

Geographic services in a Digital Library

GeoInformation Technologies, CENTIA

Universidad de las Americas-Puebla, Mexico

Point of contact: David Sol, sol@mail.udlap.mx, +52 (2)229 26 53

Researchers: Felix Garcia, Alejandra Torres

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Proposal summary

A digital library is supported by some services like information retrieval, distributed resources and user services. An additional service can be geographic services. A GIS (Geographic Information System) is a tool which operates with geographic and descriptive data. From a GIS point of view, the digital library is a very large source of descriptive data which can be distributed in several sites. In fact, geographic services propose to include in the digital library (DL) GIS functions. From this point of view, GIS functions are another service for the DL.

Geographic services in a DL imply the use of a standard format to exchange geographic data. This problem has been solved for text data on the Web. In the case of geographic data there are some efforts (OpenGis Consortium, for example) to establish a standard to share spatial and geographic data. This is the first step to include geographic data in a DL. In parallel with the standard geographic data selection, the geographic services architecture for the digital library will be developed. Human interaction issues for GIS also need to be developed.

GIS Services will permit the user interaction with other DL services. This interaction will be useful for users. The services normally included in a digital library are agent services, navigation services, translation language services, retrieval services, match analysis services and now we can add GIS services. The GIS services implementation will permit the user first to browse on the geographic data and second to use the other services. Some information is well described in a georeferenced context, so it will be useful to retrieve non-spatial data by using GIS services.

DL users can be geographers, historians or any specialist who need to analyze and to compare data from different sources. This activity can be compared with the specialist who goes to the library to find information useful for his/her investigation. In particular we will be interested by the botanist user. He/She will need specific GIS services to describe and to locate botanic data in a map.

These ideas have been briefly presented in the FDL (Floristic Digital Library) context. This a project by the Missouri botanical garden and UDLAP. Actually, these ideas could be included in the context of another project, the World-wide Thematic Repositories to handle the Capsicum species (for the Chile Pepper Institute). This digital library will have translation services for three languages. The goal of the project is to handle meta-data

standards and to build services to retrieve information. The geographic service will be another way to retrieve data. To handle geographic data, a standard to exchange this kind of data will be needed.

GIS services project will be divided in two parts:

- the architecture of the GIS services (pan, layers, zoom, basic queries) for the digital library and the standard definition to exchange geographic data
- the inclusion of additional GIS functions (complex queries, access to different databases) in the digital library GIS services.

The first part of the project will be planned for the first year. GIS services will be modeled by using the GIS traditional architecture. The user will navigate on the digital library by using geographic services. Maps that show the location of the Capsicum species will be used to give the data needed to answer user questions. The geographic layers and objects (rivers, mountains, roads, etc.) will be used to retrieve pepper descriptions. These descriptions will be obtained from the information resource on peppers from the experts at New Mexico State University. The GIS services will operate in the Web context. It will belong to the generation called WebGIS applications. The geographic services will be then accessed by the Web.

GIS services will need to exchange geographic data. For this reason, a standard to exchange geographic data need to be used. We will use as reference a standard that actually is developed to exchange geographic data. The OpenGIS consortium propose a standard that is based on the basic elements (points, lines, polygons) to represent geographic data. The standard is created to be used on the Web. Since 1994 this consortium has worked with this standard and it seems to be the solution to navigate on geographic data and to exchange this kind of data.

The second part of the project will be planned for the second year. When this part will be developed, tools to exploit geographic data will be implemented. Users have complex questions that need to combine geographic and descriptive data. The complex queries will use the other services to improve the access to data. User will be able to formulate their own queries (Query Builder). It would be possible to implement with Spatial Agents.

The benefits of this project will be to support other services. GIS services will provide mechanisms to access different types of information on Capsicum in a geographic way.