

The Use of Geographical Information Systems in Historic and Cultural Places Case Study: Town of Side

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SUMMARY

Tourism is an important factor of Turkey's economy. Cultural tourism has taken a lot of share from entertainment tourism and it has serious potential for development. According to cultural tourism, historical places are made to introduce and restore in possible with tourism management. We can realize a management manner to response capacity of e-tourism and e-culture and e-history approach for based knowledge society desires with connecting historical and tourism contents in GIS. Side is an important city for tourism in Turkey. Historical and cultural heritages must be officially registered and prevented from destructive effects of time.

In this study, Side city of Antalya has been chosen as application area. Historical data determined by the Museum of Side and photographs are taken. In this study, we are located known and unknown historical places of Side as a Sample Introduce and Tourism purposeful 3D Model Supported Historical Places Information System. In addition we take photographs and collect region's data and establish as a database for pilot application. Later, the database and digital maps are connected by relative localtion. Two historical places selected and prepared 3D model and connected by Arc GIS software. Consequently, a study, which can be taken as an example for further studies, was accomplished.

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1 INTRODUCTION

Tourism industry has been taking an important place in economical and social life in Turkey since the end of 1980s. It has risen to second major profitable activity field bringing foreign currency after exportation in the Turkey's balance sheet of payments. In 2006, the number of tourists who visited Turkey rose to 24 million and the tourism incomes rose to 16 billion 850,9 million US dollars, thus increase trend in the previous years was regained.

Side is the town of Antalya. Antalya is accepted the tourism capital and tourism locomotive of Turkey. Side is located into Pamphilia boundary and contain natural and historical places and Side mean POMEGRANATE to Luwi of Antic Anatolian Language (Mansel, 1978). We do not know the number of visitors in Side city.

Geographical Information System (GIS) is an information system, which can provide information by integrating all kinds of graphical and descriptive data. GIS, which has many application fields, is used intensively in many countries. GIS, of which benefits are seen in existent applications, must be presented as an example especially by using it in foundations.

In this article, it was aimed to transfer Historical Texture Information System Sample and the documents of Head Offices of Museums about historical places onto computer via GIS software.

In this study, the construction of "The Use of Geographical Information Systems in Historic and Cultural Places Case Study: Town of Side" for the use of foundations registering cultural and historical traces will be discussed.

In this context, an application of this sample into a tourism area will be presented. For this purpose, firstly the maps representing the region have been scanned and digitized, thus the maps that would be used in the information system were constituted. Documents related with the predetermined historical regions in Side settlement were gathered. In addition to this, literature scanning about Side was performed and information used in the study was collected. 3D Photogrammetric models are executed by Photomodeller and connected with Arc GIS.

2 MATERIALS AND METHODS

2.1 Historical Inventory of Side

Side had been located at the 75th km on Antalya-Alanya highway (Figure 1). Today Antic Side and Modern Side are living together (Figure 2). It is in the Pamphilia cultural region. Figure 3 shows the antic region map.



Figure 1: Side Map



Figure 2: Side General View



Figure 3: Antic Side City

Historical and Touristic Places in Side: City Walls, Great City Door, East Door, Aquaduct, Monumental Building, Colonnal Street, Great Agora, Library, State Agora, Bishop's House and Basilica, Vespianus Fountain, Theatre, Bachus Temple, REMnant of Antic Houses, Great Harbor Bath, Men Temple, Apollon and Athena Temple, Side Harbor, Harbor Bath and Side Museums.(Figure 4)

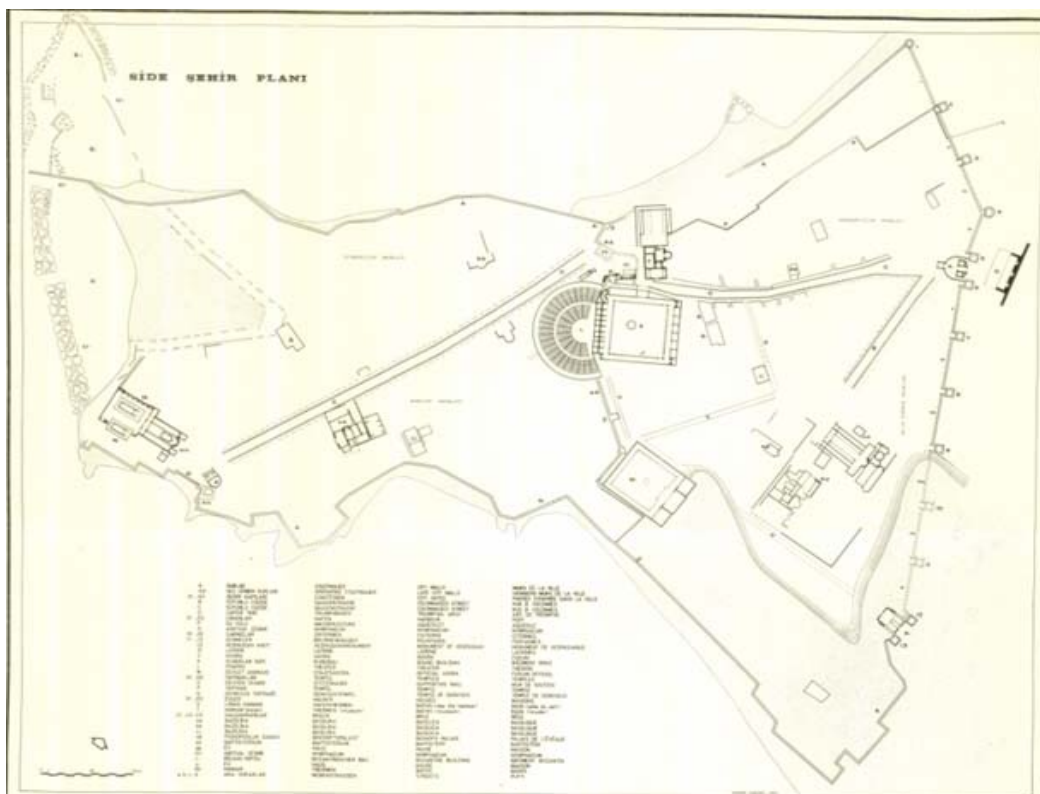


Figure 4: Antic Side City Plan (Mansel, 1967)

2.2 GIS and Management

GIS is a tool that integrates all types of graphical and non-graphical data and allows users to create interactive queries. That's why; Geographical Information Systems (GIS) is a vital instrument in making plans in management.

GISs will allow planners and other city officials to more easily use the benefits of predictive dynamic urban models and integrate them in collaborative spatial decision making processes (Stevens et al. 2006).

Historical Source Management: GIS—and geographic information Technologies in general—are used quite infrequently in studies of history and historical geography (Giordano & Gelpke, 2003). The nature of views to or from archaeological objects and sites has long been of interest because of their potential importance in the placement of cultural features within landscapes. With the advent of Geographic Information Systems (GIS), quantitative exploration of the visibility of objects has become common through analyses of view sheds (the total portion of the landscape visible from a viewpoint) and indivisibility (whether certain points on the landscape have views of each other). These visibility studies have proven popular because they offer a way to harness the analytical power of GIS to address archaeological questions of site location and also because of their potential for exploring cognitive issues (Ogburn, 2006).

Planning: Spatial planning is essentially a decision-making process. Relevant criteria have to be identified, analyzed, combined and evaluated in order to meet specific objectives. Geographic Information Systems (GISs) technology allows the matching of recreation potential with the characteristics of the regions. The capability of a GIS to allow rapid modification, addition or removal of constraints and to investigate the complex interrelations between the thematic layers is attractive for resource management and planning problems (Beedasy & Whyatt, 1999). If a region is to prosper from tourism, the natural beauty of the area must not be damaged by potential expansion of resort development. GIS can be critical for understanding how human activity is changing our environment (Levy & Dickson, 2001).

Decision: The goal of GIS and tourism destination management is to provide guidance for the creation of a comprehensive system that can serve as the basis for the organization of information currently maintained on independent systems. Another aim of these information networks should be to provide a medium in which people at different locations can more easily share data and tourism planning ideas. Because many inquiries require access to spatial data, a third goal in establishing a GIS environment is to improve the management of current operations in both the public and private sectors. Obstacles in establishing a universally accessible GIS are many. There is still a need for extensive investments in hardware, software, data, applications development and technical training. The shared responsibility for creating universal access to data and the process of planning requires the commitment of both the private and public sectors (Levy & Dickson, 2001).

2.3. Tourism Information System

Tourism Information System (TIS) is one of the application fields of Geographic Information System constructed for tourism. The aim of this system is to manage the regions relevant to tourism, make decisions about future works, and provide accordance with Urban Information System about its vicinity at the following stages.

In order to construct a tourism information system, tourism maps must be produced first. Because, in order to use a system efficiently and accurately, it is necessary that accurate information must be provided on the maps. In other words, recent situation of the area where the system will constructed must be presented.

After providing the maps, the graphical information related to the region must be transferred into computer via scanner or AD converter. Entire natural, cultural and social data about the region is gathered and assembled. Graphical and non-graphical data are processed together by means of GIS software so that the main structure of TIS could be constructed. As regards the contents of work, query and publishing on the internet could be done afterwards. Stuff must be instructed and equipped for updating, improving and maintenance of TIS.

3. Application

The main purpose of this study puts the first step in designing and applying ‘The Use Of Geographical Information Systems In Historical And Cultural Places Case Study’: Town Of Side’ as a pilot project by Geographical Information Systems for offices registering historical and cultural records.

It is get the public plan of Side and digitize to Arc GIS 9.2 software (Figure 5). For the next step, in order to extract documents related to study area, a copy of current documents was taken, also all documents such as books, magazines etc. about the region were searched.

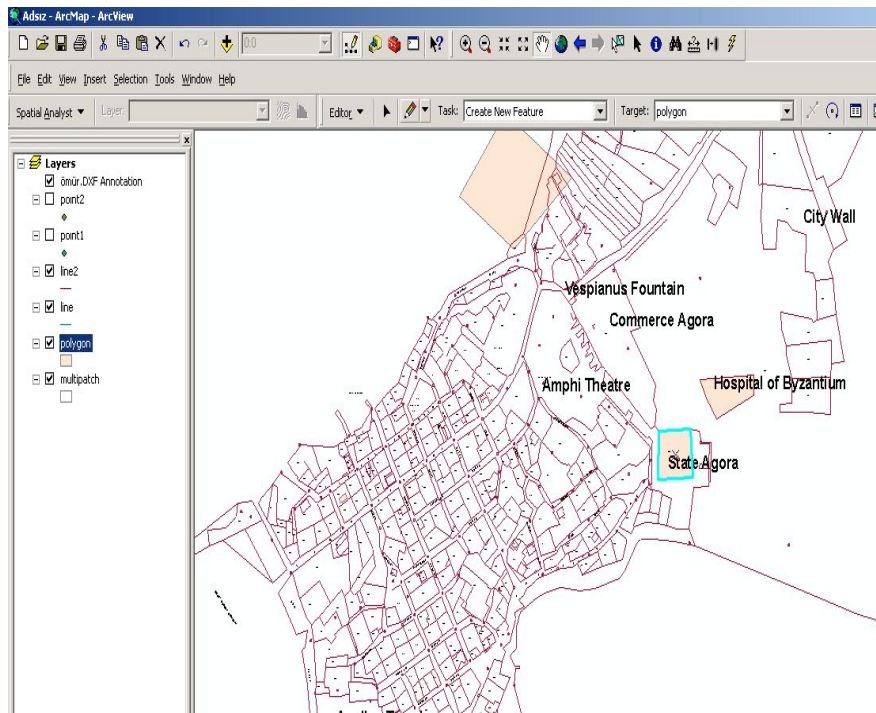
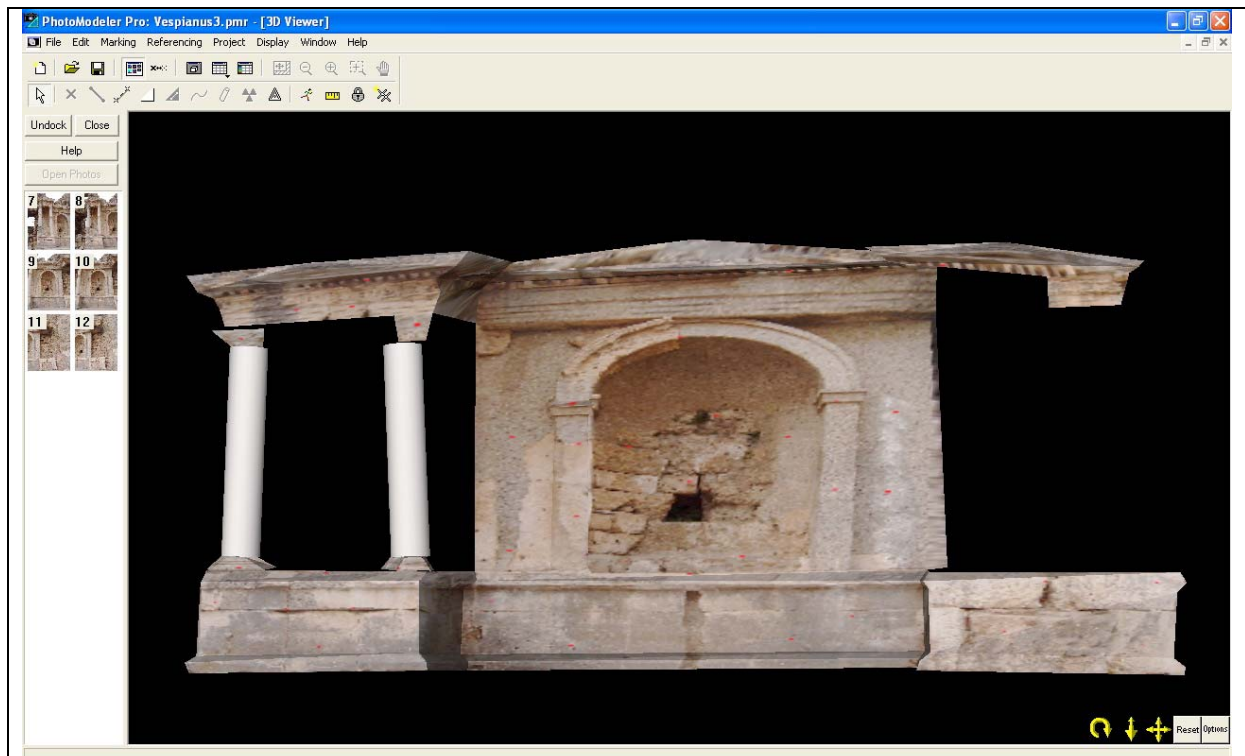


Figure 5: Side Public Plan in Arc GIS

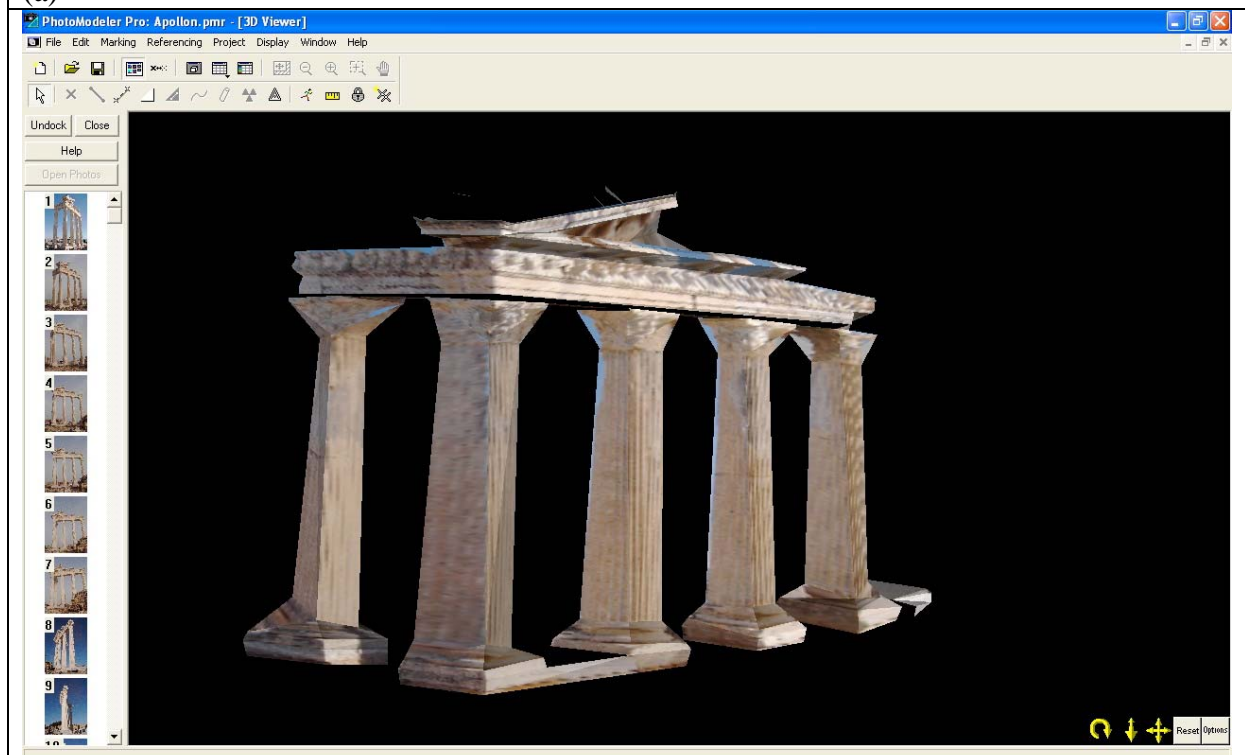
Points, temporarily marked on the historical objects of which photogrammetrical 3D models would be constructed, were measured by an electronic distance meter in a way that x,y,z coordinates could be obtained. After calculation of coordinates, these points were mapped and pictured in various angles to avoid loss of details of the historical objects. Appropriate ones among photographic data were selected during office work. It was considered for selection that each point should be viewed at least in two pictures. To avoid loss of detail in high detailed parts, more images were used then the selected photos were transferred into Photomodeler software. This software provides obtaining 3D data, implementing 3D measures and creating 3D models from the photographs. After the control points were marked in all photos, adjusting process of these points was performed with software. Seeing that value of adjusting process is accurate, 3D images of traces were constructed by constructing shapes such as ornaments, stone crafts etc.

Figure 6 illustrates the texture weared 3D models of Vespianus Fountain (a) and Apollon Temple (b) by photomodeler program.

Historical Texture Information System was wholly constructed Figure 7 and 8 illustrated the results.



(a)



(b)

Figure 6: Vespianus Fountain (a) and Apollon Temple (b) in Photomodeller



Figure 7: Vespianus Fountain in Arc GIS

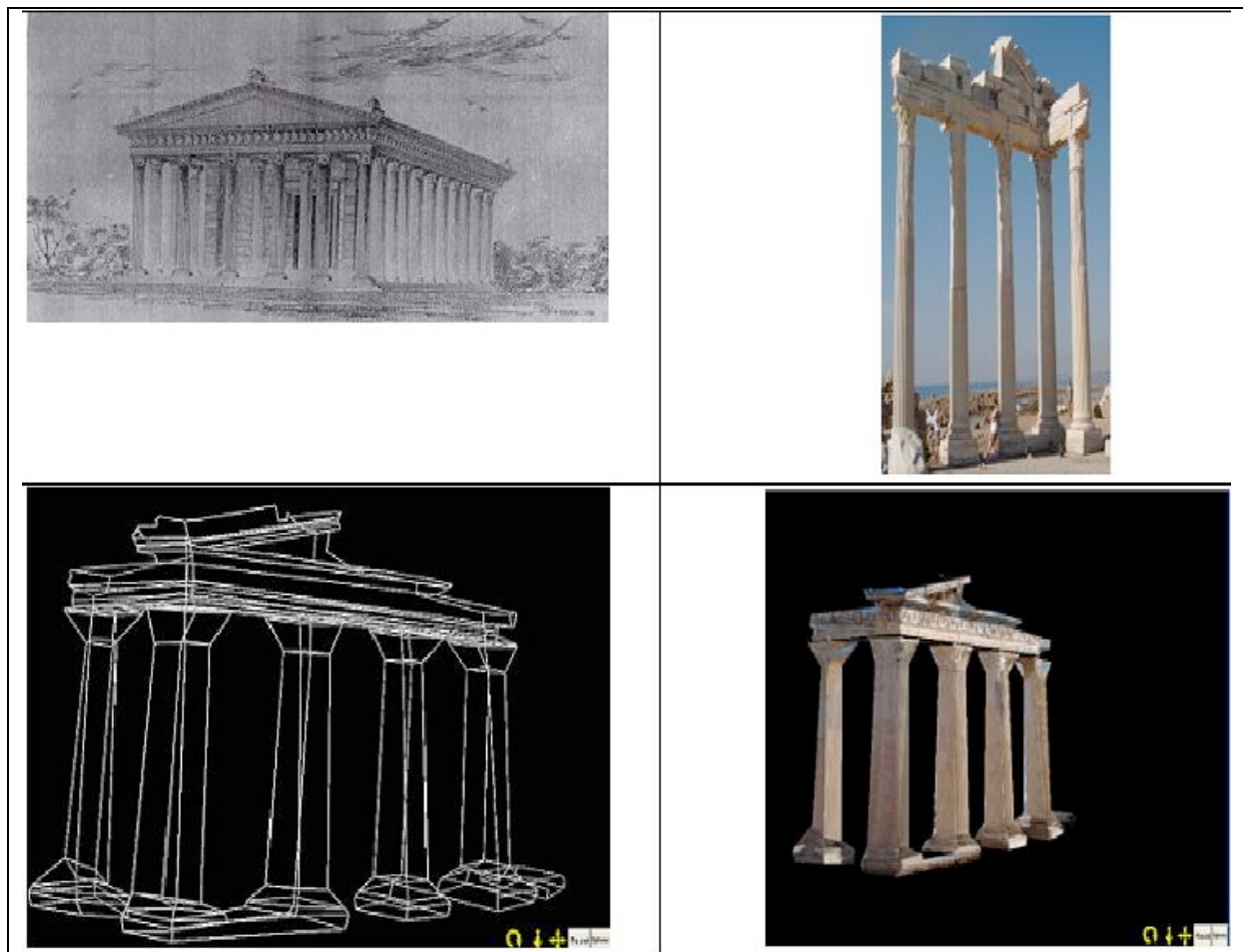


Figure 8: Apollon Temple in Arc GIS

4. RESULTS

Nowadays one of the important problems in foundations is to access information rapidly when it is needed. One of the important problems in is lack of rapid accessing capability to information when necessary.

Besides compiling current information in a systematic way, rapid reproduction of information and satisfying users' demands depend on an information system. It is especially important to construct a positional information system which has physical information about topographical structure, infrastructure and superstructure of the region besides administrative information. Geographical Information Systems have such capabilities; however, a system ought to be designed and constructed in a way that it can satisfy users' demands.

Historical and Cultural Places of using GIS can be progressed the professional procedure. Data possibilities might be augmented. In this sense, more than one foundation may need to cooperate in the project. In this study, the construction of "The Use Of Geographical Information Systems In Historic And Cultural Places Case Study": Town Of Side" for the use of foundations registering cultural and historical traces, that could be a preparatory study for the Geographic Information System, has been discussed. In this context, an application

was performed in Side City. For this example study, it must be cared that cultural and historical heritages should not be damaged new buildings and structures must be established in attention.

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