of the building can be pointed to Mogharnas, molding, valuable paintings and inscriptions. This valuable old building is belonged to the Zandie period of course this house is almost “takes advantage of the linear space combination. Introverted plan with a rectangular courtyard entrance of short corridor and linear geometry in the central courtyard these characteristics clearly shows its linearity. With the difference that the plan of this home as U-shaped is designed and built. Another house of Ardabil that has a



Fig. 7: View of Sadeghi house-writer



Fig. 8: View of Sadeghi house

U-shaped plan is Ershadi house. The current part of building is the remainder of the larger building which inside section is separated and destroyed. In this building which is implemented on two floors basement and ground the lack of direct visual connection of interiors and exteriors space of building with a vestibule at the entrance of the building is provided and this vestibule provides the relationship between the yard, outdoors space and in two parts of the building that one of them is separated and destroyed permits from four directions perpendicular to each other. Alcove is covered with a skullcap and plaster Mogharnas in its four corners has a large Orsi shape window that was double in the past and now its inner layer that includes Arabesque designs with colored glass has removed. Kitchen and the barn parts were located in the basement. Ershadi house that has U plan to enter the house, first we enter into a small corridor that enter the vestibule and then into the central courtyard. Another pattern that can be seen in traditional houses of Ardabil is cross pattern that is visible in the house of Mir Fattahi at the house of Mir Fattahi the plan is changed a little in such a way that the central courtyard has many fractures but the structure of plan of yard is the geometric structure that is also visible in other houses. Other design of houses is actually a combination of the plan in a manner that the building is placed in two sides of yard which split as winter and summer place. This combination is clearly visible in the house of Rezazadeh (Fig. 7 and 8). House entrance in the far southeast of the building is placed in front of a square that through a vestibule enters to the yard.

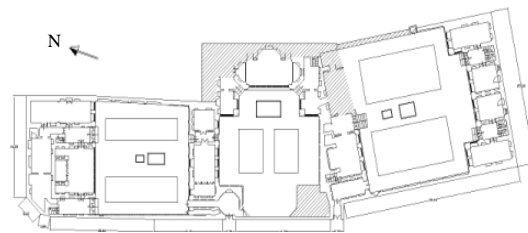


Fig. 9: House plans of Sadeghi

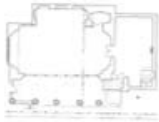







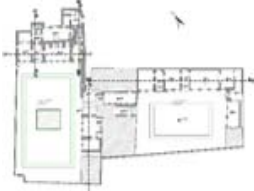

Upscale section of it is placed in a rectangular shape land in the northern part. The materials used mainly are stone and in bases and walls, adobe brick is used in its facade. The roof is wooden the front porch its upscale part has four wooden column as well as 10 brick columns also form the basis of building facades. Upscale building entrance is in the middle part that on both sides, rooms also have placed a symmetric. But house of Sadeghi in Ardabil (Fig. 9) has different structure, magnificent and luxurious house of Sadeghi is located in the center of the



Fig. 10: View of Razazadeh

historic fabric of Ardabil that is considered one of the great monuments of the Qajar era in the field of architecture of dwellings in Ardabil. This historic house takes advantage of unique features that may be all these features in one place can be found less. All the Sadeghi historic house include Hosseinieh part to provide the need of family's social relations, Alcove to meet the need for official transactions and communicate with local and foreign businessmen families the interior part the living place of family life of Sadeghi and servants place the living place of servants of the family and barn part and stable to serve the family (Fig. 10).

**Table 1: Forms used in Ardabil's historic house**

Type of plans	Plan	Full and empty place	Features
Linear	Vkil house 		Including the basement and ground floor semi-introverted entrance from yard Alcove (hall) in the center
L shape	Ebrahimi house 		Including the basement and ground floor introverted entrance from a vestibule and corridor Alcove in the center
U shape (house shoe shap)	Ershadi house 		Including the basement and ground floor introverted entrance from a vestibule Alcove in the center
Cross	Mir Fatahi house 		Including the basement and ground floor a introverted entrance from a vestibule and corridor Alcove in the center summer and winter place for staying kitchen and barn and stables
Compound of liner and U shape	Servant house 		Including the basement and ground floor introverted entrance from yard Alcove (hall) in the center

The building with limestone concrete foundations, thick brick walls and dome ceilings follows General type of historic houses of the early Qajar. The plan of this house consists of three parts and each of these parts has a U-shaped plan. This type of configuration is usually seen in hot and dry buildings. Another old house of Ardabil is the house of servant, the building consists of two large courtyards that first yard has a one-floor building with horseshoe form which one side of it has a basement. The building has 7 rooms and with lack of decoration, in the second yard (back) there is a two-story building with a basement that by the two sided staircase has a way to the first floor. Now according to a survey carried out, plans and yard form is placed in the following categories (Table 1).

## RESULTS AND DISCUSSION

**Physical form:** Forms used in Ardabil's historic houses have regular shapes and geometry, according to the construction the use of local and normal materials and human proportions. The architecture of this house is often introverted and semi-introverted. For this reason the exterior form is simple and without pomp and panache. The relationship between physical form of houses and the context in which the building is built the harmony with the old structure and the way of people life and climate is fully seen. The color and form of buildings are designed and built fit to climate. The main materials used are also stone, wood and brick. To cover some parts of the house, thatch is used. The present observations and interviews done with residents of houses the direct impact on the way of people on form of houses can be seen clearly. Other

concepts that have a direct impact in the form of houses of Ardabil are culture and religion of people. Cultural factors are major causes in changing the form of the houses and how to design their spatial hierarchy that in addition, according to the order and balance and symmetry in building is derived of principles that in indigenous and traditional Iranian and Islamic culture and religion the interest to it can be seen. Religious order that people have in mourning and religious ceremonies shows balance and order and composition in the form of buildings and also the spatial hierarchy. In the category of cultural influence and shape of building that returns to the category of materials and form and spatial structure and composition of geometric shapes in the building, the impact of this issue is such that architectural pattern of the traditional houses is originated of relationship between people and religion. An issue that Rappaport notes directly (The effect of three factors of lifestyle, religion and technical and climatic principles in traditional architecture) (Amos, 1977) category of building view on this basis is more comprehensive. The issue that causes the decryption of forms and structures of geometry forms used in building. How to spatial expansion of houses is on this basis. According to studies carried out architectural structure of this region begins from the central part to a public space that is the hall or Alcove. This space has the ornamental decorations that these decorations are derived from the concepts that people have great interest in it. Another issue that is visible in Ardabil houses is cohesion and unity in components and traditional and vernacular houses that is visible in most of these houses (Image of house) exist central yard in all buildings as the main organ of building which is taken of cultural and religious beliefs of the people causes to strengthen the family as well. In traditional houses, according to the patterns that are taken from mosques and schools symmetry in the building is maintained and in most spaces and in ornaments it is paid attention more. In these houses the majority of Alcove in the North and to the south is designed and built. Bedrooms are located on either side of it. The divisions are seen in traditional architecture in most parts of Iran. In Iranian architecture, centrality can be seen with the presence of an element in the middle of view that this element is porch. But in Ardabil due to the cooling air in traditional houses, except for a few cases it is usually unused the porch and symmetry just in view with hall (with high altitude) and corridors along it will be determined of course in the formation of traditional houses of Ardabil should not ignore the role of climate, entrance of space that starts with corridors and then the corridors are used as a communication space and also filter between spaces that in terms of climate has a direct impact on energy savings as well as other difference that is seen in hot and dry

climate buildings and cold climate is the location of the kitchen in the center of building and close to living spaces which has resulted in the use of kitchen heat for heating the interior space of the house. Another factor that influenced the process of the formation of Ardabil's houses is social factors. According to the survey, almost all the traditional and valuable houses have been for clergymen and businessmen and people with social character of course in terms of the overall structure have been the same but the social status of owners caused to change in the composition of some spaces as that clergymen houses have spaces to teach religious sciences, religious site and so that it can be seen clearly in promoter house. Also in the house of businessmen, a space for entertaining special guests and warehouse and service spaces related to job of owner can be seen in space (House of Rezazadeh Ardebil). In the Sadeghi's house in Ardebil at the religious site as well as for women use of funerals, a special place in the upper part of hall is designed and built. Of course vegetation of houses is different in Ardabil and geometric garden in the courtyard of square gardens in four sides of a central courtyard with centrality of pool is derived from Iranian garden the difference is that the coverage of deciduous plants used in winter not prevents the sun's rays into the house.

**Factors affecting in the formation of vernacular houses of Ardabil derived from ideas of rappaport**

**Climate(technical principles):** Mountainous cold; compact and contiguous and dense texture, introversion; Use underground to take advantage of global warming; Flat roof-low height-the color of dark materials.

**Cultural conditions(religious):** Introversion; Attention to the religious structures in building; The use of specific geometric shapes to man's relationship with God.

**Social conditions of residents lifestyle:** Social classes; Businessmen; Create storage; space of storage of cargo in the house a space for the reception of the guests-use-the decorations inside the building. Clergymen; create a space for teaching religious sciences; create hosseinieh; owners; a large yard to collect grains and maintenance of share of ownership; ordinary people; houses of ordinary people: life place near livestock-house 2 rooms with corridor

**CONCLUSION**

According to field studies and library sources, design of vernacular houses of Ardabil has been in accordance with the climate, lifestyle of people and social structure. Ardabil and its central context is designed as compact and conjoined houses that this issue is due to attack of

miscreants to the town and resist against them and another reason has been attention to the special climatic of these districts that these two issues has also had an impact on the architecture form of the houses. In terms of materials, almost all the houses have similar materials that most of this material has been brick with stone and wood. One of the most important features of traditional housing in Ardabil is attention to patterns in construction that almost in all buildings these patterns are used. The pattern that in terms of form and space in most buildings is similar but it has unique features in each building these patterns that are derived by lifestyle and social character of individuals and the relationship between structure and architecture that has the following characteristics of shape and form:

- Meet the needs of residents
- Identity for individuals and ordinary people
- Proportion to the geographical conditions
- Lack of the nobility to other buildings and attention to confidentiality of space
- Having a central courtyard and stylized elements of space
- Attention to the spatial hierarchy and order in the entry and exit of the building
- Attention to the geometry and geometric shapes fit to functional concept of each space
- Simple building's exterior and interior view with decoration
- Design space fit to the function and lack of superfluous spaces in the building
- Full use of the land and attention to urban patterns in the orientation of building

Design hall or Alcove in the middle of building to create symmetry of the central part to space fit to indigenous people's beliefs and strengthen attention to the presence of guests and hospitality. Orientation of the houses in this area has been as East or West with deviation to the East that this is due to good use of the sun's heat and the lack of influence of cold winds into the building. As well as unity and coherence of spaces and their regular communication, introspection, attention to privacy, unity in diversity and meet the personal and social needs of residents, creating a relaxed atmosphere and pleasant for residents, using decorations and relationship between decorations with religious beliefs are among general architectural features of Ardebil's houses.

Of other cases that it can be noted is the continuity of architectural styles used in house so that by checking the houses of Safavid period, Afsharieh, Zandie, Qajar and Pahlavi periods, we conclude that in all these periods, continuation of architecture can be seen as quite tangible also by examining the physical of the Ardabil houses in addition to historical typology that was mentioned above in terms of physical there is also almost the continuity and only by changing period, some parts has been added or subtracted of the original building. From this study, it can be noted that the houses and the use of spatial and physical elements can be very effective in the form of identity of today's houses and continuity of architecture and relationship with past architecture of Iran.

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