

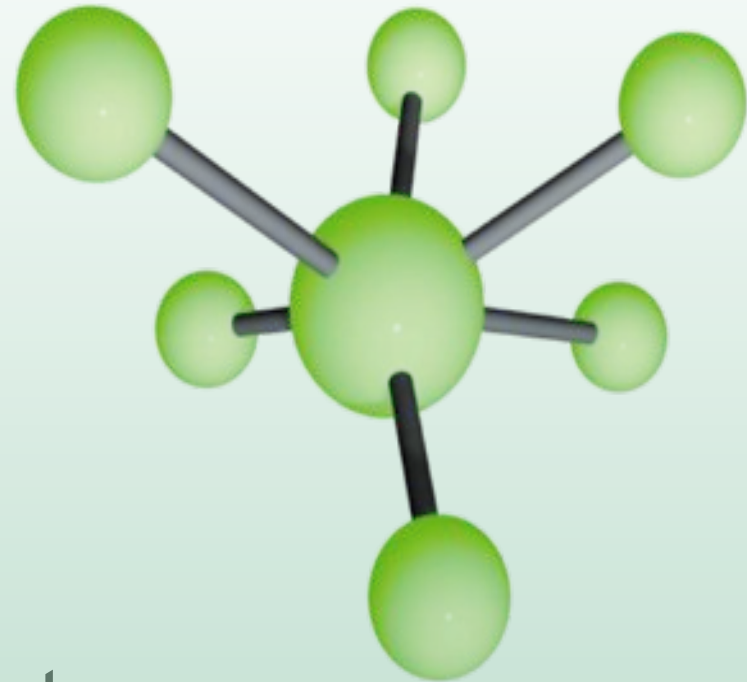
S@NY

Sensors Anywhere

Sensor Service Architecture

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GEOSS Sensor Web Workshop
Geneva, 15 November 2008



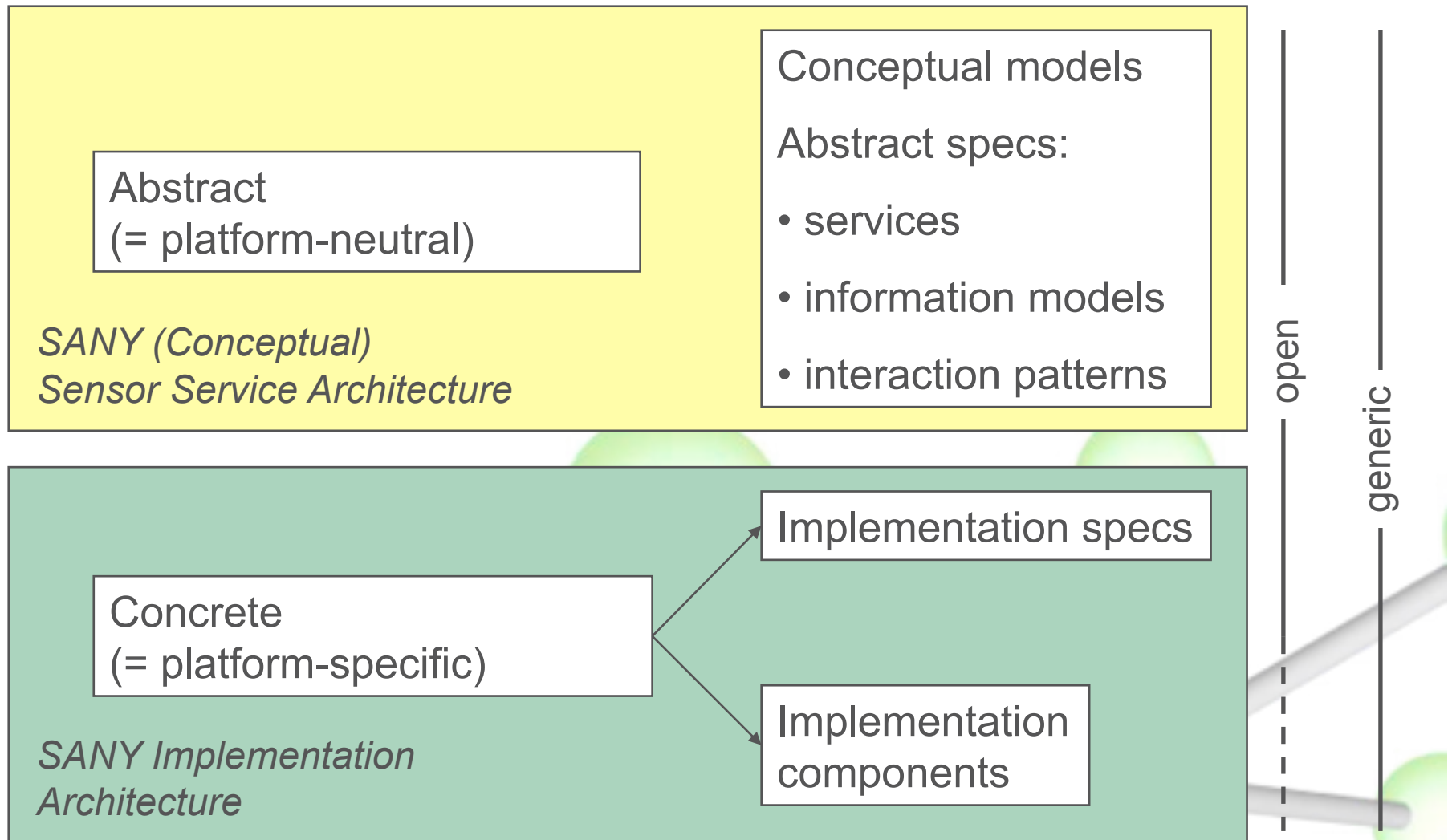
* ORCHESTRA Architecture

- Reference Model for the ORCHESTRA Architecture (RM-OA) = *OGC Best Practices document 07-097*
- Service Specifications and Implementations

* OGC Sensor Web Enablement (SWE)

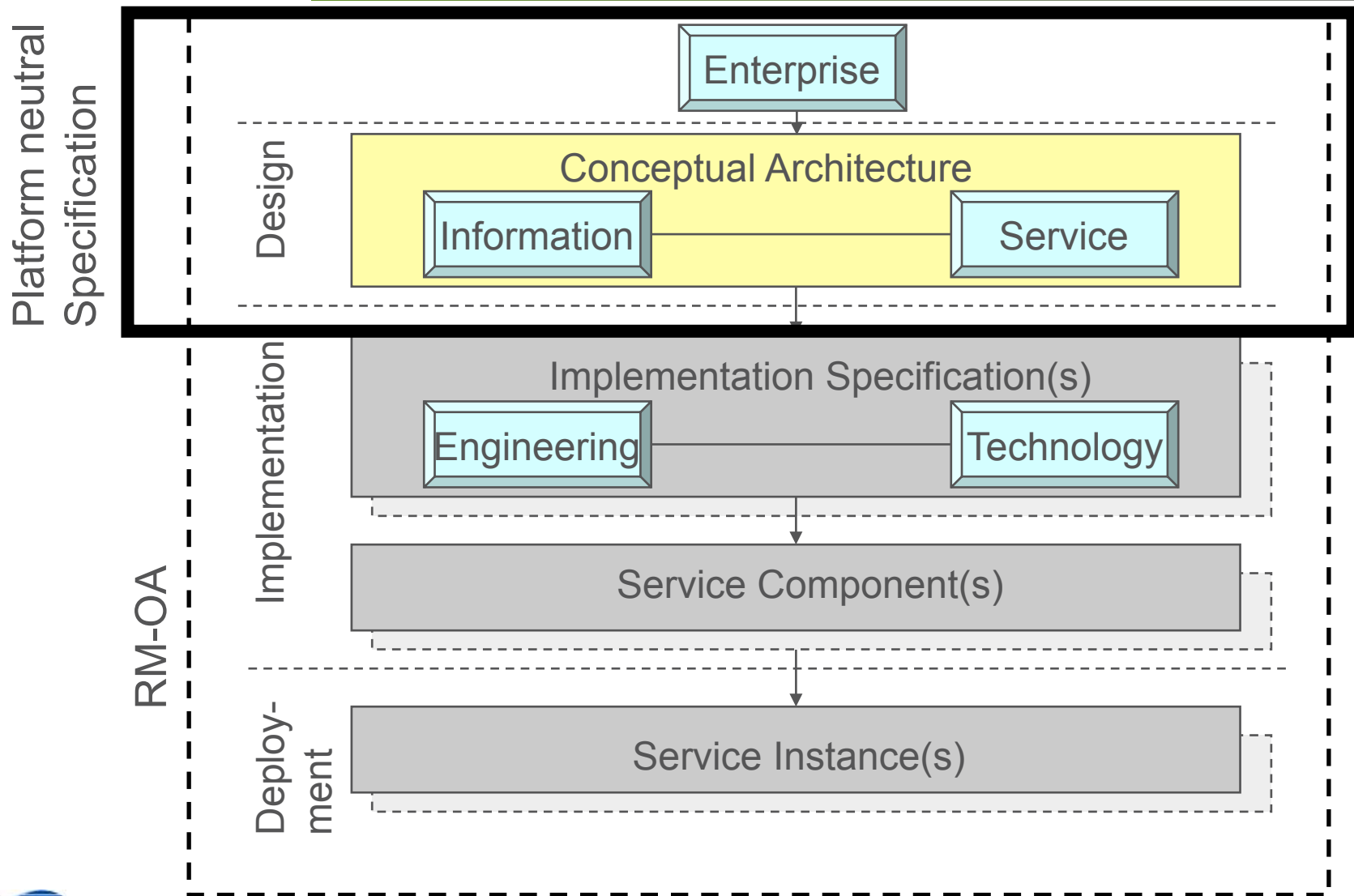
- SWE Services (SOS, SPS, SAS, WNS)
- Sensor Markup Language (SensorML)
- Observations & Measurement (O&M)

* State-of-the-art concepts and technologies

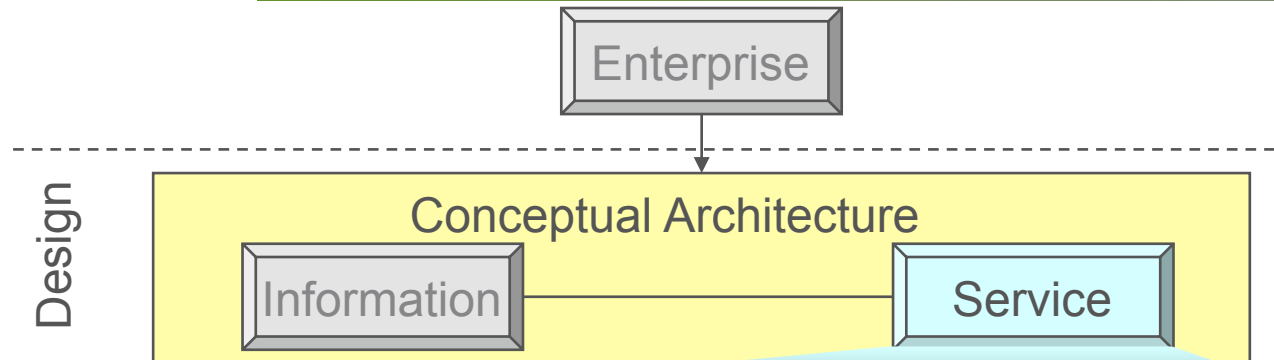


- ✱ Sensor Service Architecture design structured according to the ISO Reference Model for Open Distributed Processing (RM-ODP)
 - Compliant to OGC design process
 - Interpreted for a SOA as proposed by the ORCHESTRA Reference Model (RM-OA)

RM-ODP Viewpoints in the Architecture

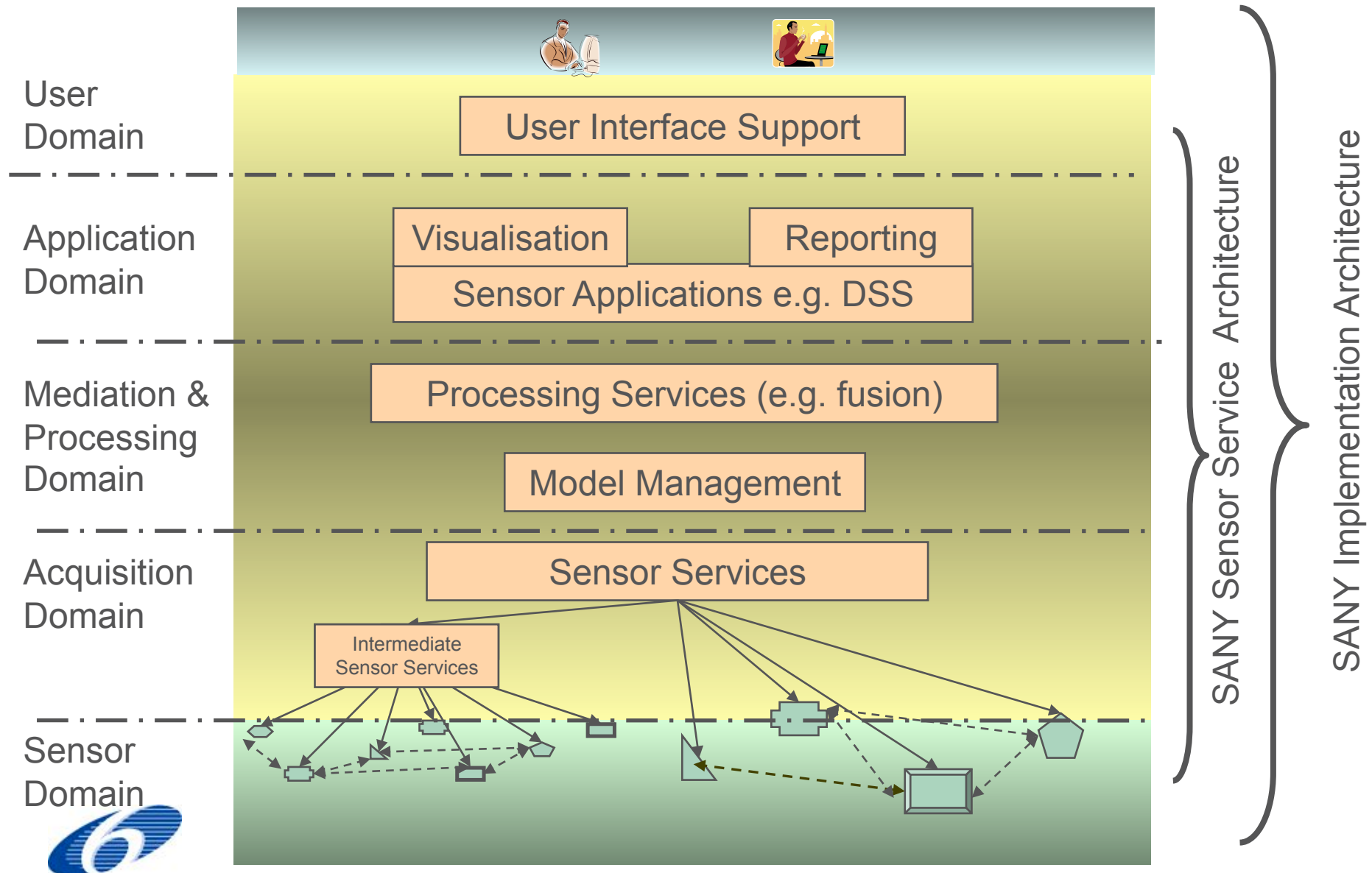


Service Viewpoint (1)

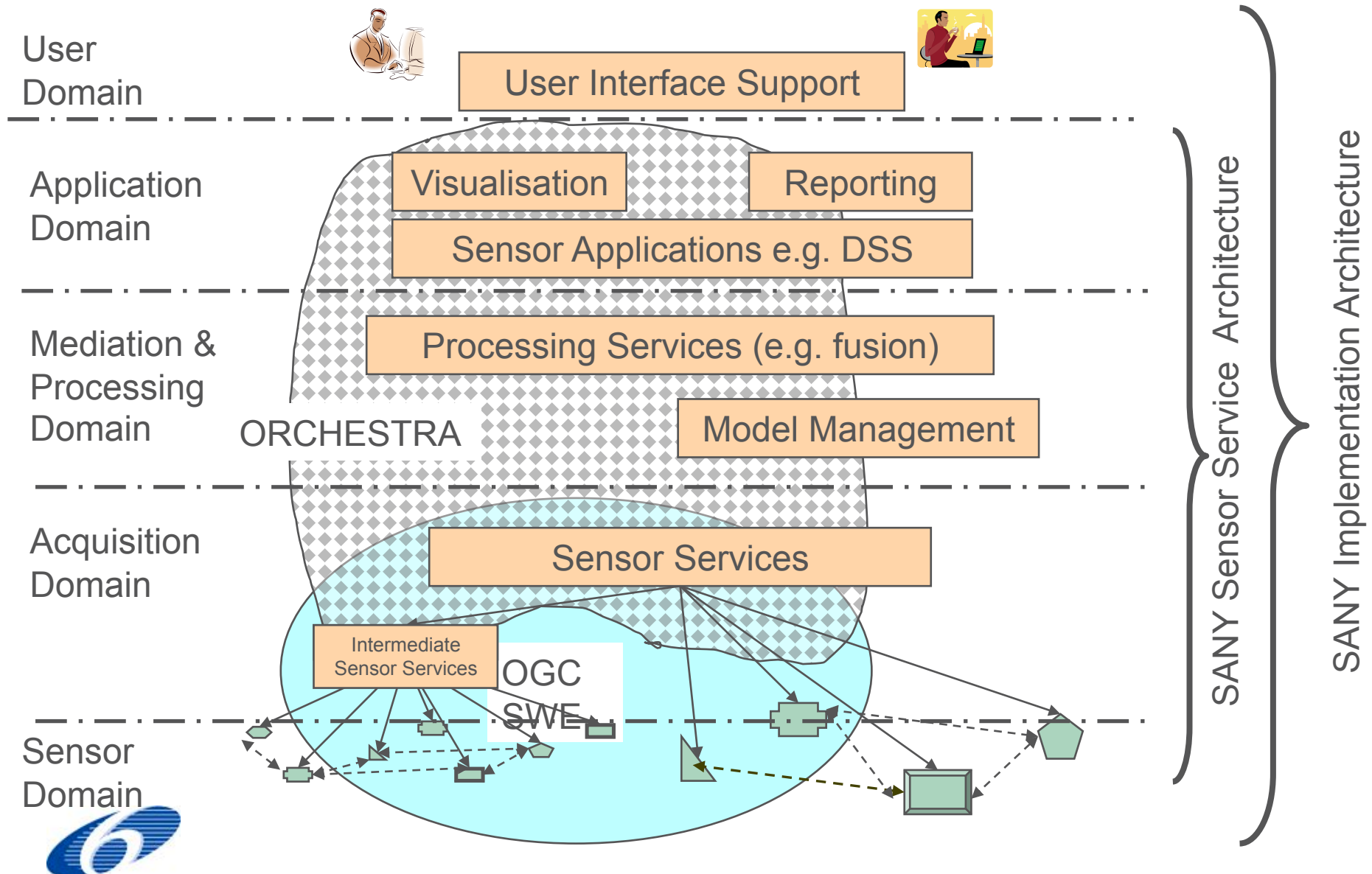


- Functional view of a sensor network in terms of services
- Specification framework for service and interface types (inherited from RM-OA)
- Provides classification of services
- Provides service and interface descriptions and specifications

Service Viewpoint (2)



Service Viewpoint (3)



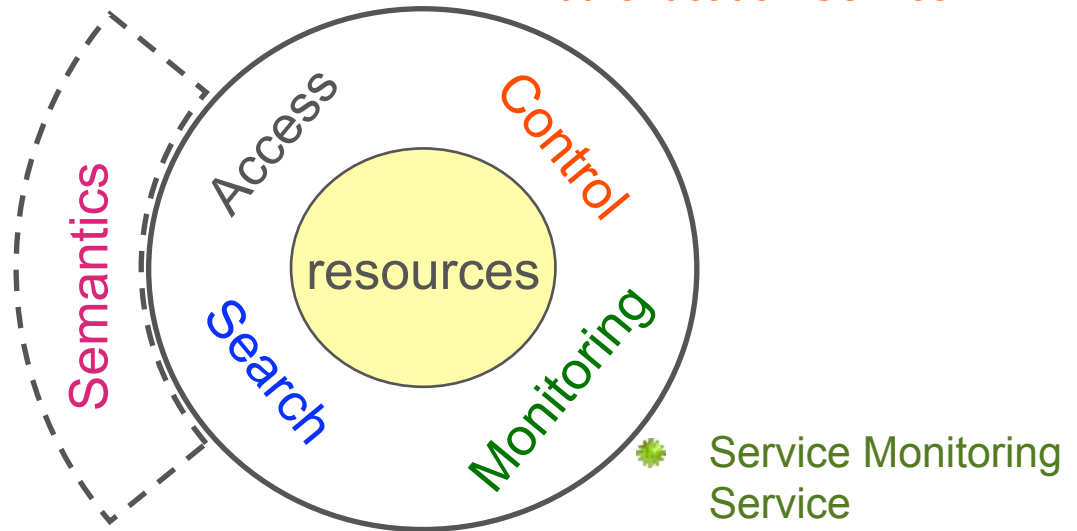
Implemented ORCHESTRA Architecture Services/Interfaces

- ✱ Service Capabilities I/F
- ✱ Feature Access Service
- ✱ Map and Diagram Service
- ✱ Schema Mapping Interface
- ✱ Coordinate Operation Service
- ✱ Service Chain Access Service

- ✱ Ontology Access Interface
- ✱ Inferencing Interface
- ✱ Annotation Service

- ✱ Catalogue Service

- ✱ User Management Service
- ✱ Authorisation Service
- ✱ Authentication Service



Primary SANY Service Extensions

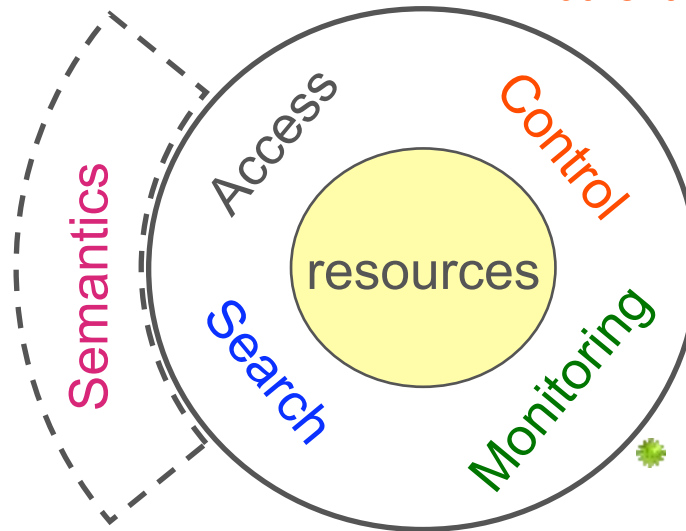
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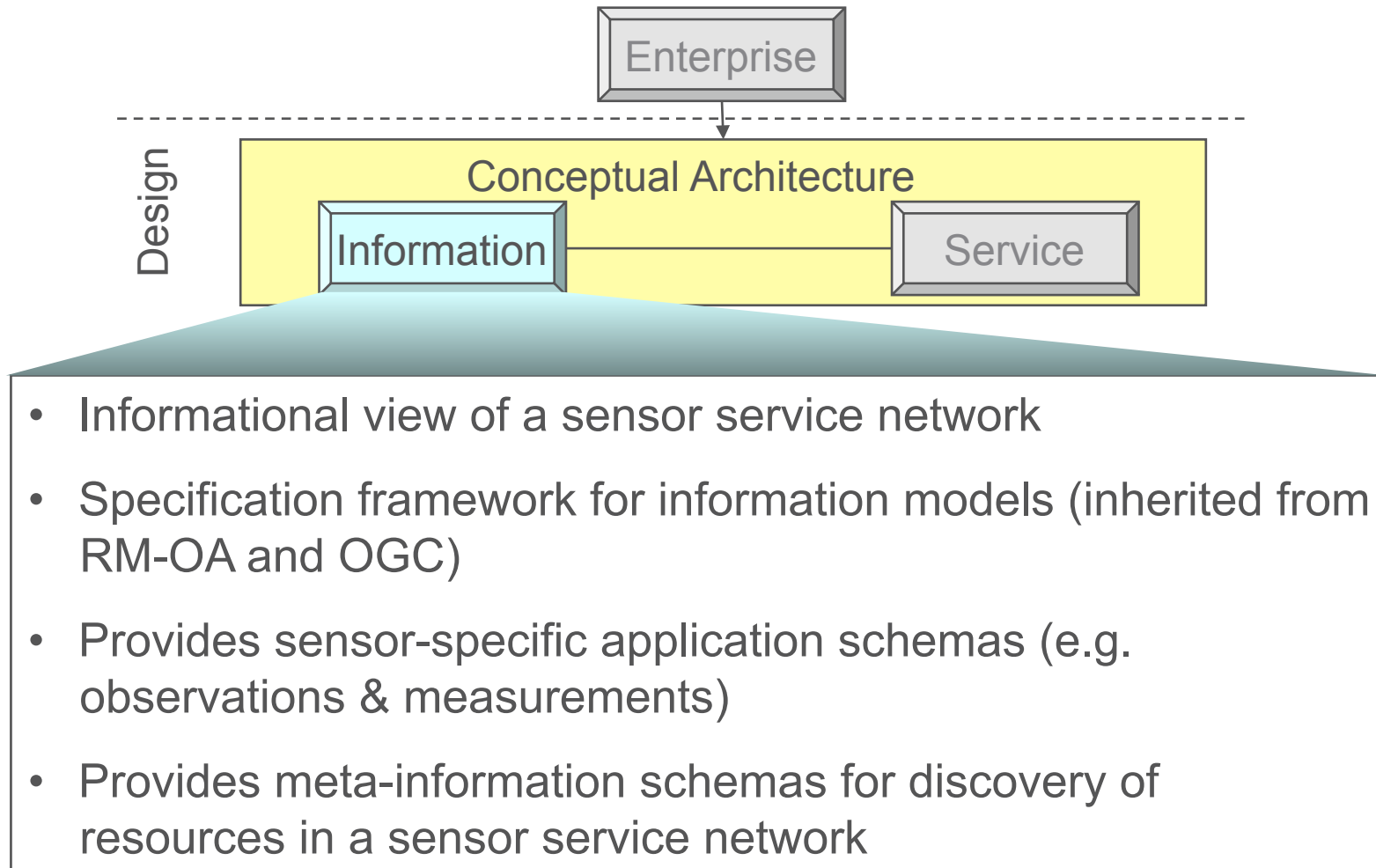


Service Monitoring Service

OGC SWE:

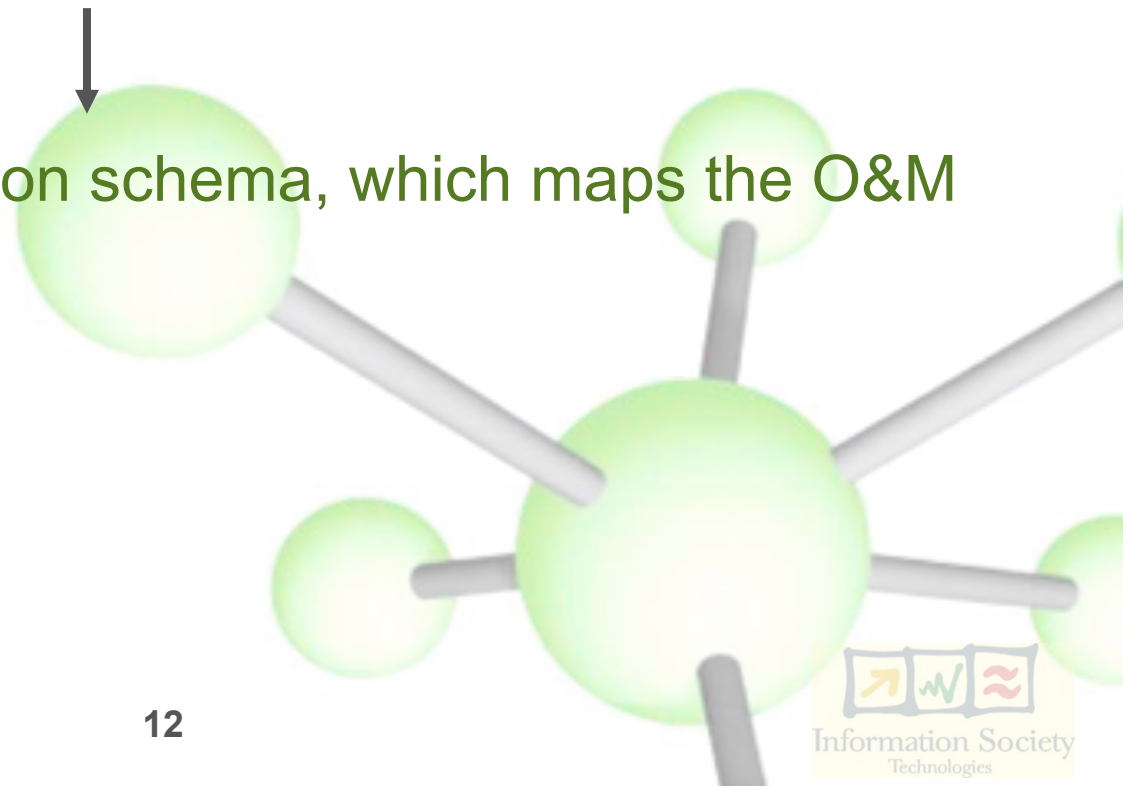
- Sensor Observation Service**
- Sensor Alert Service
- Sensor Planning Service
- Web Notification Service

Information Viewpoint

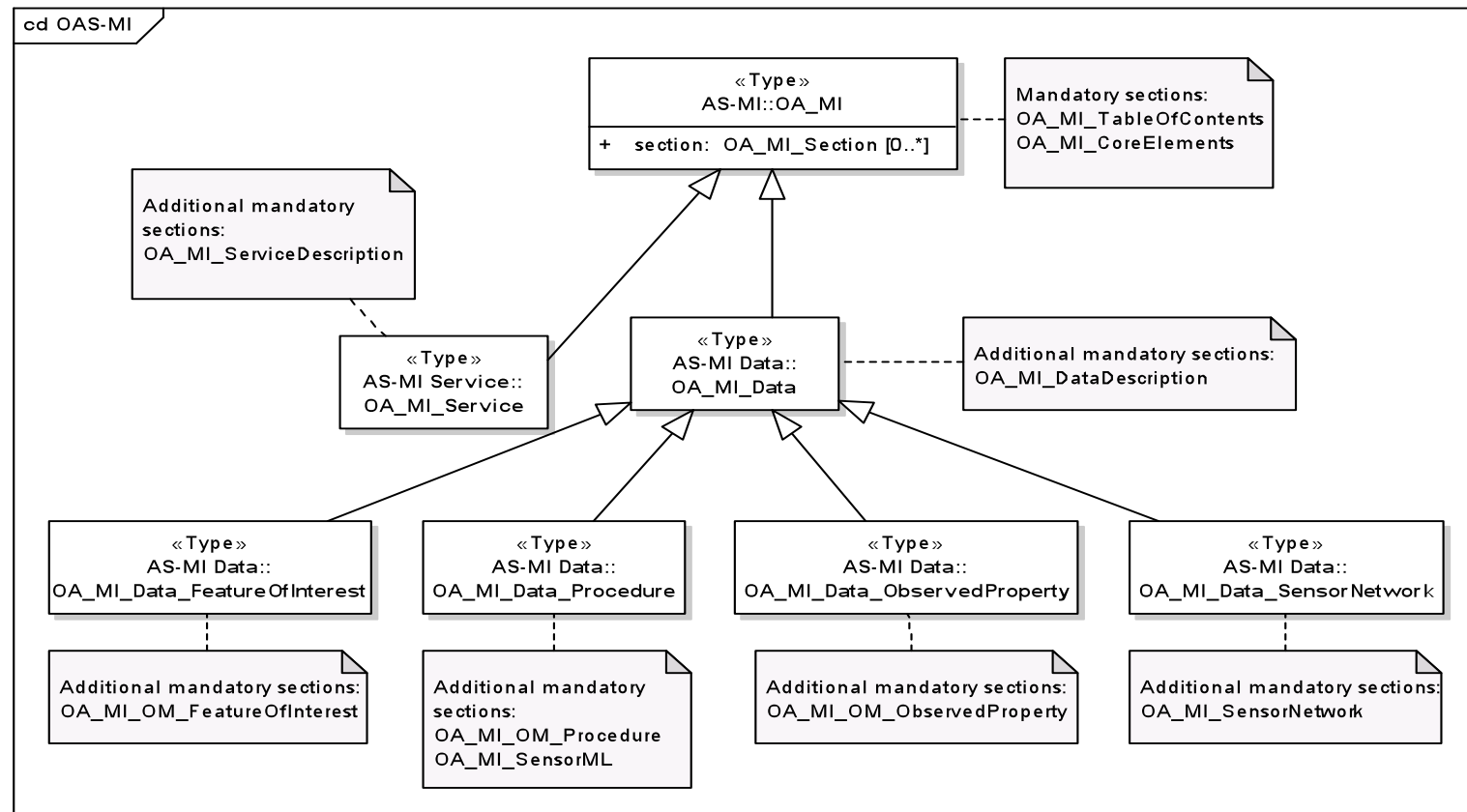


- ✱ The technical requirements of SANY related for discovery describe the need for:
 - Discovery of feature of interests
 - Discovery of observable properties
 - Discovery of procedures

Need for a meta-information schema, which maps the O&M model.

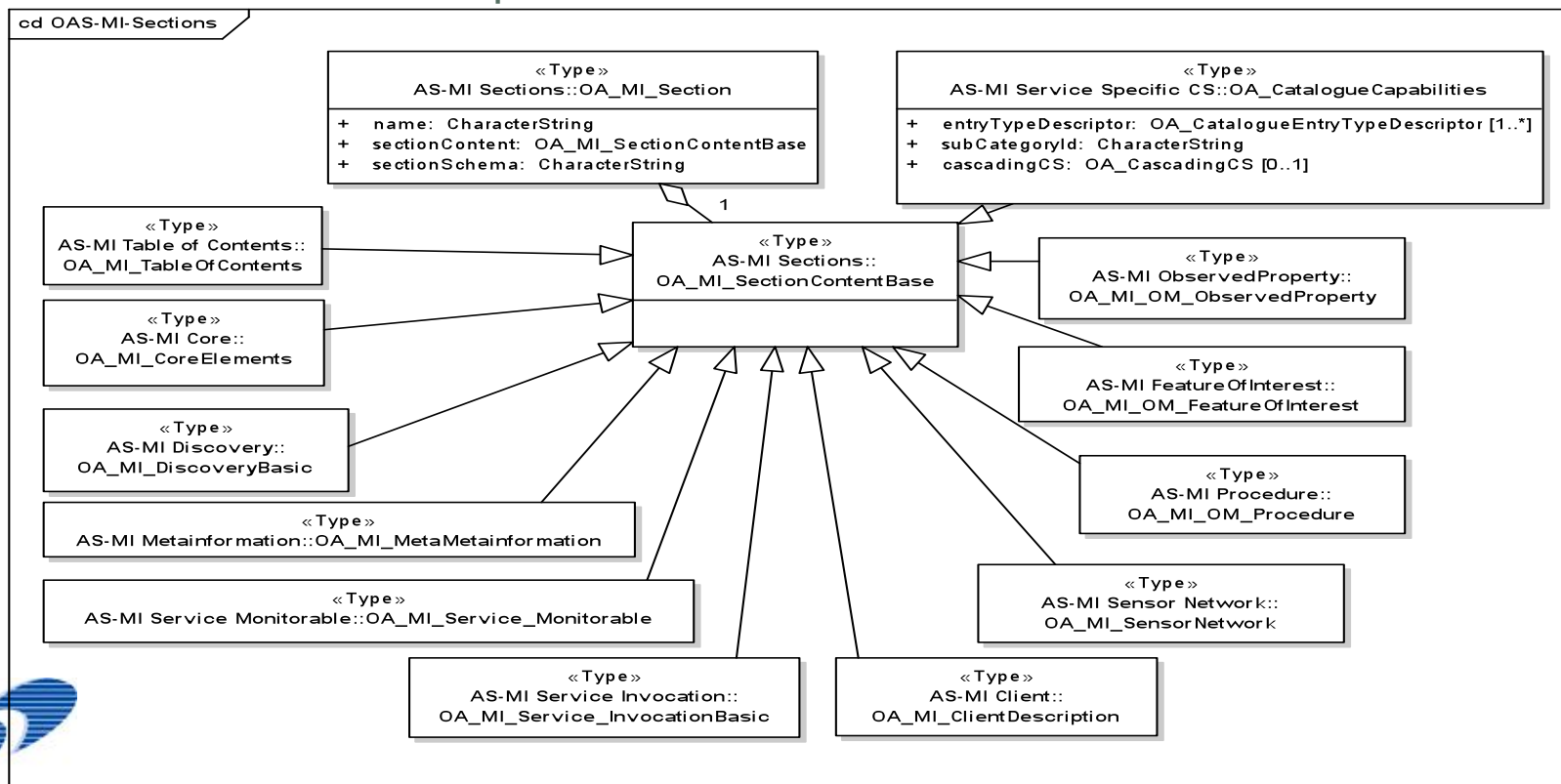


- Definition of an Application Schema for Meta-information (AS-MI):
 - Adoption of OGC Observations and Measurements principles for observation discovery
 - Available resource types



AS-MI is modular and flexible

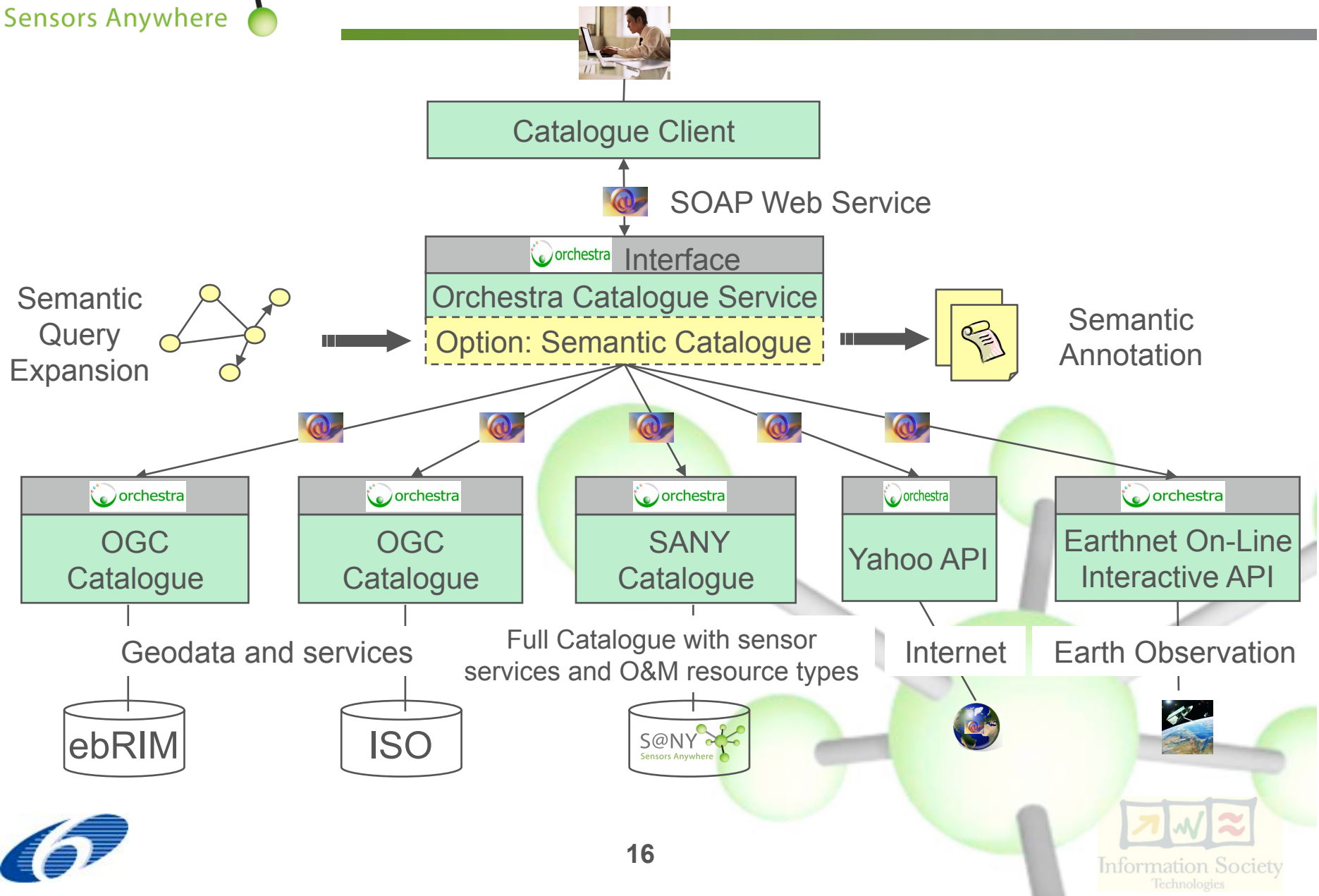
- AS-MI is structured into sections
- Minimum mandatory sections are table of contents and core elements section
- Additional mandatory sections are depending from resource type
- Other sections are optional



Currently Possible Catalogue Types

Catalogue Type	Description
Full Catalogue	catalogue containing information about all defined resources types
Feature Catalogue (Section: OM_FeatureOfInterest)	catalogue containing features, defined by a classification scheme of feature types including their identifiers, their names and human-readable descriptions (possibly in multiple languages), together with their spatial reference
Property Catalogue (Section: OM_ObservedProperty)	catalogue containing observed properties, defined by a classification scheme of property types including their identifiers, their names and human-readable descriptions
Procedure Catalogue (Section: OM_Procedure)	catalogue containing sensors or procedures, defined by a classification scheme of sensor types including their identifiers, their names and human-readable descriptions
Sensor Catalogue (Section: SensorML)	catalogue containing information about instances of sensor types available in a SANY Sensor Service Network.
Service Catalogue (Section: ServiceDescription)	catalogue containing information about instances of service types available in a SANY Sensor Service Network.

Semantic Catalogue



- ✱ Structured according to the RM-ODP viewpoints as well
 - Technology Viewpoint: several forms of a sensor
 - Engineering Viewpoint: connection of sensors to a communication network
 - Service Viewpoint: interfaces of a sensors to the outside world:
 - Access interface (e.g. OGC Sensor Observation Service)
 - Management interface (e.g. Service Monitoring, OGC Sensor Planning Service)
 - Information Viewpoint: focus on what information is being offered by the sensor (→ OGC Observation and Measurements model)

Topics to be refined in next versions

- ✱ Security
- ✱ Sensor and Service Network Management
- ✱ Event-driven architectures
- ✱ Ad hoc sensor network (“plug and measure”)

