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How to organize the data flow of the City: a case study with the Spatial Data Infrastructure CartoPOLIS

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What about ?

Context

The **multiplication of end users** (public authorities, national organizations, companies, associations, ...) and the **improvement of production methods** of geographic information (remote sensing imagery, GPS survey, ground sensors, ...) cause the **increase of the number of data on city**.

Indeed, it is now possible to have data at different time scales (years, months, days, hours, ...) and spatial scales (city, district, building, ...). This is reinforced by the development of Internet technologies and "Web 2.0" services that facilitate the dissemination of data. The "wave" of open-data initiatives such as the *Data Nantes* portal and community projects like *OpenStreetMap* are illustrations of that. It becomes easy for anyone to find geographic information.

Problem

Therefore, this raises the problem of **identifying relevant information** for an area or topic of study: geometric quality, semantic scope of the dataset, ... are burning issues.

Solution

To answer this question, public institutions, such as [Clinton, 1994] have set up **Spatial Data Infrastructures (SDI)**.

Interoperability

Structure information to facilitate the exchange.



Standardization and normalisation organisation :

- Open Geospatial Consortium (OGC)
- International Organization for Standardization (ISO)

Research Institute on Urban Sciences and Technology (IRSTV)

- French Research Federation from CNRS
- A common goal: research on the city
- Multi-disciplinary context
- a lot of data produced and used



Spatial Data Infrastructure (SDI)

Information system that allows, with different software, to **store, catalog and share** geographic information, through **flow** (metadata or data).
→ enable the discovery and delivery of spatial data from a data repository [Steiniger & Hunter, 2012]

To be **interoperable**, IDs are based on standards of the **OGC** and **ISO**.
(example: *Web Map Service (WMS)* standard for the dissemination of data through image, or *ISO 19115* which describes metadata).

INSPIRE

At European scale, the INSPIRE Directive (adopted in 2007) aims at **regulating the dissemination of environmental public data**, through the implementation of SDIs. It establish a legal framework for european states.

Needs

Aims

- ✓ Store
Organize, structure, backup data
- ✓ Catalog
Search, find, list, sort the data
- ✓ Distribute
Transform the data via streams
- ✓ Analyse
Treat, cross, extract data

Tools

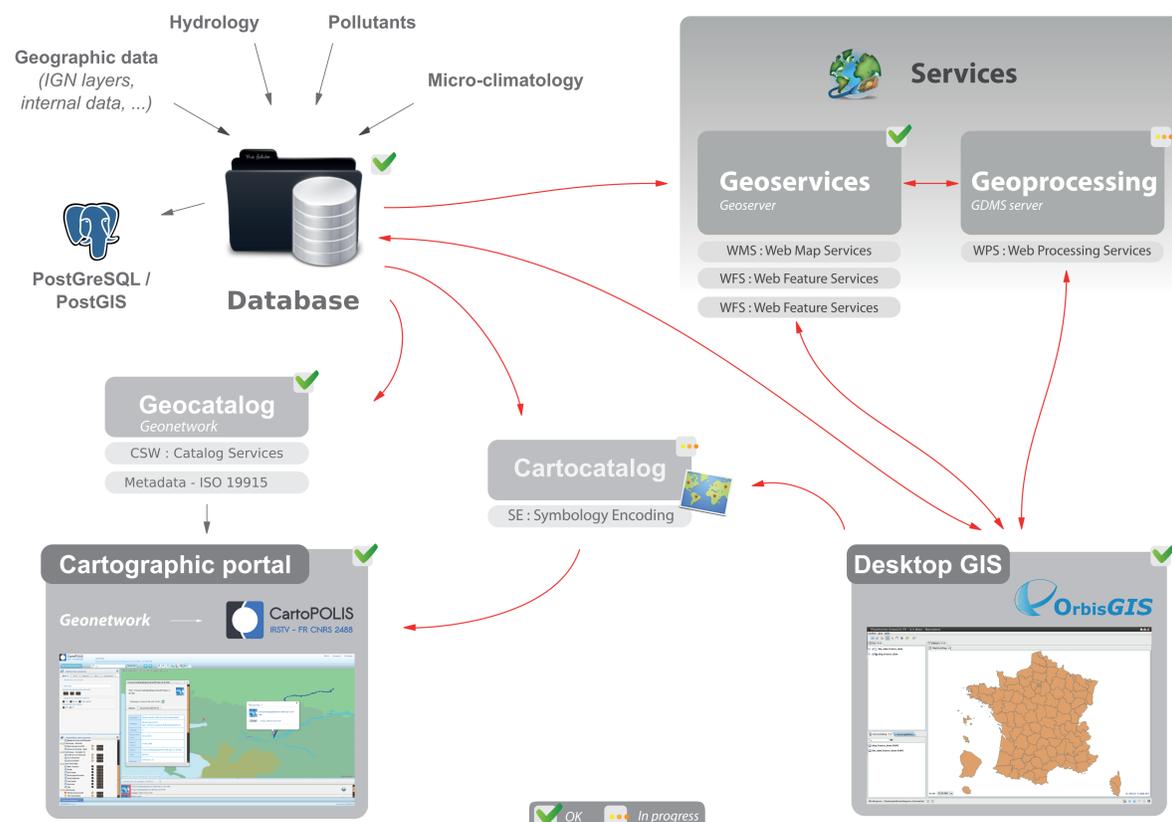
- Database Management System (DBMS)
- Metadata catalog
- Cartographic server
- Geographic Information System (GIS)

Answer

The response of the IRSTV

- PostgreSQL / PostGIS
SQL, SFS
- Geonetwork
CSW, ISO 19115
- Geoserver
WMS, WFS, WCS
- OrbisGIS
SQL, OWS ... and WPS, SE

The IRSTV SDI www.cartopolis.org



But ...

- All the tools are partitioned. So how to facilitate the communication between these components ?
- How to connect results from simulation model to SDIs ?
- The OGC must provide solutions.