

GEOMODELOS PROJECT, THROUGH A COOPERATIVE INSPIRE GEOSPATIAL DATA MODEL BETWEEN CARTOGRAPHIC AND DATA SUPPLYING ORGANISATIONS

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ABSTRACT

GEOMODELOS project, included in the Strategic Plan of the National Geographic Institute of Spain (IGN-CNIG), has among its objectives to build a Geospatial Data Model, following the INSPIRE directive principles, that meets geographic information requirements of the government to scale between 1:5.000 and 1:25.000.

To achieve it, we must organize the geographic information databases of the IGN-CNIG used to spatially represent geographic features throughout the national level, including data (geometry, topology and / or semantic) generated by other agencies.

This involves: 1. Create a **common conceptual model** (abstraction of reality) based on the INSPIRE Data Specifications and family standards UNE EN-ISO 19100. 2. Agreement, among agencies involved **all definitions** (geometric, semantic and topological) that describe the phenomena of the model and 3. Collect data only once, eliminating **duplication** during capture and keep update of geographical phenomena by creating a single source of geographic information database.

BACKGROUND AND OBJECTIVES

The Spanish Administration is divided into 3 levels depending on the administered territory. The *General Administration* of Spain, whose powers affect the entire Spanish territory, is composed by Ministries. The IGN, responsible of the national map products, belongs to the Ministry of Infrastructures and Transport. The *Autonomous Regions*, Spain is divided into 17 Autonomous Region. And the *Local Government*, composed by 8114 local City Council.

Each administration has its own mapping skills through its own map agency. The *Ordination Cartography Act of 1986 (LOC86)* is the highest law about the map competence. As indicated by the Preamble to the Act the reasons for the rise are the existence of multiple public agencies that, concurrently, and at times disjointed, perform work that cause the dispersion map, duplication of resources and unnecessary expense.

LOC86 establishes that the General Administration, through the IGN, is responsible for the general public service, producing and maintaining basic mappings that cover the whole country at 1:25K and 1:50K scale. Doesn't imply the prohibition of other ministries to product thematic maps for their purposes: Environment, Hidrography, Cadastre or Transports. Either to the autonomous regions to perform this activity through their own map agency with databases at 5K-10K scale.

One IGN's mission is to preparer draft standards containing cartographic mapping criteria to be followed for other mapping agencies in order to share the geographic data sets and to facilitate the flows of digital production, the use of GIS to product and its integration into a Spatial Data Infrastructure.

APPROACH AND METHODS

The IGN has 2 projects in development to approach the sharing:

- GEOMODELOS: to share geodata with other ministries.
- BTA+: to share geodata with Autonomous.

The goal of GEOMODELOS is to set interoperability among the geographic data models designed and produced by Spanish ministries and by the IGN according to INSPIRE directive. Interoperability refers to the topological integrity, geometric, and semantic, complying with international standards in use (ISO,OGC,...).

The first step of this project is the '*Conceptual Model*' selecting the features included in the model; setting a definition, defining the geometry, the attributes and the lists of values for each feature.

The second phase is the '*Geometric and semantic specifications*': to develop the standards to capture a feature at the corresponding scale; to set the spatial and topological relations with other features.

The last phase is called '*Production and Update*' and determines the agency responsible to capture the geometry and/or the semantic information for producing and sharing with other ministries or agencies.

BTA+ project started in 2005, when map agencies of autonomous regions and IGN joined together to bring topographic bases 1:5K-1:10K to ensure consistency with the BTN25. The result is a topographic base vector of the harmonization of existing databases at scales 1:5K or 1:10K produced by regional agencies and supervised by the IGN.

RESULTS

The results obtained in both projects can be classified in two levels. First level is composed the *Data Specifications of the Conceptual Common Model*. This doc is a catalogue with all features that composed the Conceptual Model, providing for each feature *definition*; *geometric/s primitive* used to represent it; all the *attributes*; the controlled list for each attributes; the *geometric capture rules*; and the *topologic rules* that explain the interaction with other features.

The second level is to implement the data specification in a database. This job depends on the Database Manager System (DBMS) used for the producer. Some of the most popular DBMS is Oracle. Using all the tools that Oracle provides (views, procedures, functions and triggers) it's possible to implement the model in order to be exploited by Geographic Information System.

CONCLUSION AND FUTURE PLANS

The combination of the results of GEOMODELOS and BTA+ affects to the cartographic production of the Spanish IGN and improves important topics:

- Increases the *quality*: an expert agency captures the geographic information (geometry and/or attributes);
- Reduces the *economic* cost: 'once capture-all share';
- Facilitates *interoperability* data and cooperative production
- Expedites faster *updates* by the agency responsible

Currently, and following the same rhythm of INSPIRE directive, there are three drafts of data specifications which treat hydrography, road transport network and railway transport network. The next cartographic topics will be included in INSPIRE annex 2 and 3 related to land use, buildings, public services, industries and all those included in the BTN25.