Geospatial Application using web GIS

Subathra A, Nivedha Deve S, Geetha P, Soman KP
Center for Computational Engineering & Networking (CEN), Amrita University
*Corresponding author: E-Mail:Subathranarayanan1993@gmail.com

ABSTRACT

Rapid technological growth in developments of web based geographical information systems, visualization (tours, flythrough) and navigation with 3D models plays a vital role in the application of geographical information systems. The purpose of this study is to build an interactive system and deploy a platform to visualize, navigate, analyze, and interact the 3D city models stored on the 3D city Database via web supporting which can easily access and enhance the effectiveness of 3D web-based Geographical Information System (GIS) and gives an experience and information for user needs with the ability to do with 3D data. City GML (XML-based standard) data model is used for the representation of 3D urban objects. In this context, the buildings are composed as textured 3D model by using softwares (Arc scene, Google sketch up) and stored in cityGML format which access massive rendering of large number of objects and conservation of geometry semantic properties. Integration of Google Earth and Google Maps API which aims to get 3Dcity models and attribute data of the Area of interest by using XML databases and to create a web based 3D geospatial application.

KEY WORDS: 3Dmodels, CityGML, City DB, Google Earth and Map API.

1. INTRODUCTION

Modeling is a method, which completely frames it into a 3D mesh. Recommendations are needed for constructing a 3D model from a primitive object and it is extended above, such that it is redefined and expanded to form a 3D model. These are a few sources which have vertex, edges and other line shaping tools of 2D and curves such as splines and other such as- polygon or faces. The expected 3D packages by the gathered objects has been actually modified and created. Modeling principles depend upon scale and scope (Application contexts).

City GML is a common data model for the illustration of 3D urban objects. It defines the categories and relations for the most relevant geographic objects in cities and regional models with reference to their geometrical, topological, semantical, and appearance .It replicates 3D pure mathematics, 3D scenario, and linguistics and can be viewable in five distinct scales and levels of details. The 3D information provides a free software system for the manipulation of the virtual 3D city models on high customary abstraction electronic information service. The information obtained in the visualization, provides history, version management, digital piece of land models and geo-referenced aerial pictures (Siddique Ullah Baig, 2013). Therefore, this model is appropriate for a substituting complicated GIS modeling and analysis tasks for 3D town Models in an economical manner that involves linguistics and abstraction aspects.

Two completely different versions of the 3D town information area unit provide a very supportive and matured customary abstraction (object) relational database: Oracle 10g abstraction or Postgre-SQL. For the purpose of displaying in 3D representation, the Google map source has been connected to the internet for fast retrieval. Google Earth and Google Map API area unit of measurement, visualization of JavaScript language.

The code area unit of measurement embedded in the machine-readable text terminology and the code blocks visualized as JavaScript. This unit represents the two basic styles of the server and the client side basics for the Web-based GIS application throughout the analysis.

The initial step is to shape the Google Earth Map visualization. In the co-ordinates space, the 3D building area represents the attribute data and gives location information of the three-dimensional buildings**Error! Reference source not found.**.

Literature Review: The demand being increased in the 3D model, gained attention not solely gathered from the business but also from public authorities. This chapter aims to supply a radical literature on the state of 3D town model illustration, visual imaging, and generalization.

City GML: For the 3D urban object modeling the cityGML information being the common source which is completely an associate modeling related to XML and exchange of visual 3D effects. As an associate degree of OGC, City GML has a number one role within the modeling of urban geospatial information.

The operating system enhances the ability of handling and coding. It promotes highly efficient modeling through optimized protocols with relevant specifications. It permits the systems to handle simple and the batch conservation tasks, import/export obstacles etc. Among OGC, KML and City GML are the two standards for 3D GIS.

Optical scanning and the photogrammetric scanning techniques are used in the acquisitions (Markus, 2007). In this work, land explorer studio expertise software is employed for knowledge integration and creation of the ultimate model. This computer code is directly born-again into CityGML information. The final model of the experimental work consists of the surface (ground truth), road segmented structures as such traffic lights, signs, and buildings.

- Building info Modelling (BIM) or business Foundation categories (IFC) have additionally been shown to be transmutable to CityGML
- Suggestion of a framework for the automated creation of CityGML models by strictly victimization crowd-sourced geographic info from Open Street Map (OSM) 3D CITY DB

Visualisation In Google Earth: From the resources of Google map or Google earth the image had been obtained in the KML file format. OGC has approved KML as associate degree official commonplace in April 2008 associate degree outlined KML as an XML language centered on geographic visual image, together with annotation of maps and pictures (Chan, 2012). Though KML isn't designed for 3D visual image, it employs COLLADA for the 3D model.

2. METHODS & MATERIALS

Methodology: 3D modeling and visualization has created a fast development parallel to the technology, particularly altogether with animations, and the employment of those models unit area a lot frequent than it was before. The small print of production steps and details of net service and animation are mentioned below

3D Geo-Database System: The three-dimensional geo-databases have many platforms to integrate two-dimensional maps, 3D scientific models, and varied geo-relevant data. 3D model analysis may even be a promising field to support powerful applications like 3D urban emerging with, environmental attitudes, infrastructure management, and early warning thus the disaster management and response. 3D database may even be a precise field to suggest powerful applications like 3D urban arising with, surrounding premises, and early alerts management and proper response.

On-Line Visualization: The technological enrichment in Web GIS varies with the prior geo-tagging and locating capabilities. The effective acquisition of web-based system can exclusively be completed by the earth representation in its original view. The relevant information of abstraction measure integration and object related user information.

Google Earth: Google earth additionally ready to show 3D buildings and permits the user to browse the landscape via address, latitude, and meridian or simply by the mouse pointer. The typical image resolution of satellite pictures provided by Google earth is around fifteen meters. The step of the project was to transfer the model of our field into Google Earth. This step enabled the sharing of the model with the complete Google Earth.

The final version of the model was placed on the Google Earth victimization the 'Preview in Google Earth' tool of Sketch Up. This tool is beneficial for users since it truly shows a 3D model is found and viewed on Google Earth before uploading and sharing it. Victimization this tool, the model of the field is additionally checked on Google Earth many times. The exactitude of geo-location the model and also the actual visualization of the model is checked before uploading it.
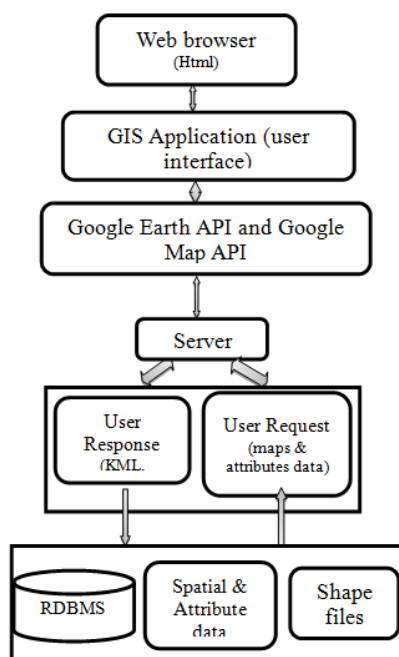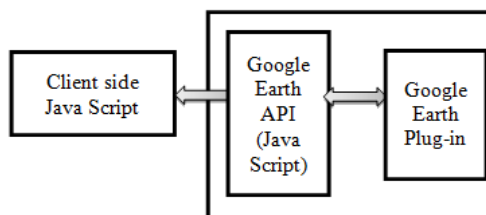

Figure.1. Flow Method representation

Figure.2. Google Earth API and JavaScript

Web-Based 3D GIS System: This Web 3D GIS system thus introduced a variety of users to the flexible platform capable of accessing and geo-data resources over the net. The 3D GIS system thus develops a platform dependent and flexible desktop 3D GIS, visualization extensively thus using the 3D video (Ran, 1998).

The main aim of the relevant project is thus developing a smart field system. For each user PC address and the address field of the browser varies, an online Server is contacted to include the requested information.

In the dot net Framework, Internet information Service provides cyber web Server. The only work of online information is, to easily settle for incoming machine-readable text transfer protocol requests and to get back the requested resource in a machine-readable text transfer protocol (De Vries, 2004). The first issue is thus IIS and one can once a letter of invite comes in, it can decide the request handling. Its decision depends on the request under file extension.
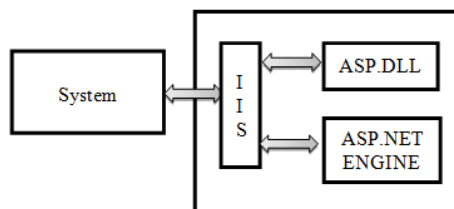
Figure.3. Architecture of Web Page

3. RESULTS AND DISCUSSION

This module has the mixing of Google Earth and Google Map API that is completed by following code

Google Earth API: Its purpose is for API definition of representation purpose.

Step 1: Google Earth define functions, google.load("earth")

Step 2: Google Earth initialize functions,
google.earth.createInstance('map3d', initCB, failureCB)

Step 3: Google Earth callback functions,
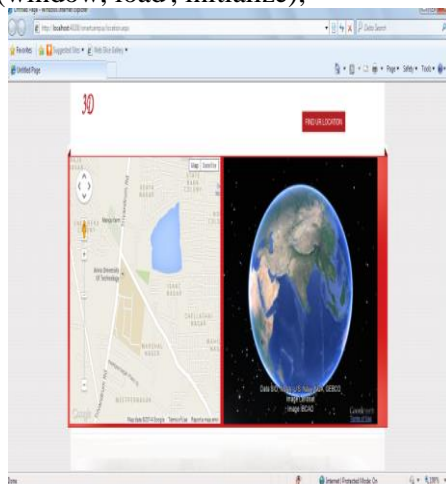google.setOnLoadCallback(init);

Google Map API

Step 1: Google Map define functions,
var map = new google.maps.Map(mapDiv)

Step 2: Google Map initialize functions,
Google_maps_event.addDomListener(window, load', initialize);

Figure.4. Web GIS visualization

4. CONCLUSION

This web based GIS application shows how Google Map integrated with Google Earth API are often used for a comprehensive web based 3D city models. Integrating with the Google Map permits road directions, street names and all alternative location information to be obtained along with the 3D buildings. This application can increase productivity and knowledge sharing for users, businesses and the public normally by creating it easy to read, analyze, and build maps with authoritative geographic information. In this contribution it was shown, that it is possible to setup an open standards based application for internet based distribution and visualization of 3D geodata.

5. ACKNOWLEDGMENT

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