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## Research Article

### WEBGIS APPLICATION IN URBAN TOURISM – A CASE STUDY OF MEGACITY OF HYDERABAD

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#### ABSTRACT

Hyderabad, a megacity with multidimensional tourism base has a great potential in improving the current tourism potential with application of the internet facilities. Generation of web-based tourist information system, include the location of convention centers, travel agents, service apartments, police stations, and tourist spots. After preparing tourist related spatial data in ArcGIS and its storage in Google maps server (Google Maps Application Programming Interface). It is linked with tourist guide map application with the output map displays that tourism-related information in the form of various thematic layers. This application will enable even the naive users who are not familiar with GIS to browse the tourism spatial content through Web over the Internet. Our research indicates that with the help of this utility tool, tourists, as well as the tourism promoters, will be equally benefitted thereby improving the overall tourism scenario.

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#### INTRODUCTION

The tourism industry is considered as one of the rising industries in the 21st century as well as the most vital service industry in the world. Tourism has major economic significance for a country. The receipts from international tourism are a valuable source of earning for all countries, particularly, the developing countries (Rogers, 2003; Dwyer & Mistilis, 1999). According to the National Conference on Urban Tourism (Rennes, 1988), urban tourism is the set of tourist resource or activities located in towns or cities and offered to visitors. The tourist spots or attractions are located within the city itself. Hyderabad, a megacity with multidimensional tourism base has a great potential in improving the tourism potential with application of the internet facilities.

Hyderabad Tourist Guide Application is used to see the location of things, to search for the position of an address, to get driving directions, and to do numerous other things. Most information has a location, and if something has a location, it can be displayed on a map. Applications and websites that are combining data or functionality from two or more sources are commonly referred to as mashups. Mashups are becoming increasingly popular and have revolutionized the way information is being used and visualized.

#### MATERIALS AND METHODOLOGY

##### Study area

Hyderabad, the capital of Telangana State is located between 17°15'N to 17°28'N and 78°-22'30"E to 78°32'33"E. It is surrounded by Ranga Reddy district on the south and Medchal District on the North. It is one of the fastest growing metropolises of India. The city is cosmopolitan in nature and is richly endowed with a variety of cultural and ethnic diversity. The city of Hyderabad presents an attractive amalgamation of old world charm together with the modern architectural edifices built in the Medieval, Mughal, colonial and Indo-Sarcenic styles. Hyderabad is known for its rich history, culture, and architecture representing its unique character as a meeting point for North & South India. It is also known as the "The city of pearls" and "city of Nizams" [2]. More recently it is also being called as "second silicon valley of India" and "cultural metro of India" [3]. The HITEC (Hyderabad Information Technology and Engineering Consultancy) city located in the northwestern part of the city has been developed exclusively for housing multinational companies. Hyderabad has a technology park with leading companies like Intergraph, Oracle, IBM, Accenture, Microsoft, Google, Dell etc. The elevation of Hyderabad ranges between 350 m to 540 m above MSL. The tourist potential of Hyderabad is reflected by a large number of

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tourist spots. These tourist spots are located in different parts of the city.

**Objectives**

The objectives of this study are:

1. To identify and locate tourism related information and services.
2. To develop Hyderabad Tourist Guide Application.
3. To make available tourism related information available on public domain by using WebGIS.

**METHODOLOGY**

The required data was collected from by using GPS and Google earth. Spatial point location data was collected by using GPS whereas, attribute data was collected from Google earth and other sources. These points were converted into a shapefile and attribute data of that shapefile was added by using Google Earth. With the help of Fusion table, the files were uploaded into Google map server. A code was written using HTML, JavaScript and files were uploaded in the code to run the application. After running the final application, the final results were displayed in the form final output i.e. tourist guide application map. The methodology adopted in brief is shown in Figure 1

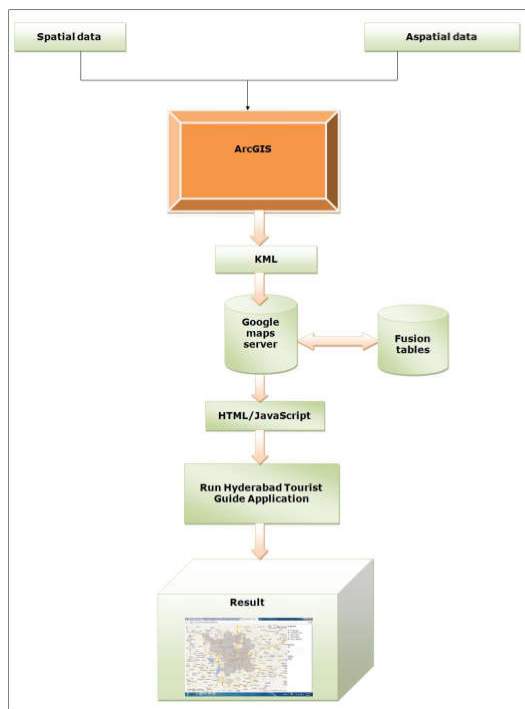


Figure 1 Shows methodology

**RESULTS AND DISCUSSION**

**Fusion Tables**

Fusion Tables is a service available from Google in which anyone with a Google Account can store large amounts of data on Google’s Servers using tables. These tables, until recently, could not be accessed by Google Map’s API. With the release of the Google Maps API v3, these tables have been fully integrated into Google maps and are currently the best means of displaying large amounts of data while also optimizing load times [4]. This feature was recently integrated with Google

Maps API to allow data from a Fusion Table to be automatically visualized on a map including the ability to generate a map overlay (Figure 3). Until recently the data needed to be manually uploaded. A Fusion Table API is available with the possibility of uploading data automatically through code.

Google Fusion Tables is a service provided by Google to store information online in a format containing rows and columns of certain data types like a database. You can also add a ‘where’ clause to your query to filter the results. This particular Fusion Table doesn’t include additional fields that you can use to filter the results [5]. It is possible to access thousands of publicly available tables and merge them with others to discover new meaning-a so-called mashup.

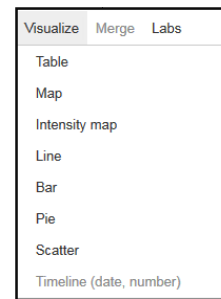


Figure 2 Shows Fusion Table visualize options

The data can be visualized using different algorithms and visualizations to investigate and discover interesting properties of the data. A Google Maps API Premier license is required if the API is used for either internal development, commercial

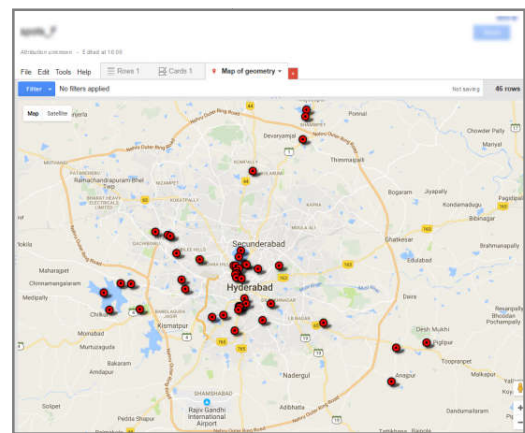


Figure 3 shows Fusion Table data format

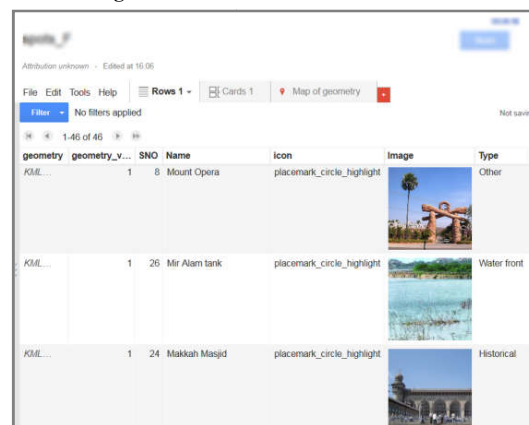


Figure 4 shows Fusion Table visualization

products or placing an advertisement (Google Maps FAQ, 2010). The Google Maps API gives developers several ways of embedding Google Maps into web pages and allows for either simple use or extensive customization. This API use as its base JavaScript. The API provides a number of utilities for manipulating maps (for eg: <http://maps.google.com> web page) and adding content to the map through a variety of services, allowing users to create robust maps applications on their websites.

### Google Maps

A Google map has been used to locate major points (Tourist spots, Convention centers etc.) in Hyderabad map. As well as seeing the map with the major points represented on it, some other features like having information about them have been included. In the part of the Google map, HTML, JavaScript has been used. It can be seen that when changing the kind of map to be shown (Map, Satellite), as once the user clicks on the button to select the map, it automatically changes to the chosen kind of view. Besides, when the user clicks on an icon in the map (representation of a tourist spot), information about this icon automatically pops up into the map too.

### Map mode

The road map view consists of topographic and street maps. The maps are in general available in several zoom levels; displaying everything in-between the entire earth and detailed street maps of cities.

### Satellite mode

The satellite/aerial mode is imagery photographed from satellites or airplanes. The images are taken at a ninety-degree angle and show landscapes and rooftops.

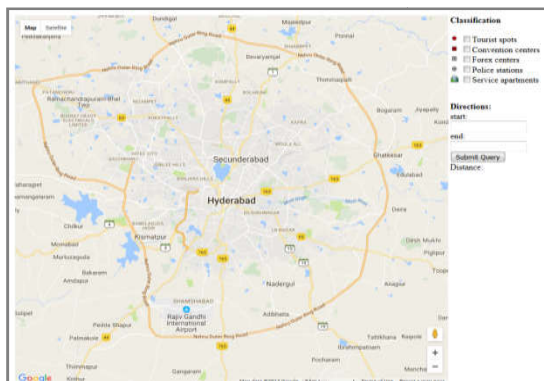


Figure 5 shows Map view of Megacity of Hyderabad

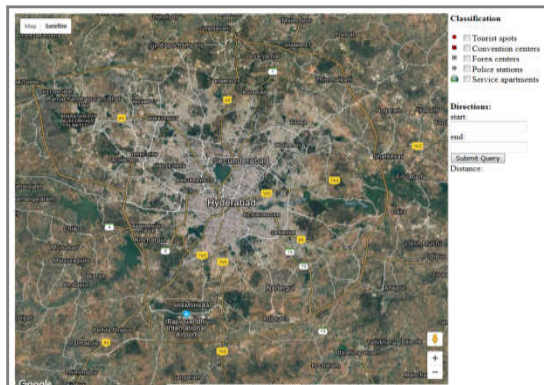


Figure 6 shows Satellite view of Megacity of Hyderabad

Normally a map provider's imagery covers the entire world; however, there is a big difference in resolution depending on the location. Major cities are normally covered with high-resolution imagery showing detailed street views and for less populated areas, only low-resolution images showing the landscape is provided.

### Polyline and polygons

Polyline and polygon objects are used to create custom objects (Figure 7), such as lines showing a route or a polygon highlighting a region, on top of the map. Both polyline and polygons objects are created from an array containing latitude and longitude points and a set of option arguments. The objects' colour, width, and opacity can be customized to adapt the object to the specific use.

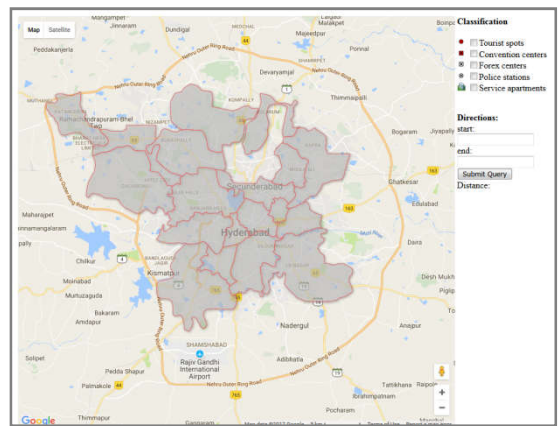


Figure 7 shows Polygon (Hyderabad municipal boundary) overlaid on Google Maps API

### Prototype

The prototype is a JavaScript framework that aims to do an easier development of dynamic web applications. A framework is a conceptual structure and a defined support technology, usually with specific software modules, in which another software project can be based on Prototype, provides an enumerable object which implements the number of useful operations to enhance JavaScript. By using prototype, some JavaScript functions become easier.

After the preparing of spatial data in ArcGIS and its storage in Google maps server, it is attached/linked with tourist guide map application. The output map displays the tourism related information in the form various thematic layers.

### Tourist spots

Hyderabad tourist guide map application shows a set of tourist related information which is displayed on the top right-hand side. When the tourist spot checkbox is clicked, the tourist spots of Hyderabad and their location is shown (Figure 8), along with places of tourist interest. Other tourist related information is displayed by clicking the other icons.

### Convention centers

The geo objects shown on the map is superimposed on Hyderabad tourist guide map application which shows the location and distribution of Convention center. The Convention center name is displayed by clicking on the icon.



**Travel agents**

The geo objects shown on map are superimposed on Hyderabad tourist guide map application. This map shows the location and distribution of travel agents. The travel agents address is displayed by clicking the icon. This information is useful to tourists for sightseeing and booking the tickets.

**Police stations**

This map displays the location police station. This information will be needed by the tourists for the purpose of safety/security etc; if needed.

**Service apartments**

Service apartments are the recent mode of accommodation related to hospitality sector which will be highlighted on the base map of Hyderabad at a click of check box. Such information facilitates the tourist in locating and finalizing the selection of service apartment.

This option automatically displayed the route and distance between them.

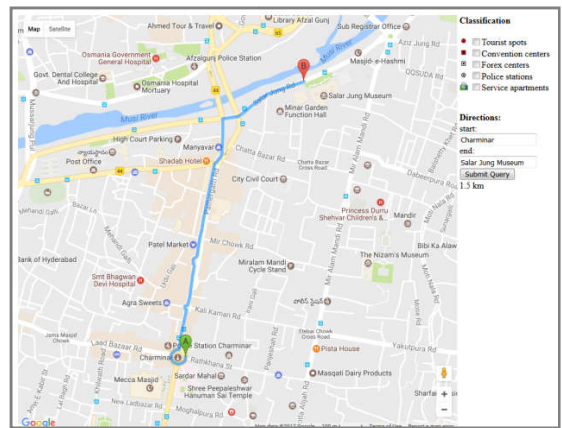


Figure 10 shows Driving directions and Distance

**Infowindow**

By clicking the geo-objects the information window is displayed, the final output is the information window which shows the image (Figure 11) or related information (Figure 12).

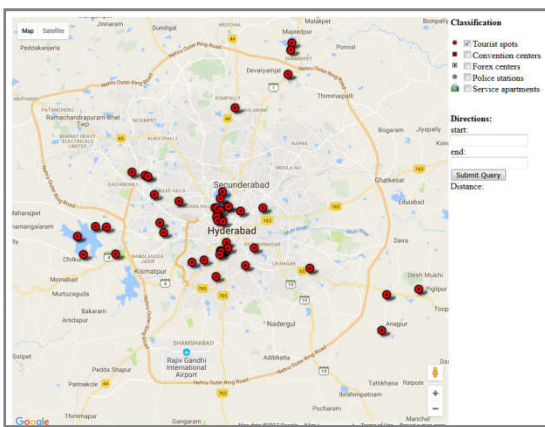


Figure 8 shows Hyderabad Tourist spots location

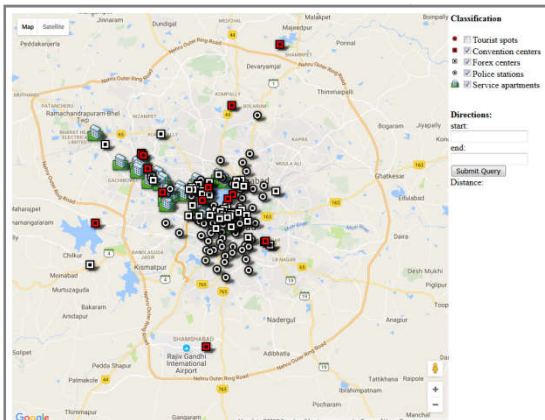


Figure 9 shows Convention centers, Forex centers, Police stations and Service apartments superimposed on Google maps API

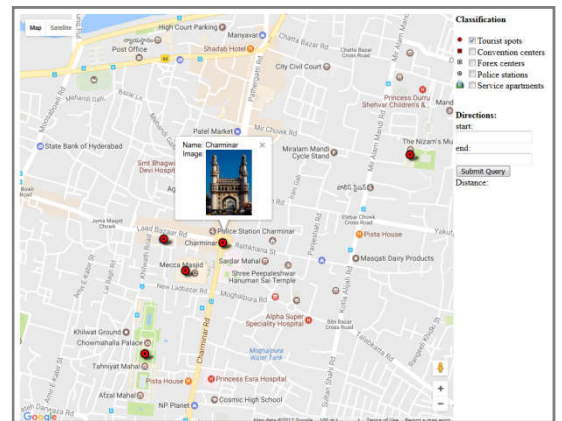


Figure 11 shows Tourist spots attribute data and Image in information window

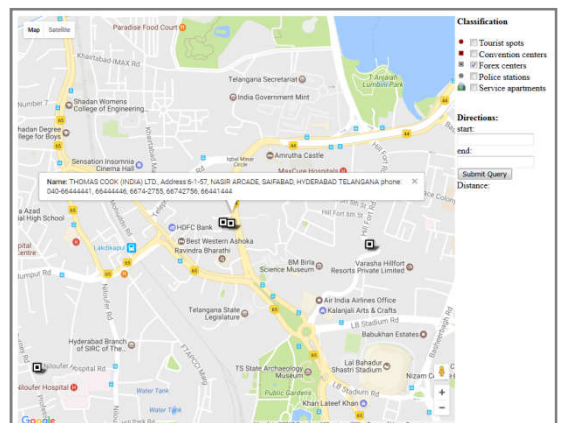


Figure 12 shows Forex center address attribute data in information window

**Route and driving directions**

The Google Maps API can provide users two-points driving directions, the route marked on a map with a polyline. (Figure 10) As shown on tourist guide map application, the direction and distance between various tourist places can be obtained by just clicking the submit button which is located in the right central part of the display area. To know the distance between two places, for example, between Laad bazaar and Salarjung museum, the name of these two tourist spots should be entered in the dialogue boxes and then the submit button is clicked.

Hyderabad Tourist Guide Application is very useful for display and analyzes spatial data on the web map. It can combine into the Tourism Department website. Using this application Tourism Department and Tour Agencies can develop customized tour packages. With this, Web based application is

useful for Promotion of international tourism to increase foreign exchange.

## CONCLUSIONS

It can be concluded that Google maps API tool proved to be very useful for building webGIS application related to urban tourism. This application will enable even naïve users who are not familiar with GIS to browse the tourism spatial content through Web over the Internet. From the tourist point of view, this application will help the tourists in making arrangements before the commencement of the journey. It has utility not only to the general public but it can serve as a making tool to promote and attract tourist. On the whole, this application will improve the quality and the level of web information presentation related to tourism.

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