Presenter: **Szalai, Sándor** (Hungarian Meteorological Service (OMSZ)), szalai.s@met.hu

Co-author: Mr Omar Baddour, Chief Division World Climate Data and Monitoring Programme. (OBaddour@wmo.int)

Abstract ID: 3O3

Meta Data of the WMO WIS

Abstract not available

ISO 191xx series of geographic information standards

Omar Baddour and the WIS group

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Contents

- Presentation of ISO TC-211

- Generalities on ISO 191xx
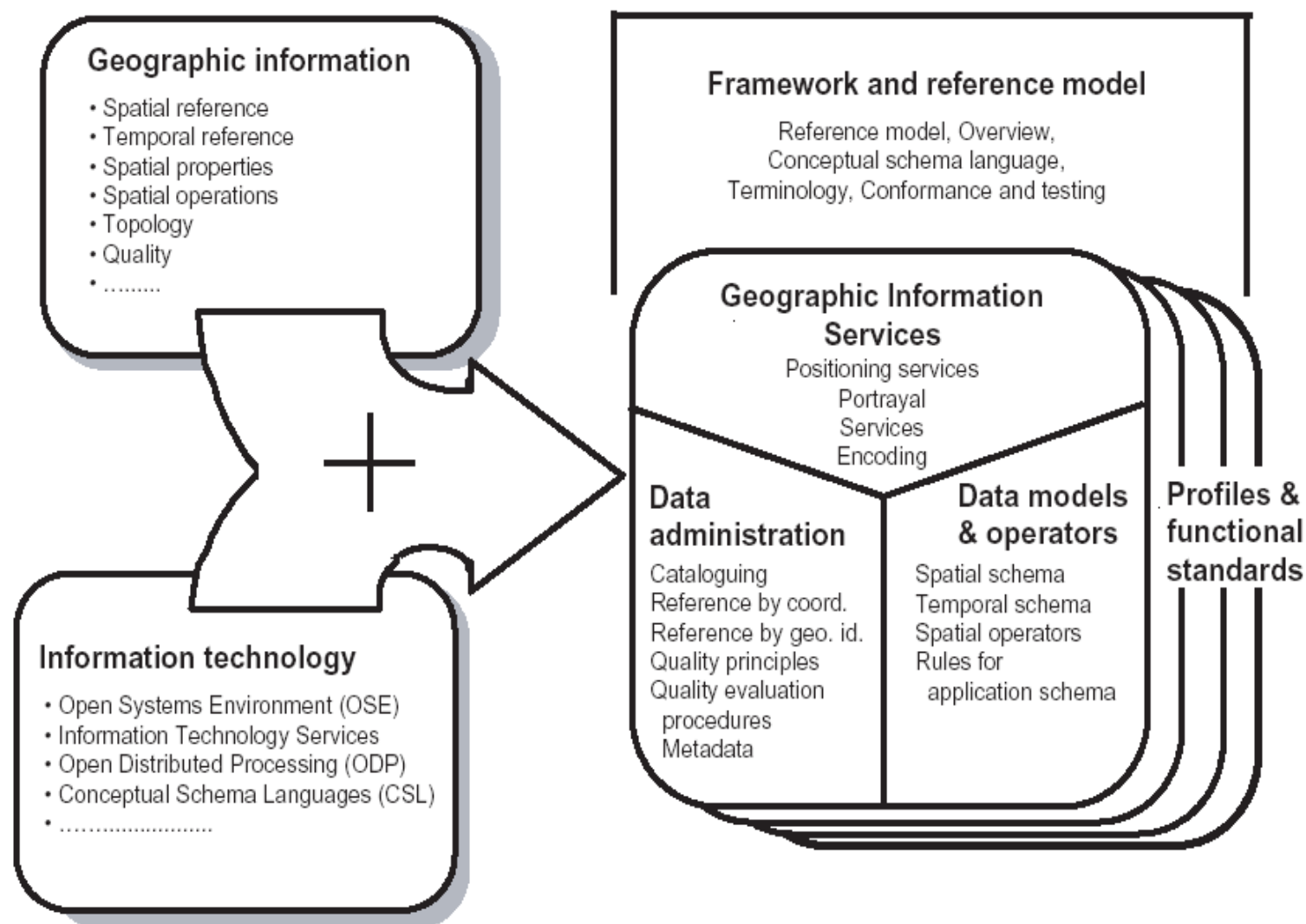
- Reference models for ISO 191xx

ISO TC 211

The ISO 191xx series are developed by the ISO Technical Committee 211 including

– 29 participating countries

– 31 observing countries

– Liaisons with 26 organizations (OGC, CEOS, FAO, ICAO, IHB, WMO, etc.)

http://www.isotc211.org/

Generalities - ISO 19101 - Concepts

Geographic information

- Spatial reference
- Temporal reference
- Spatial properties
- Spatial operations
- Topology
- Quality
- ....

Information technology

- Open Systems Environment (OSE)
- Information Technology Services
- Open Distributed Processing (ODP)
- Conceptual Schema Languages (CSL)
- ....

Framework and reference model

Reference model, Overview,
Conceptual schema language,
Terminology, Conformance and testing

Geographic Information Services

Positioning services
Portrayal
Services
Encoding

Data administration

Cataloguing
Reference by coord.
Reference by geo. id.
Quality principles
Quality evaluation
 procedures
Metadata

Data models & operators

Spatial schema
Temporal schema
Spatial operators
Rules for
 application schema

Profiles & functional standards

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Generalities

- A main goal of the ISO 191xx series is to facilitate the interoperability of geographic information systems
  - i.e. ability to discover, access, understand and use the information and tools, independently from the platform supporting them

Generalities

- Structured set of standards specifying methods, tools and services for the management of geographic information, including:
  - Definition of data,
  - Access to data
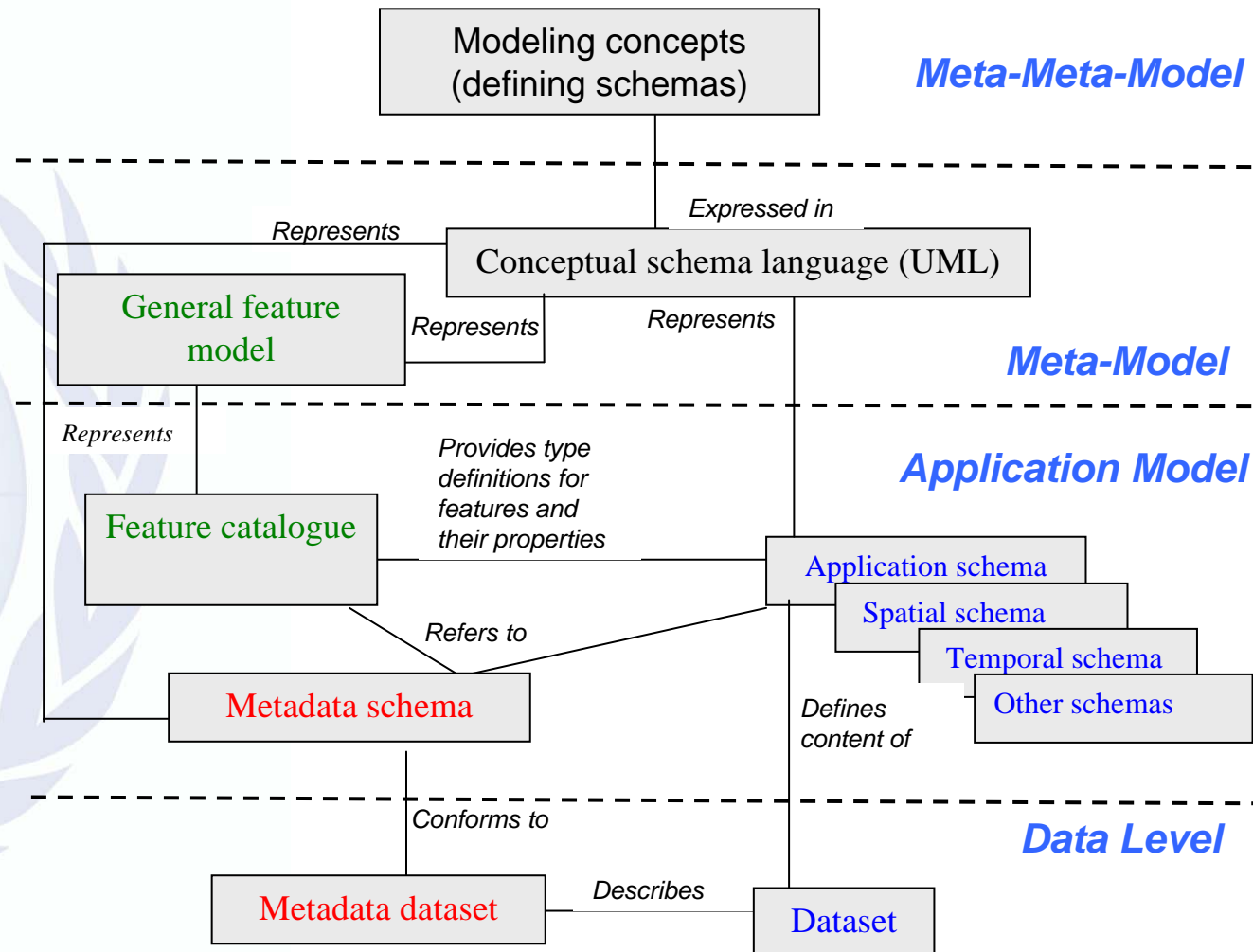 - Presentation of data
  - Transfer between users

- The ISO 191xx series comprise 51 projects for standardisation, which are at different stages of development; 34 of these projects, have been finalised and published.

- The project 19115 for metadata, very likely the most popular one, was initiated in 1996 and published as ISO standard in May 2003.

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Generalities - Profiles

- Profiles: subset of one or several of the ISO 191xx standards
- ISO 19106 describes the procedures for the development of profiles and their registrations
- Extensions to the standards may be allowed

Conceptual Schema Modelling Facilities (CSMF)

Modeling concepts (defining schemas) — *Meta-Meta-Model*

Expressed in

Represents — Conceptual schema language (UML) — *Represents*

General feature model — *Represents* — *Meta-Model*

Represents

Provides type definitions for features and their properties — *Application Model*

Feature catalogue

Application schema

Spatial schema

Temporal schema

Other schemas

Refers to

Metadata schema

Defines content of

Conforms to — *Data Level*

Metadata dataset — *Describes* — Dataset

Domain reference model - feature

- Abstraction of real world phenomena or everything with a name part of the information system
  - Feature types, e.g. observation, forecast, station, NMHS
    - Feature attributes, e.g. location of a station
    - Feature associations, e.g. a station is operated by an NMHS, observations are made at a station
    - Feature operations: to open a station

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Domain reference model - feature

- General Feature Model (ISO 19109) is meta-model for feature catalogues (ISO 19110) including the definition and description of feature types, attributes, associations and operations

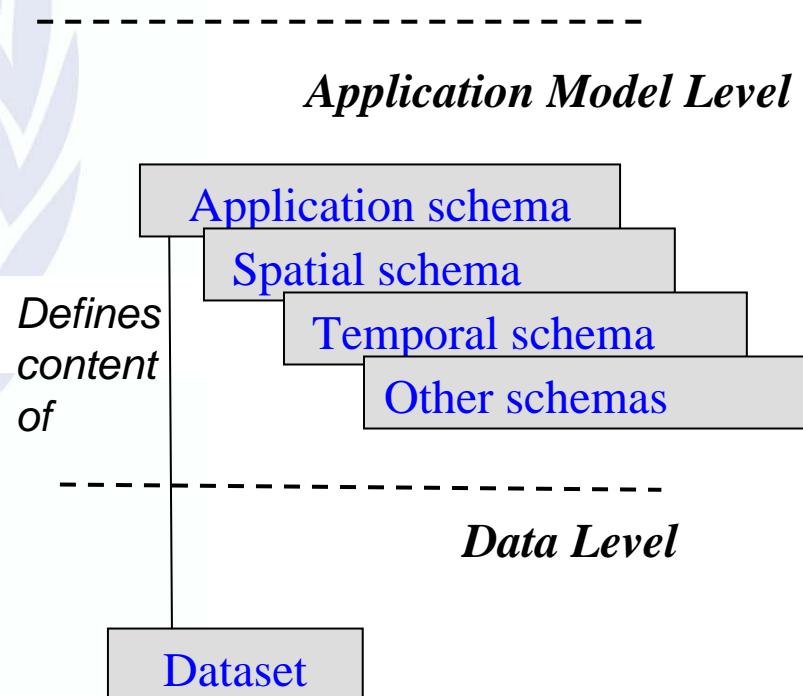| General feature model | *Meta-Model Level* |
| *Represents* | *Application Model Level* |
| Feature catalogue | |
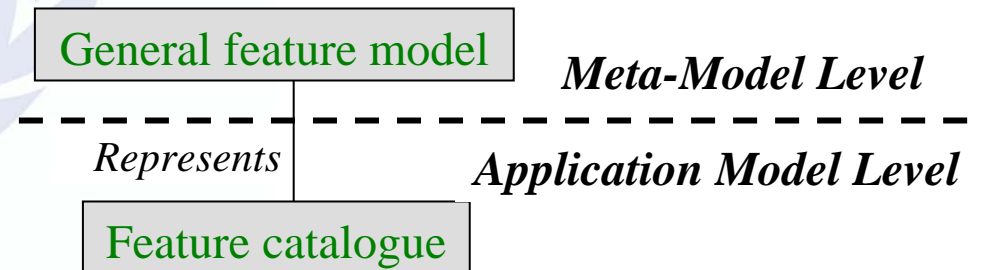
Domain reference model - feature

- Methodology (ISO 19126) for creating feature registers (ISO 19135)
- Guide for different information communities to share/develop compatible feature information registers with cross-referencing
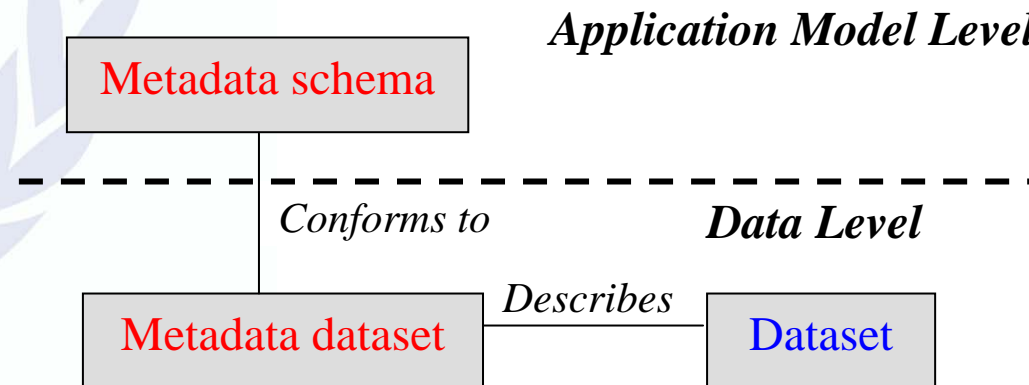
Domain reference model - Application Schema

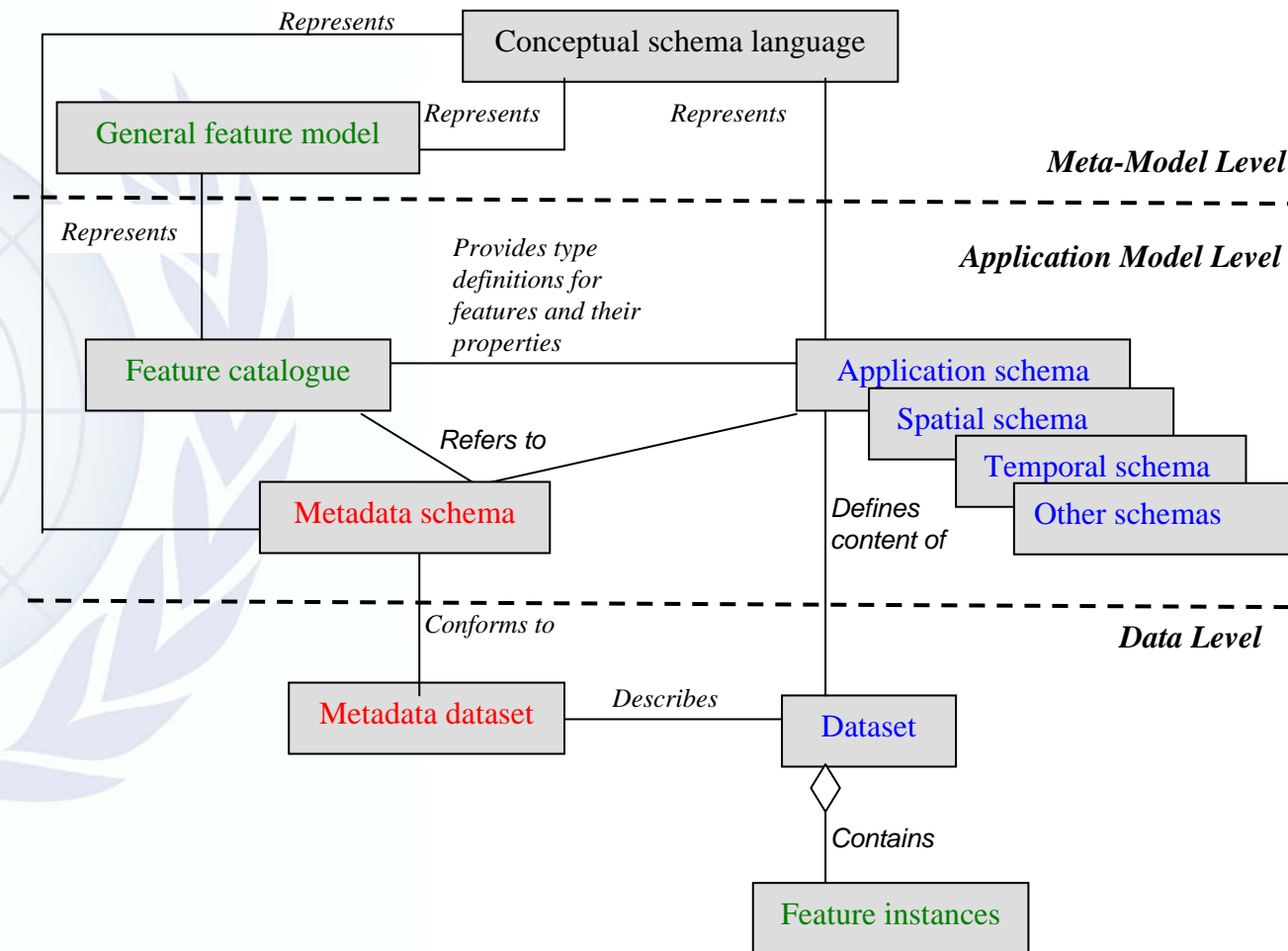- Formal description of the data structure and content of the dataset (ISO 19109)

Application Model Level

Application schema

Spatial schema

Temporal schema

Other schemas

Defines content of

Data Level

Dataset

Domain reference model - metadata
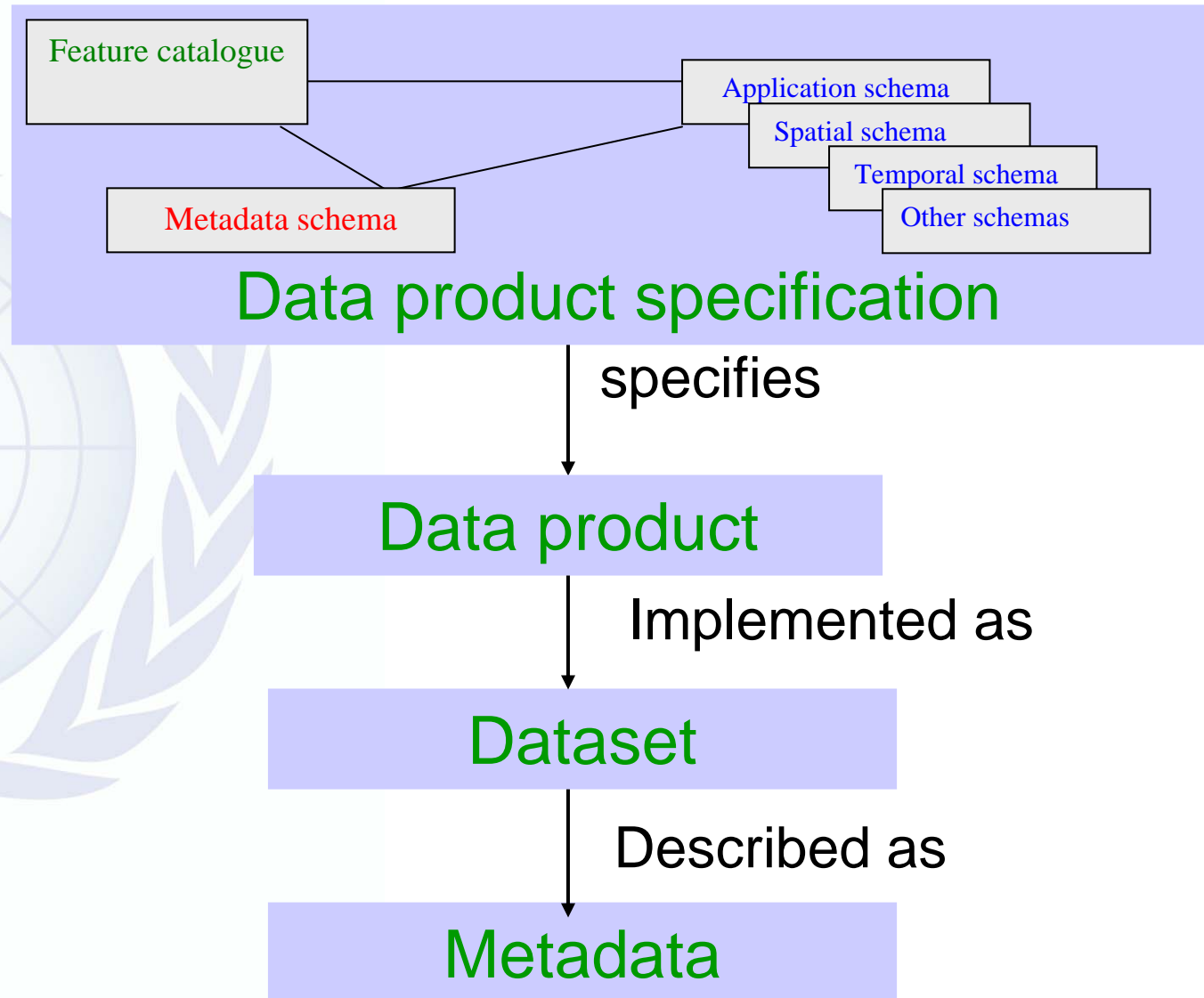
- Metadata are data about a dataset
- Metadata schema (ISO 19115) presented in UML and XML (ISO 19139)

Application Model Level

Metadata schema

Conforms to   *Data Level*

Metadata dataset   *Describes*   Dataset

Relationship between features, metadata and data within the ISO CSMF

Represents

Conceptual schema language

Represents   *Represents*

General feature model

Meta-Model Level

Represents

Provides type definitions for features and their properties

Application Model Level

Feature catalogue — Application schema

Spatial schema

Temporal schema

Refers to

Other schemas

Metadata schema

Defines content of

Data Level

Conforms to

Metadata dataset — *Describes* — Dataset

Contains

Feature instances
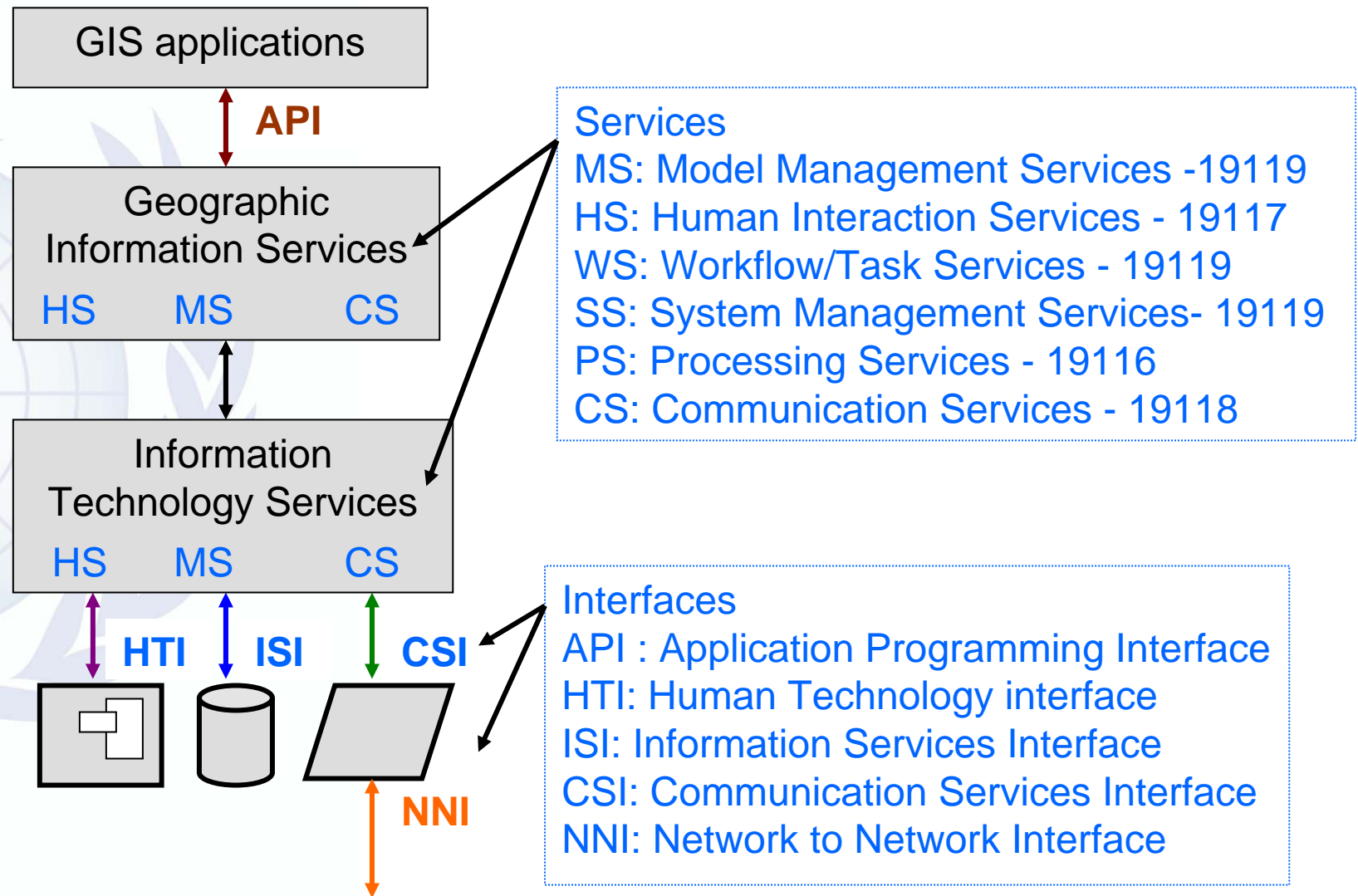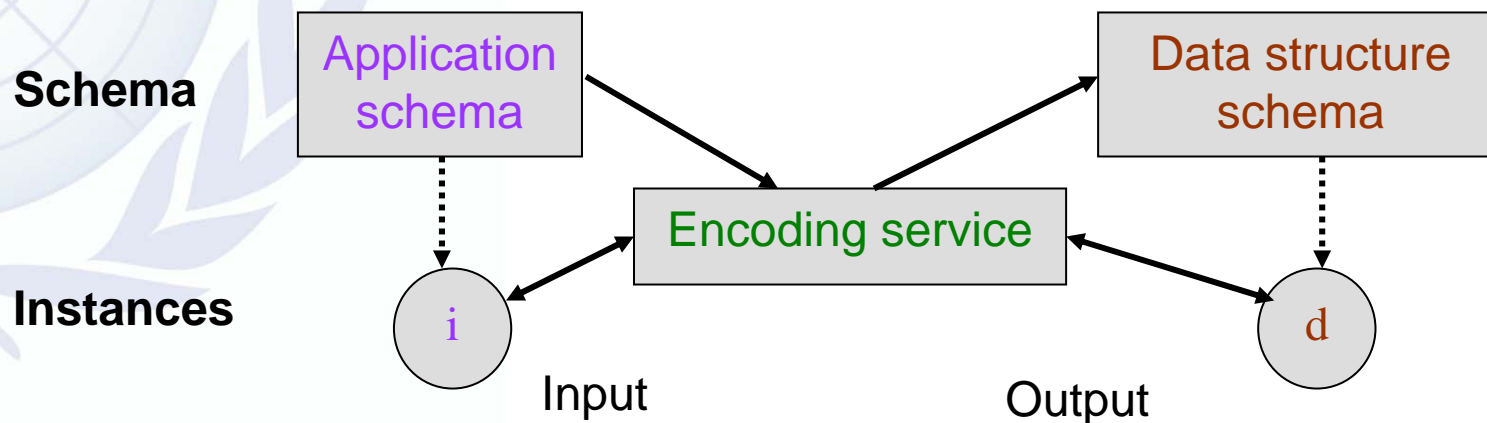
Architectural reference model

- The Architectural reference model (ISO 19101) describes the general types of services that will be provided by computer systems to manipulate geographic information and enumerates the service interfaces across which those services must interoperate (ISO 19116, 19117, 19118, 19119).

Architecture reference model

GIS applications

↕ **API**

Geographic Information Services

HS   MS   CS

↕

Information Technology Services

HS   MS   CS

HTI   **ISI**   **CSI**

NNI

Services
MS: Model Management Services -19119
HS: Human Interaction Services - 19117
WS: Workflow/Task Services - 19119
SS: System Management Services- 19119
PS: Processing Services - 19116
CS: Communication Services - 19118

Interfaces
API : Application Programming Interface
HTI: Human Technology interface
ISI: Information Services Interface
CSI: Communication Services Interface
NNI: Network to Network Interface

Architectural reference model

- Example of Communication services (CS): encoding service
  - ISO 19118 specifies the encoding rules that shall be used for data interchange purposes
  - Based on XML

Schema

| Application schema | | Data structure schema |

Encoding service

Instances

i   d

Input   Output

Thank you for your attention!