TOURISM PURPOSEFUL CARTOGRAPHY AND APPLICATIONS ON THE INTERNET

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ABSTRACT: Nowadays, the requirement of implementing the activities in social life and environmental introducing purposes with city guides is arised especially parallel to the development of computer technologies. Content of a city guide should include necessary and adequate introduction information about the relevant region rather than its using for addressing. After the interests of social events and human activities about a region determined firstly, giving answers to these details with a city guide in computer environment should be investigated. These requirements may extend textual expression about a historical or touristical place, introducing videos or from an animated advertisement to all types of spatial informations. In this paper, a part of city guide Project relating to Konya city which has the biggest city in Turkey is explained. The aim of the Project is to perform a useful guidance system that provides context-sensitive multimedia information to city visitors during their trips by using multimedia techniques which bring the computer systems more useful and organizing the social activities of peoples living in the city. For this point of view the system which prepared with Delphi programming language and providing location-based content information to users is introduced (Gundogdu, 2007).

Keywords: *Tourist cartography, visualization, city guide, delphi and active X, historical heritage.*

ÖZET: Günümüzde, bilgisayar teknolojisinde meydana gelen gelişmelere paralel olarak, günlük hayatımızdaki aktiviteleri ve çevresel tanıtım amaçlı çalışmaları, kent rehberleri ile gerçekleştirmeye duyulan gereksinim, gün geçtikçe artmaktadır. Bir kent rehberi, ilgili olduğu bölgeler hakkında adreslemeden ziyade önemli ve yeterli bilgiyi barındırmak zorundadır. Bir bölge hakkında ilk olarak sosyal yaşam ve insan aktiviteleri ile ilgili ihtiyaç duyulan bilgiler tanımlandıktan sonra, bilgisayar ortamında bu gibi detaylarla ilişkilendirilmiş bir kent rehberi oluşturulmalıdır. Bu ihtiyaçlar, bir tarihi veya turistik bölge hakkında öznitelik bilgilerinden, tüm konumsal bilgi türleri hakkında tanıtıcı video görüntülerine kadar genişletilebilir. Bu makalede, Türkiyenin yüzölçümü bakımından en büyük ili olan Konya şehri ile ilgili oluşturulan kent rehberi projesinin bir bölümü tanıtılmaktadır. Projenin gayesi, şehri ziyaret eden insanlara gezileri boyunca, bilgisyar sistemlerini daha kullanışlı hale getiren ve şehirde yaşayan insanların sosyal hayatlarını düzenleyen multimedya teknikleri kullanarak, konuya özel multimedya bilgisi sağlayan kullanışlı bir uzman rehber sistemi oluşturmaktır. Bu bakış açısıyla, Delphi programlama dili ile geliştirilen ve kullanıcılara konum tabanlı bilgi sağlayan sistem tanıtılmaktadır.

Anahtar Kelimeler: *Turizm amaçlı kartografya, görselleştirme, kent rehberleri, delphi ve active X, tarihi miras.*

INTRODUCTION

During the latest years, tourism industries enjoy many advantages offered by the internet. From the reservation of hotels and transportation to the visualization of any destination for the traveler, via the internet today there is the possibility of supplying all information of tourist interest.

In this particular proposal, the map constitutes the tool of report, while the information that is provided - according to the cartographic norms and symbolisms - is renewed, including new tourist needs. Respectively the cultural information enriches the environment describing also the life and the culture of residents of Konya.

The application proposed in this work is designed to cover the demand of tourist information via the internet, as long as via info kiosk.

Functions and characteristics of this application and details about the programming tools used for its creation are presented. Great importance was placed in the design of a visual interface so that the retrieval of data from users without essential experience in Geographical Information Systems (GIS) or in database management systems can be possible even by using complex search criteria.

For the creation of interactive maps in application presented, there are followed specific cartographic norms and international symbolisms. This is done for better as possible interaction between dynamic maps and users

Future plans about the evolution of this application proposed are also in this work.

Today's tourist, who is the user of this application, cannot be categorized in a strict level of education, age, etc. The challenge of the development of such application is the visualization of the cartographic information by the proper cartographic methods, in order that the "decryption" from the user will be really easy. On the other hand, the environment of the application is modern, up to date, functional, and finally doesn't demand any special knowledge of using this kind of computer systems from the user-tourist. For the success of the first target, the use of rebus symbols is decided, for the visualization of all the cartographic information. The use of these symbols is considered as a really affective way of cartographic communication with non experts. On the other hand, the success of the second target modern tools of web design were used, and special care to the environment was given. Colors, buttons, labels with the same characteristics are used with coherence in the whole application (Karanikolas et al., 2006).

There are some studies about visualisation and city guides. As an example, Real time vizualization for urban scenery Sillion et al. (1997). Haavik (2003) studied on the Historic House Trust of New York City, Lerma et al. (2004) studied about tree dimensional city models, about semantic web specifications, Heat and Motta (2008), Takeuchi and Sugimoto (2009)'s study is about user-adaptive city guide system for determining particular points by GPS on city plans, Demestichas et al. (2009)'s study is also about mobile applications

In general meaning, if any city guide will prepare, all address information and various elements concern with the space (education, health, worship, entertainment, tourist information centers) must be registered in data base. These elements can be used for any purposes according to changing requirements. These requirements are extend from its sort to location on the map or query of qualities. The main elements which the city guides have to them are:

Any street or point can be query on the map as a position. This query should be 3 base sorts.

1. as to name of the elements
2. as to variety of the elements
3. as to which elements are on the same street or location. All query results could be pointed the map.

As other work, Distance calculation at certain two points can be executed automatically with map scale which is determined before.

• All screen coordinates can be converted to GPS (Global Position Systems) coordinates by entering minimum 2 points. All user can be queried any point at new coordinate system.

• Principal points which taken photographs supply visualization frame by illustration modules.

The query of geographical elements based on coordinates and illustrating of them on the maps are basis of the GIS. But in this study a complete city guide will not illustrated, only introduction of place will illustrated.

First of all, when a city guide which is aimed promotion will compose, all social activity on related environment must be determined. All

elements about environment are variable in different zone. Some regions have different business areas, others have more commercial centers, and the others have important tourism regions. So, firstly, the special features must be determined. These features are listed below:

– Transportation Networks (paths, railways, streets etc.)

– all coordinates in different coordinate systems,

– determination of map scale,

– attractive photos or zoomable or animated visualization modules should be used the project.

MATERIAL AND METHOD

Description of the study area

Konya is a city which attracts attention of people with its historical, cultural and natural resources. Konya, the city where Mawlana Jalal al Deen lived, has been a host for cultural and art activities for thousands of years and a capital for culture and art since the Neolithic Age (Bakırcı, 2005).

Excavations have shown that the region was inhabited during the Late Copper Age, around 3000 BC. The city came under the influence of the Hittites around 1500 BC. These were overtaken by the Indo-European Sea Peoples around 1200 BC. The Phrygians established their kingdom in central Anatolia in the 8th century BC. Xenophon describes Iconium, as the city was called, as the last city of Phrygia. The region was overwhelmed by Cimmerian invaders c. 690 BC. It was later part of the Persian Empire, until Darius III was defeated by Alexander the Great in 333 BC. Alexander's empire broke up shortly after his death and the town came under the rule of Seleucus I Nicator. During the Hellenistic period the town was ruled by the kings of Pergamon. When Attalus III, the last king of Pergamon, died childless, he bequeathed his empire to Rome. Under the rule of emperor Claudius, the city's name was changed to Claudioconium, and during the rule of emperor Hadrianus to Colonia Aelia Hadriana.

Iconium was visited by Saint Paul and Barnabas, according to the Book of Acts, in 47, 50 and 53 AD. In Christian legend, it was also the birthplace of Saint Thecla. During the Byzantine Empire the town was destroyed several times by Arab invaders in the 7th-9th centuries (URL 1).

Settlement of the life in and around Konya starts from the prehistoric period. Within this period we can see the cultures of Neolithic Calcolithic and early Bronze Era.

The Sultan of Anatolian Seljuk's, Suleyman Shah, declared Konya as the capital city in 1076. In 1080 the capital city was transferred to Iznik, Kilic Aslan I carried the capital city to Konya in 1097. Konya, from 1097 to 1277, was capital city of Anatolian Seljuk's.

Konya, which is a neighbor city of has a border between Ankara, Nigde, Aksaray, Icel, Antalya, Isparta, Afyon, Eskisehir and Karaman on the central Anatolia High plateau of 39,000 km2, occupies a place between 36o22′ and 39o08′ northern parallels and 31o14′ and 34o05′ Eastern meridians. Its traffic code is 42, Municipality of Konya founded in 1876 achieved the status of being "major city" according to the law numbered 3030 that was put forth in 1984. Since 1989 municipality services have been carried out according to this status.

According to the census done in 1990, the total population of Karatay district to which two sub districts and twenty nine villages are connected, is 169,000 and its central population is 142,678.

The total population of Meram district to which three sub districts and thirty five villages are connected, is 213,644 and its central population is 182,444.

The total population of Selcuklu district which has two sub districts and twenty nine villages is 202,154 and its central population is 188,244. According to the census done in 1980 the total population of Konya provenience is 1,750,303 and it is the fifth city after Istanbul, Ankara, Izmir and Adana.

Alaeddin Hill is a tumulus which hides relies of 400 years under it. Once upon a time, it attracted attention not as an area of settlement but as an area where the richness of history, culture and nature were protected and a place where people's needs of having a rest were met. In the north of the hill Alaeddin Mosque has the pleasure of meeting its people after efforts of restoration that lasted for many years.

Figure 1. Konya is the biggest provinence in Turkey.
Şekil 1.

Konya, with its historical works, is a city that seems like an open-air museum (URL 2).

In addition, although there are more region to visualize in the city, several particular center' introduction is created. These are:

Alaeddin Mosque, The Seljuk Mansion, Karatay Medresseh, Ince Minaret, Aziziye Mosque, Selimiye Mosque, Mevlâna Museum

Visualization Steps

There is an old proverb saying that one image is worth more than thousands of words, giving thus the simplest answer to the question why visualisation is necessary. It is an act of learning, i.e. man's capability to develop images mentally that makes the recognition of pattern and the formation of arrangement possible. Although some authors discover and connect the visualisation only with computer technology, it is not a new method in computer technology or in digital cartography (Franges et al., 2001).

Maps are the essential tools for geographical information visualization. Geographical information could be efficiently transmitted to users who are capable of capturing the knowledge on location, shape, quantities and qualities traits and the change information with maps helping. The basic theme of geographical information visualization is to display geographical features on screen, which can represent all features, features in one layer or features in some region. Graphical representation enables the users to distinguish where the geographical features are and distributed pattern. This representation, which uses computer graphics to make the digital geographical information visible, is the most basic level of geographical visualization. Its shortcoming is that it can not efficiently transform level and quantities information of geographical entities to users, because of neglecting the traits of human's spatial cognition and geographical phenomenon (Yang et al., 2008).

Visualization is the technology that serves an existing data to users by running on their personal computers. Active X is the group of technologies that provides interactive content on the web. The term called visualization is defined as; presents data groups, constitutes textures for user, conveys symbolic representation to geometry by making correlations between data groups, implements data interpretation and representation of multi-size graphical data by fitting textures. In addition that Information Visualization can be defined as the use of computer-supported interactive visual representation of abstract data to amplify cognition (Gündogdu, 2004)

Active command strings are the Microsoft technologies that allow interaction with another component of different software components on network environment by ignoring developing language. In addition Active command strings provide web pages to use animations and to change contents dynamically.

The following application steps have been implemented during the study.

− The base map has been provided.

− Documentation and preliminary studies related to that place have been collected, and the required permissions for taking photographs have been obtained.

− The pictures of buildings have been taken by using a Panasonic DMC-FZ-7 digital camera with 6 MP picture quality and a terrestrial tripod.

− The points have been designated carefully to cover whole area that would be visualizated. -Locations of these points have been evaluated individually for displaying of important components more detailly.

− The pictures have been taken with same height and to overlap transversely %40-%60.

− A restricted vertical motion tripod has used because of the negative effects of vertical overlaying on visual clarity.

− The interface page has been prepared by Delphi 7

− Scale has been introduced.

− Data input for GPS transformation.

− Linking with special points to visualization modules.

APPLICATION

With the flow-chart determined below, Active X forms have been constituted by Delphi 7 enterprise edition programming language and they have been rendered to be transmittable on the web. Delphi support developing ActiveX libraries using TActiveXControl class that defines the core behavior and interfaces required of an ActiveX control and connects that behavior to any VCL control derived from TWinControl. This allows the control to be embedded in any ActiveX container, including Internet Explorer, Visual Basic, PowerBuilder, Paradox, Borland C++, IntraBuilder and, of course, Delphi. ActiveX has typical OCX extension and must be registered using regsvr32 (Mandys, 2006). This operation occurs with deployed interfaces.

The following application steps have been implemented during the study. This is shown in Figure 2.

− The map sheet is a road map that has selected to be the most suitable for the purpose.

− The points that would be demonstrated have been determined as private points for selecting by seeing during the presentation.

− The areas and objects that would be demonstrated have been computerized by taking appropriate inward or outward photographs generally. The result image of merged photos is illustrated in Figure 3.

Active X forms and source codes are prepared in programming. The line number of source code for this application is approximately 450 lines. The Active X preparing window is shown in Figure 4.

− A best suitable scaled map sheet has been selected for show whole area of the region that would be demonstrated. Scale is important for estimating the distance between selected two points. The scale of the map sheet in this application is 1/10000.

− The screen coordinates obtained by the movement of the cursor on screen image have been converted to another coordinate system (GPS coordinate system) by the equations below: Figure 5 is showing the relation between screen and WGS84 coordinates.

Formulation for transformation screen from coordinates to WGS84 coordinates.
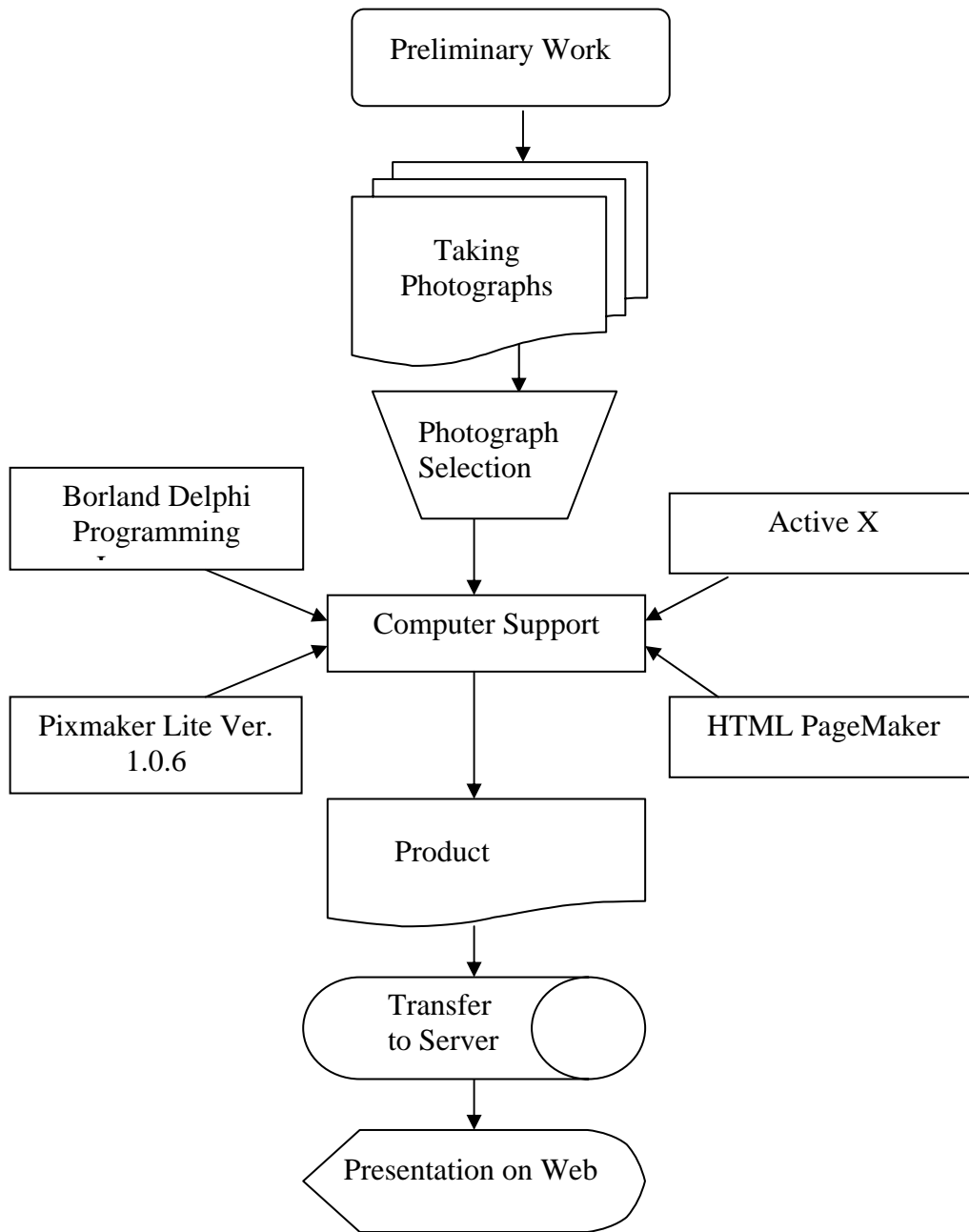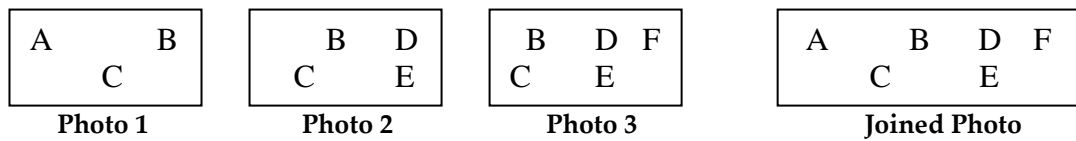
Figure 2. Visualization application steps.
Şekil 2.

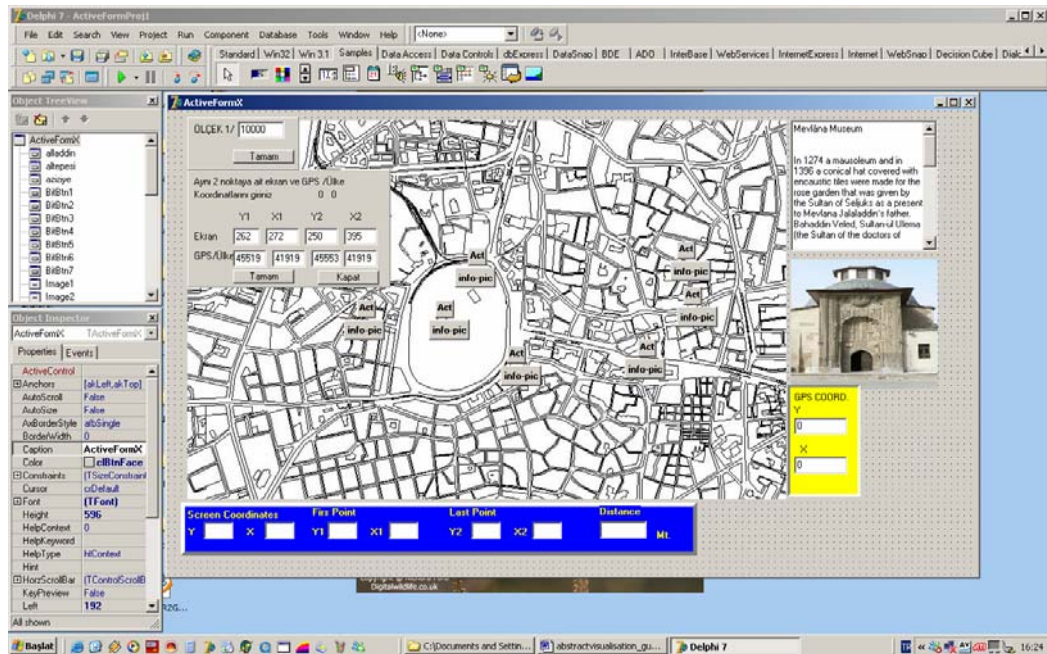**Figure 3.** Successive photos and result product.
Şekil 3.

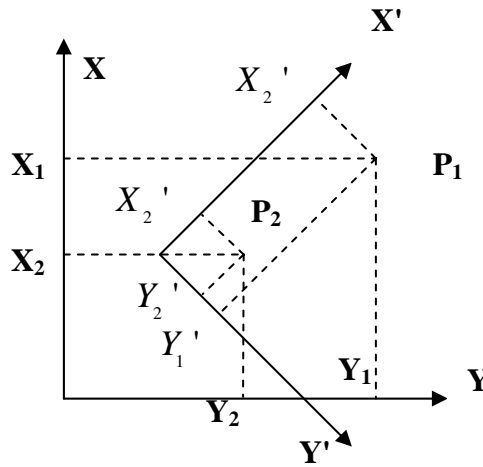**Figure 4.** Creating and designing Active x forms
Şekil 4.

Figure 5. New and old (screen and WGS 84) coordinates systems.
Şekil 5.

By Helmert transformation,
Screen coordinates: X' and Y'
WGS 84 coordinates: X and Y
At least with 2 points

$$\Delta Y' = Y_2' - Y_1' \quad \Delta X' = X_2' - X_1'$$

$$\Delta Y = Y_2 - Y_1 \quad \Delta X = X_2 - X_1$$

$$a = \frac{\Delta Y.\Delta Y' + \Delta X.\Delta X'}{\Delta Y'^2 + \Delta X'^2}$$

$$\theta = \frac{\Delta Y.\Delta X' - \Delta X.\Delta Y'}{\Delta Y'^2 + \Delta X'^2}$$

$$\Delta x' = x_3' - x_1',$$

$$\Delta y' = y_3' - y_1'$$

$$Y_{New} = Y_1 + \theta.\Delta x' + a.\Delta y'$$

$$X_{New} = X_1 + a.\Delta x' + \theta.\Delta y' \quad ....[3]$$

Here X_{New}, Y_{New} and x_3', y_3' are new point's coordinates

Obtained visualization modules are already prepared to presentation by linking to buttons that have been located at certain points.

Result Products

The screen image of product on the web is shown in Figure 6 which has prepared by the operation steps explained above.

RESULTS

There are different methods for city guides, various demonstrating applications or visualization. This study is one of the first applications that using Active X Technologies for the purpose of city guides. Because of the security problems, the internet Explorer may obstruct Active X access. Especially for unsigned Active X use some adjustments required.

To see this page, all Active X properties must be enable from Tools/Internet options/security-custom level in Internet explorer. For the study it is maked used of (Gundogdu,2007). See http://www.bgundogdu.selcuk.edu.tr/konya for application.
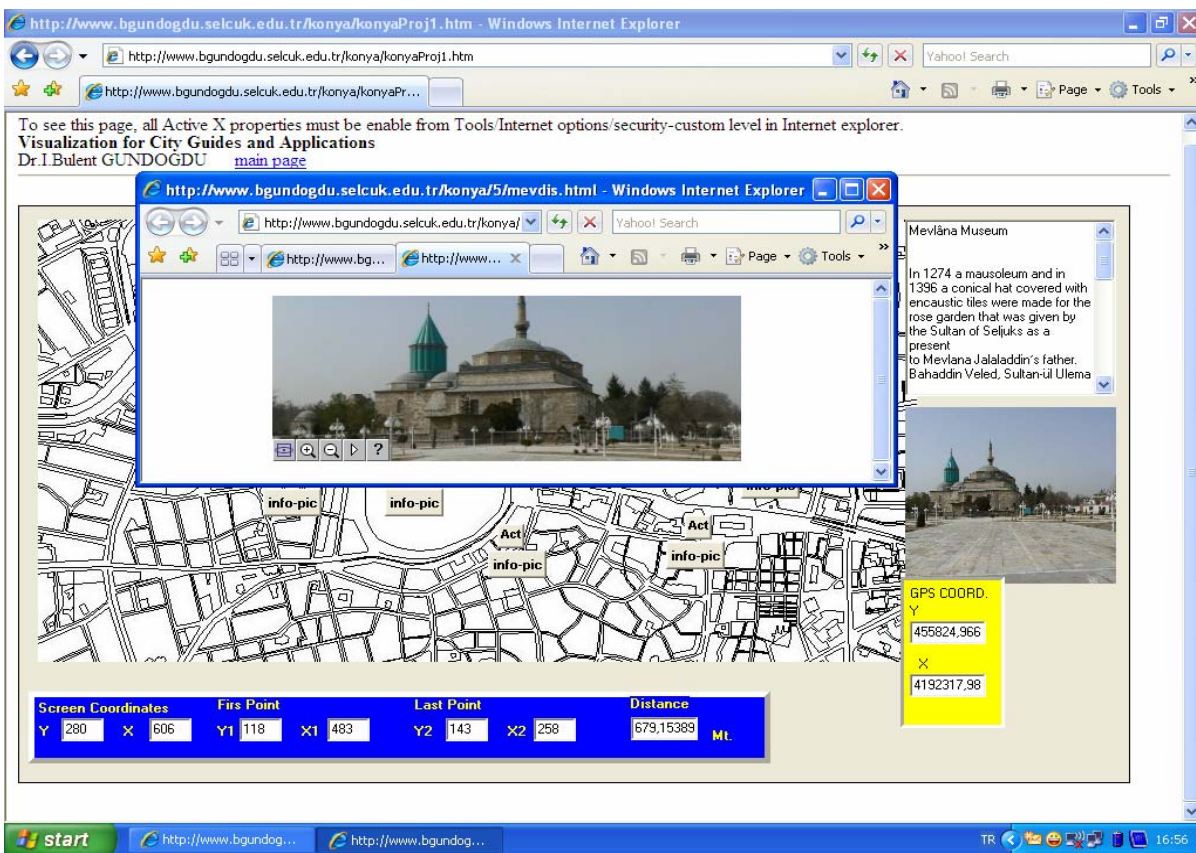

Figure 6. Result of application on the web.
Şekil 6.

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