

# GIS Technology for MSP

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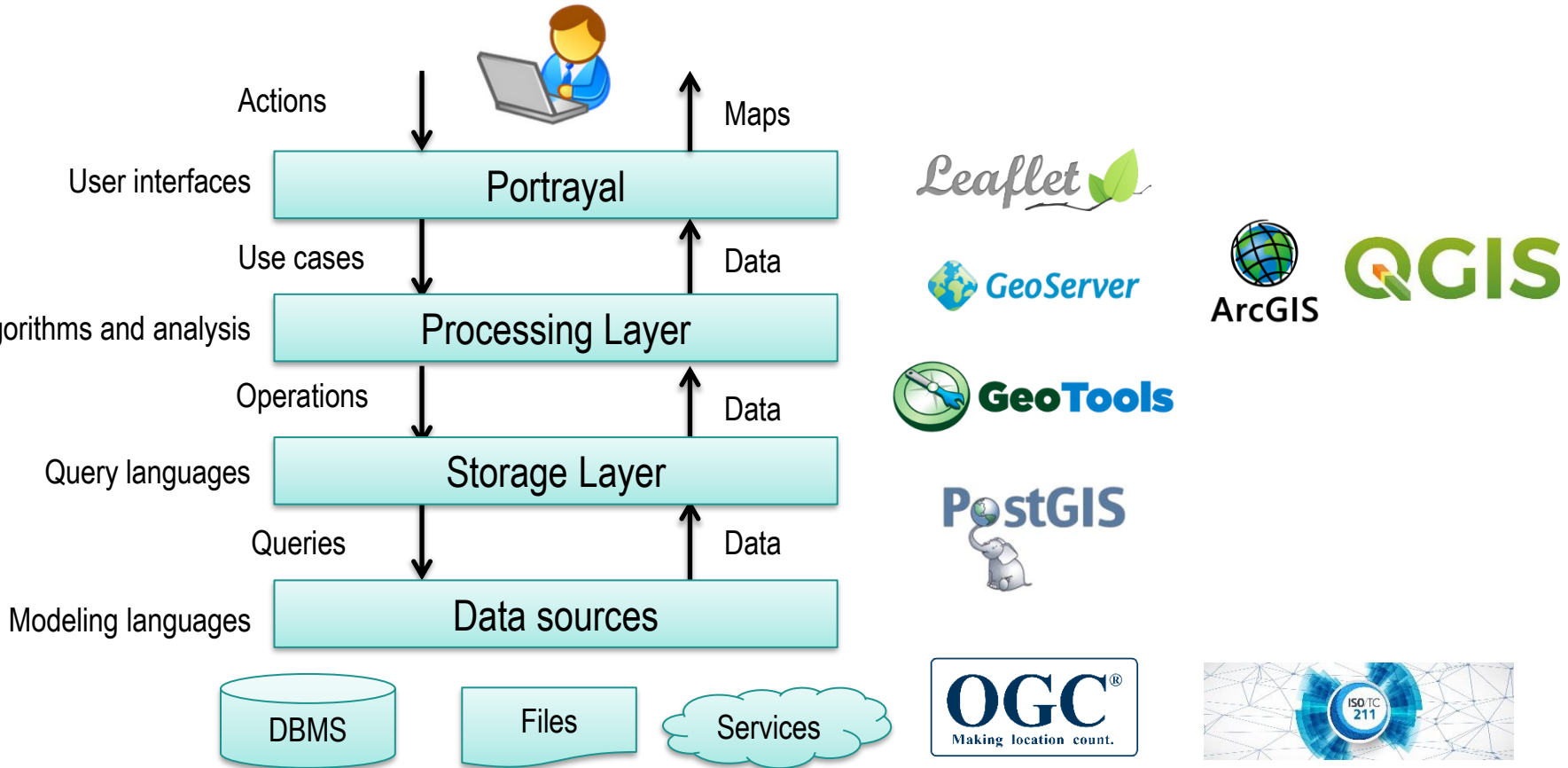
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# GIS Technology for MSP

- Current GIS technology supports MSP



# GIS Technology for MSP

- But, is there **explicit support** for MSP?
  - Proprietary software
    - ESRI: only targets the sector of Ports and Maritime authorities
  - Open-source software
    - Multiple alternatives on each layer of an information system
    - Do not usually focus on application sectors

# GIS Technology for MSP

- Is the **current GIS technology enough?**
  - Portrayal and processing seem to be enough
    - Apart from the 3D challenge, analytic methods are quite complete (vector and raster)
    - Visualization in multiple devices (desktop, web, mobile) with different techniques (maps, 3D visualization, AR) is well supported
  - Can we store MSP data in databases?
    - Spatial databases are focused on 2D GIS, only Building Information Systems are using 3D GIS
    - Temporal data is not yet supported
      - Trajectory data (moving points)
      - Evolution of surfaces (polygons) and spatial attributes (raster)

# GIS Technology for MSP

- What is needed for **transboundary MSP**?
  - Common data models and infrastructure
  - INSPIRE is being successful defining:
    - A spatial data infrastructure composed of standard-based web services
    - Data specifications for 34 specific data themes
    - Started in 2007, it includes 13 laws and 66 guidance documents
  - But, does it include MSP?

# GIS Technology for MSP

- Transboundary MSP: **INSPIRE data specifications**
  - Annex 1: Hydrography, delegates on Annex 3: Sea Regions
    - Description of the sea, lakes, rivers and other waters, with their phenomena
  - Annex 1: Administrative units
    - Defines MaritimeBoundary, MaritimeZone and Baseline
  - Annex 1: Protected Sites
    - Spatial frame for linking and/or pointing at other information that belongs to other thematic fields
  - Annex 1: Transport networks
    - Road, rail, air and water transport networks and related infrastructure
  - Annex 2: Elevation
    - Elevation of a terrain surface, whether land based or bathymetric in nature
  - Annex 3: Buildings
    - Describes a use case travel security for marine navigation
  - Annex 3: Sea Regions
    - Describes what most people would refer to as “the sea” and “the coastline”

# GIS Technology for MSP

- Transboundary MSP: **INSPIRE data specifications**
  - Annex 3: Environmental Monitoring Facilities
    - Describes a use case on marine environment monitoring facilities
  - Annex 3: Oceanographic Geographical Features
    - Describes the physical and chemical characteristics of the sea
  - Annex 3: Area Management / Restriction / Regulation Zones and Reporting Units
    - Several zone types related to MSP
  - Annex 3: Habitats and Biotopes
    - Geographical areas characterised by specific ecological conditions, processes, structure, and (life support) functions that physically support the organisms that live there
  - Annex 3: Bio-geographical Regions
    - Areas of relatively homogeneous ecological conditions with common characteristics
  - Annex 3: Species Distribution
    - Geographical distribution of occurrence of animal and plant species
  - Annex 3: Agricultural and aquaculture facilities
    - Complexes, Sites and Installations

# GIS Technology for MSP

- Future trends: **Big Data**

- Big Data technologies are changing the way data management and analysis is performed
  - Spatial Hadoop, GeoSpark, GeoWave, GeoMesa, ...
- Spatial data collection and storage is becoming cheaper
- Spatial analysis is being incorporated into Big Data technologies
- New opportunities open for MSP
- But spatial big data tools are still built with **duct tape and paper clips**



# GIS Technology for MSP

- **Key challenges**

- In there **missing functionality** on software?
- Do software vendors focus on **marine use cases**?
- Will we have **data specifications** for MSP?
- Is anybody going to **implement** them?
- When will **Big Data technologies** be stable enough?
- Is there going to be **funding** on EU research programs?