Mapping a New Future for GIS Healthcare in Iraq (Case Study)

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Abstract

Most areas of Iraq are suffering from many problems and challenges represented by the poor distribution of health centers and the provision of health services. In addition, the existence of these centers in the city center and the non-observance of planning standards in the distribution process and in line with the rate of population growth in these areas as well as to assess the needs of the citizens of these health centers. This study deals with the subject of spatial planning for health centers in Iraq and using GIS technology as the main objective of this study is to determine the extent of the distribution of health centers, health and its efficiency and suitability to the needs of the Iraqi people and offer some suggestions for the spatial distribution of better and efficient health services. That the correct spatial distribution of health centers will help decision-makers and the competent authorities in a position suitable for the development of this important service and vital steps. This study looked forward to discussing how the arrival of the Iraqi individual to health care and medical services centers without the trouble and at a lower cost and to avoid misallocation of these centers, which causes them service pressure in some health centers, which in turn is affecting the efficiency of the delivery of services to the citizen by identifying the nearest health center.

Keywords: GIS; Geographic Information Systems; Medical Geography; Public Health; Mapping.

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1. Introduction

This study focuses on the importance of the distribution of health centers that provide health services for individuals and the importance of spatial planning and the most important basic concepts related to health services and distribution at different levels.

The use of GIS in spatial planning processes have become important because it focuses on different dimensions, where he deals with the time-past, present and future and maintains relationships and bridges to connect them To achieve the goals of a clear time, effort and cost of specific and acceptable budgets.

The use of GIS data It is a scientific approach aims to study the importance of all the resources and facilities available and is available in a certain area and used properly, balanced and rational within a specified period of time and in line with the needs of the geographical area.

The goal of this study is to provide a principle of justice in the distribution of health centers in Iraq and develop appropriate solutions to get people to health centers for medical services.

A GIS technology offer- bestead systems of in terms of:(Methodology, Technology, Profession, Business)

Then the GIS task is:(Input+ manipulation +management+ query and analysis+ visualization).

2. Definition and structure of GIS:

GIS geographic information systems area system of computer that contains: software+hardware+data, it is a mean of sorting, retrieving, comparing and sorting spatial data to analytic process.
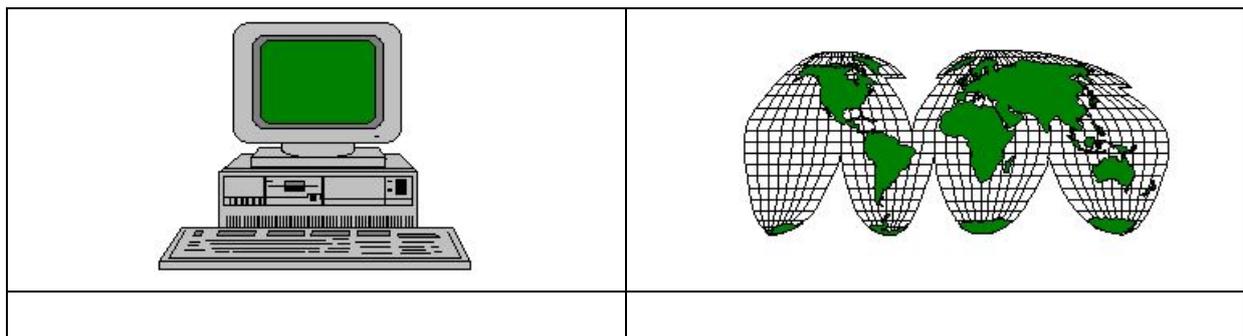
GIS = information system +geographic position

[1]	[1]

Figure 4

Then GIS is a method to visualize and display spatial data and it's a smart map that linking a data base to the map.
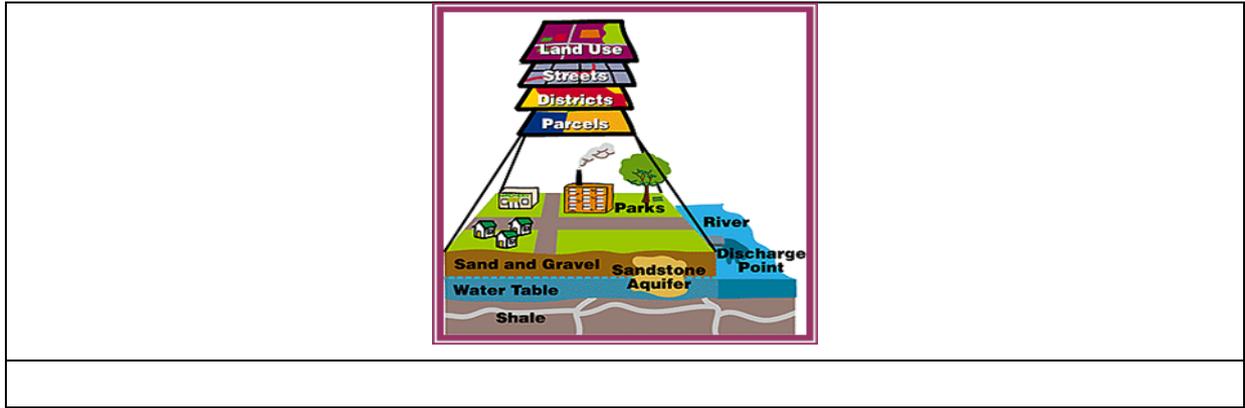
Figure 5

So when we talk about visualize mean include 2 ways: [1]

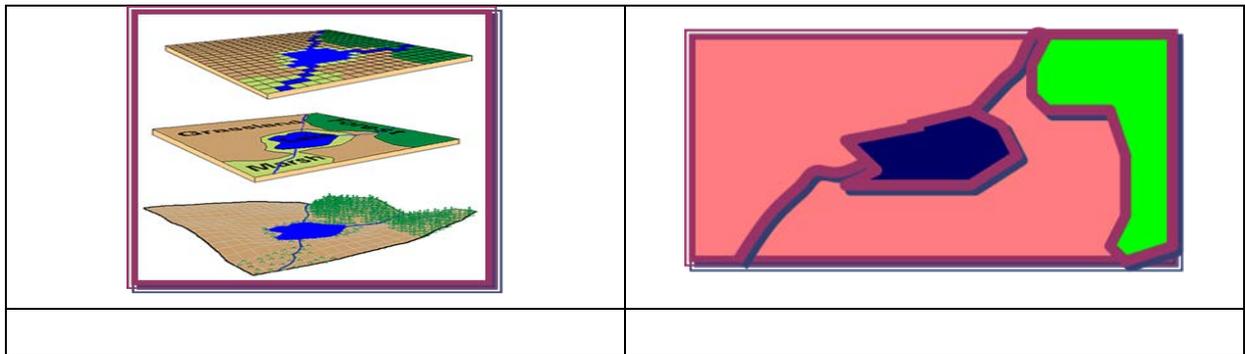(Raster –grid + vector-linear.)

Figure 6

GIS = raster grid (pixels, location, satellite, image) + vector linear (point, lines, features like house, lake, attributes, size, length)

2.1 Data for GIS applications

- In GIS system has five kinds of data
- Data bases –table of data
- Remote sensing +aerial photography
- Digitized +scanned maps
- Gps- Global position system.
- Attributes +field sampling

2.2 Data layers in GIS: [2]

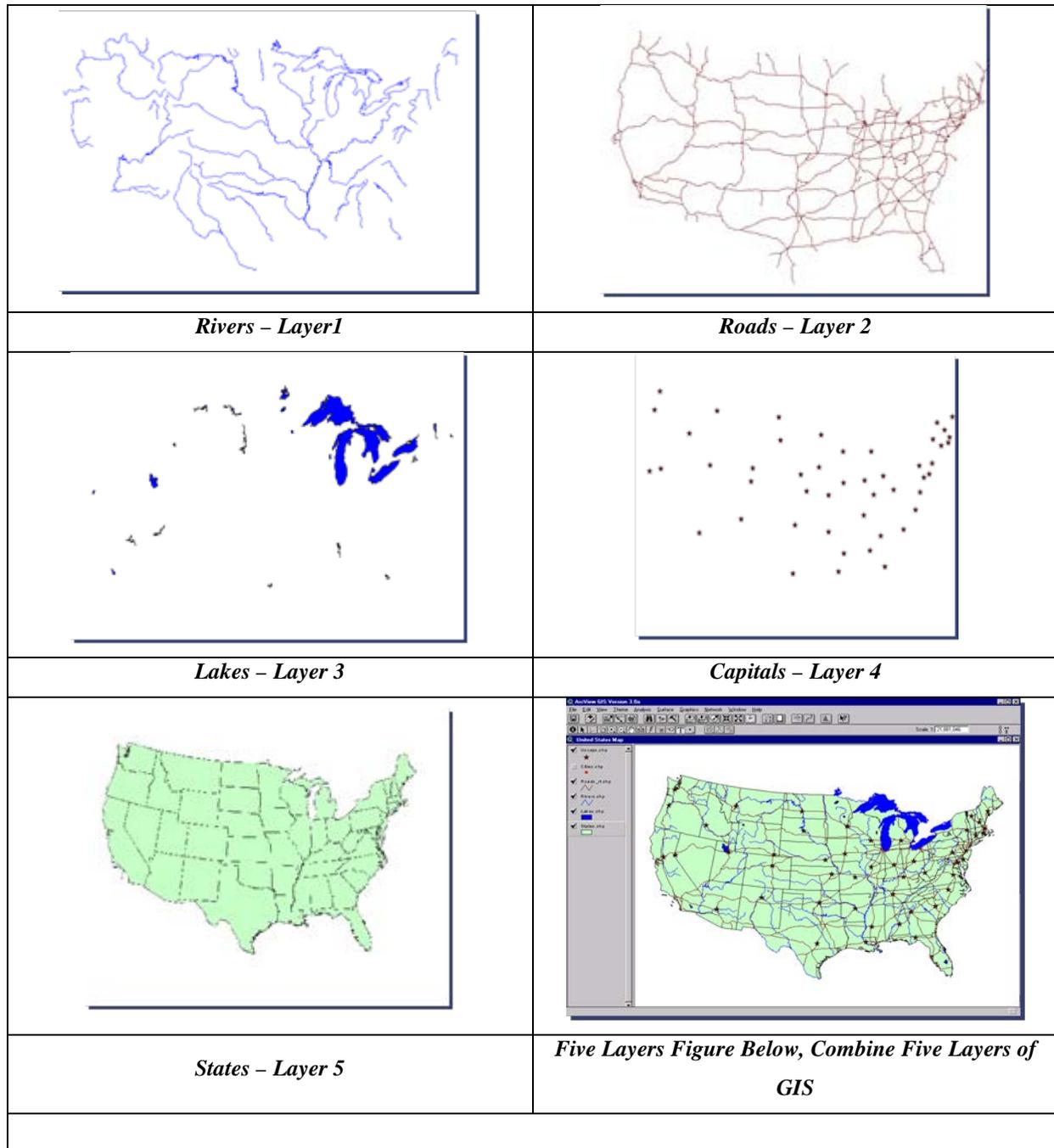- Rivers

- Roods
- Lakes
- States
- Capitals.

Rivers – Layer1	*Roads – Layer 2*
Lakes – Layer 3	*Capitals – Layer 4*
States – Layer 5	*Five Layers Figure Below, Combine Five Layers of GIS*

Figure 7

2.3 GIS functionality

GIS function = manipulation of spatial data + analysis of spatial data

Common manipulation =(map projection changes) +(re classification)

Common analysis= (buffering) + (overlay) + (net work).

3. Healthcare with "GIS"

The use of geographic information systems in the health sector has several aspects and trends, including the use of geographic information systems in dealing with the data from the electronic health record assessment of technology.

As well as the use of GIS technology to locate the spread of epidemic diseases and develop appropriate solutions to such disasters.

In this study, the focus was on the cooperation of geographic information systems with spatial planning for the purpose of determining the appropriate places, and geographic area to set up health centers, medical services, pharmacies and medical centers rays This makes the impact of GIS on the health care system appropriately and informative.

For this there will be ease in dealing with desktop GIS systems and data that we need in GIS technology which is real-time data and take advantage of GIS tools in the ability to visualize objects and using maps [5].

4. Healthcare systems in Iraq

The centers and medical services are of great benefit health care centers to provide several service benefits to citizens, whether preventive services or curative services, as well as the inclusion of the principle of health care (primary health care, secondary health care).

Where the areas where health centers shall be in urban and rural areas.

In Iraq and the presence of these health centers in the city are concentrated in the largest whether hospitals or medical centers or first aid and emergency services or maternity and child care centers, radiology centers, physical therapy centers, pharmacies, etc.

5. Requirements of the geographical location of medical center:[6,7]

- You must consider the choice of health centers and sites in the city center and a nearby residential building and close to the popular modes of transport.
- The site must be characterized by calm and far from the commercial market.
- Far from environmental pollution (smoke, dust and other environmental hazards).
- Easily accessible from the main roads by automobiles.
- Preferably of the site multiple secondary entrances to the building.
- Services such as parking availability outside the health center.
- The site contains the emergency entrance on the road does not suffer from traffic jams.

- Be next to the site pharmacies selling and dispensing.

6. The current reality of health in Iraq (current situation)

In Iraq, there are more than a thousand health care center first and work on the average population, which is estimated at thirty-five thousand each center, but the distribution of these centers and staff disproportionately from the spatially and choose the appropriate geographical area in terms of the nature and number of the population and other determinants.

There are poor in the health sector and medical centers planning because it is well thought out areas chosen with the needs of the job and the number of residents in these areas.

Therefore, the health sector in Iraq faces challenges and crises and problems in the construction of infrastructure for the health care centers in terms of choosing the right place as well as the management of these medical centers [3].

7. Vision and priorities:[8]

Vision in this study is to improve the health situation and health promotion and improved access to the best level of services for the Iraqi people by providing health care centers close to the initial residence and location have easy access to him and communicate with him.

So use GIS to assist in determining the appropriate spatial planning data to get to meet the needs of the citizen and better and simple [4].

8. Main challenges

- Reconsider the distribution of health centers in rural areas.
- Find appropriate geographic area when choosing health centers in the city.
- Address the demographic changes that are the number of population and population movements.
- The establishment of a healthy and accurate information system.
- Address the rapid advances in technology and rising health care costs.
- Attention to the security situation for some areas that are selected.

9. Study methodologies

When choosing a search area for the work we feed into the database of geographical information system must choose a region or location and determine the latitude and longitude, which is located including the site.

After that, taking into account the number of people in this region and then selecting the area of this region and public services that fall within this geographical area and to identify the problems of this region.

The analytical framework are evaluating the current situation of the geographical area and the location, such as

the needs of the site as well as the proportion of health services it and then put new proposals on the development of these services using spatial analysis and statistical analysis.

As well as see how random distribution of health centers and locations within Iraq may be in the form of questions because the geographic information system depends form the foundation on the questions and answers in systematic and possible questions to be used is:

- Is there a self-sufficiency service at this location?
- How are distributed health centers in Iraq?

Through the study found that there are health centers distributed appropriately and other inappropriate and there is good in the city centers and other sites are not good and also in rural centers may find a good location and another badly and as such.

Figure 1: below Show (High Quality of Medical Service in Baghdad)

Figure 2: below Show (bad Quality of Medical Service in Yusufiya)

Figure 3: below Show (Worst Quality of Medical Service in DhiQar)

10. Conclusion

Through the results of this study showed that there are areas suffering from the problem of poor distribution of health services and that most of the health centers not on the basis of a planning studied scientifically and as required to set up health centers and medical services standards.

And that there is weakness in some of the services such as the provision of ambulances or the presence of a suitable site for health centers that must be where the emergency centers.

The study also focused on the appearance of a lack of health centers in rural and remote areas of the city center And even the existing centers in the city center, some of which is not available with the terms of the integrated geographical area specifications for the establishment of a service medical center for the citizens with the lack of some centers to a computerized database helps geographic information system for identifying appropriate medical centers base in addition to the security aspect for the selection of the appropriate geographic area and how the arrival of the citizen to these centers.

It showed a random distribution of medical centers, pharmacies and clinics where there are study areas where concentrated services and other non-serviced.

It is therefore possible to consider GIS as an invaluable approach in terms of medically weak areas (in medical services and the presence of health centers in Iraq) to serve the rural and remote areas. Therefore, the proposed system is a link between medicine and social and demographic sciences. We hope to implement this system in Iraq under the technological advances and methods and analytical analysis.

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