ILAF

Open Geospatial Consortium, Inc.

http://www.waterp-fp7.eu/

WatERP

SEVENTH FRAMEWORK PROGRAMME

Hydrology Domain Working Group

Día de la Interopeabilidad

Speaker: Gabriel Anzaldi

Contact: ganzaldi@bdigital.org

New York, 08-16-2014

OGC®

Making location count.

www.opengeospatial.org

WatERP Project

"Water Enhanced Resource Planning"

WatERP

CALL FP7-ICT-2011-8. Topic 6.3. (ICT for efficient water resources management). Challenge 6: ICT for a low carbon economy.

STREP (Small or Medium Scale Focused Research Projects)

PERIOD: 36 Month (2012-2015)

BUDGET: CONSORTIUM: 4.350.653 €

FUNDING: CONSORTIUM: 3.304.802€

COORDINATOR

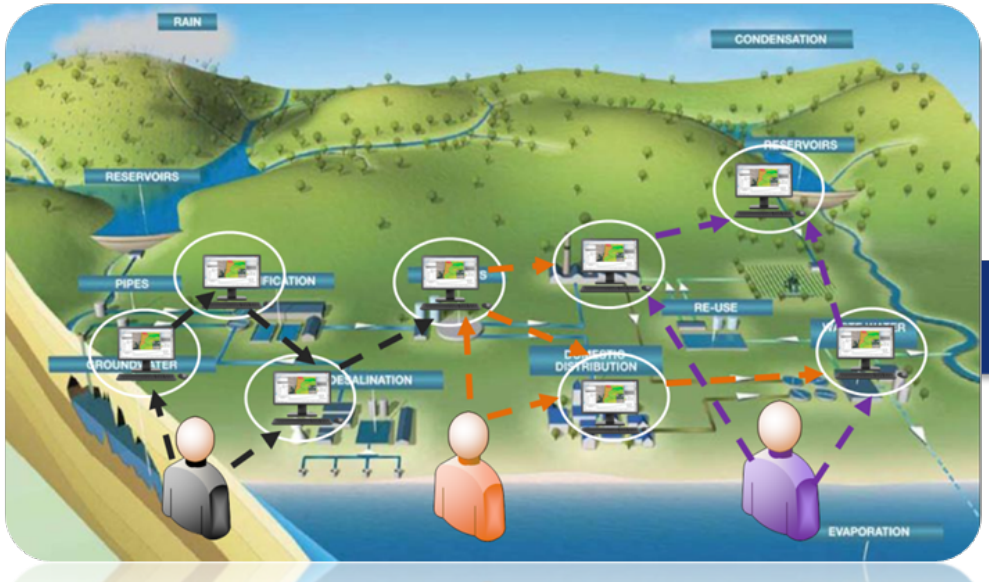
4 Companies (3 SMEs), 3 Research Centres, 1 Association, 1 Public administration

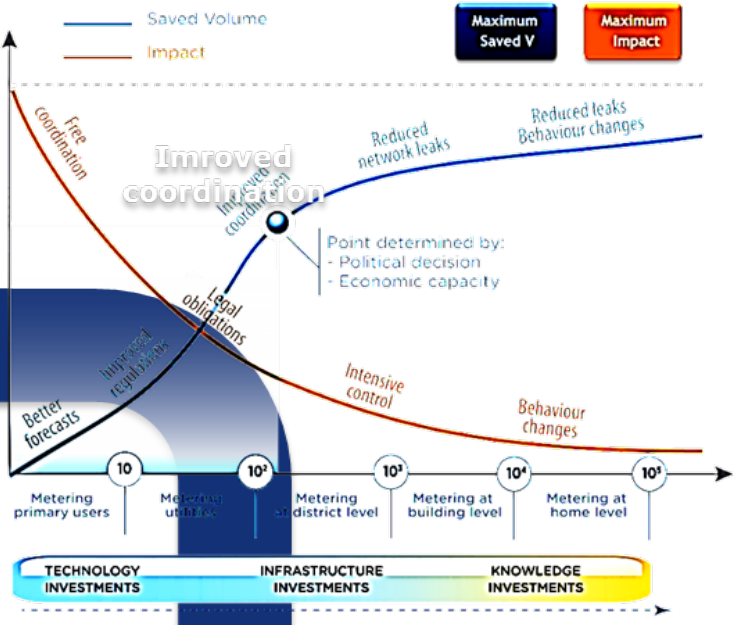
www.waterp-fp7.eu/index.php/partners

Water Domain

Motivation

WatERP





8% Water Saving

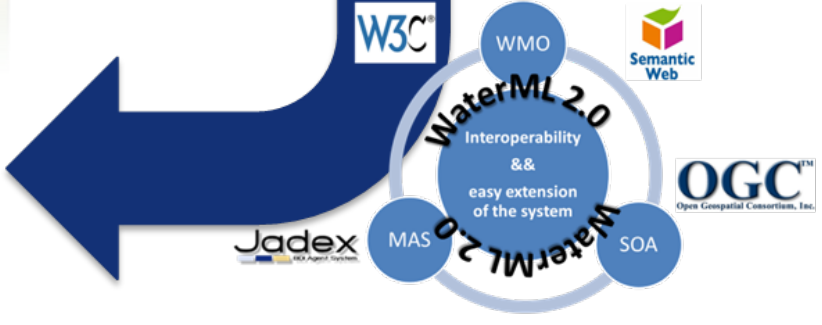
Scarcity Regions

5% Energy Saving

Abundance Regions

Where water supply meets demand

WatERP

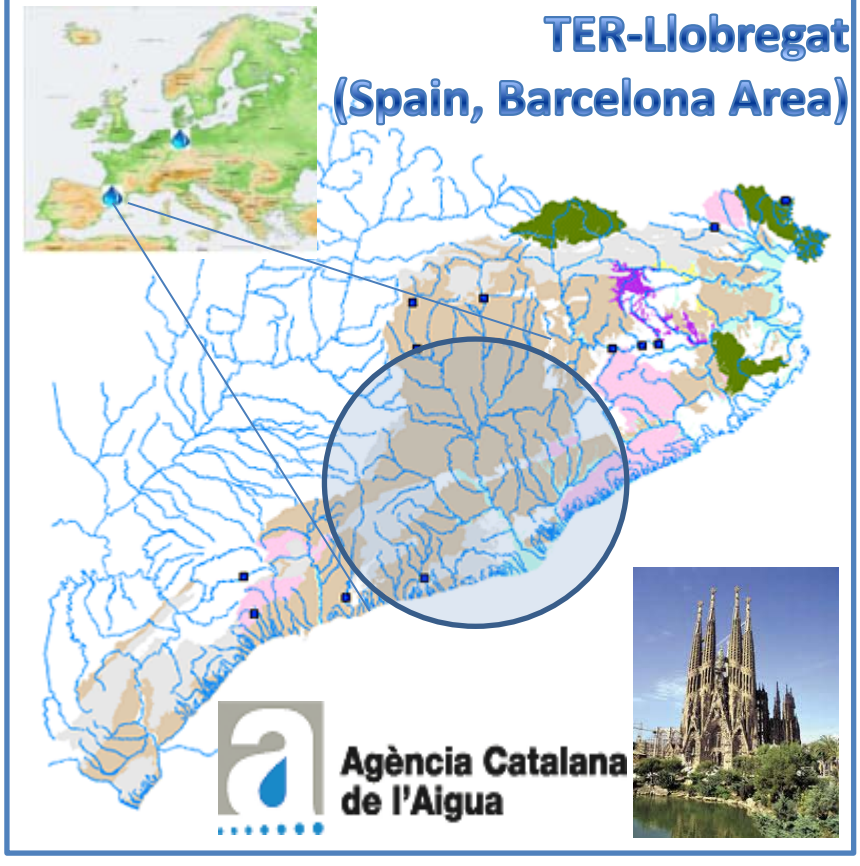


BARCELONA TECHNOLOGY DIGITAL CENTRE bdigital TECNIO disy INCLAM Ingeniería del Agua Agència Catalana de l'Aigua ICCS DVGW STAFFORDSHIRE UNIVERSITY hydro meteorological innovative solutions STADTWERKE KARLSRUHE VERSORGUNG MIT VERANTWORTUNG SEVENTH FRAMEWORK PROGRAMME OGC® ILAF Open Geospatial Consortium, Inc.

Pilots

WatERP

TER-Llobregat (Spain, Barcelona Area)



City of Karlsruhe (Germany, Baden-Wurtemberg)

Water Authority

Water Utility

BARCELONA TECHNOLOGY DIGITAL CENTRE bdigital TECNIO disy INCLAM Ingeniería del Agua Agència Catalana de l'Aigua ENIZEY ICCS DVGW STAFFORDSHIRE UNIVERSITY hydro meteorological innovative solutions STADTWERKE KARLSRUHE VERSORGUNG MIT VERANTWORTUNG SEVENTH FRAMEWORK PROGRAMME OGC® ILAF Open Geospatial Consortium, Inc.

WatERP

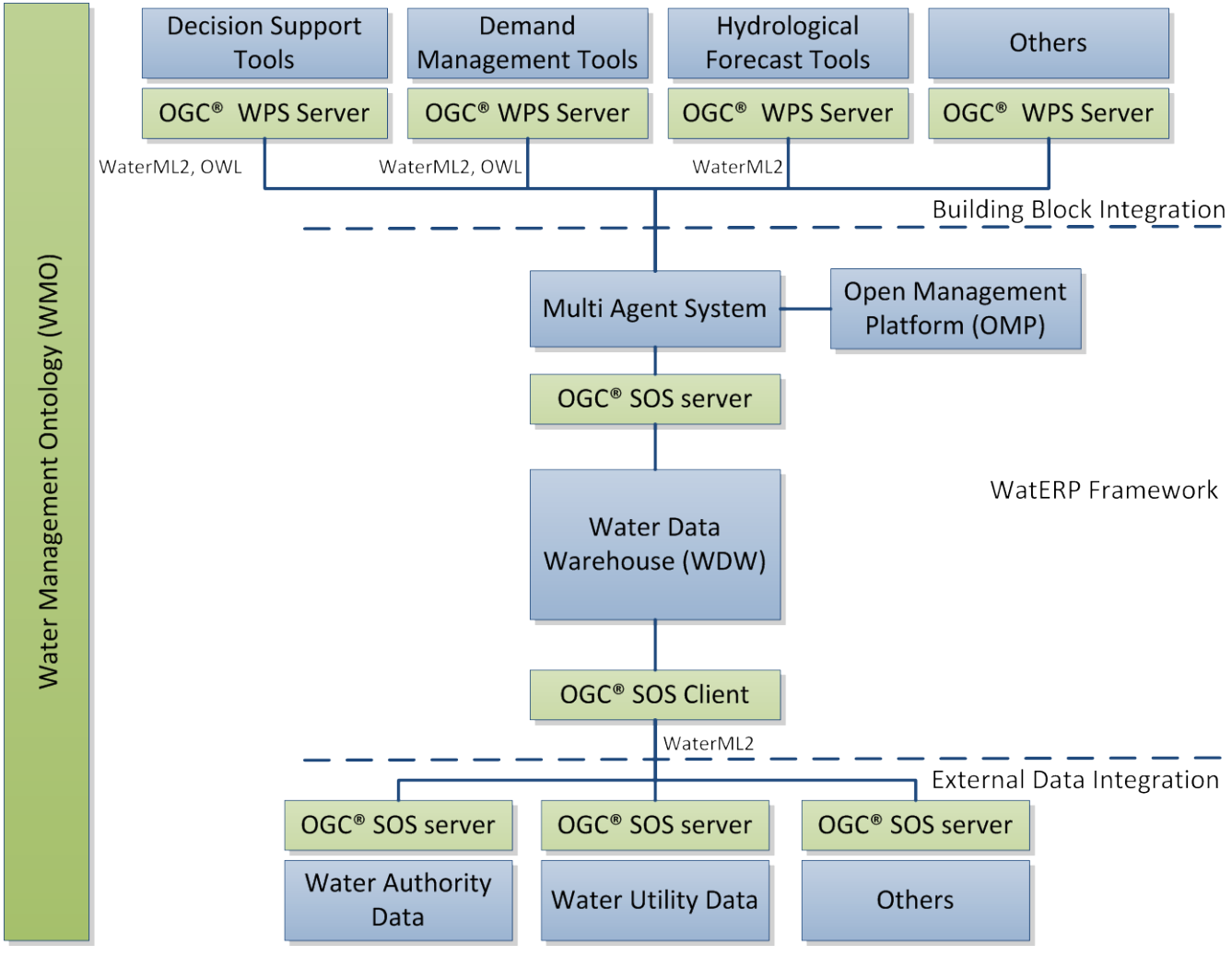
Main Features

1. **Link each decisional/informational system** to help the integration in a collaborative framework.
2. Provide **near real–time information/knowledge** flow.
3. **Distribute intelligence** to generate actions and alerts related to management processes.
4. Perform **orchestration** of existing and new management tools.

Architecture Implemented

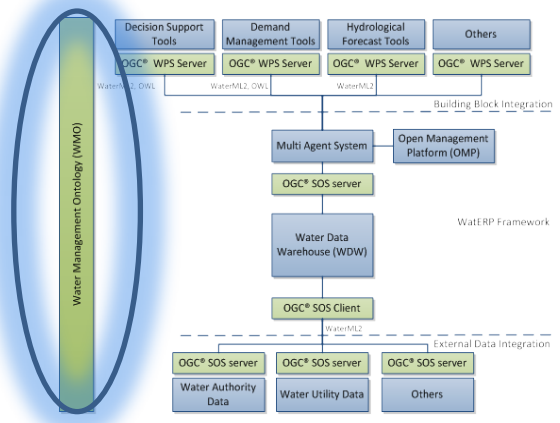
WatERP concept

WatERP architecture

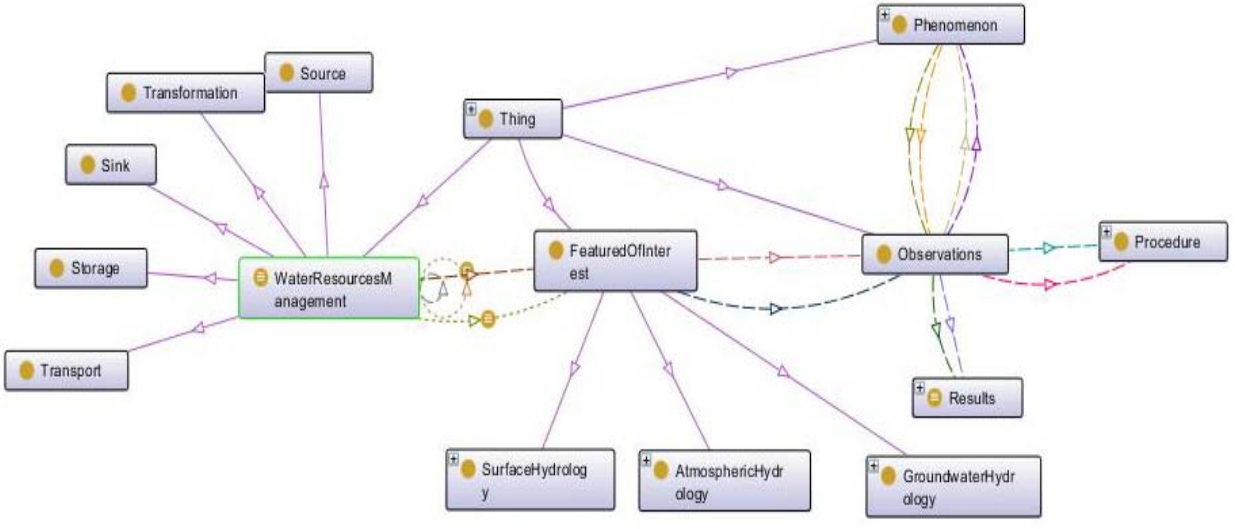


WaterML/TimesSeriesML/HY_FEATURES use

Water Management Ontology (WMO)



(i) **Human-made interactions and decision making**;
(ii) Water resource availability;
(iii) Ecological, cultural and social functions of water resources and potential impacts of changes on hydro logical regimes;
(iv) Current water infrastructure/assets and the economic value of water
(v) Administrative, policy or regulatory issues of relevance
(vi) Sectorial use and water hierarchy.



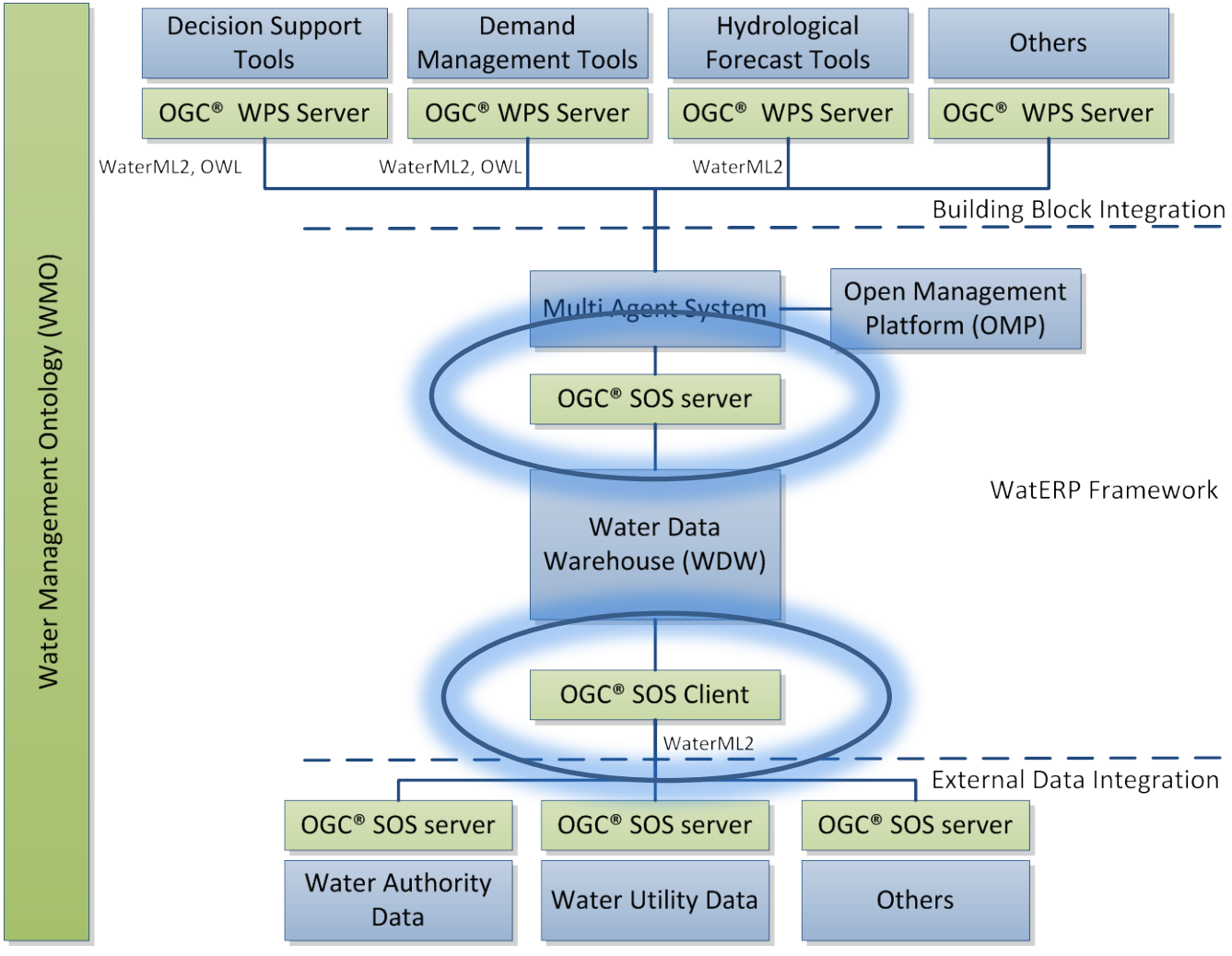
This allows alignment of water-physical objects ("FeaturesOfInterest") with decisional concepts. This decisional correspondence is supported by the real-objects situation ("FeaturesOfInterest") that gathers hydrological information by an observation-and-measurement process described by "observations", "procedures", "phenomena" and "results".

Ontology Experiences

- Alignment with OGC standards guarantees an highest level of interoperability.
- Mapping of WatertML2 schema in an ontological representation allowing reasoning over it.
- The incorporation of the human-engineered water permit to abstract decisional actions over the physical representations of the water supply distribution chain.

OGC© OWS Use

WatERP architecture



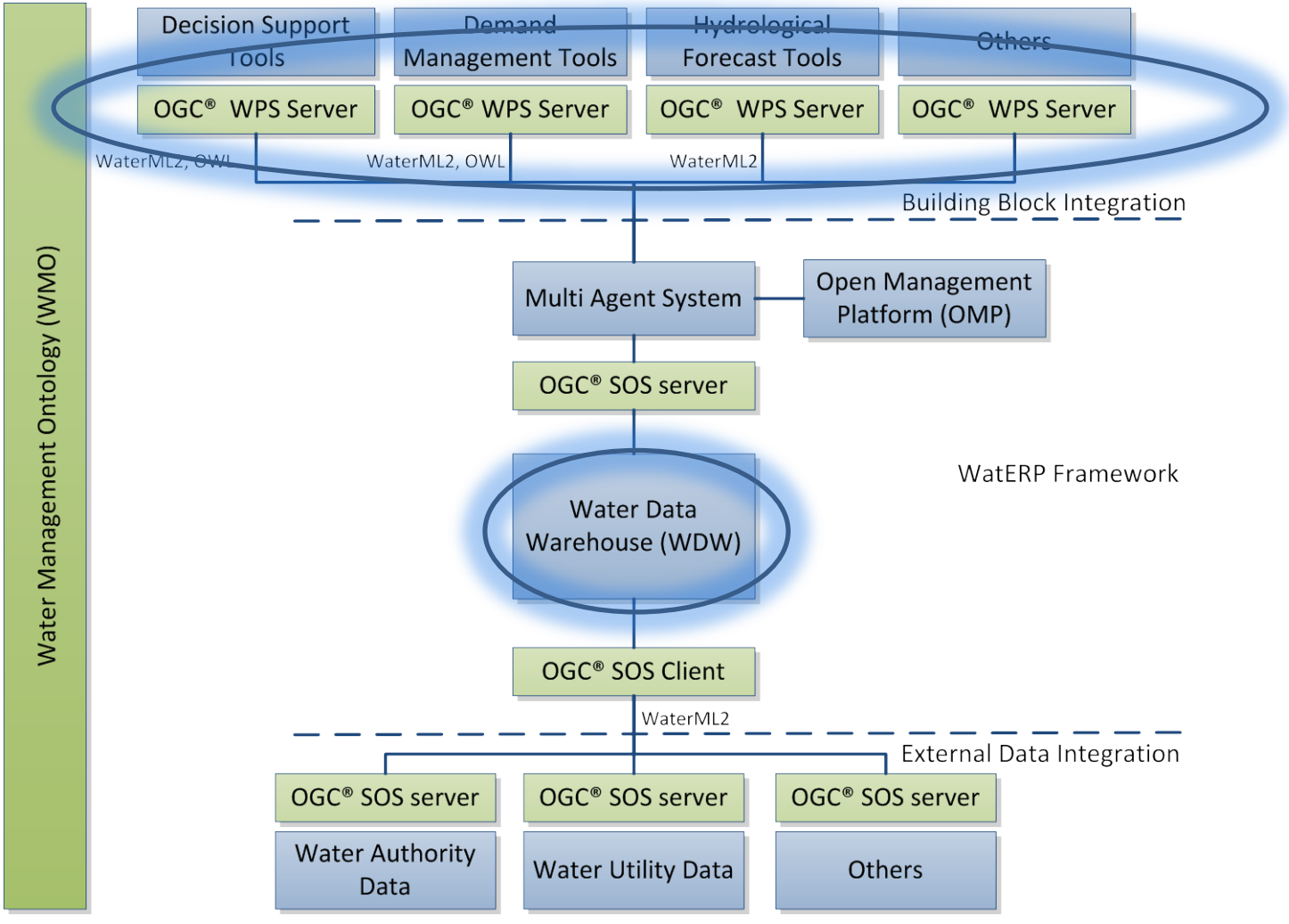
OGC© SOS

OGC© SOS are being used in WatERP to:

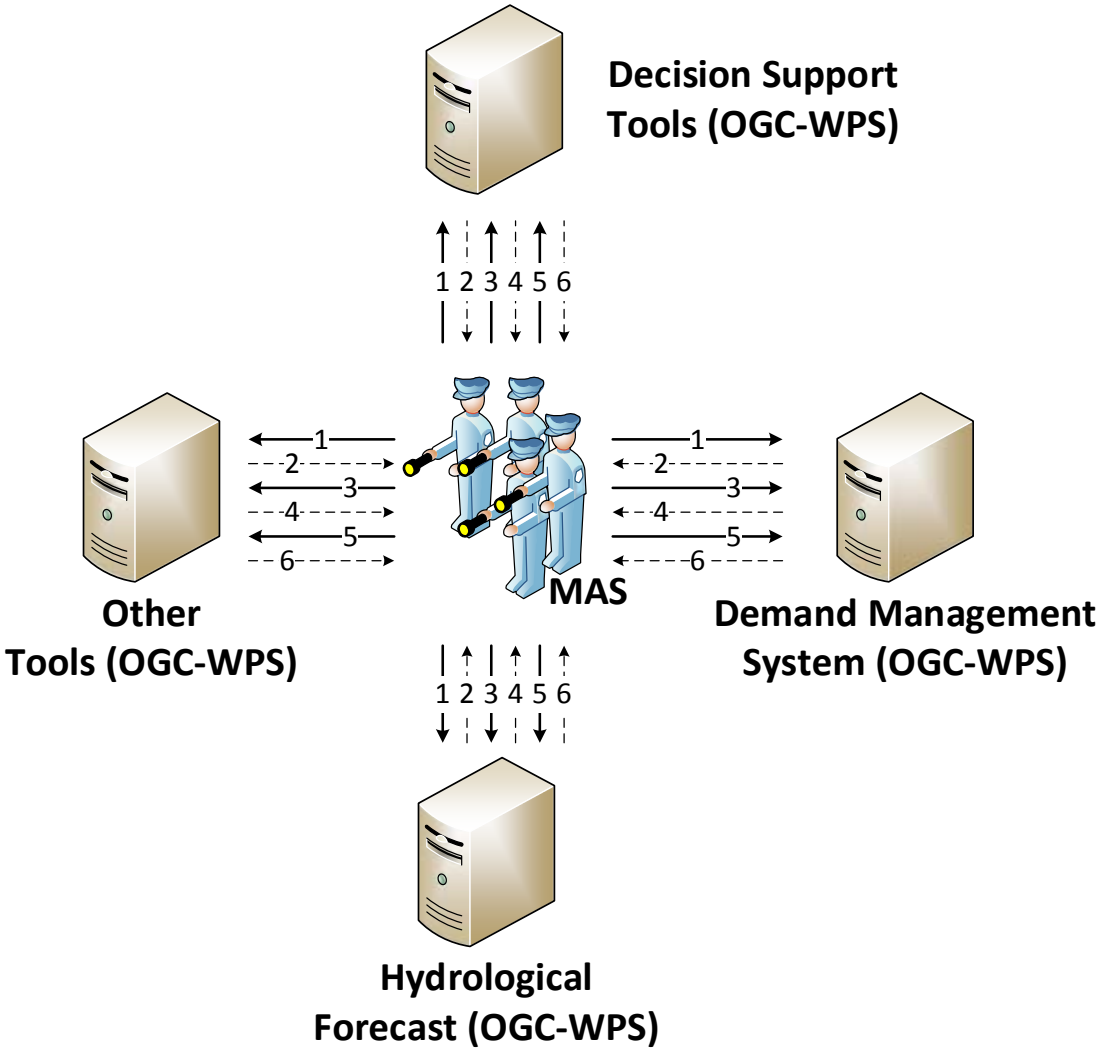
- To **homogenize the integration of pilot data** (52º North SOS)
  - Standardize the access protocol which allows to work with different datasources
  - An SOS-Server-Installation has to be prepared for each data source to be incorporated, homogenizing the resources used for data import and thus facilitating data source integration
  - SOS WaterML2.0 is the first step to ensure data integrity, while at the same time making it fast and easy to incorporate new data sources.
  - Every data source implementing a WaterML2.0 data scheme can be added, enabling a constant development and enlargement of the water data warehouse with almost no additional cost
- To **publish the observations inside the framework** (52º North SOS)
  - Standardize the access protocol to consume the cleaned and validated data (SOS and WaterML2) facilitating the data consumption for third parties
  - Facilitate the queries data from R function calls using 52º North SOS4R

OGC© WPS Use

WatERP architecture



WatERP SOA Interface

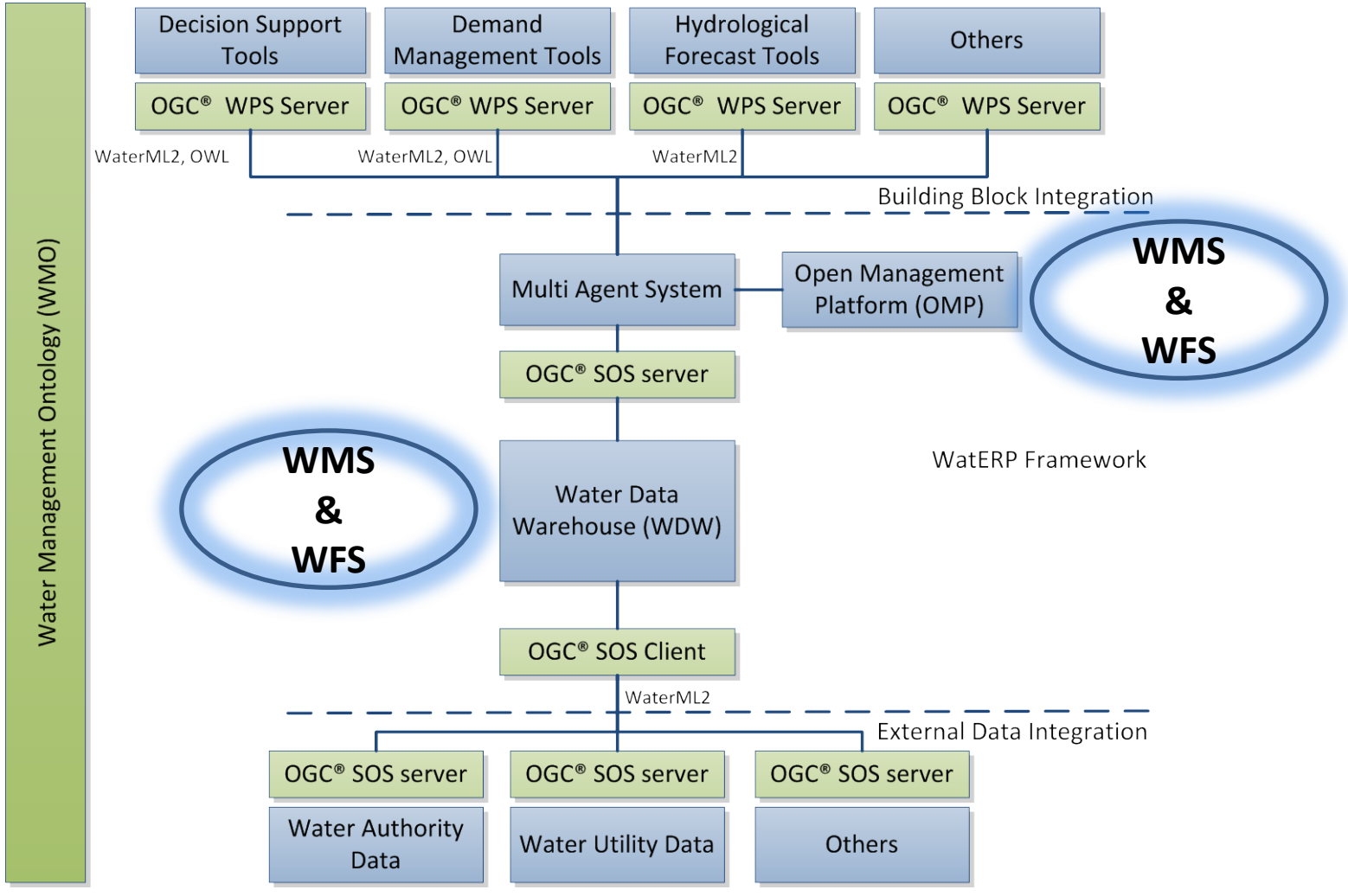


Difficulty to differentiate two process with similar sintaxis during matchmaking

SOLUTION: semantic annotations in OGC-WPS operations = semantic interoperability

OGC© WMS/WFS Use

WatERP architecture



OGC© WMS & WFS

OGC© WMS are being used in WatERP to:

- To **publish geospatial map images** (52º North WMS) in a homogeneous and standardized way
- To **consume standardized maps by the GUI** using OpenLayers framework as OGC© WMS client

OGC© WFS are being used in WatERP to:

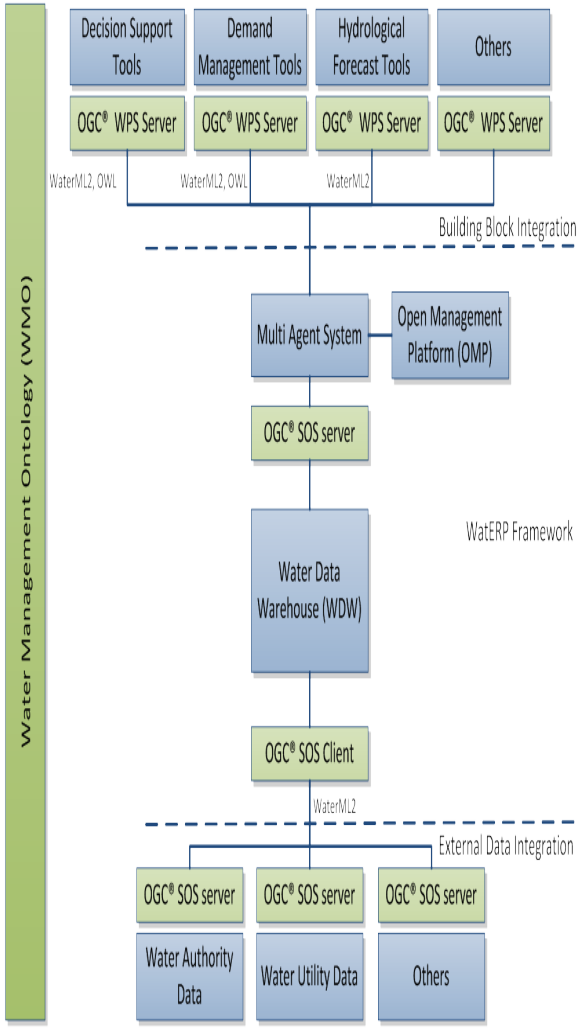
- To **publish SOS/WaterML2 transportable data through OGC© WFS**, granting access to other clients either not being able to process SOS/WaterML2 or explicitly using WFS to avoid protocol overhead from WaterML2 (52º North WFS)
- To **consume standardized geographic features by the GUI** using OpenLayers framework as OGC© WFS client with the aim of providing extra information to the maps

Experiences

The use of libraries (e.g. OpenLayers) to consume information facilitates integration with both standards avoiding typical problems of overlapping namespaces

CONCLUSIONS

Conclusions



- WaterML2 is a large schema and it allows to encapsulating the same information in different ways. Therefore a **WaterML2 subschema** for water management was created.
- **Other options could be considered for exchanging data** (e.g. JASON as an option to XML)
- Non-trivial use of the extended **XML frameworks** (e.g. JAXB…) due to the name spaces overlapping (WatERP implements JAX-Bindings to provide rules that permit overcome conflicts)
- Count with **libraries** for the most extended programing languages could be useful for extend the implementation
- Semantic annotations recommend by the OGC© minimizes the semantic lack. A specific specific field for this purpose might be interesting to give more semantic power in WPS or other standards OWS.

Thank you very much for your attention!

Contact:

Gabriel Anzaldi

ganzaldi@bdigital.org

Phone. +34 93 553 45 40

M. +34 619 11 36 72

gabriel_anzaldi

@gabriel_anzaldi

es.linkedin.com/in/gabrielanzaldi/

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