Analysing the Transformed Urban Patterns of Al-Najaf Historical Center: Urgent Issues and Possible Solutions

Sabeeh Lafta Farhan1, 2*, Haider I Alyasari 3, Venus S Akef 4, Salah L Zubaidi 5 and K S Hashim 6,7

1Department of Architecture, College of Engineering, University of Wasit, Iraq
2School of Architecture, Design and the Built Environment, Nottingham Trent University, UK
3Department of Architecture, College of Engineering, University of Kerbala, Iraq
4Architectural Engineering Department, University of Technology, Baghdad, Iraq
5Department of Civil Engineering, Wasit University, Wasit, Iraq
6Environmental Research and Studies Center, University of Babylon, Hilla, Iraq
7BEST Research Institute, Liverpool John Moores University, Liverpool, UK
*Corresponding author: drsabeeh@uowasit.edu.iq

Abstract
The Old Holy Al-Najaf is the third influential religious center for Shia Muslims in the whole Islamic world after Mecca and Madinah. This historical city embraces a rich tangible and intangible heritage that has long distinguished its architectural identity and enriched its spiritual experience. Along its history, since its establishment around the 8th century AD, the city has faced continuous challenges defying its capacity to resist, preserve, and evolve based on the root causes of its formation (Islamic culture and climate requirements). However, since the mid of the 20th century, the city has been challenged with new cultural, economic, and political forces causing radical transformation in its deep organizational urban structures and architectural features. Thus, the paper will include analysing the current structure of the traditional urban morphology of the Old City of Al-Najaf highlighting the major problems that are threatening its unique inherited architectural and urban characteristics. Despite the dramatic heritage loss in the city, there are many trajectories to protect the still-existing parts of the historical center. The proposed vision is not to refuse the modernization of the city, but rather to embrace a rational urban preservation.

1. Introduction
The Old City of Al-Najaf is a traditional organic urban morphology that is structured in a circular shape around a central core of the city that embraces the Holy Shrine of Ali ibn Abi Talib who is a central Islamic spiritual personality. For his fundamental influential role, his martyrdom was a key juncture in the history of Islam and around his holy shrine. The city has continued growing and became a centre of Shiite Muslim pilgrims taking all the characteristics of traditional Arabic and Islamic cities (figure 1). Four residential districts shape the urban structure.
The traditional urban morphology of the Old City of Al-Najaf is an organic and compact structure comprised of smaller units of courtyard houses and an organic web of alleyways to connect the residential units with each other and with the center. The hierarchical spatial arrangements, privacy, centralization, and land use system are among the main distinguished characteristics of the city that reflect the key factors behind its formation: Islamic culture and climate requirements [2].
This historical city, Al-Najaf, was developing and expanding, it had always been protected with defensive walls. The most recent wall, the sixth one, was constructed in 1811 AD with four main gates which had been carefully placed at the main movement axes respecting the city’s existed land use [3]. However, the first half of the 20th century (as Iraq granted its independence as a kingdom of Iraq which came in coincidence with the oil discovery, economic boom in the country, and the worldwide modernization movements) marked the beginning of modernizing the historic city[2]. Exotic architectural styles have penetrated into the city, and the land use system, spatial organization, hierarchical privacy structure, and city’s skyline have all been transformed. The result is a huge loss in the rich tangible and intangible heritage of the city.

Important to mention at this point, is that this case is not limited to Al-Najaf city. Rather, almost all high profile historic sites and historical cities such as Karbala, Kadhimiya, Samarra and other religious and historical centers in Iraq are facing similar challenges. Urgent issues are accumulating requiring careful and professional solution to avoid further heritage destruction and save the preserve the remaining parts.

In this paper, shedding light on the issue of the radical transformation of the deep organizational, Instead, it is to envision a carefully planned roadmap to address the essential requirements of the existing historical fabric considering the key factors of its formation (Islamic culture and climate requirements) using the best possible preservation and construction technology. Over the last 13 centuries and along its history, the traditional urban fabric of Al-Najaf city has adapted to all the forces of change, expansion, and development. It was able to preserve and keep its key distinguished characteristics by respecting the root causes of its formation. The city, thus, does definitely have the capacity to embrace the contemporary development if it would carefully been planned. Otherwise, if the commercial development has continued with the same current negative impact, the city will completely lose its unique architectural and urban identity.

2. Research Purpose and Methodology
By adopting a descriptive and analytical methodology, this paper highlights the urgency of preserving of Al-Najaf. Focal point of this paper is particularly on identifying the major issues that are threatening the existence of the traditional architectural features and urban patterns of the city. The goal is to demonstrate a clear understanding of the current situation of the Old City of Al-Najaf, and envision potential and rational preservation plans. In order to achieve this gaol, this paper is structured to include an analytical description for the current urban organization of the Old City of Al-Najaf and the history of its formation. This section is a key step forward to identifying the main problems in the urban structure of old city. The next step is to clearly define the conceptual structures behind the radical urban transformation. Analysing and comparing the root causes will lead to the final conclusions and recommendations. All these steps are structured within the following sections:

3. Describing the Urban Organization of the Old City of Al-Najaf
The principles of Islamic religion were a dominant organizer force as the city was first initiated based on religious motivations represented mainly with the complete loyalty of Shiite Muslims to Imam Ali Inin Abi Talib. Whereas, responding to the climate requirements was the distinguished skill of almost all the old Arabian builders and craftsmen. When such skillful professional craftsmen build their city based on their extreme commitment to the Islamic religious principles, the result is a city like Al-Najaf historical center [5].

This core is the source of Islamic principles, it is the center that regulate both the urban structure of the city and the social life of its residents. The city also includes the residential units, Islamic religion schools, the main market, a web of organic zigzagged alleyways. Wadi Al-Salam cemetery, today is one of the biggest cemeteries in the world, is located to the north, outside the city [6]. The largest part in the city is the organic and compact urban fabric comprised of smaller units of courtyard houses and schools. The fabric is extremely compact that the houses around the shrine share the same wall with the Sahen (the open space around the shrine) and directly attached to it. This urban relationship
reflects the strong connection between people and the Islamic religion represented with the Imam. The web of the organic zigzagged alleyways is the circulation system that penetrates through the compact fabric in a very well planned structure. This circulation web of alleyways moves gradually from the wider and the most public roots which are closer to both the center of the city and the market area, to the narrower and the most private zigzagged alleyways inside the residential quarters. This circulation system is to link the most private unites (courtyard houses) with the most public spaces (the shrine and the mosque) in the center and the market. It is also to create an urban structure that resists and interacts with its extreme desert climate. The narrower are the alleyways, the less heat it contains as the shade is more than the sunlight. These narrow alleyways also provide perfect tunnels for wind circulation through the whole city.

Both the shrine and the mosque, with its golden dome and minarets, are the predominant features that distinguish the traditional skyline of the Old City of Al-Najaf. The organic urban fabric is on human scale, the largest and highest structure is the Shrine and the Mosque. In this sense, the hierarchy of both the activities and the privacy of the city are extremely respected. All the narrow alleyways lead to the center (the shrine and the mosque). Around the shrine there is an open space called Sahen where people can gather for prayers and for important events. The direct attachment of the narrow alleyways and the compact fabric to the outer walls of Al-Sahen, creates a distinctive element of surprise as a result of the sudden movement from the solid and compact fabric to an open peaceful space. The spirituality becomes in its higher sensations with piety and reverence.

Moving through the urban structure and seeing the golden dome and the minarets through the narrow human scale alleyways creates attraction and tension between the visitors and the shrine [7, 8]. According to the mentioned above, the basic urban features of the Old City of Al-Najaf can be concluded as the following:

- The traditional organic and compact urban fabric had been directly attached to the fence that surrounds the open space around the shrine and the mosque (the Sahen). The shrine and the surrounding fabric had been founded and developed together as one holistic unit; the Sahen (the public open space) around the shrine and the mosque can be considered as the main open space of the whole city. Whereas, in the other traditional Islamic cities, there is this central urban node which represents the main open public space where all the public activities locate including the mosque which has its own smaller open space (Sahan). The urban structure of the old city of Al-Najaf differs as the Sahen of the Mosque and the shrine is, in itself, the main and central public space of the city. All the alleyways end up with this Sahen. It is the place where all the religious, social and teaching activities are practiced [9]. The sudden transition from the narrow alleyways to the open space around the shrine creates a distinctive surprising element in the urban experience. This experience enhances the spiritual, piety and reverence sensations.
- The spatial privacy hierarchy, and the organization of the land use on the urban scale are the key characteristics of the Islamic cities including the historical center of Al-Najaf. there is this perfectly planned grading from the most public spaces and public activities (the mosque, the shrine, the center of the city, the market) into the most private spaces in the city (the courtyard houses).
- The unity and the harmony of the urban and architectural images as the construction of all the individual buildings follow the same criteria: the Islamic culture and the climate requirements. The buildings’ façades are all characterized as being solid and simple with unified fenestration elements such as the use of Shanasheel as a main window system on the elevations of a building.

4. Describing the Main Problems in the Old City of Al-Najaf
The beginning of the radical transformation in the organizational of Old holy City of Al-Najaf, in the first half of the 20th century, started with major urban development projects to modernize the Iraqi cities, including the holy cities such as the Old City of Al-Najaf. However, these development projects...
have never recognized the particularity of the traditional holy cities nor considered the particular requirements of these historic religious centers. One of the major development projects was the modernization of the circulation network by opening new streets in the traditional city fabrics in order to update the transportation system, take in the booming of vehicles in use, and to provide accommodation for the increasing numbers of pilgrims [2]. On this basis, in Al-Najaf historical center, the sixth wall that was surrounding the city had been demolished and replaced with the first street around the city: Al-Soor Street (the Wall Street). Moreover, new modern geometrical streets were opened and imposed on the compact organic urban morphology of the Old City of Al-Najaf after demolishing and removing the traditional buildings and historical monuments in order to provide enough space for the modern transportation systems. The part of the historical urban morphology have been completely removed and replaced with a round road around the Shrine. In addition, in 1980s and based on a political decision, a tragic urban scale demolition took place by removing a whole urban part including all the historic buildings from Al-Emarah district causing a radical deep deformation in the urban structure of the city that is impossible to be rectified of restored (figure3). This decision was publicly announced as being a development project to build what is currently known as the City of Visitors to provide enough accommodation for the growing numbers of visitors and pilgrims who are temporarily residing in the city during the religious seasons.

By destroying the sixth and the last historic wall that used to protect the city and replace it with the round road, the city became vulnerable to the external intrusions. The city became open to the modern urban expansion from the outside. The historic walls that include towers, gates, entrances observations and water canals have been also lost [12].

The modern geometrical streets have penetrated through the city deconstructing its compact urban structure and destroying its privacy and land use organizational structure. Imposing the new modern geometrical straight streets on the traditional organic and compact urban fabric has paralyzed the traditional alleyways and the organic circulation system. It also caused a traffic issues inside the historic center and around the holy shrine because of the intersections between the pedestrian walkways, and vehicle transportation especially during the peak days of the Shiite pilgrimage seasons. Further, the use of vehicle have moved inside the residential alleyways destroying its privacy. The problem exacerbated when the profit-oriented commercial projects started its investment projects inside the historical center causing a dramatic overlapping between the private residential uses and public commercial activities and services inside the historical center and around the holy shrine [13]. These structures have neither considered the requirements of the historic contexts nor the factors of the city’s formation represented with the Islamic culture and climate requirements. The golden dome, mausoleum and mosque minarets are no longer the predominant features of the cityscape. The dramatic consequences, thus, are more visual pollution, deformation of the traditional city’s sky line, exotic architectural style, and distorted urban image.

In addition to all the consequences mentioned above, demolishing the units of the urban fabric that used to be directly attached to the outer walls around the four sides of the Sahen of Imam Ali Shrine and Mosque and replace it with a round road to enable and facilitate vehicles movement at this space. This has further damaged the urban structures and the deep roots of the conceptual organization of the old city which was mainly based on Islamic principles and climate requirements [14]. This also affects the spiritual sensations of the urban experience; the visitors could no longer enjoy the element of surprise which was used to be created when moving from the narrow alleyways directly to the open space of the Sahen [15]. Today, the visitors can move around the Sahen in an open space that does not belong to any part of the old city. The result is a complete and dramatic relegation of the shrine.
The urban scale demolition and the removal of the entire historical part in Al-Emarah neighborhood has further deepened the destruction of the compact urban fabric and the transformation of its organizational structures. The rich cultural and architectural heritage that was housed in this area have been destroyed including traditional religious schools, mosques, graveyard and other historic buildings such as Al-Molah house, Al-Musawi house, Al-Musawi graveyard, Al-Khaleeli school [15].

The whole historic area has been removed and replaced with the new Visitor City which is designed to be an expanded part from the Sahan of the shrine. The holistic structure of the city was transformed as the shrine expanded in a linear axis creating a longitudinal structure. The holy shrine, thus, has lost its dominant position as an organizer core of both the social and urban structures [16].

These irresponsible development projects and urban scale demolition caused the fragmentation of what has long been a compact organic and traditional urban fabric [17]. The private and the public spaces have been overlapped and the use of the vehicles inside the historical city center caused more traffic issues. Alien structures with exotic architectural styles have been imposed inside the traditional urban morphology with no consideration to any of the context requirements causing extreme visual pollution, deformation of the traditional city’s sky line, and distorted urban image. All these issues have extremely damaged the deep roots of the conceptual, architectural, and urban structures of the old city which was mainly based on Islamic principles [18].

**Figure 3.** The urban scale demolition of the historical parts of the traditional urban morphology of Old City of Al-Najaf has intensely transformed the compact and hierarchical urban fabric into fragmented parts. Source: Authors, google map, [4], [2], [10], and [11].
5. The Conceptual Structure of the Urban Transformation

Several factors impact on the urban transformation for each city with different scenarios such as climate change [19-21], availability of fresh water sources [22-24], and its adversely affected by industries [25-27]. The main conceptual structures behind the formation of Al-Najaf city are the Islamic culture and climate requirements. Along its history, despite many cultural and political challenges, the city has been continuously evolving and growing, yet keeping the root sources of its formation. By the 20th century, new cultural and political forces have emerged challenging the capacity of the old city to resist and preserve its key cultural and architectural structures [28]. (figure 4).

The first force of transformation was mainly related to the concept of western modernization that was the dominant culture on the global scale at the beginning of the 20th century [29]. Iraq among the leading countries in Arab world that adopted this culture influenced by the British colonization. The idea of nationwide developing project was necessary to keep Iraq connected and updated with the global system. However, there should be a carefully studied plan to address the particularity of the historic cities and sites in Iraq [30].

The second conceptual structure behind the radical transformation of Al-Najaf architectural and urban characteristics was mainly political [31]. The tragic urban scale demolition of the historical part in Al-Emarah neighbourhood was mainly a political decision which was covered as being a step forward to preparing for a necessary development project in order to provide accommodations for the increasing number of visitors. Moreover, the unprofessional urban development plans were always a result of political decisions that never considered the particularity of the historical cities and sites [32].

The lack of strict preservation legislations and laws is also a political decision. The third conceptual structure is the commercial investment and financial benefits. The new development projects are mainly centered on financial benefits led by profit-oriented development agencies.

The fourth and last point the poor intervention from the professional stakeholders to lead the preservation culture in Iraq.

| The Conceptual Structure of the city center |
|--------------------------------------------|
| Concept of western modernization            |
| The political concept                       |
| The profit-oriented projects and development plans for financial investment |
| The lack of public awareness about historic preservation and its key role in sustaining the spiritual sensation of the holy places and enhancing the economy on the long run (cultural and architectural preservation as a sustainable development strategy). |
| Underdeveloped preservation culture in Iraq  |
| The poor intervention from the professional stakeholders (Bottom-up intervention) |
| The lack of preservation legislations and regulations (Top-down intervention) |

Figure 4. The main conceptual structures of the Old City. Source: Authors.

6. Conclusion and Recommendations

As summarized in (figure 5), the envisioned preservation and development strategy for the historical center of Al-Najaf city does not refuse the modernization of the city. It rather specifically rejects the commercial and profit-oriented development projects that are destroying the cultural and architectural heritage of the city. The envisioned plan is to embrace both a rational preservation strategy to protect the historic parts of the city, and a sustainable development strategy for modernization to respects the requirements of historical context and consider the root causes of its formation: Islamic culture and climate requirements.

Serious and professional top-down and bottom-up actions and interventions are needed to legislate strict preservation laws. Such legislations are crucial to protect the remaining parts of the historic
center of Al-Najaf City and other historic cities and sites, end the irresponsible demolition, and control and regulate the arbitrary development projects in the city.

Professional studies are very important to build a comprehensive survey, and to carry out an in-detail inventory of the historic buildings and sites in the city including a full documentation project.

This includes identifying the historic sites and buildings to be legally protected and to specify the exact parts that are damaged and the level of the damage. This is very important as a step forward to propose the best preservation and sustainable development plans for the city. This requires a collaboration work between all the stakeholders from preservation and social experts, historians, architects, Islamic urban designers, archaeologists, academic scholars, governmental institutions, and the local residents.

Raising the public awareness about the importance of the preservation of the inherited architectural and cultural values of the city. The local residents should be aware about the essential association between architecture and the spirituality of city as a religious center. In addition, they should be aware about preservation as a sustainable development strategy that ensures economic enhancement on the long run. This will help the locals to invest in their own properties through preservation rather than selling them into the commercial profit-oriented agencies to be demolished and replaced with alien structures. Collaboration from the government and international NGOs is crucial in this sense to provide financial support and best professional preservation experiences for the locals.

**Recommendations for Urban Preservation of the City of Al-Najaf**

- The proposed preservation plan for the historical center of Al-Najaf city is a sustainable development strategy. It does not refuse the modernization of the city, but rather regulates the development projects considering requirements of both the current historical context and the root causes of the city’s formation: Islamic culture and climate requirements.

- **End the destruction of the cultural and architectural inheritance of the city.**

- Activate the role of professional stakeholders to build a database by and initiating a documentation project. This includes identifying the historic sites and buildings to be legally protected and specifying the exact parts that are damaged and the level of the damage as a step forward to proposing the best preservation plan as a sustainable development strategy.

- Legislating preservation laws and regulations (Top-down intervention)

- Collaboration between (Top-down intervention) and (Bottom-up intervention)

- Raise awareness among the public.

- Offer financial support to local residents to maintain and invest in their historic properties.

- Activating the role of NGOs in Iraq to enhance the culture of historic preservation

**Figure 5.** The required intervention to maintain the heritage of the city.

### References

[1] Mahboba J 1957 *Najaf’s Past and Present* 3 vols Najaf: Al-Adab Press

[2] Farhan S, Akef V and Nasar Z 2020 The transformation of the inherited historical urban and architectural characteristics of Al-Najaf’s Old City and possible preservation insights *Front. Archit. Res.*
[3] Farhan S L, Abdelmonem M G and Nasar Z A 2018 The urban transformation of traditional city centres: Holy Karbala as a case study Archnet.-IJAR 12 53–67
[4] Imam Ali Network https://www.imamali.net/?id=1367
[5] Saoud R 2001 Introduction to the Islamic city published by Muslim heritage. https://muslimheritage.com/introduction-to-the-islamic-city/
[6] Edmund A and Beth K 2004 Historical dictionary of Iraq Lanham, Maryland and Oxford: The Scarecrow Press, Ltd
[7] Hala M Fand Frank C 2009 A brief history of Iraq Info base Publishing 140
[8] Poseidon Y 2019 Green Card Available from: https://www.greencardcekilisi.com
[9] Sadiq K 2016 Representing Najaf: an investigation into the current pressure on the physical and social fabric of Najaf’s old town in Carola Hein
[10] AL-Kubaisy F 2009 The architectural and urban heritage of Iraq’s holiest city Manama, Bahrain.
[11] DEWAN ARCHITECTS AND ENGINEERS 2015 Urban Renewal of the City Centre of Holy Najaf: Comprehensive Master Plan of the City Centre of Holy Najaf 5th edition Najaf, Iraq: Ministry of Municipalities and Public Works
[12] Farhan L, Jasim A and Naji A 2020 The sustainable house: Comparative analysis of houses in Al Kut Neighborhoods-Iraq Developments in Systems Engineering (DeSE)
[13] Falamaki M 2008 Technology of architectural restoration Tehran, Iran: Faza Scientific & Cultural Institute
[14] Tabby Y, Mervin S 2014 Najaf the gate of wisdom: History, heritage and significance of the holy city of the Shi’a In: 17th IPHS Conference: History, Urbanism, Resilience (Delft: TU Delft) 532
[15] Al-Hakim H 2006 Detailed history of the Najaf: the history of Imam Ali shrine (2; Qom: Al-
[16] Farhan L, Jasim A and Naji A 2016 Urban sustainability in Old City Centres, a Comparison Between the City of Najaf in Iraqi and Italian Cities Eng. & Tech. Journal 34
[17] Farhan S L, Jasim A and Al-Mamouri S 2020 The transformation of the city of Najaf, Iraq: Analysis, reality and future prospects Journal of Urban Regeneration and Renewal 13 160–171
[18] Farhan S L, and Nasar A Z 2021 Urban identity in the pilgrimage vities of Iraq: Analysis trends of architectural designers in the city of Karbala. I. Urban Regen. Renew. 14-2
[19] Zubaidi S L, Al-Bugharbee H, Muhsin Y R, Hashim K and Alkhaddar R 2020 Forecasting of monthly stochastic signal of urban water demand: Baghdad as a case study. In: IOP Conference Series: Materials Science and Engineering, ( Najaf, Iraq: IOP) pp 1-7
[20] Zubaidi S L, Abdulkareem I H, Hashim K, Al-Bugharbee H, Ridha H M, Gharghan S K, Al-Qaim F F, Muradov M, Kot P and Al-Khaddar R 2020 Hybridised Artificial Neural Network Model with Slime Mould Algorithm: A Novel Methodology for Prediction of Urban Stochastic Water Demand Water 12 1-18
[21] Zubaidi S L, Hashim K, Ethaib S, Al-Bdairi N S S, Al-Bugharbee H and Gharghan S K 2020 A novel methodology to predict monthly municipal water demand based on weather variables scenario Journal of King Saud University - Engineering Sciences. 1-7
[22] Hashim K S, Eswad H M, Muhsin A A, Zubaidi S L, Kot P, Muradov M, Aljefery M and Al-Khaddar R 2020 Phosphate removal from water using bottom ash: Adsorption performance, coexisting anions and modelling studies Water Science and Technology 3 1-17
[23] Zubaidi S L, Kot P, Alkhaddar R M, Abdellatif M and Al-Bugharbee H 2018 Short-Term Water Demand Prediction in Residential Complexes: Case Study in Columbia City, USA. In: 11th International Conference on Developments in eSystems Engineering (DeSE), (Cambridge. United Kingdom: 11th International Conference on Developments in eSystems Engineering (DeSE). IEEE) pp 31-5
[24] Ethaib S and Zubaidi S L 2020 Removal of Methylene Blue Dye from Aqueous Solution Using Kaolin. In: IOP Conference Series: Materials Science and Engineering, (Nasiriya, Iraq: IOP) pp 1-7
[25] Alyafei A, AlKizwini R S, Hashim K S, Yeboah D, Gkantou M, Al Khaddar R, Al-Faluji D and Zubaidi S L 2020 Treatment of effluents of construction industry using a combined filtration-electrocoagulation method. In: IOP Conference Series: Materials Science and Engineering, ( Najaf, Iraq: IOP ) pp 1-8
[26] Alnaimi H, Idan I J, Al-Janabi A, Hashim K S, Gkantou M, Zubaidi S L, Kot P and Muradov M 2020 Ultrasonic-electrochemical treatment for effluents of concrete plants. In: IOP Conference Series: Materials Science and Engineering, ( Najaf, Iraq: IOP ) pp 1-10
[27] Al-Marri S, AlQuzweeni S S, Hashim K S, AlKhaddar R, Kot P, AlKizwini R S, Zubaidi S L and Al-Khafaji Z S 2020 Ultrasonic-Electrocoagulation method for nitrate removal from water. In: IOP Conference Series: Materials Science and Engineering, ( Najaf, Iraq: IOP ) pp 1-9
[28] Farhan S L and Abdelmonem M G 2018 NAVIGATING THE SOCIO-SPATIAL AND PLANNING CONDITIONS OF TRADITIONAL PUBLIC SPACES IN IRAQ’S HOLY CITIES. Traditional Dwellings and Settlements Review 30 1.
[29] Farhan S L, Jasim I A and Naji A A 2016 Urban sustainability in Old City Centres, a Comparison Between the City of Najaf in Iraq and Italian Cities Experiences Engineering and Technology Journal 12 Part (A) Engineering 34 2347-2360.
[30] Jasim I A, Farhan S L and Attalla A T 2018 Sustainable neighborhood Comparative Analysis of Al Kut Neighborhoods Journal of University of Babylon for Engineering Sciences 26 302-317
[31] Jasim I A, Farhan S L and AL-MAMOORI S K 2017 Smart government: Analysis of shift methods in municipal services delivery: The study area: Al-Kut – Iraq journal of kerbala university 13
[32] Zubaidi S and Jasem I A 2014 Sustainable urbanization-an analytical study of the expansion axis of Kut City International Conference of Engineering Sciences-Mustansiriya University