

Tourists optimal path-finding by GIS
(Case study: historical texture of Sanandaj)

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Abstract:

In spite of continuous changes in different era, historic and old cities with their unique attraction can be considered as a best place for tourism activities. Sanandaj as a capital of Kurdistan, with its' compressed and labyrinth old texture which during the time according the physical, social and natural features had been made, because fascinating historic architecture, unique cultural and artistic features, among Iranian's cities can become one of the best destinations for tourists. Path-finding and designing of walking rout, with aim of visit management, meeting needs of tourism and introducing this texture, are most important steps to tourism development in this textures. Designing of tourist walk rout to conservation of historic part, tourism development, decreasing negative impacts of tourism and social safety, is our attempt in this study. The method of research is descriptive – analytical and in view of type, can be categorized in applied studies. Needed data collected thorough library search and survey. In addition, according our study all route of historic texture doesn't have needed criteria for tourist walking, so, to achieving mentioned aims, with use of GIS , effective routing factors turned

to quantitative data, then, according them, spatial analysis, algorithm as an overlay, network analysis, best route for tourist walk identified.

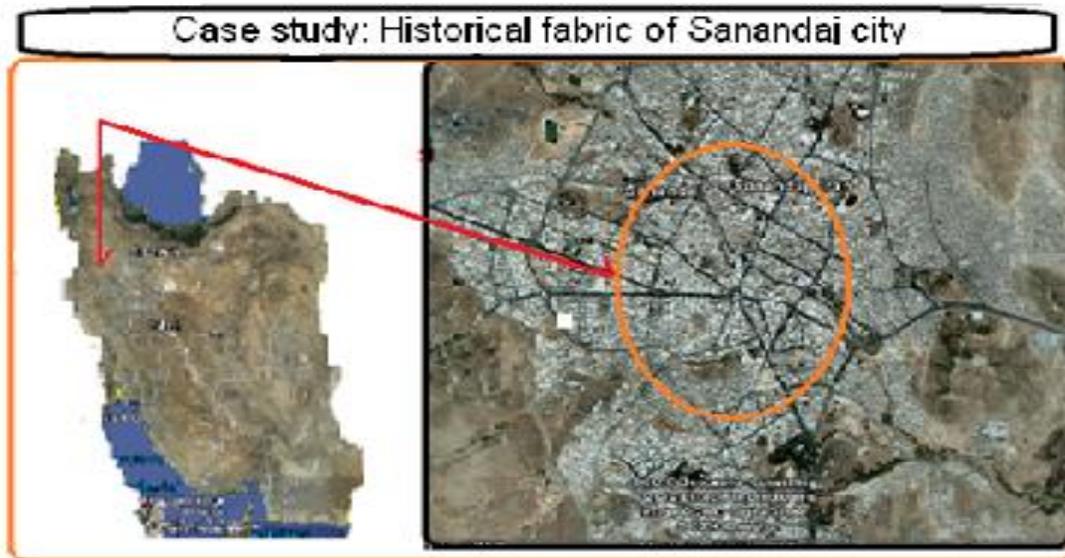
Key words: tourist path -finding, urban tourism, network analysis, Sanandaj

1. Introduction:

City has a significant role in tourism as a geographic unit. (Hyeon.Y, et al, 2006) In fact city and citizenship have had a gradual and low process in the past centuries and had faced many tackles since they have been formed. However, city has had some common aspects in all these years which have saved its physical, architectural, artistic and cultural dominance. It is hard to distinguish the differences between the cities if David Harvey's ideas on the cities appearances high similarities, historical cities an historical parts het more values and such urban characteristics are considered as tourist aspects of a city. (Movahed, 2007) In such environment, public urban places in which citizen could have face to face interaction has an important role in new urbanism and also tourism. In this regard, on foot tourism has an important role for its entertaining and tourism aspects in addition to its interactive nature. (Fatemi, 2008) In accordance with such ideas, old cities have the potential for performing on foot tourism, or they have organic nature and their tourist attractions are relatively close to the heart of the cities. Also, it should be noticed that the civil life in these parts of the cities are bound with the progressive pedestrian movements in such area. (Rapoport, 1984) Having pedestrians in cities has a vital effect in the urban physics and a way to make the old parts, which are the civilization, city identity and civility manifestations of a city is to make pedestrian roads. (Asadollahi, 2004) Sanandaj city, as the capital of Kurdistan province, which is located in mountain foot, has a unique historical context in the center of the city which manifests a traditional architecture by its streets and high walls. These parts of the city contain most historical parts of the city such as mosques, markets, museums and old buildings which could be a tourist destination for domestic and foreigners and attract many people. In the following study, a pattern for tourists' movements in city public places, based on the on foot tourism and by applying the tourism and urban studies with mathematical methods and models, in Sanandaj city is offered.

2. Study Area:

Sanandaj is the capital Kurdistan province with the coordination of 35°19'02"N 46°59'56"E/ 35.3172°N 46.9989°E with a medium sea level. (boomnegare pars,1374) The center of the city contains a lot of historical places and is official, urban and economic part of the city. Tourists' navigation is a significant step in revitalizing the old city context and it has an important role in city economy and returning the residents.



3. Research Methodology

There are many goals for people navigation in tourism that of which pedestrians' navigation, security navigation and suburban navigation could be cited. (Corner.O, et al, 2005) The following research is of descriptive- analytic type and GIS is used or data analysis. Data needed for this research is collected through documents and libraries and for the data completion field study and data sources provided for GIS databases are used. In accordance with tourists navigations and design in Sanandaj with goals of developing tourism, reducing the negative tourism effects in the city and also reaching other objectives, Sanandaj historical context and routs are identified though GIS and applying network analysis model. To achieve this, the databases should be formed to exercise a good data management. To eliminate the errors and increase the analysis accuracy, the topology maps should be formed

based on the topological relationships and by providing this, the ability for network analysis is created. The listed cases will be described in details.

4. Historical Context, Walking and Tourism

Human has always travelled for visiting natural attractions, discovering economic opportunities, benefiting from a better life condition and recognizing the ethnic and cultural diversities. Hence tourism is as old as history. (Zahedi, 2006) As tourism industry develops, tourists show more tendencies in history and cultural heritages. Tourism is a huge bound between nations and countries. Tourism also could increase the ties between people and nations and a fair distribution of wealth in all country parts. This industry is also of important factors in region civil development which will level the social- economic development in the region, having a role in fair distribution of wealth, creating jobs and complementary resources, and changing the economy. (Omidvar, et al, 2008) Walking has been the oldest way of human in transportation which is in trend, although new technologies are advancing. Walking tourists to visit old parts of the city, which contain historical values, has a vital role in city physics. (Asadollahi, 2004) Ignoring the pedestrian routs and its organizing are of the problems which decrease the urban environment quality and lads to decline in social, cultural and visual values in urban areas. There have been some efforts to decrease such problems in the past three decades in global urbanism which is called “the on foot tourism movement”. (Mehdizade, 2000)

Prior to the industrial revolution, the city form was dependent on the geographical conditions. Urbanism would be in human scale mobility and the use of the quadruped. Hence the city would grow by the human social and psychological needs. In fact, sidewalks are the oldest way in human transportation. (Mo’ini, 2007) They are the city urban life manifestations and a place for citizens’ social activities in urban life.

So right design and develop this cases make a richer social and cultural life (same source: 19). Of Another important roles that play sidewalk is the revival of the historic fabric by eliminating traffic that even former social classes also are return to that neighborhood and provide identity of community (Pakzad , 1386). So if we

believe that the street and the path of walk is of the main elements of public urban area. Then the street and path of walk sometimes manifested in the urban civil life of the city and it is location of event and social activities of citizens, foreigners and tourists. No doubt that success each of these cases themselves specific features in the design paths of tourist walking will lead tourism, That this consider as part of main effort to achieve the ultimate goal .

5. Path-finding tourist in historical fabrics

Today the study of tourism activities and design tourist routes in spatial and place is one of important issues in tourism management (Lunglin.M, et al 2009). Routing tourists in ancient fabric as a step bilateral and multi-sided, perhaps to protection of fabric and guided tourism can act as a pre-desired reclamation ancient fabric and as a complementary step leads be to restore fabric. This path that design accordance with human moves for fabric according with move of human. While introducing fabric and valuable elements of texture as a narrator and a suitable conductive can make each acquaintance with familiar textures and can be a way that current life within the context .Ability to attract tourists not only provider related needs and contemporary textures, but it accounted also as a necessity to solve old problems of ancient and valuable fabric at the center of cities. In order to a rout Qualified for the moving of tourists must have a series of features and factors, the number of these factors in related with present conditions increase and decrease . . the amount of impact these factors have been studied based on expert opinion and each factor weight given by based on their important in models It is noteworthy the number of the parameter by the researchers have harvested based on method of observation. Combinations informative factors regardless of the importance of each of them on the path can not interference their real value in the final integration, and units with different values located in a value .while each of these parameters have particular importance in routing .Then in order for this research, It appropriated weighted method and for each of the factors based on degree of importance in path-finding appropriate to their specific weight. The Category methods are used for weighting factors. Determination weight of factors was relative and for specifies importance of each factor or more information is used of expert study. Method Sort these criteria are more; in the study area based on weighting method based on the classified category the way such that each criterion measures than their next criteria has highest priority and more value has for tourists of considered region.

The approaches proposed in relation with tourists routing in the old and historical fabrics criteria for the recognition of a tourism route optimization in relation to the desired tissue is necessary, based on the importance such that each criterion

measures than their previous values are less organized, These criteria are as follows:

- It is necessary to be selected route of routes of existing in fabric, this condition be included physical and cultural values and behavior and the principle of survival, about the definition and scope and respect privacy space and natural conditions.
 - It is path that in way historic route that places urban events or in urban life today have been identity role and effectively role.
 - Path is that the specific time in the past had function and loss their role now and restoring its lost can be effective in reclamation the surrounding urban space .
 - Nature path that could be completely sidewalk property and or specific times ability acceptance to walk and Cavalry has been in itself. This time can included hours, days, specific periods, day, week, month or season.
 - Path is the maximum space that can walk and provided least desirable space in the vehicles.
 - The path that the continuity in the center of the surrounding tissue has flexible and prevent not choice tourist route and can possible decide provide for his in along route
 - Path that can be implemented in various stages and attention to fabric conditions, limitations and executive problems and also accepting the changes provided of side residents (Hbyyby, 1387).
 - A path that included of high security.
 - Path be that provided access to equipment and tourism facilities (hotels, the information centers,...) easily .
- The path be that highly access have to be for valuable historical sites.
- The path be that while including dynamic function and passing of aspect economic and social very important (Falamak, 1386).
 - The path is the path that provide basis guidance passing path for to surrounding access.
 - Based on was studies in this context, factors such as safety, security, comfort, continuity, suitable network , attractive, land topography, climatic conditions, the capacity (service level), mental image, social environment , Social fabric and Cultural in Moving and replacing passenger(tourist) is fundamental role . (Fruin, 1971,Rappport,1987,Desylleseyal,2003)).

5.1. Models of transportation and routing of movement

Geographers and researchers are interested to know that people how and what ways choose places for visit and attempt to knowing that what model patterns of movement of tourists show in the city (Cornler.O, et al, 2005 .) models and patterns of urban transport efficient show way of movement people from starting points to visit the target areas as graphics The first model of urban transportation

has designed in the 60's by Mr. Lavry (Miller.M, 1984 and Meyer, M.). Of course, there is no model that the path blow over by any person to register, but also on how to distribute the highest, lowest and most irregular and tourist attractions and functioning transportation networks existing and ways is that this place joins connected to each other and gives enough information for efficiently design service, with regard to the need tourist and shopping centers to feasibility. Review the status of transportation as analytical and graphics can a tool appropriate design, Of course based on condition that tourists have a pattern of tourist and tried to visits done under an optimal model and same. Finally, the study tourists activities and design tourist paths in space and spatial and return and approach to the vitality of this urban spaces, particularly in urban centers from the perspective of the pedestrian appeared inevitable necessity (, Hillam et al 1990, choay 1985 , Carmona et al 2003).

5.1. GIS, routing, models and applications relevant criteria

Each Scientific research is requires usage methods and tools in certain stages. In this research used also of GIS. Operations collect, store, combine location information and analysis they with consider effective factors in traditional and manual routing, require time-consuming and overwhelming activity, As that necessary information about the targets and methods and standards for each user type of urban landuse city need for plenty and various data Geographic Information System changes to displayed shape, amount of production and updating and dissemination of geographic data (Azizi, 1383).

In general, GIS provides a tool that by they can geographic information used for a wide range of applications and for can this data apply for making correct decision , the quality they should be prediction and correct. Standards required quality for existing data in GIS database and methods of determining the size should carefully started before entering that phase to the system known to be seriously (Amy ᠒ Arghdy, 1388). In fact, what In fact, what a system of geographic information system of another systems specified , It is analysis functions that this functions location data and descriptive and Non-descriptive data available in GIS database used for answer to questions about the real world . TO Lines optimization and optimal route selection, what is important?

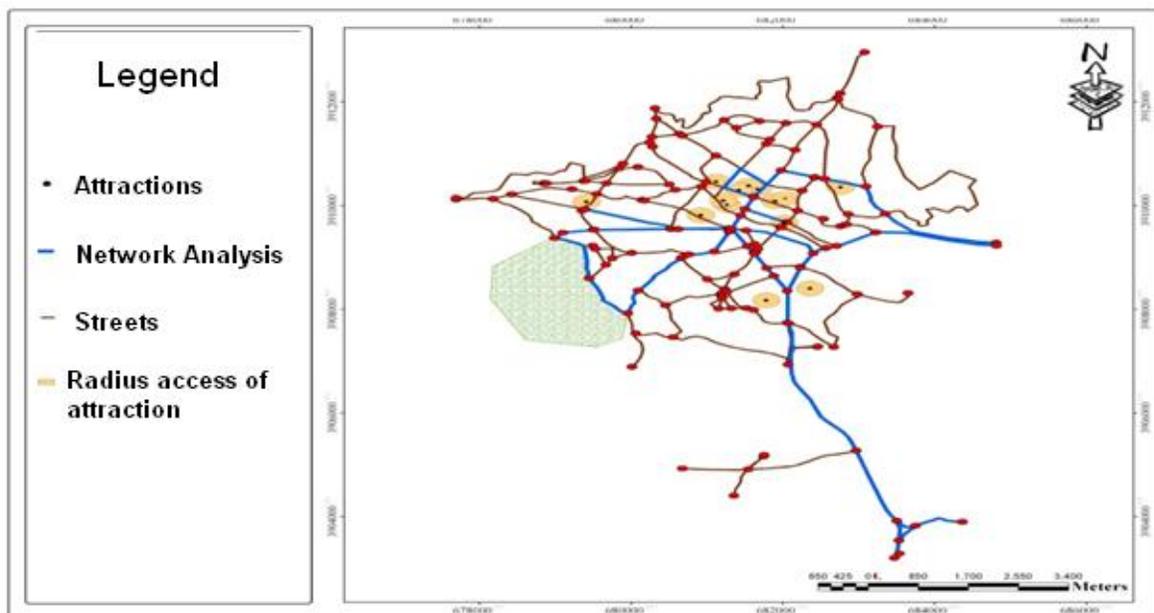
Access to places of historical value. The model and methods that have been employed in this study achieved for access to this goal are based on the criteria listed above.

6. Finding

In order that apply model and appropriate criteria in identifying optimal path for moving tourists initially desired topology map was prepared. In this map elimination cases that would cause error in the map and was reduced precision analysis. In this way necessary basis for an efficient and appropriate analysis was provided. Then, beginning with little off criteria for routing tourists in GIS have been considered essential and application of mentioned criteria in model of spatial network analysis for each of the route passing in urban fabric based on codes in related described tables were saved best route for passing tourists in the city specified and were identified. This route includes streets (original grade and second grade), including ; Guards Street, Ferdowsi Avenue, St Taleghani ,Shhydchmran, Salahaaddin Ayubi, Shohada, Imam Khomeini , Namaki Street, Hassan Abad, independence, Ekbatan, and the like.

In shape (2) the best routes that include all suitable indicators for moving tourists in the city were identified and in format of proposed map for moving tourists efficient routes that also to provide easy access to attractions for tourists and supplier needs tourists of various aspects and It is proportion with sustainable tourism principle.

Optimal rou: of movement of tourist in Sanandaj city by Network Analysis



7. Conclusion:

In order to access to efficient routing patterns, geographic information systems with used quantitative technique in make decisions, determination of process and routing. Can in Studies relevant to place on different levels of planning can be benefited? In the present study with used the criteria listed above and quantity to use them in the ARCVIEW ARCGIS and apply spatial analysis that are of main criterias distinguish GIS from other systems and As a result, usage algorithms as the overlay and create topology for modeling location and scale relationship between the complications that this connection created by the laws and relations topology, ultimately basis for network analysis in GIS was provided, that eventually with use of network analysis in path-finding and

Application routing criterias, appropriate optimal routing paths in the city for tourists, was identified and proposed. As was previously stated. Sanandaj, Kordestan province in the West that Iran is located as an ancient city having historical value of attractive in the downtown core and center can be welcomes domestic and foreign tourists .This city, With including historical valuable elements as , Moshir Court Mansion, Hajrh Khatun (sister of Imam Reza), and the indoor market and the neighborhood Srtapoleh, Khan bath mansion in the neighborhood and Qazman Qtarchy in the neighborhood mosque and the mosque Daralhsan Old.

Is an old mosque with a fabulous traditional architectural pattern as a sign of the city has given face of beauty to this part of the city and another several neighborhoods in cities that located in the middle part of urban neighborhoods , There are neighborhoods as Golshan that located in that Emama zade Pir Mohammad, and Khosro abbad neighborhood Khosro Abad Mansion, That Additionally this elements Iran's largest landscape as Abydar Park is unique in themselves kind and can welcomes domestic and foreign tourists. In order that , optimal routing of tourists in the city of Sanandaj, in the range of historical context and according to this pattern attempt that of side be considered rusty fabric and of another side considered city economic prosperity and this new spirit to dead body be breathed into the city .

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