JEASD

THE IMPACT OF MODERNITY ON TRADITIONAL BUILDINGS IN BAGHDAD

Shahbaa Ahmed Ali[1*]

M. Tayfun Yildirim[2]

1) Architectural Engineering Department, College of Engineering, Mustansiriyah University, Baghdad, Iraq
2) Gazi University, Architecture Faculty, Department of Architecture, Ankara, Turkey

Abstract: This research traces the study of the development of traditional housing in Baghdad in terms of the internal changes of housing and the impact of modernity on them in AL Adhamiya area in the city of Baghdad. where 6 houses from this area are selected as a non-comprehensive intentional sample to be studied, analyzed and compared to the rest of the pattern of the Modern residential period, based on detailed plans, pictures and illustrations. The main objective of this paper is to identify the process of transformation in the type, spatial and visual style of the houses through the application of comparative evaluation of different periods and to indicate the impact of modernity on the disruption or improvement of the houses in Baghdad in order to study the continuity of these patterns or ruptures among them. The conclusions are drawn to emphasize contemporary challenges

1. Introduction

Housing transformations around the world are caused by major demographic and social and economic changes combined. In the case of housing, houses have always been a direct expression of the level of buildings capacity, the availability of local construction materials, and local climatic and culture. [1]. As a result of the political changes in Iraq and the emergence of ideas of modernity across the world, and in Baghdad in particular, a clear change took place in the city to change the shape and style of buildings (and especially houses) from the inside and outside. These changes had a negative effect on the city's dwellings. Traditional homes that conveyed the standards of the Muslim society in Baghdad were forgotten in favor of Western designs that are ill suited to the city's residents and cultural needs.

The problem of this research is the need to form a set of guidelines for design policies and decisions for contemporary architecture in Baghdad, focused on housing in particular, with regard to possible innovations in modern housing, whilst applying principles from the traditional Baghdadi houses.

The best examples of courtyard houses in Baghdad can be seen in Kadhimiya, Adhamiya, Old Rusafa) and Old Karkh. Adhamiya was chosen as a case study for the first period (traditional houses). Adhamiya is in the city of Imam Al-Adham (Abu Hanifa al-Nu'man), named after the famous Muslim jurist who is buried there. The city of Al Adhamiya includes the mosque of Imam Abu Hanifa al-Nu'man and the royal cemetery, in addition to ancient and modern landmarks. The history of Al Adhamiya

Corresponding Author: shahbaa85@uomustansiriyah.edu.iq

to the era of the Abbasid state is as follows: it was first a cemetery before houses were built around and near it. The reason for selecting the study area (Al Adhamiya) is because it expresses the traditional Baghdadi city of its narrow winding streets and houses with a central courtyard and shanshil overlooking the alley dating back to the beginning of the city of Baghdad (the middle of the 9th century), and its location in the center of Baghdad and has an important cultural and social role in the city. Also, large numbers of houses of traditional style exist in this region.

2. Housing in Baghdad

2.1. The Traditional Housing in Baghdad

The traditional house is a simple model that indicates a humble experiment with local styles and the use of available local building materials. However, it is widely recognized as a distinct example of a housing development that ideally faces the hot environment and responds appropriately to the basic needs of its peoples. [1]. Traditional houses in Baghdad are either built on several floors or one floor. The one-level houses consist of a courtyard open to the sky, surrounded by rooms and an iwan space, and all houses have a basement for use during the hot climate. In two- level houses, the first floor contains one or two corridors, basement, dry-food ستore room, and hot kitchen. The second floor consists of bedrooms connected to each other by a corridor with external outlets for light and ventilation. [4].

The traditional houses are inward oriented and never outward oriented, with empty outer walls of windows at the eye level of pedestrians in the alley. Street-facing windows are built higher than the pedestrian level in the street, and are often accompanied by "shanashil" (windows made of wood) to ensure road visibility, as women can see pedestrians outside but pedestrians cannot see inside. In addition to providing privacy,

"shanashil" reduces sunlight and cools the temperature inside the alley [5]. The hot environment also played an important role for privacy as a moderating factor and complemented the cultural and religious need. For this reason, the residents built their windows inward facing the central courtyard of the house. In most residences in Baghdad, the courtyard was used to achieve privacy and also to enhance thermal comfort for the users inside the houses. Moreover, the compact urban fabric of attached houses the neighborhood with the safety they need from stranger attacks as well as preventing sandstorms. The arrangement of houses followed certain rules to maintain neighbors' privacy.
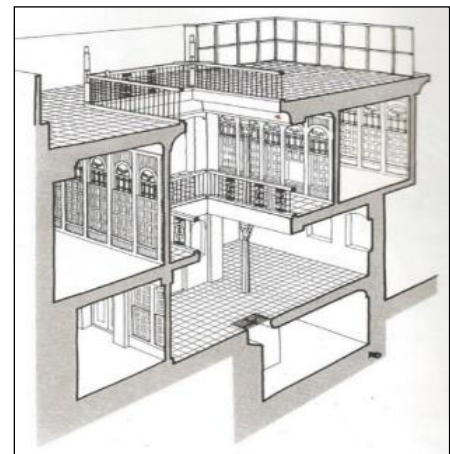

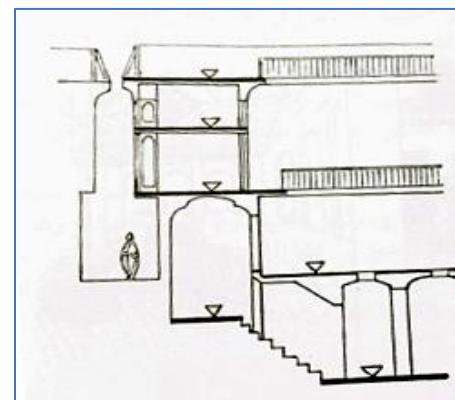**Figure 1.** Section for the traditional house of Baghdad [14].

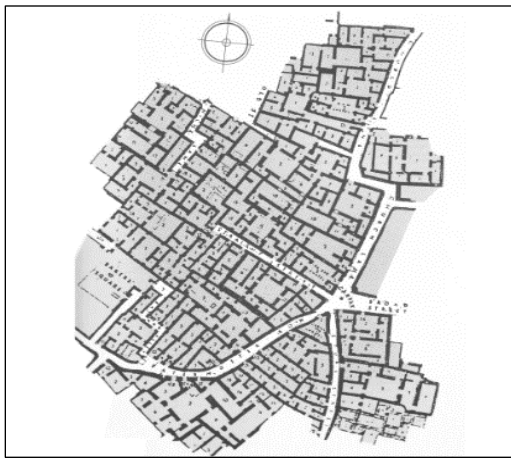**Figure 2.** The levels in the traditional house of Baghdad [14].

Figure 3. Traditional houses of Baghdad [19].

Because the roof was a main entertainment and sleeping place for the family in the summer time, the morphology of traditional houses, especially those which faced each other in the main road, developed to protect the privacy of family zones, the courtyard and roof [6].(See figures 1, 2, 3). The materials used in the buildings were local materials and clay as a base material mixed with straw as a binder. These materials crack easily and for this reason they used stones to give strength to buildings and in proportion to the hot weather in Baghdad [4]. The privacy in the traditional houses in Iraq is observed in the suspended elements represented by (Shanshil), (Ursi) and (Kabshkkan), which represent the physical composition within the entire structural complex that helps to confirm the privacy of the residents. It is especially important for females to ensure the idea of gender segregation and to achieve direct contact with strangers outside or guests inside the house without being seen, with the exception of family members. [7].

2.2. Modernity in Baghdad

At the British rule in Iraq, political and economic changes occurred that directly affected architecture, urban planning and urban development, the aim being to move away from the old ways and patterns that were used in the Ottoman period [8]. The influence of Western architecture, especially that of Britain, on Baghdad gradually grew at the British rule in Iraq, and modern Western architecture became the main source of urban designs. Construction and housing design were among the activities that international companies got involved early and quickly, especially after the World War I, and almost without any discussion from local builders or involvement in the design. In the thirties of the last century when a few young Iraqi architects returned after studying abroad, most of them studied in England. Then, in the fifties of the last century, local heritage ideas were increasing in Iraq, encouraging those interested in the construction sector to search for a modern local architectural identity [2]. There are four main factors that have contributed to the entry of modernity to Baghdad, In this way, the types of houses in Baghdad have changed, which are as follows: The political factor, The cultural factor, The population factors, The schematic factor.

2.2.1. The political factor

The buildings are inseparable from their political and historical surroundings. Thus, modernist architecture was shaped by both the decline of the Ottoman Empire and the beginning of a new occupation era, which can be evidenced by the Western influence in architecture in Iraq in the middle of the twentieth century [9].After the end of the Ottoman Empire, Western colonialism remained in the Arab region, which led to the formation of new states in the region, including Iraq. The British occupation brought together the three region, Baghdad, Basra, and Mosul, to establish a new state, Iraq [2]. The colonial occupation interfered with everything in Iraq, in addition to defining the duties of the new government, including the enactment of new laws related to architecture, and the introduction of a set of changes to Iraq through the development of modern urban projects [10].

Since the early twentieth century and precisely following the oil-economy boom in Iraq in the 1970s, economic and political changes have affected the socio-cultural inherited aspects, traditions and, as a consequence, the behavioural patterns within the home[7].

2.2.2. The Cultural factor

Culture is part of facts, beliefs, history and physical structure. The Arab world believes that Western ideas and Western methods are more appropriate and better than their methods. This led to a loss of self-esteem and identity [11]. Culture and its various factors take a major role in influencing the behavior of society and interactions with others. Architecture, in its simplest form, materially expresses this influence. People and their social, cultural and psychological aspects draw and define the physical properties of the home which in turn give a clear expression of the social style and status of the group using it [7].

2.2.3. The Population Factors

Baghdad at the Ottoman Empir was a small capital of a new state, its people numbered about 200,000 people. During the fifties of the last century, Baghdad began to suffer from pressures on its urban composition similar to those in the Arab countries. This massive population growth had major effects on the city's infrastructure and led to a housing shortage. One of the reasons for the population growth was the increase in the number of rural immigrants looking for work, and their informal settlements formed in the city. Then, until the fifties of the last century, there was a tendency to deal with the unregulated growth of the urban population and the increase in the numbers of informal housing [2]. By the 1950s, Baghdad had a population of about one million, so the Islamic Development Bank

decided to focus on developing the city. Engineers and companies were invited to work in Baghdad [9].

2.2.4. The Schematic Factor

Since the beginning of the twentieth century, many modern urban planning and renewal programs have included changing economic centers, demolishing existing buildings, constructing network streets, and redistributing service buildings and residential communities in line with urban development goals. Baghdad is no exception to this trend [13]. After the discovery of oil in Kirkuk in 1927, the increase in oil revenues in Iraq contributed to the implementation of new urban development projects. Among these projects are many projects related to housing, implemented by English architects in Baghdad during the 1930s [2]. In 1958, the Iraqi government commissioned Dioxide to design a master plan for Baghdad. The master plan assumed a rectangular area along the southeastern and northwestern axis of the Tigris River. They proposed a set of new streets as well as existing roads to divide the rectangular area. A grid scheme has been proposed to accommodate the residential and sub-sectors with a slight modification in the city center to adapt the commercial center located in and around the old city center. The development of industrial areas located on the edges of the rectangular shape [13]. By analyzing the Doxiadis plan for Baghdad in particular, we can show that such projects appear as an attempt to modify the Western style with the local Baghdadi context, which failed in terms of social and cultural understanding and in terms of climate [9].
Shortly thereafter, Iraq decided to stop working with Doxiadis and abandon its masterplan proposals.In 1965, Iraq asked its new planning consultants, the Polish company Polservice, to develop other urban studies and plans for

Baghdad to replace previous studies that the Baghdad local government had deemed inappropriate and unrealistic. In accordance with the new agreement, Polservice developed a new master plan and zoning for Baghdad. The plan defined the center area of the city on both sides of the Tigris River. It also suggested developing eight sub-centers around the center to decentralize activities in the center and thus reduce pressure there [2].

3.Case Study

The analysis method was included analysis of houses in Baghdad, in order to achieve the goals of this research study, using the qualitative literature research approach, surveys were completed and the effect of modernism in the housing typology of Baghdad was analyzed in two stages.

The analytical stage, including analysis of the houses in several aspects, these aspects are:
Analysis of type - Analysis of façade - Analysis of zoning **-**Analysis of horizontal movement - Analysis of space syntax.
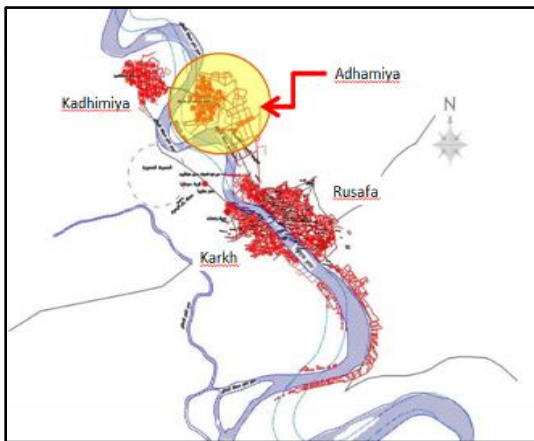

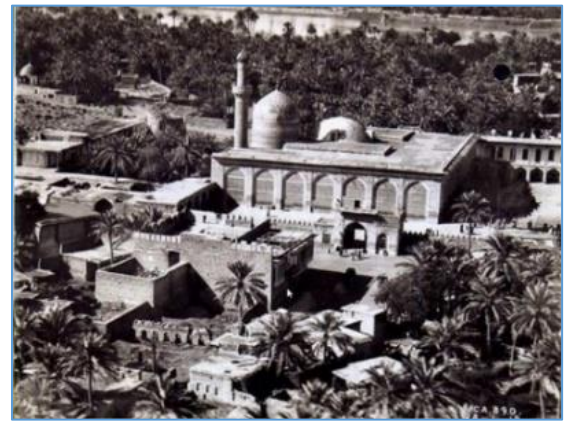**Figure 4.** A map of Baghdad, shows ALAdhamiya area [15].

Figure 5. A view of Baghdad, during the late Ottoman rule, shows mosque of Abu Hanifa Nu'man and AL Adhamiya area [19].

3.1. Material and Method

Most of the traditional houses present today in the old parts of Baghdad are not more than 100 years old. This is because most of the older houses were destroyed by the seasonal floods of the Tigris River, which also contributed to the destruction of ancient building materials such as wood, clay and mud bricks. Also, the second stage (case study) includes:

1. Samples of residences were taken within (Al Adhamiya) area of Baghdad and along the time scale of the research.
2. Determining the spaces of this period, identifying the new spaces, in the dwellings of each phase.
3. Determine the number of types of relationships that the traditional house is linked to in Baghdad within its various elements, which are linked within the larger system, by using the space syntax method . (Space Syntax is a method for describing and analyzing the relationships between spaces of urban areas and buildings. In space syntax, the spaces are understood as voids such as streets, squares, rooms and fields, between walls, fences and other things that restrain pedestrian movement or the

visual field) [17]. Local and global integration, Integration, also called availability, is a variable that refers to how a space is connected with other spaces in its surroundings. This is the key parameter leading to the understanding of the relationships that exist between users and the urban space and it is a global measure. It can be used to predict the potential of meetings in the space, because it is directly linked to the presence of people in a given location. The greater integration of the space, the more people will appear in it. For this reason, integration is sometimes called accessibility by SSA researchers [18].

4. Examine the evolution of these relations through follow-up, and analysis of the drawings, information, and photos of the samples collected.

The first stage (literature review): A literature survey was done to create a foundation for the research objectives and questions to help build up the gap of knowledge in the research topic in Baghdad houses. The methodology of the plans, the types and mass, the façade, Movement within the vertical axis and movement within the horizontal axis, the zoning and Privacy, as well as the integration spaces analysis with used the space syntax method. The research incorporated 6 houses of Baghdad habitations. They have been taken inside the Al-Adhamiya district of Baghdad and along the time scale of the research. Likewise, research methodology incorporates deciding the spaces of every period, recognizing the new spaces dropped in the abodes of every period, determine the number of sorts of connections that the house is connected to in Baghdad inside its different components, which are connected inside the bigger framework by use space construction.

This paper methodology will do authentic and historical analysis of six houses in Baghdad utilizing relative analysis.

4. Analysis of Houses

4.1. Analysis of Traditional Housing in Baghdad

The type of houses in this period, which dates back to the second half of the 18th and 19th centuries (during the Ottoman rule of Iraq) and have characteristics of local architectural Baghdadi heritage, which bears the features of the planning of Arab Islamic architecture.

This means that they are responsive to the climatic and economic requirements on the one hand and religious beliefs and social and cultural customs on the other, and they are an extension of the previous era in terms of the use of architectural elements and structural materials and traditional building techniques using bricks as a basic material in construction and wood for the roofing and decorating the interior and the Shanashil. They are also distinguished by the presence of the central courtyard surrounded by the rest of the house.

The house falls into the interior before the emergence of shanashil with its beautiful decoration on the first floor and the broken entrance to achieve the privacy of the house of strangers and the presence of basement as a basic part of the components of the traditional house Baghdadi. These traditional houses have undergone many changes either for the purpose of repair and restoration or because of the introduction of new building concepts and new construction materials, causing a lot of modification and damage to them. This type of house ended after the British colonization of Iraq and the emergence of new western construction concepts in the traditional Baghdadi style. District of Al Adhamiya was chosen for study and analysis in the research, with ٦ traditional houses selected: house of Qasem Ali, house of

Ali ALMajid, Ahmed AL RAWI, house of Naeem ALMSHIHDANY, Omer Al-ISSAWI, and the house of Muwafaq AL-ANY.

4.1.1. Qasam ALI 'S house in Baghdad

This house is small in size and overlaps with neighboring houses. It was built almost in a 1918 (according to the residents' estimation) with an area not exceeding 75 meters. It was distinguished by the presence of the central courtyard surrounded by the rest of the house. It also features a gradient facade overlooking the street, and also the interior facade that represented by the facade of rooms overlooking the central courtyard from all sides. It consists of 4 levels. The house includes the following components: majaz or corridor, guest room, two iwans, courtyard, kitchen, on the ground floor, and 2 ursi, corridor, and bathroom on the first floor, then two sets of stairs, one of which is the main ladder, and the second is a ladder to the basement (See figure 6) (Figures by the researcher).
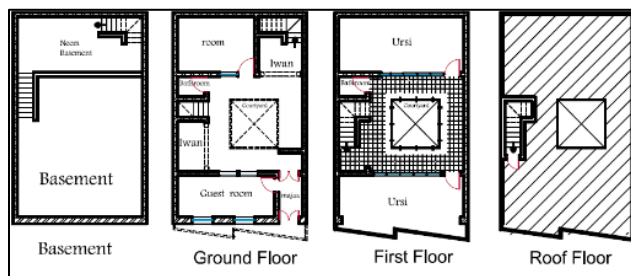

Figure 6. The plans of Qasam ALI 'S house in Baghdad, by the researcher

Figure 7. Photo show the façades of Qasam ALI 'S house in Baghdad

4.1.2. Ali ALMAJED'S House in Baghdad

The Ali ALMAJED 'S house is characterized by an irregular square shape and the central courtyard in the middle part of it, and this house is adjacent the Saad ALJUBURI'S house in the same alley. The house has large area about 150 meters and almost built in 1921 (according to the residents' estimation), and the increase in the number of spaces as compared to the previous examples. The Ali ALMAJED'S house consists of 5 floors. It also features in its side entrance with a corridor for privacy. The ground floor composed of (majaz., iwan, courtyard,3 rooms, kitchen, and bathroom), the first floor contains (2 bedrooms, and 2 ursi), and the kabshkan floor contains (2 kabshkan rooms) (See figure 8) (Figures by the researcher).
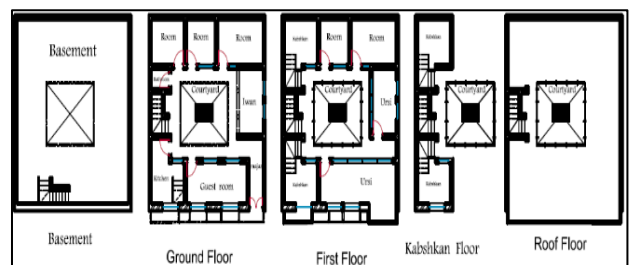

Figure 8. The plans of Ali ALMAJED'S house in Baghdad, by the researcher

Figure 9. Photo show the façades of Ali ALMAJED'S house

4.1.3. Ahmed AL RAWI'S House in Baghdad

The Ahmed AL RAWI'S house is characterized by its distinctive facade, with a gradient shanashil that is in line with the shape and slope of the surrounding alley, and an entrance in the side of the façade, also the house has small area about 85 meters and almost built in 1920 (according to the residents' estimation). The Ahmed AL RAWI'S house consists of 5 floors. It also features in its side entrance with a corridor (majaz) for privacy as the former hoses. The ground floor composed of (majaz., 2 iwans, courtyard, 2rooms, kitchen, and bathroom), the first floor contains (room, iwan, and 2 ursi), and the kabshkan floor contains (one of kabshkan room) (See figure 10) (Figures by the researcher).
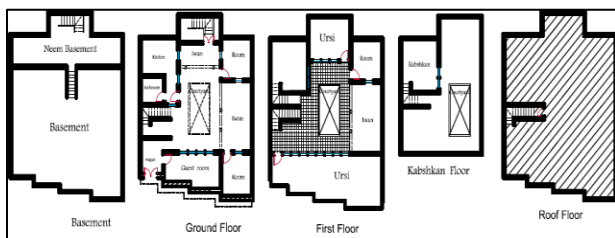

Figure 10. The plans of Ahmed AL RAWI'S house in Baghdad, by the researcher

Figure ١١. Photos show the façades of Ahmed AL RAWI'S house in Baghdad

4.1.4. Naeem ALMSHIHDANY'S house in Baghdad

The Naeem ALMSHIHDANY'S house is characterized by irregular shape near the square shape, the house has small area about 75 meters and almost built in 1919 (according to the residents' estimation), and contains one courtyard on which the house depends on lighting and the distribution of interior spaces around it, in addition middle entrance, which contains the corridor (majaz). It also features in its center entrance with a corridor for privacy.The Naeem ALMSHIHDANY'S house consists of 4 floors. The ground floor composed of (Majaz, guest room, iwan, courtyard, room, kitchen, and bathroom), the first floor contains (3 rooms, and 2 ursies,) (See figure ١٢) (Figures by the researcher).
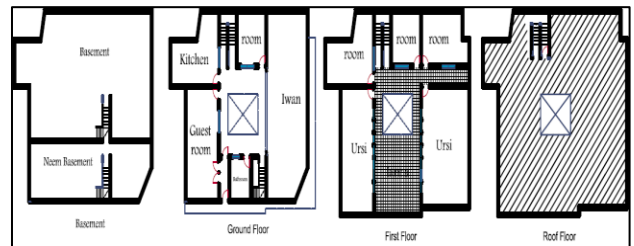

Figure ١٢. The plans of Naeem ALMSHIHDANY'S house in Baghdad, by the researcher

Figure 1٣. Photos show the façades of Naeem
ALMSHIHDANY'S house in Baghdad

Figure 1٥. Photos show the façades of Omer Al-
ISSAWI'S house in Baghdad

4.1.5. Omer Al-ISSAWI'S house in Baghdad

The Omer Al-ISSAWI'S house is characterized by irregular shape near the L shape, the house has large area about 160 meters and almost built in 1922 **(**according to the residents' estimation), and contains one 2courtyards on which the house depends on lighting and the distribution of interior spaces around it, in addition middle entrance, which contains the corridor (majaz). It also features in its center entrance with a corridor for privacy. This house has undergone many changes in internal design, either for the purpose of repair and restoration or because of the introduction of new building concepts and new construction materials, causing a lot of modification and damage to this house. The Omer Al-ISSAWI'S house consists of 4 floors. The ground floor composed of (Majaz, guest room, iwan, 2 courtyards, 3 rooms, kitchen, 2ursi and bathroom), the first floor contains (5 rooms, 2 ursi and bathroom) (See figure ١٤**)** (Figures by the researcher).
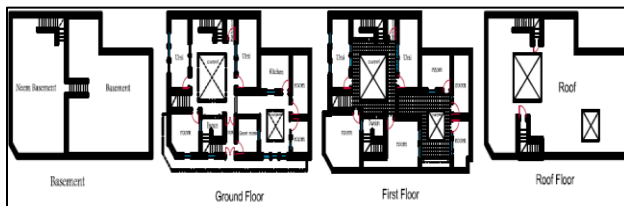
4.1.6. Muwafaq AL-ANY'S house in Baghdad

The Muwafaq AL-ANY'S house is adjacent to the former house and is located in the same alley, and has area about 155 meters and built in 1923. It is similar to the previous example in the shape of the façade (shanashil). The Muwafaq AL-ANY'S house has undergone many changes either for the purpose of repair and restoration or because of the introduction of new building concepts and new construction materials, causing a lot of modification and damage to this house. The The Muwafaq AL-ANY'S house consists of 4 floors (the ground floor, the first floor, the roof and basement - neem basement floor). The ground floor contains (Majaz, guest room, iwan 2 courtyards, 5 rooms, kitchen, and bathroom), the first floor contains (6 rooms, ursi, iwan, and bathroom) (See figure١٦) (Figures by the researcher).
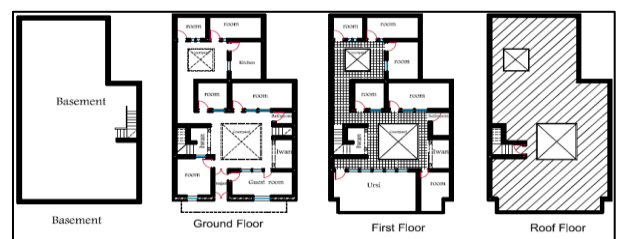

Figure 1٦. The plans of Muwafaq AL-ANY'S house in Baghdad, by the researcher

Figure 1٤. The plans of Omer Al-ISSAWI'S house in Baghdad, by the researcher

Figure 1٧. Photos show the façades of Muwafaq AL-ANY'S house in Baghdad

4.2. Results and Discussion

4.2.1. Analysis of type

The houses are inward looking, with a projection of shanashil with its beautiful decoration on the first floor and the indirect axis of the entrance to achieve the privacy of the house of strangers and the presence of basement as a

basic part of the components of the traditional Baghdadi house. Also, the traditional houses in Baghdad consist of five or four floors, which include: the ground floor, the first floor, the kabshkan floor, the basement or neem basement, and the roof. Sometimes the kabshkan floor or the neem basement floor disappear, according to the design of the house.

The residential space, which is enclosed by its compact walls, in principle and details in its urban structures, is organized into two parts: The first is the central inner courtyard, open to the sky. The second part is the collection of different spaces that surround this interior courtyard and overlook it. The residential spaces of the Baghdadi house are called by certain names locally traded based on their urban structures,

their use, their location or their dimensions. As these spaces vary between them through the arrangement of windows or the height of the ceiling or details of the walls or details of decoration and ornament, and others or the absence of some parts of them. Therefore, it is possible to distinguish between :First - closed spaces which are: Ursi, room, guest room, kabshakkan, majaz, basement and neem basement, in addition to the spaces of services such as kitchen, bathroom, sanitation and others . Second - Other spaces some of the parties are open and without a wall, such as: corridor and iwan .Third - Other spaces are exposed and have no surface such as the roof and the courtyard of the house. The type of the houses was influenced by the effects of Western civilization as a result of the British colonization of Iraq on the local architecture and the emergence of new building styles that were not previously known (the style of the Modified Arab House) with a central courtyard and facades with windows overlooking the outside Where the building goes outward instead of closing inward and the emergence of (window) on the ground floors and the upper, in addition to the replacement (ALshanashil) with (balconies), and the survival of the courtyard and changing the central position and turn into a back garden sometimes), as well as the disappearance of the (Iwan) and replaced by the reception room of guests and also disappearance of (ALkabshkan) and replaced by a room (store) at this stage affected by designs West Houses. New construction methods and materials, such as steel structures (ALShelman), were used and the basement remained in some houses and disappeared from each other according to the wishes of the owner, ending with the end of the 1950s with the establishment of the Republic of Iraq in 1958. (See table 1).

Table 1. shows a comparison of the type for houses

Type of Houses	The House Shape	The type of entrance	Type of floors	The spatial type of the components.
The Traditional houses	Organic shape	Indirect axis of the entrance	4-6 Floors	A closed block toward the courtyard
The Modern houses	Regular shape	Direct axis of the entrance	1-3 floors	An open block out towards the surrounding park and street and disappearance of the courtyard and replaced by the Living room

4.2.2. Analysis of the façade

The façades of the houses of this phase (traditional houses) were characterized by wooden Shanashil, overlooking the alley, on the first floor and the closing of the house on the ground floor. The shape of the Shanashil is either oblique meandrous or prominently on the alley, the traditional houses have two facades: one is exterior overlooking the alley and the other is interior represented by the rooms overlooking the central courtyard from all sides. The shape of the entrance is a decorative wooden door gives the facade a beautiful and distinctive form. The wood, brick was used as building materials in the decoration of the façade and in the construction of the house (See table 2).

Table 2. shows a comparison of the facade for houses

Type of Houses	Facade type	Description of the facades
The Traditional houses	wooden Shanashil	The ground floor does not contain deaf locked openings without any windows.
The Modern houses	Large balconies	The ground floor has windows that open outward, and the first floor contains balconies

4.2.3. Analysis of zoning

There is always a mechanism that emphasizes the flexible kinetic concept of social, physical and spatial space related to privacy and separation between male and female and direct contact in a way that shows a deep understanding of the human relations of the Baghdad city society .This can be shown in the guest rooms were isolated by majaz space or (corridor), on the ground floor of the traditional house to achieve privacy. The house design should provide privacy to the three main zones inside the house (guest's part and family part) as well as provide privacy from outsiders by avoiding the house designs that have a number of windows facing the neighbours and the streets, even in the privet bedroom spaces (See table3).

Table 3. shows a comparison of the zoning of houses

Type of Houses	Block direction	The main space in the house
The Traditional houses		High privacy achieved by isolating the entrance by corridor (majaz) and represents to block the gaze of strangers to the residents of the house. The zoning of these houses was contact a two zoning, the first the zoning for the family, the second is the zoning for the guests.
The Modern houses		The zoning of these houses was contact a three zoning, the first the zoning for the family, the second is the zoning for the guests, and the zoning for the open area. High privacy achieved by isolating the entrance by corridor and represents to block the gaze of strangers to the residents of these houses.

4.4. Analysis of horizontal movement

It was noted through the traditional houses selected in this research that there is a hierarchy of spatial privacy in the movement system starting from the alley which represents (the public) passing through the Twisted (corridor)

space which represents the " semi - public" to reach the middle courtyard, The core of the house which represents (private public) through which it can be passed to the spaces of the house (private) of the bedrooms and rooms of ursi and the rooms of kabshkan and health services. It concludes from the above that the axis of horizontal movement in houses of this phase is a twisted axis to achieve privacy, and the central courtyard controls on the motional levels within the house.And it was achieving the privacy of the inhabitants through the form of its central closed block that achieves the hierarchy between the public and private spaces, as well as the broken shape of corridor that prevents the gaze and the entry of strangers into the private spaces of the house (See table 4) .

Table 4. shows a comparison of the movement analysis of houses

Type of Houses	The number of levels of houses	Description the levels of houses
The Traditional houses	The house has several levels It ranges from 5-6 floors	The houses consist of a ground floor, a first floor, a roof floor and a basement and some of the houses contain a kabshakan floor (the middle floor).
The Modern houses	It ranges from 2-3 floors	The houses consist of a ground floor, a first floor, and the roof floor, in these houses the basement was disappearance, and the disappearance of the middle floor.

4.5. *Analysis of space syntax in traditional houses of Baghdad*

It was observed through the sketches of the traditional conventional houses chosen in this period of Baghdad that the customary houses comprise principally of the basement that most incorporated spaces. Where the highest integration value recorded in the courtyard and the lowest integration value recorded in the basement (See table ٥), (table ٦), (table ٧), (table ٨), (table ٩), (table ١٠) and (table ١١). Current usage and first use plans were created and syntactic analyzes of each house were made in line with these plans. Firstly, the access graphs of the houses were created and then the depth values and integration values were calculated. Total depth (TD), mean depth (MD) and integration value (RA) were evaluated according to the results.

Table ٥. Analysis of space syntax in Ali ALMAJED'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	41	2.277	0.136
co	Courtyard	28	1.555	0.065
Gr	Guestroom	32	1.777	0.091
U	Ursi	46	2.555	0.182
U	Ursi2	46	2.555	0.182
iw	Iwan	44	2.444	0.169
R	Rooms1	44	2.444	0.169
R	Rooms2	46	2.555	0.182
K	Kitchen	42	2.333	0.156
B	Bathroom	44	2.444	0.169
kb	Kabashkan	46	2.555	0.182
kb	Kabashkan2	46	2.555	0.182
ro	Roof	46	2.555	0.182
bs	Basement	46	2.555	0.182
ST	Street	58	3.222	0.261

Table 6. Analysis of space syntax in Qasam ALI'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	32	2.285	0.284
co	Courtyard	23	1.642	0.098
Gr	Guestroom	45	3.214	0.340
U	Ursi1	41	2.928	0.296
U	Ursi2	41	2.928	0.296
iw	Iwan1	32	2.285	0.197
iw	Iwan2	36	2.571	0.241
K	Kitchen	36	2.571	0.241
B	Bathroom	36	2.571	0.241
ro	Roof	41	2.928	0.296
bs	Basement	48	3.428	0.373
ST	street	46	3.285	0.351

Table 8. Analysis of space syntax in Muwafaq AL-ANY'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	74	2.642	0.121
Co1	Courtyard1	50	1.785	0.058
Co2	Courtyard2	71	2.535	0.113
Gr	Guestroom	75	2.678	0.124
iw	Iwan1	77	2.75	0.129
iw	Iwan2	71	2.535	0.113
R	Rooms1	77	2.75	0.129
R	Rooms2	98	3.5	0.185
K	Kitchen	98	3.5	0.185
B	Bathroom	77	2.75	0.129
ro	Roof	102	3.642	0.195
U	Ursi	71	2.535	0.113
bs	Basement	102	3.642	0.195
ST	Street	101	4,482	0,183

Table 7. Analysis of space syntax in Omer Al-ISSAWI'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	53	2.208	0.105
Co1	Courtyard1	44	1.833	0.072
Co2	Courtyard2	68	2.833	0.159
Gr	Guestroom	78	3.25	0.187
iw	Iwan1	67	2.791	0.155
iw	Iwan2	62	2.583	0.137
R	Rooms1	67	2.791	0.155
R	Rooms2	62	2.583	0.137
K	Kitchen	67	2.791	0.155
B	Bathroom	67	2.791	0.155
ro	Roof	69	2.875	0.163
U	Ursi1	67	2.791	0.155
U	Ursi1	67	2.791	0.155
bs	Basement	88	3.666	0.231
ST	Street	78	3,25	0,195

Table 9. Analysis of space syntax in Ahmed AL RAWI'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	43	2.388	0.1263
Co1	Courtyard	30	1.666	0.078
Gr	Guestroom	60	3,333	0,274
iw	Iwan1	47	2.611	0.189
iw	Iwan2	47	2.611	0.189
R	Rooms1	47	2.611	0.189
K	Kitchen	47	2.611	0.189
B	Bathroom	47	2.611	0.189
ro	Roof	47	2.611	0.189
U	Ursi	47	2.611	0.189
kb	Kabshkan	47	2.611	0.189
bs	Basement	79	4.388	0.398
nb	Neem Basement	62	3.444	0.287
ST	Street	60	3,333	0,274

Table ١٠. Analysis of space syntax in Naeem ALMSHIHDANY'S house

Code	Space	(TD)	MD)	(RA)
M	Majaz	36	2. 25	0.166
Co1	Courtyard	24	1.5	0.066
Gr	Guestroom	37	2.312	0.174
iw	Iwan1	43	2.374	0.224
iw	Iwan2	43	2.687	0.224
R	Rooms1	43	2.687	0.224
R	Rooms2	44	2.75	0.233
K	Kitchen	43	2.687	0.224
B	Bathroom	43	2.687	0.224
ro	Roof	43	2.687	0.224
U	Ursi	43	2.687	0.224
bs	Basement	52	3.25	0.3
ST	Street	51	3,187	0,291

Table ١١. shows a comparison of traditional houses on the level of space syntax

Type of Houses	The most integrated	The least integrated space
The Traditional houses	The middle courtyard	Basement
The Modern houses	Living space	Roof

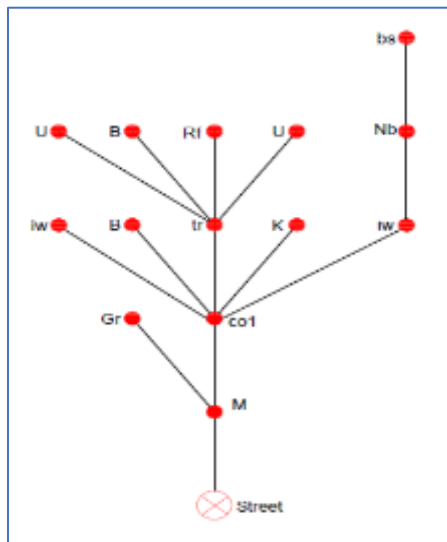*Syntactic calculations of Qasam ALI 'S house in Baghdad*

Figure 1٨. Syntactic calculations of Qasam ALI 'S house in Baghdad

$$MD = \frac{46}{(15-1)} = 3,285$$

$$RA = \frac{2\,(3,285-1)}{(15-2)} = 0,351$$

Syntactic calculations of Ali ALMAJED'S house in Baghdad
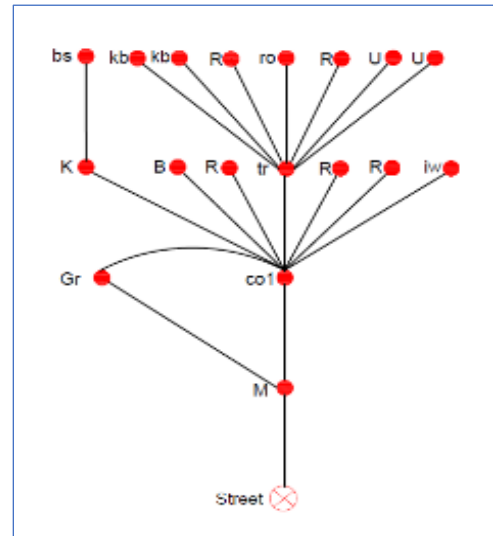

Figure 19. Syntactic calculations of Ali ALMAJED'S house in Baghdad

$$MD = \frac{58}{(19-1)} = 3,222$$

$$RA = \frac{2\,(3,222-1)}{(19-2)} = 0,261$$

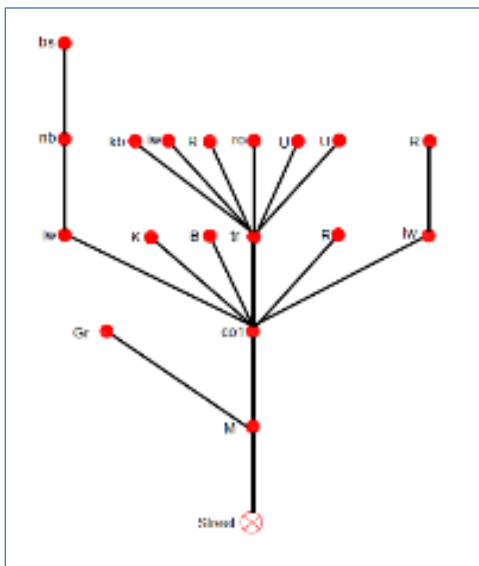*Syntactic calculations of Ahmed AL RAWI'S house in Baghdad*

Figure 20. Syntactic calculations of Ahmed AL RAWI'S house in Baghdad

$$MD = \frac{60}{(19-1)} = 3,333$$

$$RA = \frac{2\,(3,333-1)}{(19-2)} = 0,274$$

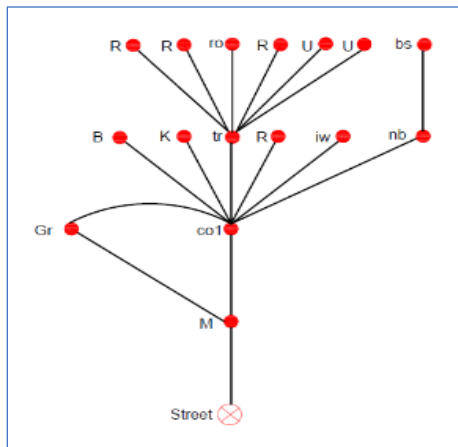*Syntactic calculations of Naeem ALMSHIHDANY'S house in Baghdad*

Figure 21. Syntactic calculations Naeem ALMSHIHDANY'S house in Baghdad

$$MD = \frac{51}{(17-1)} = 3,187$$

$$RA = \frac{2\,(3,187-1)}{(17-2)} = 0,291$$

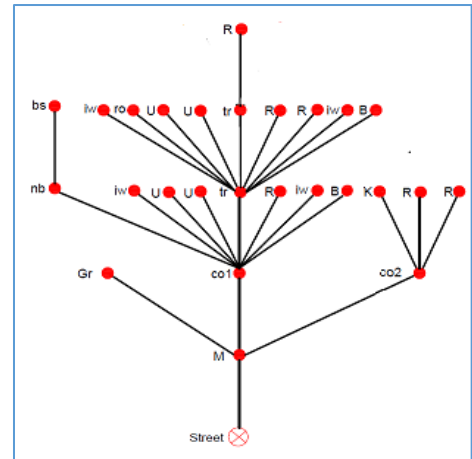*Syntactic calculations of Omer Al-ISSAWI'S house in Baghdad*

Figure 22. Syntactic calculations Omer Al-ISSAWI'S house in Baghdad

$$MD = \frac{78}{(25-1)} = 3,25$$

$$RA = \frac{2\,(3,25-1)}{(25-2)} = 0,195$$

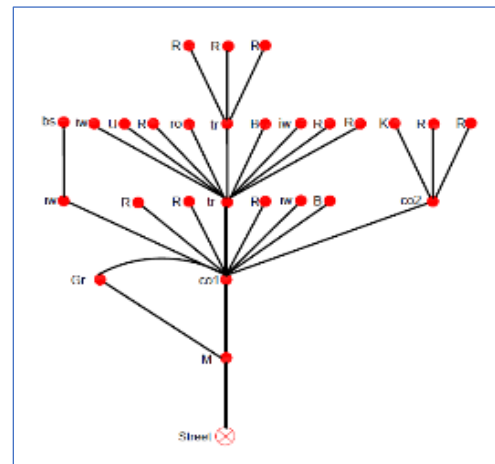*Syntactic calculations of Muwafaq AL-ANY'S house in Baghdad*

Figure 23. Syntactic calculations Muwafaq AL-ANY'S house in Baghdad

$$MD = \frac{101}{(29-1)} = 4,482$$

$$RA = \frac{2\,(4,482-1)}{(29-2)} = 0,183$$

5. Conclusions

1. As a result of the previous factors' impact in Iraq and the emergence of ideas of modernity across the world, and in Baghdad in particular, a clear change took place in the city to change the shape and style of buildings (and especially houses) from the inside and outside. These changes had a negative effect on the city's dwellings.

2. The essence of the idea of traditional housing was to identify the appropriate personal space to protect the family members and receive guests and prepare the living necessities required for housekeeping in a flexible manner for multiple purposes. While in the traditional house every living space was flexible in furnishing, in principle it has many uses such as sleeping, eating, resting, receiving guests or various household chores without that space being reserved for a particular use, and of course this did not include service spaces.

3. The nature of the movement within the traditional house, ranging from public space to semi-public spaces and semi-private spaces, ending with special spaces, while the nature of the movement within modern houses does not have this gradation, from the public to the private directly, which reduces the privacy of the occupants inside the house.

4. The Baghdadi houses consist mainly from either the main courtyard or main hall as their most integrated spaces. Also, the transition-space-centered spatial organization that was initiated during the early of 20th century in traditional Baghdadi houses has been continued through the 20th century in modern plans. In addition, it can be resulted that, there was a transition era happened to the Baghdadi's houses. This transition made the transformation from the traditional house to the modern house. We can note this difference in the space configuration and the transformation from living-centered organization towards transition-space-centered organization. For sure, this transformation in the domestic life happened because of the transformation in the social structure and the modern life in the new Iraqi society.

5. low-cost limited area which it needs to understanding all former factors. To achieve a modern design, it requires metaphor from the principles of a traditional house in Baghdad that covers all the requirements for successful housing for the environment and culture of the Baghdadi community.

6. To achieve Baghdadi house in a contemporary style suitable for residents, it does require the use of the traditional house style by taking into account the privacy and provide a space to prevent the penetration of the eyesight of strangers and reduce openness to the outside as much as possible and provide a hierarchy of the transition between space from the public to the private, And the environmental aspect through the use of low-energy consuming building materials as well as the provision of open spaces with adequate ventilation and natural lighting, and the social aspect by providing a central space that combines the family and strengthen the bonds between them and maintain the family's presence with each other most of the time and space adequate and adequate, And the cultural aspect through the use of elements of the traditional facades and

reformulation in a modern style, which provides aesthetics of the style of contemporary homes.

Conflict of interest

The publication of this article causes no conflict of interest

6. References

1. Remali, A. M., Salama, A. M., Wiedmann, F., & Ibrahim, H. G. (2016). *A chronological exploration of the evolution of housing typologies in Gulf cities. City, Territory and Architecture,* 3(1), 14.

2. Elsheshtawy, Y. (2004). *Planning Middle Eastern Cities*: An Urban Kaleidoscope: Routledge.

3. Al-Taie, E., Al-Ansari, N., & Knutsson, S. (2012b). *The progress of buildings style and materials from the ottoman and British occupations of Iraq.* J. Earth Sci. Geotech. Eng, 2, 39-49.

4. Al-Taie, E., Al-Ansari, N. and Knutsson, S. (2012a). *Materials and the style of buildings used in Iraq during the Islamic period.* Journal of Earth Sciences and Geotechnical Engineering, 2(2), 69-97.

5. Al-Kodmany, K. (1999). *Residential visual privacy: Traditional and modern architecture and urban design.* Journal of Urban Design, 4(3), 283-311.

6. Al-Jamea, M. (2014). *Towards social and cultural sustainability in the designs of contemporary Saudi houses.* Int J Sustain Hum Dev, 2(1), 35-43.

7. Al-Thahab, A., Mushatat, S., & Abdelmonem, M. G. (2014a). *Between Tradition and Modernity: Determining Spatial Systems of Privacy in the Domestic Architecture of Contemporary Iraq.* ArchNet-IJAR, 8(3), 238-250.

8. Pieri, C. (2006). *Baghdad 1921-1958. Reflections on history as a" strategy of vigilance".* Paper presented at the Bulletin of the Royal Inter-Faith Studies.

9. Harrington, L. (2014). *Architecture and Nation-building in Mid-20 th Century Urban Turkey and Iraq.* University of Washington.

10. Jackson, I. (2016). *The architecture of the British Mandate in Iraq: nation-building and state creation.* The Journal of Architecture, 1-43.

11. Abedi, M. and Soltanzadeh, H. (2014). *The interaction between tradition and modernity in contemporary architecture of Persian Gulf States: Case study of United Arab Emirates.* International Journal of Research in Humanities and Social Studies.

12. Al-Hasani, M. K. (2012). Urban space transformation in old city of Baghdad– integration and management. *Megaron Architecture, 7*(3), 79-91.

13. Makiya, M. (2005). Baghdad. Dar Al Warraq for Publishing ,*book in Arabic*

14. Majeed.F. (2013). *Urban Development in Baghdad, Master thesis, Engineering Faculty, University of Baghdad.*

15. Municipality of baghdad, (2018). *A proposal for the design of the foundation of the city of Baghdad for the year 2030.*

16. Jacoby, K. (2006). *What is Space Syntax?* Does the urban form of the city affect the level of burglary and crime? Royal Institute of Architecture Stockholm.

17. W. Dettlaff (2014). Space syntax analysis – methodology of understanding the space.

18. Internet: http://aladhamya.blogspot.com/2013/04/

19. Fathi, I. J, W. (1982). *Traditional house in Baghdad.* England: Coach Publishing House Ltd.