

CARTOCIUDAD 2009-2011: THE CHALLENGE OF COLLABORATIVE MAINTENANCE AND UPDATING

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CartoCiudad is a seamless network of the streets and roads topologically structured all over Spain. It also contains building numbers, toponyms and postal and census information. Launched in 2006, this project is the result of harmonization and integration of official digital cartography and information produced by the main suppliers of official geographic information in Spain: Cadastre, Statistics Office, Post Office and the National Geographic Institute, besides regional organisations according to their own competences.

With the objective of integrating all the Spanish municipalities in CartoCiudad in a seamless way, collaboration has always been considered essential. So firstly a common agreement was required with the national stakeholders indicated above. Furthermore, cooperation with Autonomous Regions was considered necessary in order to achieve a sustainable maintenance of the project. These agreements enable the data harmonization and integration at a national level, facilitating the harmonisation within the European Framework, and it also implies an optimisation of the resources in the Administrations involved, since only one product is created for everyone.

According to SDI principles, data are published at CartoCiudad Geoportal (www.cartociudad.es) where they are handled through standard on-line services implemented according to OGC specifications: WMS for visualising, WFS to locate entities (addresses, postcodes) and WPS to implement functionalities like routing or reverse geocode.

During the period 2009-2011, the main objective of continuity and completeness has been practically achieved, since every municipality but the smallest municipalities from Andalucía and Castilla y Leon regions has been produced and integrated in the database, i.e. more than 6000 municipalities covering 96 % of Spanish population.

Therefore CartoCiudad is now facing the challenge of the maintenance and updating process. CartoCiudad data model had to be modified to consider the updating and improvement of the data by means of the storage of the entities temporal life-cycle. Consequently every object shall have a unique identifier in the database, so temporal variations of an object are entered in the database using several records that share its identifier. Thus it is possible to know the date of addition and its forward modifications. If the object does not exist anymore this model also stores its previous existence.

In order to include this information new attributes were added to the data model: Estado (Status), which indicates the possible values of status that can be assigned to an entity of the data base (i.e. proposed, current, reserved or historical), Fecha_Alta (begin life object date) and Fecha_Baja (end life object date). This information enables obtaining which record (among those which share the same unique identifier) represents each object at any moment, as only one record has the value "current" in the Status attribute. Furthermore in the updating process just proposed and reserved records corresponding to the new, modified or disappeared entities in the real world will be added to the database.

In order to take a step towards a collaborative maintenance, inter-administrative agreements have been signed between the National Geographic Institute and the regional governments of La Rioja, Valencia, Illes Balears and Murcia, resulting in the incorporation of updated data of those regions in CartoCiudad during 2011. The importance of such agreements lies in that regional organisations in Spain may produce their own geographic data regarding streets and roads network, usually at a larger scale and according to their own competences, which can be used to enrich CartoCiudad, becoming a useful and official streetmap for national and also for regional administrations, therefore optimising the resources invested in geographic information.

Further challenges regarding automated updating have to be considered. In fact, an application was developed to download cadastral data changes in GML format from Cadastre, whose information is updated daily and published using standard web services, e.g. WFS, WMS. In the case of the other aforementioned organisations, technical and administrative issues shall be addressed prior to define an optimised workflow of maintenance and updating. Should they publish their data using standard web

services like WFS, it would be possible to develop applications to harvest data changes and synchronize the databases from each project partner.

Next steps in CartoCiudad involve the promotion of an active collaboration with other regional administrations as well, in order to decentralize the production and guarantee the sustainability of the project.

Regarding CartoCiudad technical implementations, new developments regarding web services and applications have been carried out as well. The CartoCiudad Geoportal has changed to fully comply with SDI and INSPIRE principles, incorporating Cadastre WMS as a transparent overlay. Hence the most updated cadastral information is provided directly by the competent organisation. The PNOA (National Aerial Orthophotography Plan) WMS has also been integrated to make the navigation more intuitive.

Additionally, since October 2010 CartoCiudad is available through the Download Data Center of CNIG, allowing users to download a ZIP file of each Spanish province in Shapefile format.

Finally, the involvement of CartoCiudad in EURADIN (European Address Infrastructure), in which it acted as a tester of the Data Specification on Addresses and as a node in the EURADIN Gazetteer Service, led to the conclusion that the adoption of that European specification is feasible in Spain, so that a service providing Spanish addresses according to INSPIRE Data Model has already been published.