

Implementing E-government in Karbala city correlated with the application of GIS

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المخلص:

يعد استخدام نظم المعلومات الجغرافية (GIS) و تقنيات الاتصال هي الخطوة الأولى لتطبيق الحكومة الإلكترونية في الدول النامية. واضح جدا هناك تأخير في تنفيذ الحكومة الإلكترونية في مدينة كربلاء و العراق بصورة عامة نتيجة لعدم وجود نظام إدارة قواعد البيانات. وهذا بسبب عدم رتباط إنجاز دراسات نظم المعلومات الجغرافية بتنفيذ الحكومة الإلكترونية. على الرغم من ان هناك دراسات متزايدة ومتنوعة لنظم المعلومات الجغرافية في السكان والنمو الحضري والمشكلات الصحية والأنشطة البشرية بشكل فردي في مدينة كربلاء. وهذه الدراسات يمكن أن تكون أساساً ملموساً لتطبيق الحكومة الإلكترونية. يهدف هذا البحث على تسليط الضوء على دراسات نظم المعلومات الجغرافية وأدائها في تسريع وتيرة التقدم في تطبيقات الحكومة الإلكترونية. يتناول هذا البحث مفهوم الحكومة الإلكترونية وتطبيق نظم المعلومات الجغرافية من جانب، ومن اخر اهمية الحكومة الإلكترونية في ستراتيجيات مكافحة الفساد وتشجيع إعادة بناء و تطوير مدينة كربلاء في العراق.

لكلمات المفتاحية

مفهوم الحكومة الإلكترونية ، GIS ، قاعدة البيانات الجغرافية ، مدينة كربلاء.

Abstract

Using the geographic information systems (GIS) and communication technologies in the developing world is the first step to prompt their applying of electronic government. However, there has been retardation in implementing e-government in Iraq, and Karbala city in particular as a consequence of the lack of a database management system. The accomplishment of GIS studies are not correlated with implementing e-government. Individually. There are growing and varying GIS studies in population, urban growth, health problems, and human actives in Karbala city which can be concrete basis to implementing e-government. This paper aims to assess GIS studies and their performance in accelerating the progress of e-government applications. This paper will deal with the concept of e-government and GIS apply to anti-corruption strategies and encourage redevelop Karbala city in Iraq.

Keywords

E-Government conceptual, GIS, The Geodatabase, Karbala city.

ارتباط تنفيذ الحكومة الالكترونية في مدينة كربلاء بتطبيق نظم المعلومات الجغرافية

1-Introduction

E-government (brief for electronic government) means the delivery of public assistance to residents and other personalities in a city or province via electronic intelligent connected devices, such as technology and the Internet (Satyanarayana, 2004) (Silcock, 2001) (Abramson, 2003) (Curtin G. G.-S., 2003) (West, 2007). The appearance of the concept of e-government began during the 1950s and 1960s. The e-government is scientific management ideas. The concept of e-government spread and expanded in the early 1990s. It was being the most common concept in political systems since the era of US President Bill Clinton (Ubaldi, 2010) (Fountain, 2009). The concept has been started by many countries such as the United Kingdom in 1997, in addition to Canada, New Zealand, and Australia (Palvia, 2007) (Grönlund Å. , 2010) (Grönlund Å. a., 2005) (Backus, 2001) (Gil-García, 2007) (Ubaldi, 2010) (Fountain, 2009).

One of the most important previous studies in E-government is (Chen, 2006), which is focusing on the framework, implementation, and process of E-government in both developed and developing countries (Chen, 2006). As well, to the study of (Scholl, 2013) In this paper over 200 scholars, including more than 80% of the domain's most prominent scholars, were surveyed and data on disciplinary backgrounds, topical orientations, and publication preferences were collected from the global e-Gov researcher community (Scholl, 2013). The results of the study demonstrate the richness and diversity of electronic government research worldwide. The paper (Stephen H, 2003) is referring to some topics are more prevalent in some regions than others. The papers (Chen, 2006),(Scholl, 2013) and (Stephen H, 2003) finding reflect the breadth and diversity of e-government research around the world. Some subjects are more common in some regions than others according to the paper (Scholl, 2013).

Research in this study focuses on the use of GIS and databases to analyze the improvement of e-government. Many previous studies have attempted to clarify the role of GIS in the implementation of e-government. According to (Ramadhan, 2011), (Eitiveni, 2012) studies GIS has a wide range of capabilities that can be useful in a number of fields, including e-government. This study evaluates the use of geographic information systems (GIS) in ninety-one Indonesian institutions' e-Government plans. The assessment was carried out using a variety of criteria. GIS availability and usability in the first place, GIS facility establishment date, and GIS technology and interactivity are among these requirements (Eitiveni, 2012)

(Ramadhan, 2011). Once all government information has a geographic dimension—a street address, a transportation route, a river, a city, a state, and so on—GIS plays an important role in e-government applications (de Souza Baptista, 2004).

The study's aim is to evaluate the reality of e-government in Karbala. On the other hand, failure to use GIS in e-government is one of the reasons for the service's relapse in Karbala. The study's hypothesis, GIS is one of the most pressing problems in e-government. GIS may have particularly significant implications for e-government, which is extremely sensitive to changes in e-government procedures.

2. Study area

Karbala is situated at 32:60N, 44:00E, some 110 km southwest of the capital, Baghdad, and Its population is estimated at around (1300000) one million and three hundred thousand people (agency, 2021). The nearest town is Hindiye, on the bank of the Euphrates River, some 22 km east. Karbala has direct roads to Syria and Jordan in the west and one to Saudi Arabia in the south. Karbala links the north with Baghdad and beyond (see Figure. 1). The increase in the range between the contour lines and the city center at the bottom of Karbala is 15 meters and is about 36 meters above the mean sea level. It is around 10Km by 3Km in distance. The northern section of the town is green farmland and an arid desert to the south. The soil, however, is ideal for cultivation, provided that adequate water is provided, and the necessary procedures are adopted (Al-Bayati, 2006).

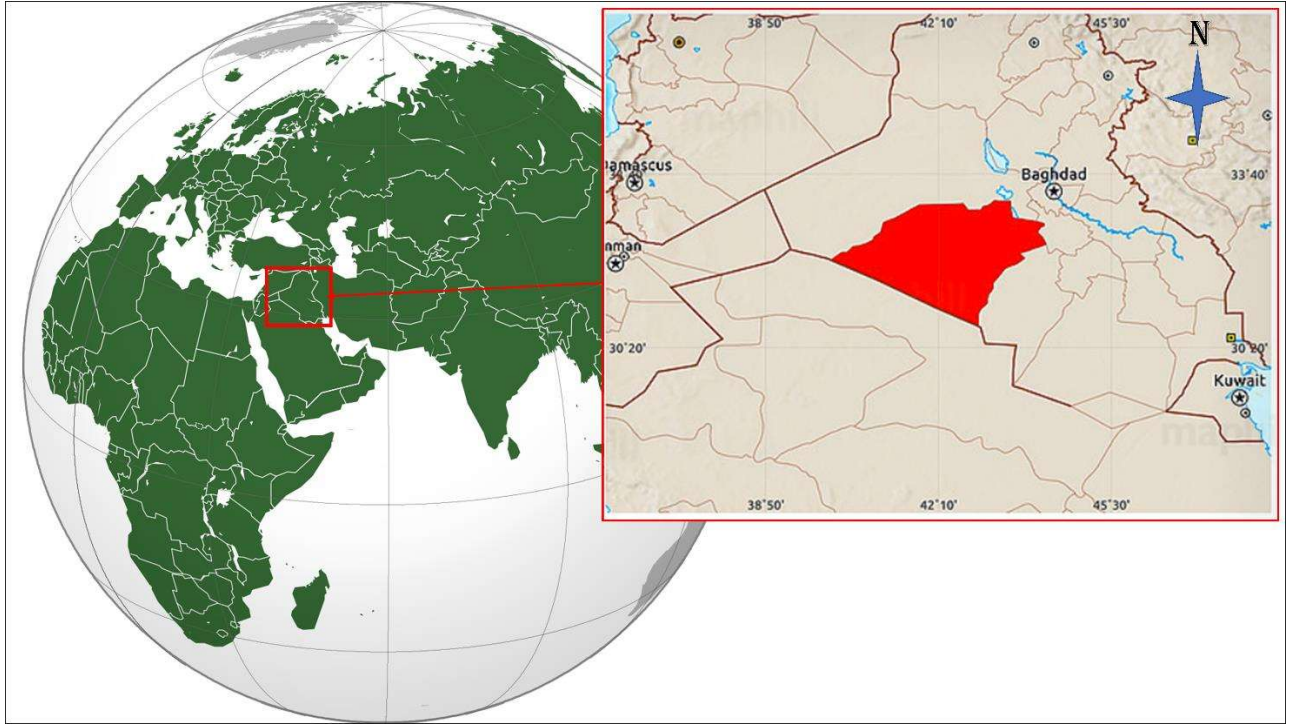


Figure 1: Study area (Karbala City) (agency, 2021)

3- Design of E-Government

Overall governments are developing a new system depending on the relevant concepts through numerous modernization processes and technical implementations: a specific and common vision of customers (residents) with an emphasis on delivering integral, differentiated and personalized government services. According to what provides more sense to people, governments want to be coordinated. An adaptive public administration capable of anticipating and responding in advance to the needs and requirements of people. An interactive and usable public administration that centralizes citizen communication in a single point through any medium that is accessible to them (e-mail, phone, sms, fax,web, ...). The key e-government models of distribution can be divided in four ways (figure 2), depending on the services provided:

Government-to-Citizen(G2C)

Government-to-business (G2B)

Government-to-Government (G2G)

Government-to-Employee (G2E)

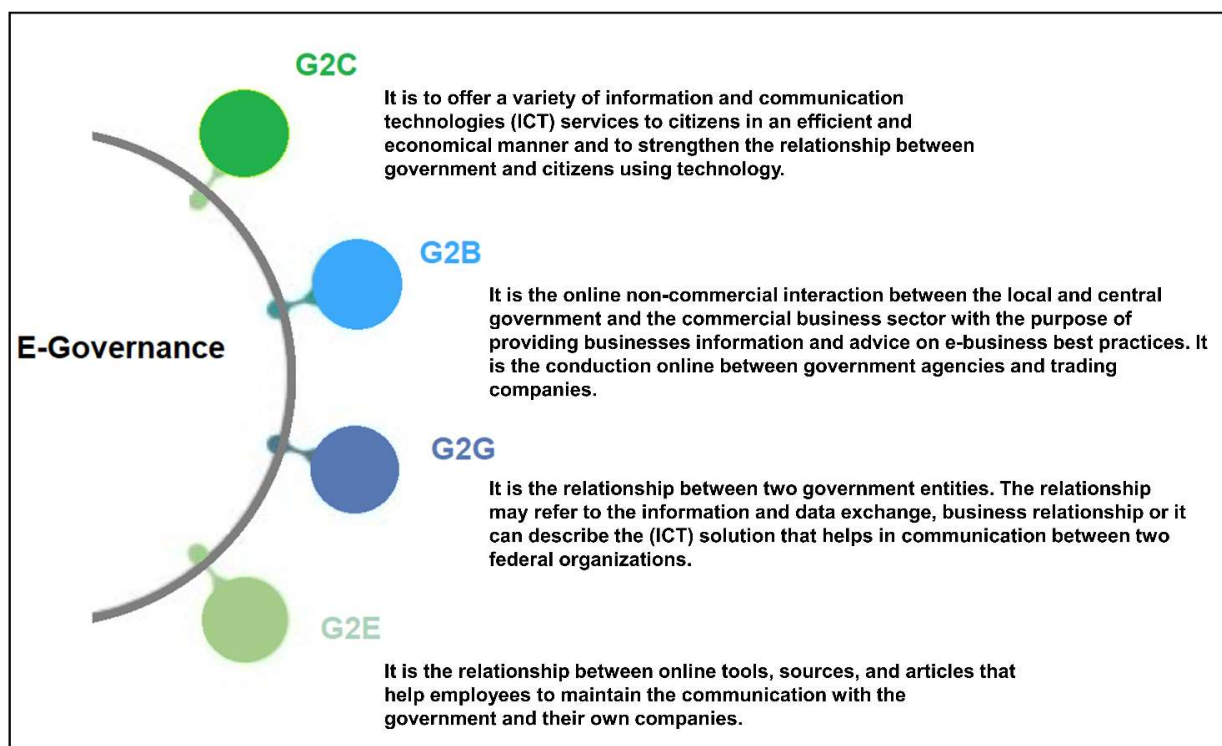


Figure 2: The e-government models

4- Iraq's E-government

E-government aims to make public institutions more transparent and accountable. Iraq's government and Karbala's government as a part of Iraq recognized the importance of digital transformation of the state as early as 2010 and is currently implementing the Iraq e-Government Action Plan 2010–2020 (United Nation, 2010, 2020). Since 2012 and on a yearly basis, it publishes the e-government benchmark reports which compare the penetration, and digitization of e-Government services in Iraq (United Nation, 2010, 2020). The e-participation index (EPI) is a supplementary index to the UN E-Government Survey that indicates how citizens' access to information and public services can be improved. System for E-Participation (United Nation, 2010, 2020) (Pirannejad, 2019) (Girish, 2014) see Figures (3-a,4-a):

1. E-information: Enabling community engagement by delivering public information and on-demand access to information.
2. E-consultation: Involving people in the creation and deliberation of public policies and services by electronic means.
3. E-decision-making: Empowering people through policy co-design and co-production of service components and delivery modes.

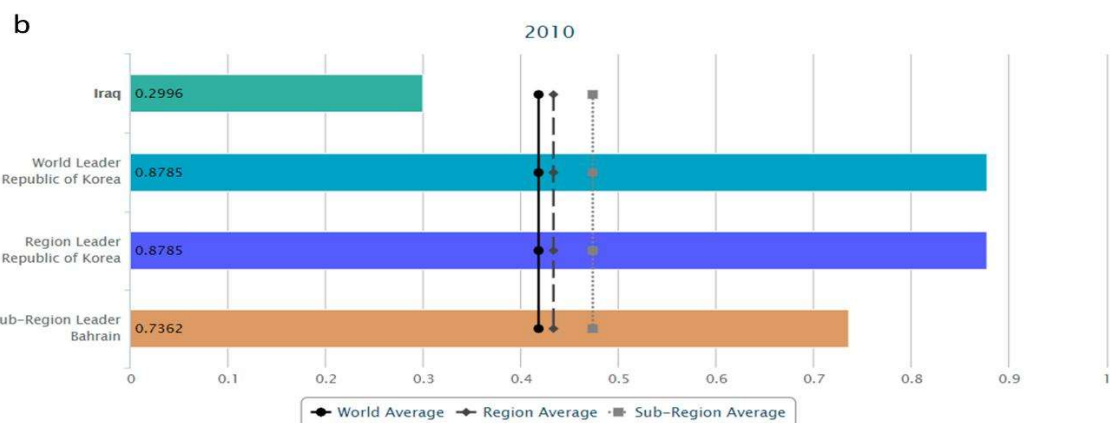
The UN Member States' EGDI (E-Government Development Index depicts) the current state of E-Government Development. The EGDI integrates access characteristics, such as (Curtin G. G., 2006) (United Nation, 2010, 2020) see Figures (3-b-c,4-b-c):

1. infrastructure and educational levels
2. website development trends, to show how a country is using information technology to facilitate access and inclusion of its citizens.

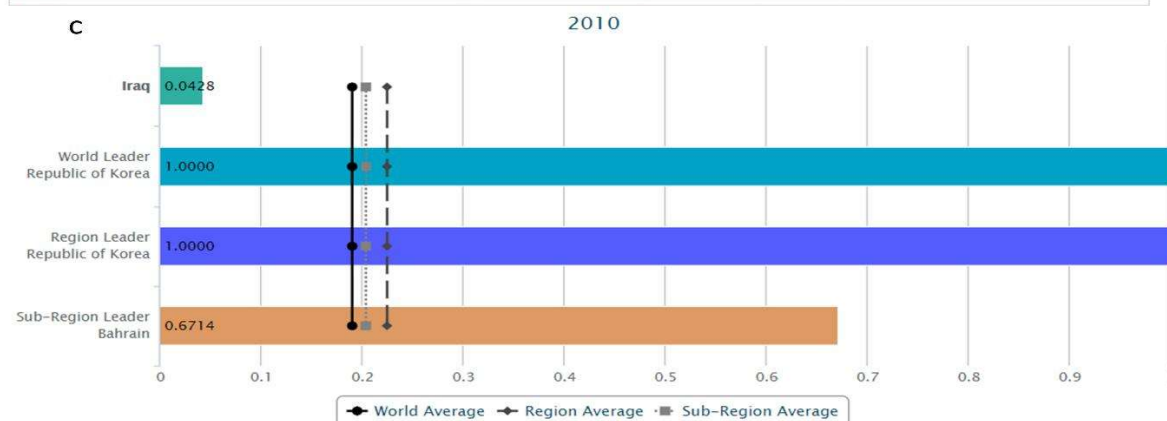
The EGDI is a composite index that measures three main aspects of e-government (see 3-b-c,4-b-c), (Curtin G. G., 2006) (Pirannejad, 2019) (Girish, 2014):

1. online service provision
2. telecommunication connectivity
3. and human capacity.

Figures 3-4 indicate that in 2010, Iraq's e-Government growth index was 136, and e-participation was 135 as a result of the e-Government survey comparison. In the 2020 study, the e-government index was 158, and the e-participation index was 143. As a result, we can infer that the e-Government growth index was higher in 2010 than it was in 2020, as well as the e-Participation index, which was higher in 2010. This is a negative trend and a warning sign for Iraqi democracy and technology adoption (United Nation, 2010, 2020) (see Figures: 3-4).



E-Government Development Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Iraq (Rank)	143	155	141	134	137	136	151	118	103	174
Iraq (Value)	0.43600	0.33760	0.33335	0.31414	0.34093	0.29957	0.26900	0.33340	0.35662	0.00000



E-Participation Index	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003
Iraq (Rank)	158	140	104	152	101	135	60	151	97	151
Iraq (Value)	0.30950	0.33710	0.42373	0.13725	0.10530	0.04285	0.20454	0.00000	0.03278	0.00000

Figure 3: Iraq status in UN e-Government survey (2010), (United Nation, 2010, 2020).

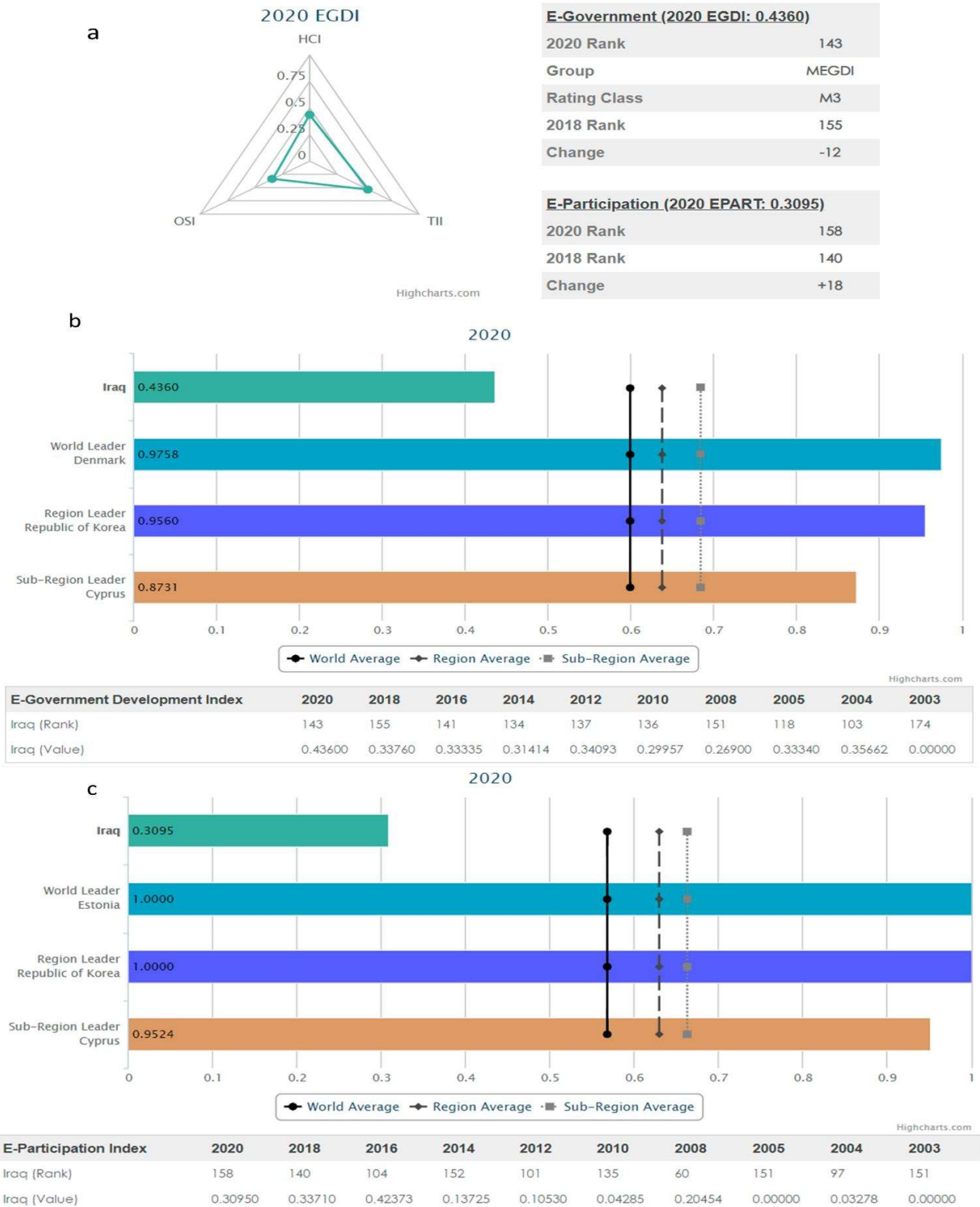


Figure 4: Iraq status in UN e-Government survey (2020), (United Nation, 2010, 2020).

5-The significance of GIS in the implementation of e-government

In the developing world, using GIS and communication technology is the first step toward encouraging them to use electronic government (Peng, 1999). However, due to a lack of a database management system, there has been a delay in implementing e-government in Iraq, especially in Karbala city. The completion of GIS studies has bearing on the implementation of e-government. GIS has been dubbed the strongest of all information technology by numerous studies because it emphasizes the incorporation of multi-source knowledge and offers a collaborative (Kemp, 1992) (Longley, 2006). Furthermore, since it is simultaneously intuitive and conceptual, GIS is appealing to most individuals who experience it (Goodchild M. F., 2011). It integrates a powerful visualization framework with a solid geographic science-based analytical and modeling system (Peng, 1999), (Goodchild M. F., 2011). This combination has resulted in technology that is science-based, accurate, and simple to communicate with across languages, social classes, cultures, and limitations (Kemp, 1992) (Longley, 2006). GIS incorporates three essential elements or views to support this vision (Goodchild M. F., 2007) (Goodchild M. F., 2005) (Irizarry, 2013) (Maguire, 1991):

1- The geodatabase view:

A GIS handles knowledge about geography. As a spatial database containing datasets that represent geographic information in terms of a standard GIS data structure, rasters, functions, topologies, attributes, networks (see Figure 5).

2- The map view:

A GIS is a collection of intelligent maps as well as other views showing the landscape of the earth's characteristics and feature relationships. To facilitate the query, analysis, and editing of geographic information, various map displays of the actual geographic information can be produced and used as windows in the geographic database (see Figure 5), (see Figure 6).

3- The geoprocessing view:

A GIS is a series of resources for the transformation of information that extracts new data from existing datasets. These geoprocessing functions take information from existing datasets, apply analytical functions, and make new derived datasets with performance. Geoprocessing provides the ability to string a number of services together so that users can conduct spatial analysis and automate data analysis, all by constructing an organized production process (see Figure 5), (see Figure 6).

6- Studies for GIS applications and uses in Karbala.

Three decades ago, the GIS was used in important studies in Karbala (see table 1). It was very possible for these studies to be developed the e-government. Unfortunately, the government in Iraq does not use GIS studies to improve e-government. These studies are distinguished by their use of the natural and human activities analysis methodology. These studies look at how people, businesses, organizations, and facilities can change a life if they work together in the study area. These studies and researchers generate information and bring it from sources in order to raise levels of efficiency and effectiveness when the decision-making process is initiated and taken (Al-Taie, 1993) (Al-Masoudi, 2013) (Al-Bayati, 2006) (Hassoun, 2005) (Hanoun, 2011) (Abu Jerry, 2001) (Ziboon, 2015).

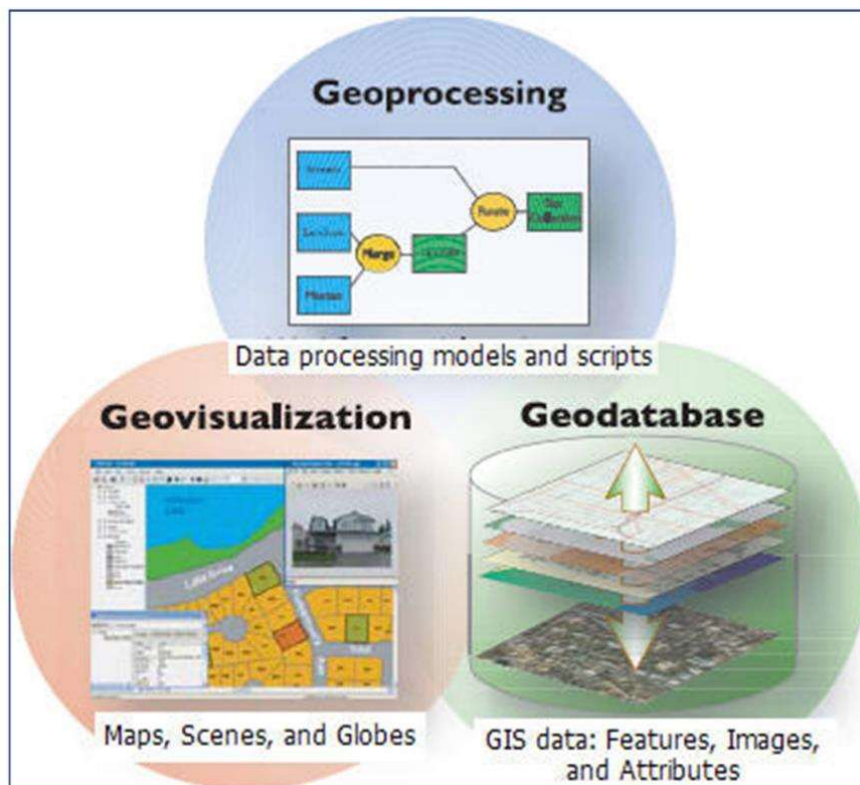


Figure 5: GIS views Geoprocessing, Geovisualization and Geodatabase (ESRI, 2004).

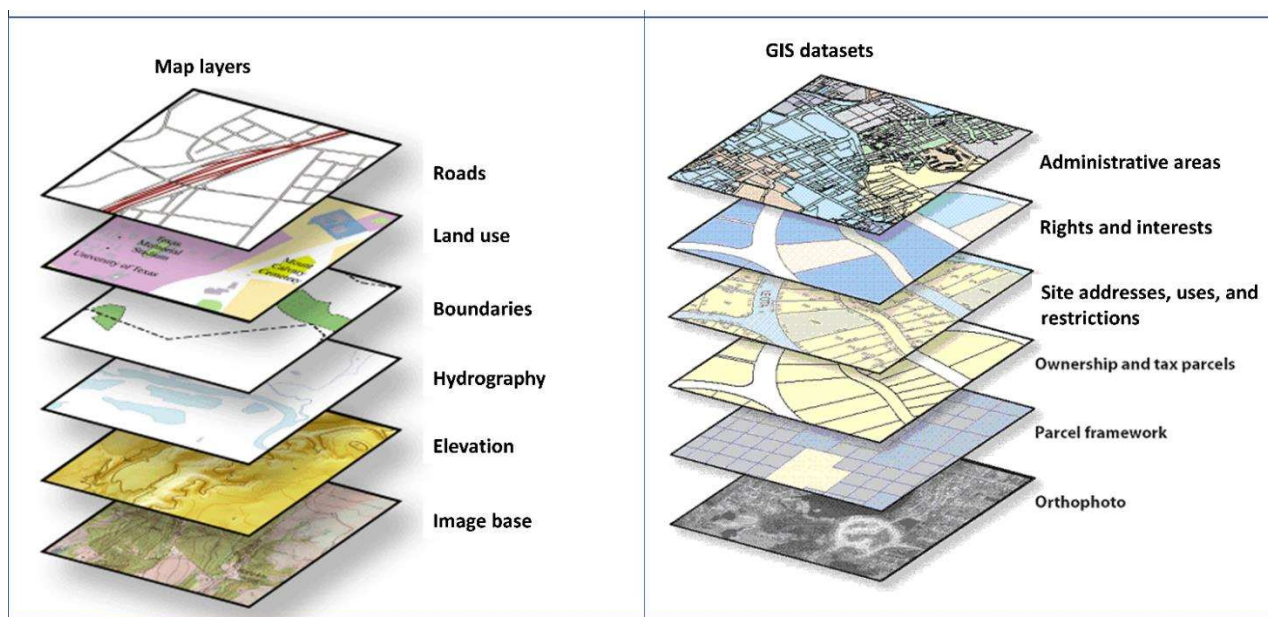


Figure 6: The difference between map layers and GIS datasets (Desktop.Arcgis.Com, 2021).

GIS Applications & Uses	SITUATION Describe the study and context	Topic GIS Applications In Karbala City	citation of the studies
Urban Planning	Application of GIS and remote sensing in Urban Planning	The Use of Aerial Surveying and Remote Sensing to Find Axes for the Expansion of Cities (Karbala City)	(Al-Taie, 1993)
Agriculture	Application of GIS Agriculture Capability	The Cartographic Representation of Agricultural Land Use in Karbala Governorate for the year 2011	(Al-Masoudi, 2013)
spatial analysis	Application of GIS and spatial map	Karbala Governorate, Applied Study in Regional Maps	(Al-Bayati, 2006)
Geography region	Application of GIS and rural regions	Diagnosis of spatial variation of the elements of rural development in the Karbala region using GIS	(Hassoun, 2005)

Hydro geomorphology	Application of GIS and hydrologic processes with geomorphology	Hydro Geo Morphology of Karbala Region	(Hanoun, 2011)
Climate Change	Application of GIS and Desertification	1- Spatial Variation of the Desertification Phenomenon in Karbala Governorate, Using GIS. 2- Study and analysis of desertification phenomenon in Karbala governorate by remote sensing data and GIS	(Abu Jerry, 2001) (Ziboon, 2015)

Table (1): Studies for GIS applications and uses in Karbala.

Conclusion

In the end, e-government is still the fundamental solution to the obstacle of bureaucracy and corruption in governments. Especially since we face the risks of a severe dual health and economic crisis as the world struggles with the coronavirus pandemic. Consequently, e-government initiatives, especially with a rising number of businesses and people working online, are becoming much more urgent and crucial than ever. GIS research can help create a more sustainable future with e-government for Karbala city. It is possible to describe eGovernment as the conversion of the government in the conventional to the modern way achieves a stronger government via using GIS. GIS application is processes of change and operational efficiency to the public, Companies, and between agencies. The use of GIS means making the optimal decision and providing the necessary information to management, internally or externally. GIS is motivating departments to pursue planning and control processes to confront administrative corruption.

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