Using GIS And Application For Tourism

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KEYWORDS: GIS, Tourism, Esfahan, Application, Design, Network

ABSTRACT:

The success of tourism in any country depends on the ability of that country to sufficiently develop, manage and market the tourism facilities and activities in that country. Most developing countries depend mainly on tourism for economic growth and diversity. Iran, a developing country in middle east, is one such country. In Iran, oil is the largest foreign currency earners. But uncertainties in prices of oil products on the international market, causes tourism is the reliable source of investments and foreign currency. Geographical Information System (GIS) technologies provide us with these possibilities. In this study, GIS design and network analysis were carried out by taking advantages of GIS possibilities for tourism in Esfahan and An analysis of the shortfalls of the system in place is investigated.

1. INTRODUCTION

tourism is one of the industries with the strongest effect on the economy, because it helps in developing other sectors. "Tourism is a composite of activities, facilities, services and industries that deliver a travel experience, that is, transportation, accommodation, eating and drinking establishments, entertainment, recreation, historical and cultural experiences, destination attractions, shopping and other services available to travelers away from home." (Tourism and Leisure Committee, 1997). The significance of tourism, as defined by Ghosh (1998), is, among other, one of the major items of international trade.

According to Fridgen's (1991) study of an American model, the success of any tourism business could be determined by:

- Tourism planning
- Tourism development and research
- Tourism marketing

According to Van Arragon and Wessels (1994), there has always been a direct relationship between tourism and cartography. Maps of travel routes and general information about the areas to visit are used in selecting the destination and in planning travel and stay.

GIS has been commonly used in different fields such as tourism activities enabling people from different countries and cultures to interact with each other. Tourism is a way of conserving the environment, creating jobs and promoting tourism. Tourism has the potential of becoming the highest generator of foreign currency for Esfahan. Esfahan Council of Tourism investigated the use of GIS in Tourism Research in storing, manipulating and analyzing the voluminous tourism data and survey carried out. It also discussed the possibility of producing graphics on paper or on screen to broadcast the results.

2. NETWORK ANALYSIS

A network is a set of linear features that are interconnected in GIS. Common examples of networks include highways, railways, city streets, rivers, transportation routes (e.g., transit, school buses, garbage collection, and mail delivery), and utility distribution systems (e.g., electricity, telephone, water supply, and sewage). Collectively, these networks form the infrastructure of modern society. They provide the means for the movement of people and goods, the delivery of services, the flow of resources and energy, as well as the communication of information (Haggett and Chorley, 1969; Kansky, 1963).

Network analysis is useful for organizations that manage or use networked facilities, such as utility, transmission and transportation systems. Utilities employ network models to model and analyze their distribution systems and meter-reading routes. Municipal public works departments use networks to analyze bus and trash routes, whereas

businesses use them to plan and optimize the delivery of goods and services. Network analysis can also be applied to retail store planning. For instance, solving of the driving times can aid in the determination of retail store trade areas. Three principal types of network analysis are network allocation, network routing and network tracing.

Network Allocation: As well as one of the most important processes in the Planning and investment activities is network allocation. In other words, Network allocation is an analysis occurring at the same time of geographical entities and determination process as a point of the optimum center.

Network Routing: Network routing determines the optimal path along a linear network. The selection of the path can be based on numerous criteria, such as "shortest distance," "fastest route," "no left turns" and "minimum cost." The path can pass between two points or through several selected points.

Network Tracing: Network tracing determines a particular path through the network. This path is based on criteria provided by the user.

Geographical data used in Network Analysis have to be vector structure and also based on line. Arc-node topology is established for Network Analysis Query in GIS. Network Analysis is closely related to spatial interaction modeling. A set of geographic locations interconnected in a system by a number of routes (Kansky, 1963). A network refers to a system of lines topologically structured. Networks may be reduced to topological graphs, which are arrays of points connected or not connected to one another by lines. This simplification facilitates the revelation of common topological structures of the networks.

3.   DESIGN AND APPLICATION

In this study, all of the GIS implementation phases were applied. In addition to this, current state and necessities were fixed on feasibility phase. Data design, process design and physical design phases were carried out on design phase. Finally, Esfahan was selected as the working area in which there are a lot of tourist places. The system application phase of GIS Design and Application for Tourism was carried out. Furthermore, we used Microstation Ver 8.0 and Arcview 3.2a with Network Analyst Extension and Arcinfo 8.0.2 in this study.

District boundary maps, current maps, orthophotos, middle lines of roads and their name are graphical components of GIS Design and Application for Tourism. In addition, non-graphical components consist of attributes of designed layers. And also, detailed information related to photos and objects is available for better recognition of query object. In this study; middle lines of roads which have vector and graphical characteristic for network analysis, and historical and tourism places and all of the geographical objects considered as necessary items for tourism were designed as point layer. Only building layer was designed as polygon layer for imagination. We used different layers for analysis. There is general information on the entry requirements to the country, the climate, rules of the road and disease prevention. For every town, in this case Esfahan, information on the tourist facilities on offer, the rates at each facility, types of rooms, services on offer, the nearest police station, bazaar, park and restaurant can be obtained. On clicking on a tourist facility, and sample pictures of how the facility looks like can be obtained, viewed and printed for a client on request.

Table 1. Layers and its attributes

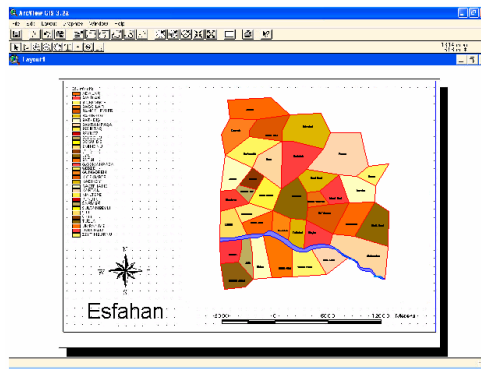| Name of Layer	Attribute
Hotel	ID,Name,TEL,Servises
Mosque	ID,Name,Image,Doc
Restaurant	ID,Name,TEL,Address
Park	ID,Name,Services
Museum	ID,Name,TEL,Image
Police	ID,Name,TEL
Church	ID,Name,Image
Public Building	ID,Name,TEL
Way	ID,Name,Type
Bazaar	ID,Name,Image

Figure 1. Boundary of District in Esfahan

4. APPLICATION

This study was carried out in Esfahan, which has a lot of historical and tourist places. These results can be achieved by queries in GIS Design and Application for Tourism:

- Determination of important and necessary places for tourism.
- Determination of historical and tourist places.
- Determination of the best suitable hotel.
- Determination of the optimum plan for sightseeing places
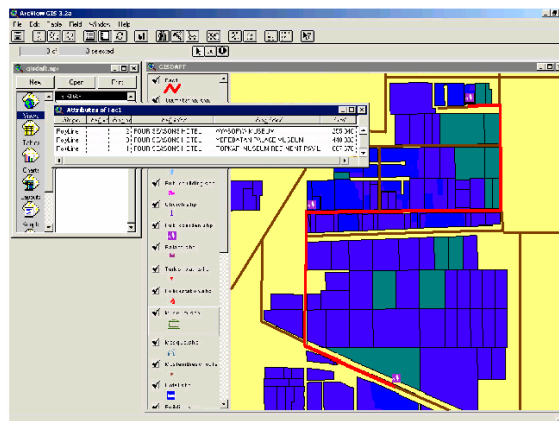- Determination of the shortest distance between the selected places

Figure 2. Distance between museums and Optimum Sightseeing Planning
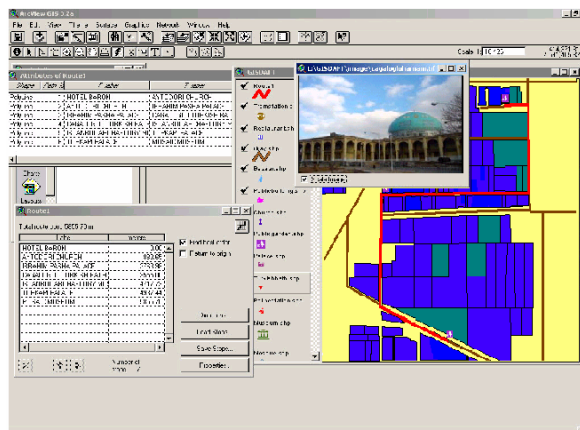

Figure 3. Detailed information about object and optimum route for sightseeing

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With ArcView Network Analyst, there is the ability to calculate the shortest route between places and also to generate directions. These can be printed out for a client and would make it easier for him/her to get to the required destination by following the mapped out directions. Information on the type of road, the width and whether it is tarred or not can be obtained from the attribute tables. This is also required and enables those visitors who will be driving to choose the best mode of transport to use.

Queries can be made on parks and hotel concerning their accessibility from the nearest distance and mode of transport. Services provided at each park can be obtained from the tables. By clicking on several points in each park, information on the animals, birds or vegetation in that section can be obtained. This list of queries is endless, and unique to every potential tourist. For the system to be more effective, it can also be made available on the Internet for access by lots of potential visitors from the country and other parts of the world.

5.   PROBLEMS AND SUGGESTIONS

There were not standards among the data during the system creating process and some problems occurred during transferring the graphical data to the GIS. Afterwards, the standards were formed between graphical and non graphical data. All of the problems among the graphical data were solved by Arc Info Software.

Tourism has been considered to be one of the crucial industries in the world due to being source of income. It also enables people from different cultures to interact with each other. Therefore, every country must be conscious of tourism and make use of GIS directed towards tourism effectively. Every country should advertise her history, architectural characteristics of buildings in order to make them known all over the world. These details can be obtained in a query by forming a spatial connection with GIS.

6.   CONCLUSION

In this study; optimum planning for sightseeing, query of geographical data, obtaining the visual and detailed information about the geographical data and network analysis applications were carried out. GIS design and application for tourism and network analysis help users to supply optimum planning for tourism. Moreover, users seem to save time via GIS design. In the future, importance of GIS will continue increasingly.

7.   REFERENCES

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