Project no. 018340

Project acronym: EDIT

Project title: Toward the European Distributed Institute of Taxonomy

Instrument: Network of Excellence

Thematic Priority: Sub-Priority 1.1.6.3: "Global Change and Ecosystems"

C5.64 Global background maps available in printing quality

Due date of component: Month 24
Actual submission date: Month 25

Start date of project: 01/03/2006   Duration: 5 years

Organisation name of lead contractor for this component: 14 RMCA with
4 CSIC, 12 SMNS, 18 HNHM, 19 CUB, 20 IBSAS

Revision: Draft 1

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level		
PU	Public	**X**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

C5.64 Global background maps available in printing quality

This report has been compiled by Patricia Mergen (RMCA) with major contributions by Pere Roca Ristol (CSIC) and Bart Meganck (RMCA) as well as the comments received from the EDIT GIS and developer groups

Introduction

The assessment of the needs of taxonomists in terms of Geospatial components and the e-conference previously held (see Component 5.32) indicated that there is a high interest in having access to camera ready maps for different publication means (Websites, Presentations, scientific papers, large format maps, posters). The local post processing of maps for publication has been identified as being far from straightforward and often rather time consuming for non-specialists in GIS systems. The development of a freely available and easy-to-use tool able to produce maps for those taxonomists not experienced in the use of GIS programs is indeed an essential part of EDIT Work Package 5.4 (Geospatial Component).

To answer this request it was thus decided to produce one or several modules for the Geospatial components of the EDIT cyber taxonomy platform dealing specifically with production of camera ready maps for different publication means. It is clear that even the most accurate distribution points for specimens need to be presented with nice background maps, when published or presented to decision makers to enhance their impact, thus the implementation of the modules for "Global background maps available in printing quality".

Implementation

Core Geospatial platform
The Museo Nacional de Ciencias Naturales, Madrid is responsible for the core components of the Geospatial platform. For the camera ready availability of maps, they have been developing a web-application (EDIT mapViewer, http://edit.csic.es/edit_geo/prototype/edit_project.html that currently allows following actions:

> - the visualization of user point data in a specified map context; this ability is based on the insertion in a postgreSQL/postGIS database of user information in a comma-separated-values text file format (CSV extension). EDIT mapViewer can now "print" this data in the form of maps. The CSV must have at least Latitude and Longitude fields in decimal degrees, with datum WGS84 (the GBIF standard). Also a third field in the CSV is required for further classification and symbolization. The tool is currently designed to work with Genus and Species fields but it may change in the future.

> - the filtering and symbolization (colour, symbol and size) of the uploaded data, getting back immediately also a legend. It allows the user to visually identify his data.

> -the identification of user data through two different tools:
> > -Query by point: click on a point (user point data)
> > -Query by area: user can draw a box to query

> - add different WMS layers coming from EDIT Web Map Server (data stored by our server).
> - make thematic searches in remote WMS Servers, adding these layers in our own tool.

-an easy-to-use management of the layers to visualize
-the basic GIS operations: zoom in, zoom out, pan...

The tool has been designed to be easy to use and have a good performance, allowing a nice interaction with the user. The technologies used are various, but all are Open Source and standard compliant.

In short:
-the web-mapping application is javascript code: Mapbuilder. Other components are based on the jQuery library, allowing the use of different plug-ins (jqModal and farbtastic).
-Geo-information (maps) is served using Geoserver, getting data from postGIS.
- the actions that require a database interaction are based on PHP code and plpgsql functions running on postgreSQL/postGIS.

The tool's source code is available at:
http://dev.e-taxonomy.eu/trac/browser/trunk/geo/mapviewer

Additional module
The Royal Museum for Central Africa has developed an associated service for further map display and manipulation that can than be used for publication by the end-users. This also in anticipation of further (point data) components such as C5.65 and C5.72 (amongst others) :
http://synthesys.africamuseum.be/itin/home.html.

Basically, it takes in a point data set (supposed to be a pathway) and performs some interpretation (currently limited to simplification of the pathway through the RDP-algorithm, later a complete detection mechanism for most probable pathways) :

- inserting the data points into a PostGreSQL/PostGIS database
- connecting this database directly to a WMS service
- visualising the points on an interactive map through WMS
- visualising the point interpretation layers (Ramen-Douglas-Peucker simplified pathway / Dijkstra algorithm) on the map
- offering the raw and the interpreted point layers in various formats for download (csv, kml) for easy visualisation in Google Earth and easy import in a spreadsheet/database

Data can be uploaded in many different formats, catering for many possible user scenario's :

- KML (e.g. for quickly capturing some points in Google Earth)
- GPX (direct offload of GPS devices)
- CSV (e.g. points coming from a spreadsheet)
- GML (from various GIS applications)

The tool is written in PHP in an object-oriented and modular way, for easy integration with the CSIC mapview tool and the EDIT Cybertaxonomy platform.

All tools and techniques used (PostGreSQL, PHP, PostGIS, MapServer, OpenLayers) are open source and standards compliant,

The tool's source code is available at:
http://ww2.biocase.org/svn/synthesys/trunk/itineraries
(the module is a joint EDIT/SYNTHESYS NAD development)

Future plans:
>   - the integration of additional functions to make easier the printing of the resulting maps in different formats and for different means easier like for example:
>> - a legend bar tool
>> - a wind rose
>> - a legend with all the layers the user is visualizing
>
>   - a test demo conducted with the taxonomists from the African Fishbase taxonomists identified the needs for following additional features that we will take into consideration for the enhancement of the currently available functionalities:
>
>> - Need for black and white or gray scale maps, not only color maps for paper journals where colored pages are either not allowed or too expensive
>> - to cope with black and white or gray-scale maps more easily distinguishable symbols will be needed.
>> - providing options with 400 dpi minimal resolution
>> - files generated for download can be very large, need options to compress them if high quality images are needed.
>> - Many journals request Tiff format, would thus be easier to have the option to have the image of the map directly in Tiff to avoid that the end-user has to do the conversion himself locally
>> - Provide maps in a size optimized for common page standards (A5, A4 ….)
>> - Have clear and nice background maps going from whole continent level to the level of a small river basin.
>
>   - Testing the interoperability with the other components of the Cybertaxonomy and the CDM. A first step here would be a test between the core platform and the itinerary module.
>
>   - test with data coming from the ATBI sites (Stuttgart and SK) and test with data coming from a published atlas (HU)

Deviation from Plan

No deviation from plan in the implementation of the products. The writing of the report on this component was delayed by more or less one month due to the very high administrative workload in EDIT and SYNTHESYS in the months February, March and April 2008 (AUDIT, filling in the IMT tool, writing PAR2 and JPA3, …).