UNIVERSITAS
GADJAH MADA

May 17, 2024

Course: Geospatial Information Infrastructure

Konsep dan Implementasi OpenGIS Specification

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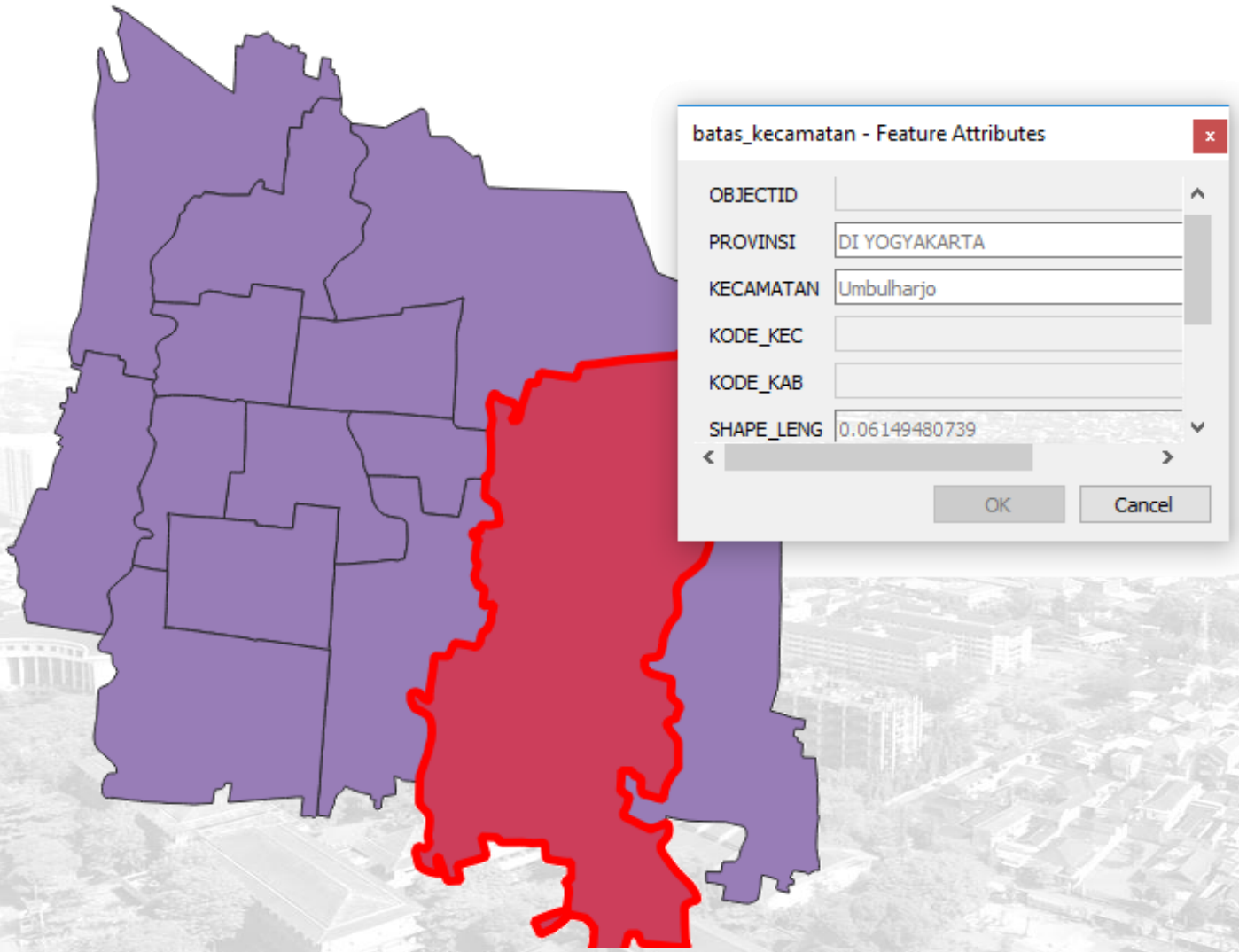
Departemen Teknik Geodesi UGM

OpenGIS Specification

- Interoperabilitas Data Spasial dan Prinsip FAIR
- Konsep OpenGIS
- Implementasi OpenGIS
- Standar OpenGeospatial Consortium (OGC)
- The Way Forward

Prinsip FAIR pada Data Spasial

Interoperabilitas Data Spasial

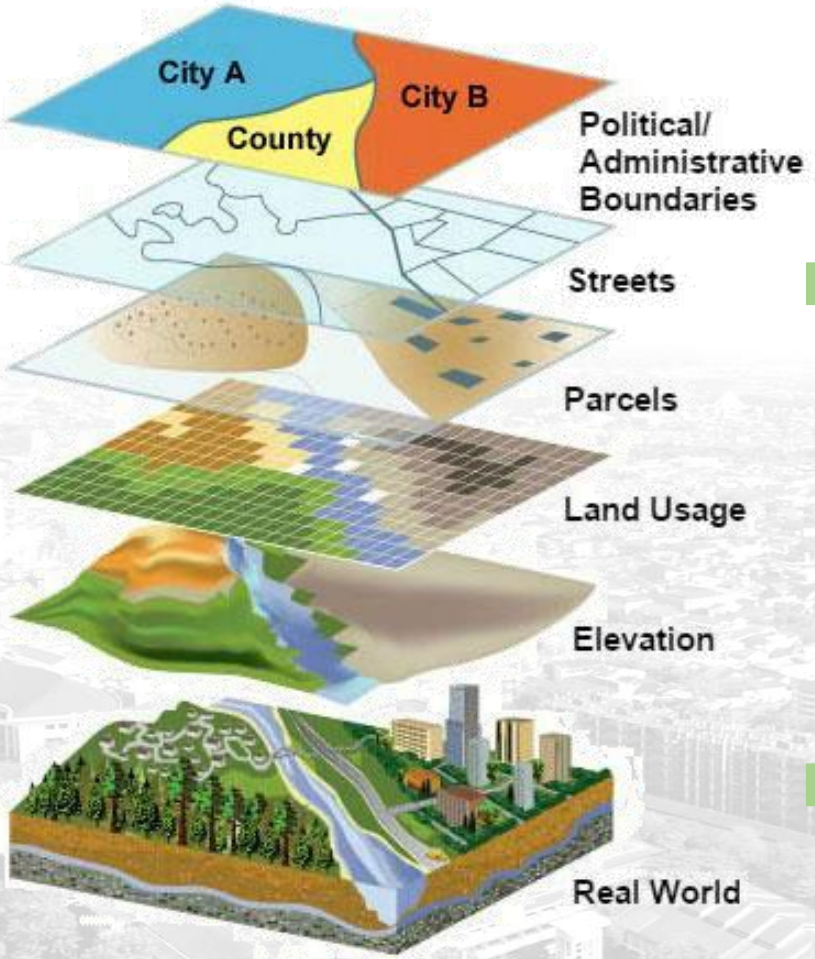


Data spasial itu

'spesial':

- ☑ Bentuk (geometry)
- ☑ Extent
- ☑ Proyeksi
- ☑ Atribut
- ☑ Waktu
- ☑ Topologi
- ☑ Dimensi

Interoperabilitas Data Spasial



Vector & Raster Spatial Data

Format Data
A

Vendor A

Format Data
B

Vendor B

Interoperabilitas

Instansi X

Instansi Y

Diskusi:

Berapa banyak format data spasial yang Anda ketahui?

Format apa yang menurut Anda paling banyak digunakan?

STRATEGY : THE DEVELOPMENT OF GEOSPATIAL INFORMATION INFRASTRUCTURE NETWORK NODES

Target : *57 Ministries, 34 Provinces, and 508 Regencies/Cities*

PerPres Nr. 85 / 2007 saat ini sudah direvisi No. 27 /2014

PerPres JARINGAN INFORMASI GEOSPASIAL NASIONAL

Pasal 4 ayat (1)

Jaringan IGN terdiri atas:

a. Jaringan IG pusat; dan

b. **Jaringan IG daerah.**

Pasal 4 ayat (2)

Jaringan IG daerah sebagaimana dimaksud pada ayat (1) huruf b meliputi **Pemerintah Daerah**.

Pasal 4 ayat (4)

Instansi Pemerintah, Tentara Nasional Indonesia, dan Kepolisian Negara Republik Indonesia sebagaimana dimaksud pada ayat (2) dan **Pemerintah Daerah** sebagaimana dimaksud pada ayat (3) bertugas sebagai **Simpul Jaringan**.

Pasal 5 ayat (3)

Dalam hal Simpul Jaringan di **Pemerintah Daerah**, unit kerja sebagaimana dimaksud pada ayat (2) merupakan **satuan kerja perangkat daerah yang ditetapkan Gubernur atau Bupati/Walikota.**

Mengapa Perlu Berbagi Peta?

Home > Ekonomi > Berita Bisnis

Insiden Pipa Pertamina, Menhub Sebut Peta KCIC Tak Lengkap

CNN Indonesia | Minggu, 27/10/2019 00:28 WIB

Bagikan :

Jakarta, CNN Indonesia -- Menteri Perhubungan (Menhub), Budi Karya Sumadi, menduga kebakaran pipa minyak milik PT Pertamina akibat pengerjaan proyek Kereta Cepat Jakarta-Bandung disebabkan peta jaringan pipa yang digunakan PT Kereta Cepat Indonesia China (KCIC) tidak lengkap. Menurut Budi, seharusnya PT KCIC selaku kontraktor Kereta Cepat Jakarta-Bandung meminta peta jaringan infrastruktur yang lengkap kepada para pemangku kebijakan.

"Pemetaannya yang tidak komprehensif. Jadi kita minta kontraktor supaya minta kepada Pertamina, PLN, bahwa ada jalur infrastruktur. Itu akan dijadikan pola kerja yang akan KCIC lakukan," kata Budi kepada awak media di Gedung PUPR, Jakarta Selatan, Sabtu (26/10).

Budi malah khawatir PT KCIC tidak memiliki peta jaringan infrastruktur tersebut. Padahal peta tersebut jadi acuan bagi KCIC untuk melakukan pekerjaan proyek kereta cepat.

Lebih lanjut, Budi mengatakan Kemenhub mendukung KCIC. Akan tetapi, Kemenhub tidak mengetahui soal koordinasi antara KCIC dengan Pertamina.

"Karena *lead* dari pembangunan itu tidak di saya, saya memang tidak mengikuti. Tapi bahwa KCIC kita support penuh. Kalau koordinasi antar lembaga itu, kami sebagai regulator tidak ikut serta," katanya.

Lihat juga: Gubernur Jabar akan Tegur KCIC soal Pipa Pertamina Terbakar

Indonesia Menangkan Gugatan Arbitrase Internasional

Oleh: **marsot** Selasa, 02 Apr 2019 04:57

BAGIKAN:

Dalam putusan pada Jumat (29/3), majelis arbiter menolak gugatan yang diajukan oleh IMFA serta memerintahkan IMFA untuk mengembalikan biaya yang dikeluarkan selama proses arbitrase kepada Pemerintah RI.

"Ini keberhasilan yang dicapai dengan jalan yang panjang," ujar Jaksa Agung HM Prasetyo di Kantor Kejagung, Jakarta, Senin 1 April 2019.

Jaksa Agung mengatakan keberhasilan penanganan perkara yang disidangkan sejak Agustus 2018 itu didukung tim terpadu yang dibentuk berdasarkan Peraturan Presiden Nomor 17 Tahun 2016

Majelis arbiter dalam putusannya menerima bantahan Pemerintah RI soal permasalahan tumpang tindih dan batas wilayah merupakan permasalahan yang telah terjadi sebelum IMFA masuk sebagai investor di Indonesia.

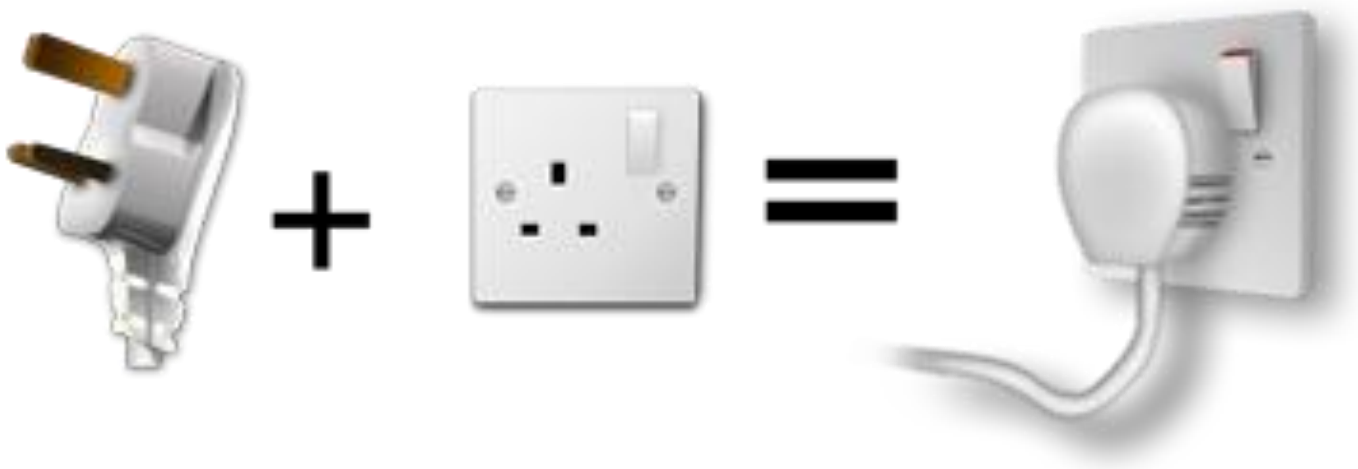
Permasalahan tersebut semestinya telah diketahui oleh IMFA sehingga Pemerintah RI sebagai negara tuan rumah tidak dapat disalahkan atas kelalaian investor.

emberikan
n Kantor
Kantor FAMS

a 24 Juli 2015
ıbangan
ı lain akibat

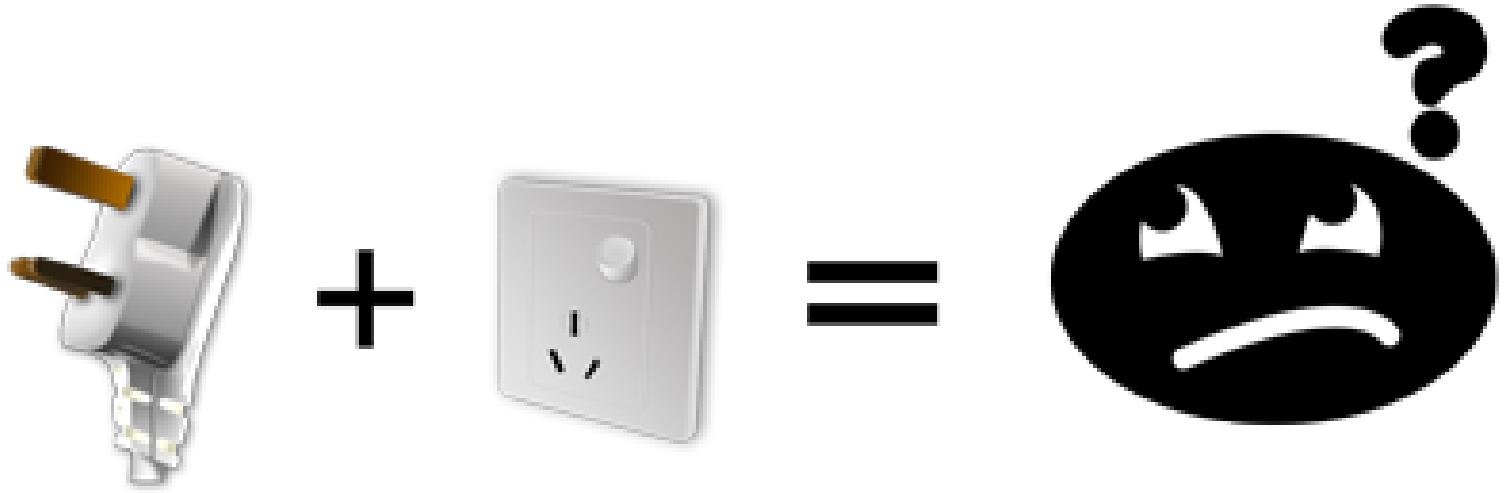
gklaim
meminta

Apa itu Interoperabilitas?



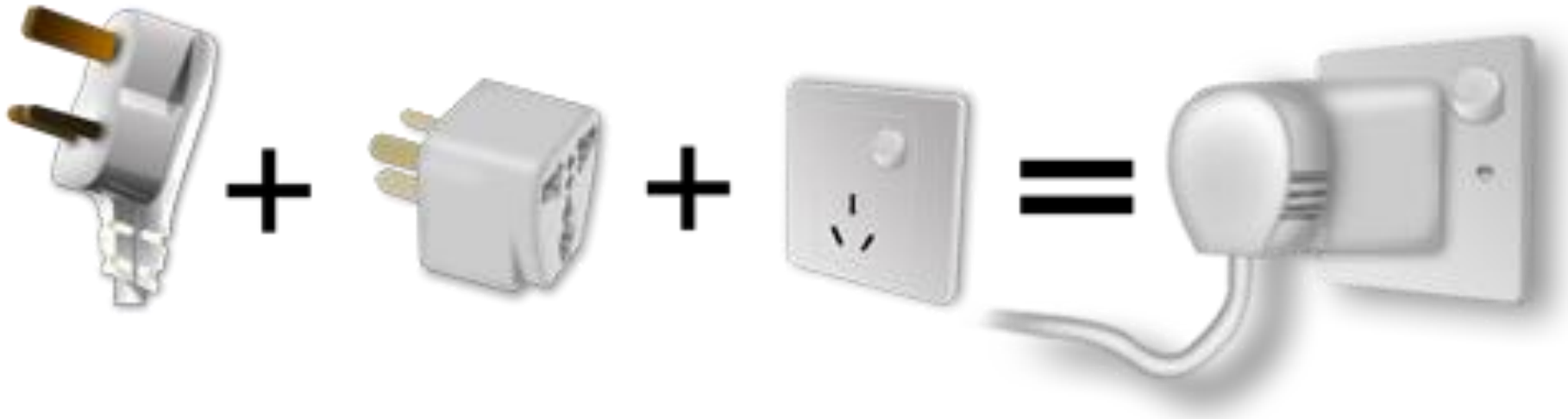
Stop kontak (dan ‘colokan’) dibuat dengan desain tertentu untuk dapat digunakan satu sama lain di negara atau Kawasan tertentu

Apa itu Interoperabilitas?



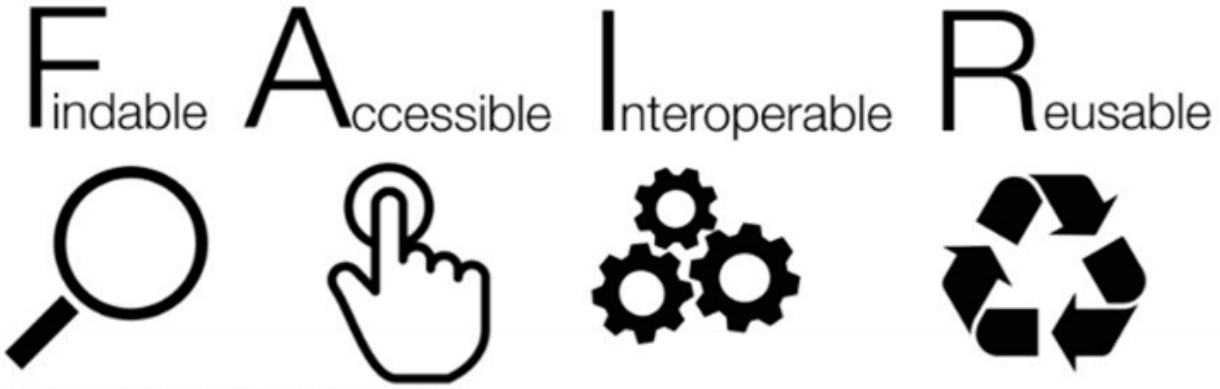
Bagaimana kalau colokan Indonesia digunakan di luar negeri?

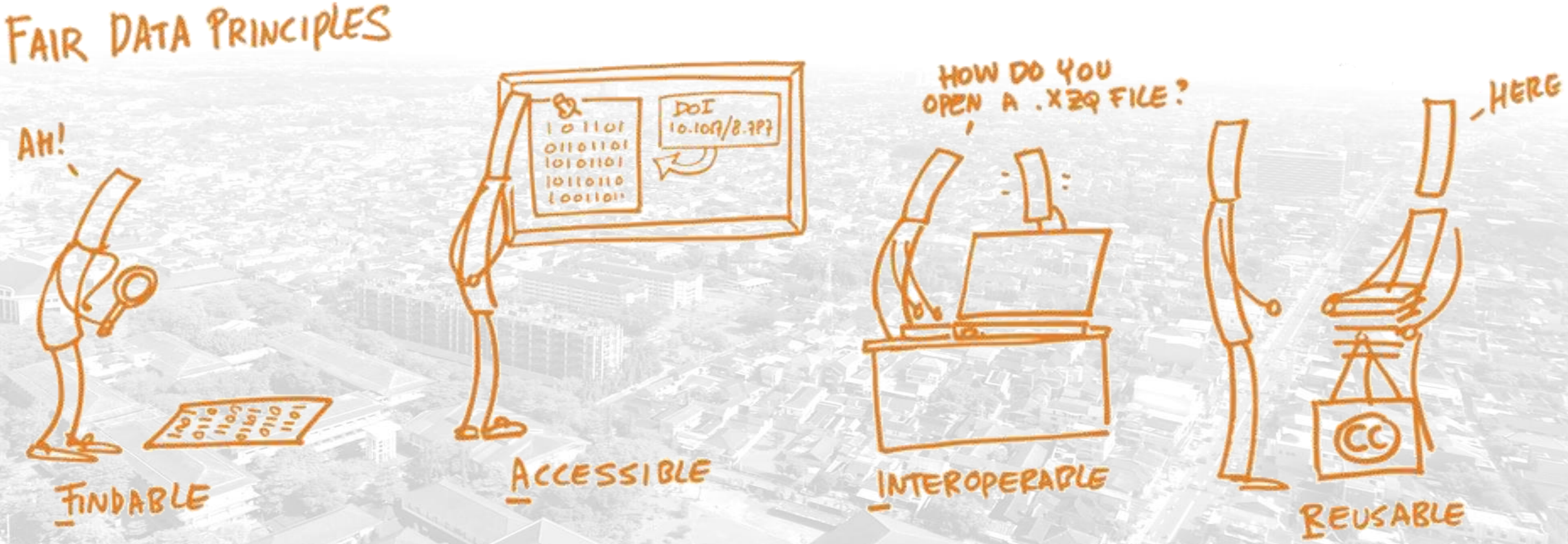
Apa itu Interoperabilitas?



Salah satu solusi adalah: menggunakan adaptor untuk menjamin colokan bisa digunakan di lokasi lain

FAIR Principle:





FAIR Principle:

FINDABLE

Unique identifiers and metadata are used to allow data to be located quickly and efficiently

ACCESSIBLE

Data is open, free and universally available for research discovery efforts

INTER-OPERABLE

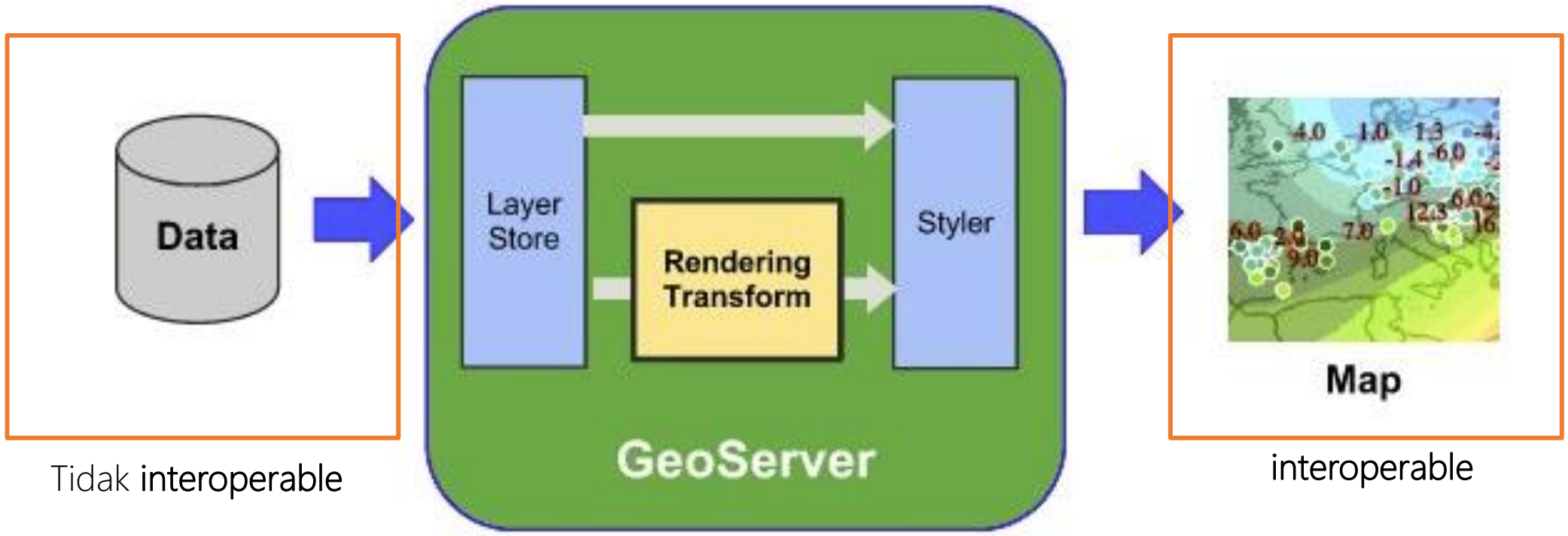
A common programming language is used to allow use in a broad range of applications

REUSABLE

All data is clearly described and outlines associated data-use standards

Menjamin Interoperabilitas

Penggunaan format layanan standar (OGC) untuk interoperabilitas data spasial



Tidak interoperable

interoperable

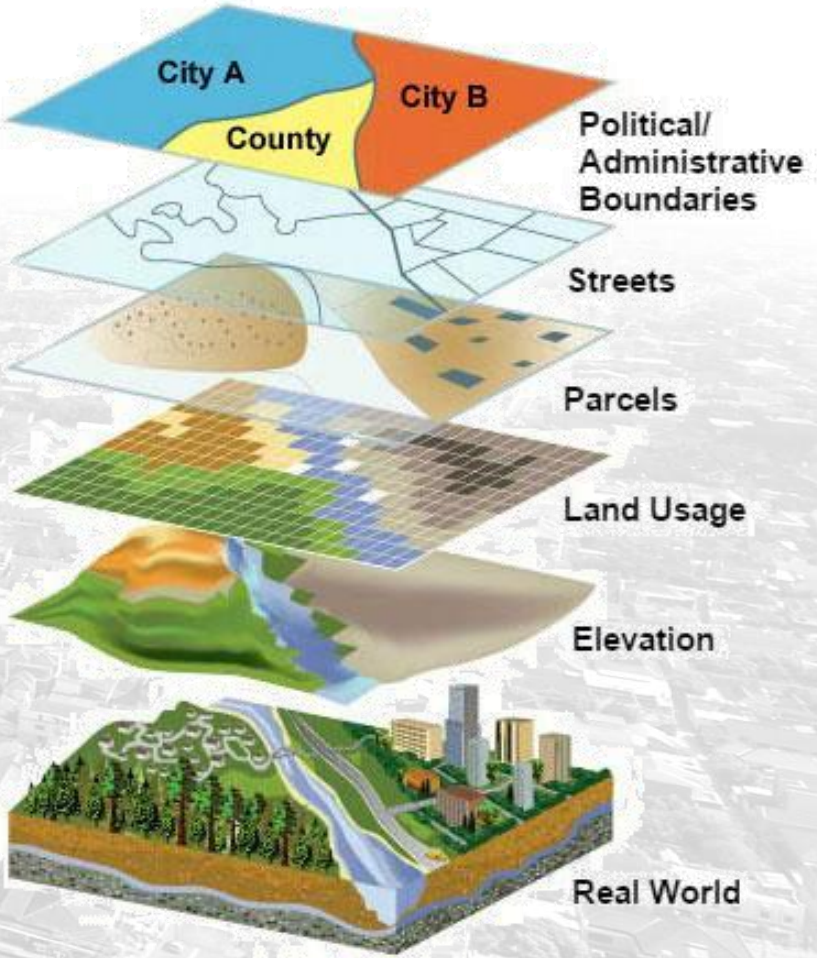
Konsep OpenGIS Specification

Spatial Data is a Model of the Real World

Real World

Abstraction Process

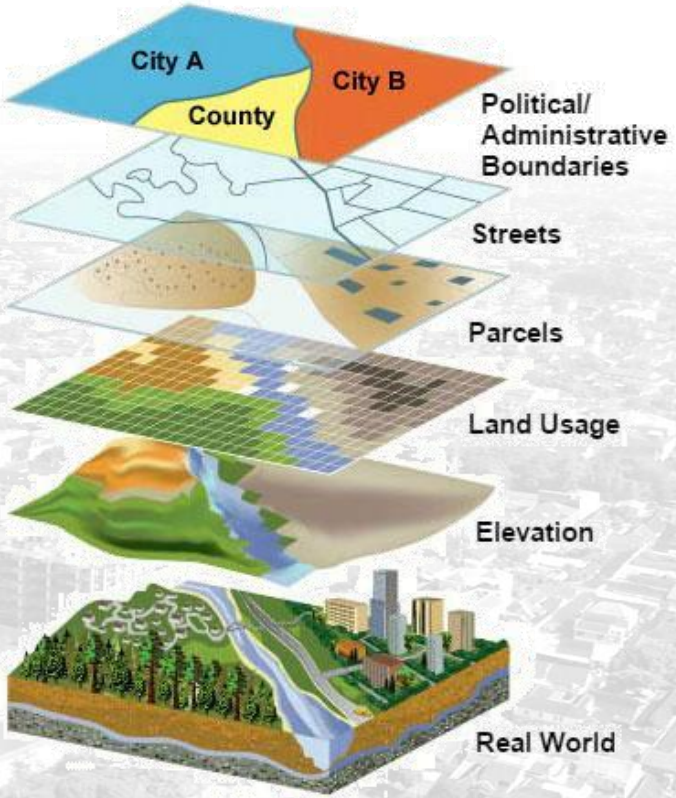
Spatial Data Model



Spatial Data is a Model of the Real World

Real World

Spatial Data Model



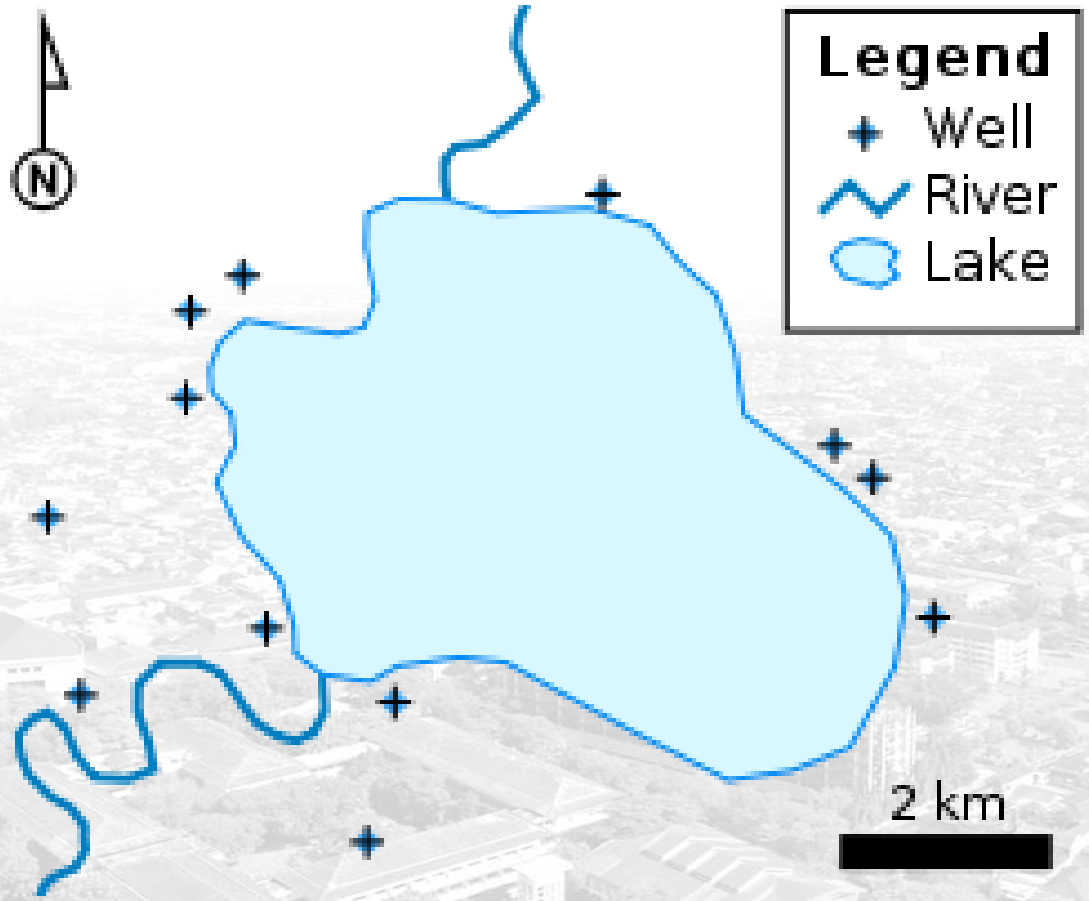
Internet GIS

How do we present spatial data on Internet according to FAIR Principle?

How to represent spatial data on the web?

Data spasial itu 'spesial':

- ☑ Bentuk (geometry)
- ☑ Extent
- ☑ Proyeksi
- ☑ Atribut
- ☑ Waktu
- ☑ Topologi
- ☑ Dimensi



Formats understood by the internet

```
<gml:LineString gml:id="p21“
srsName="http://www.opengis.net/def
/crs/EPSG/0/4326">
    <gml:coordinates>
        45.67, 88.56 55.56,89.44
    </gml:coordinates>
</gml:LineString >
```

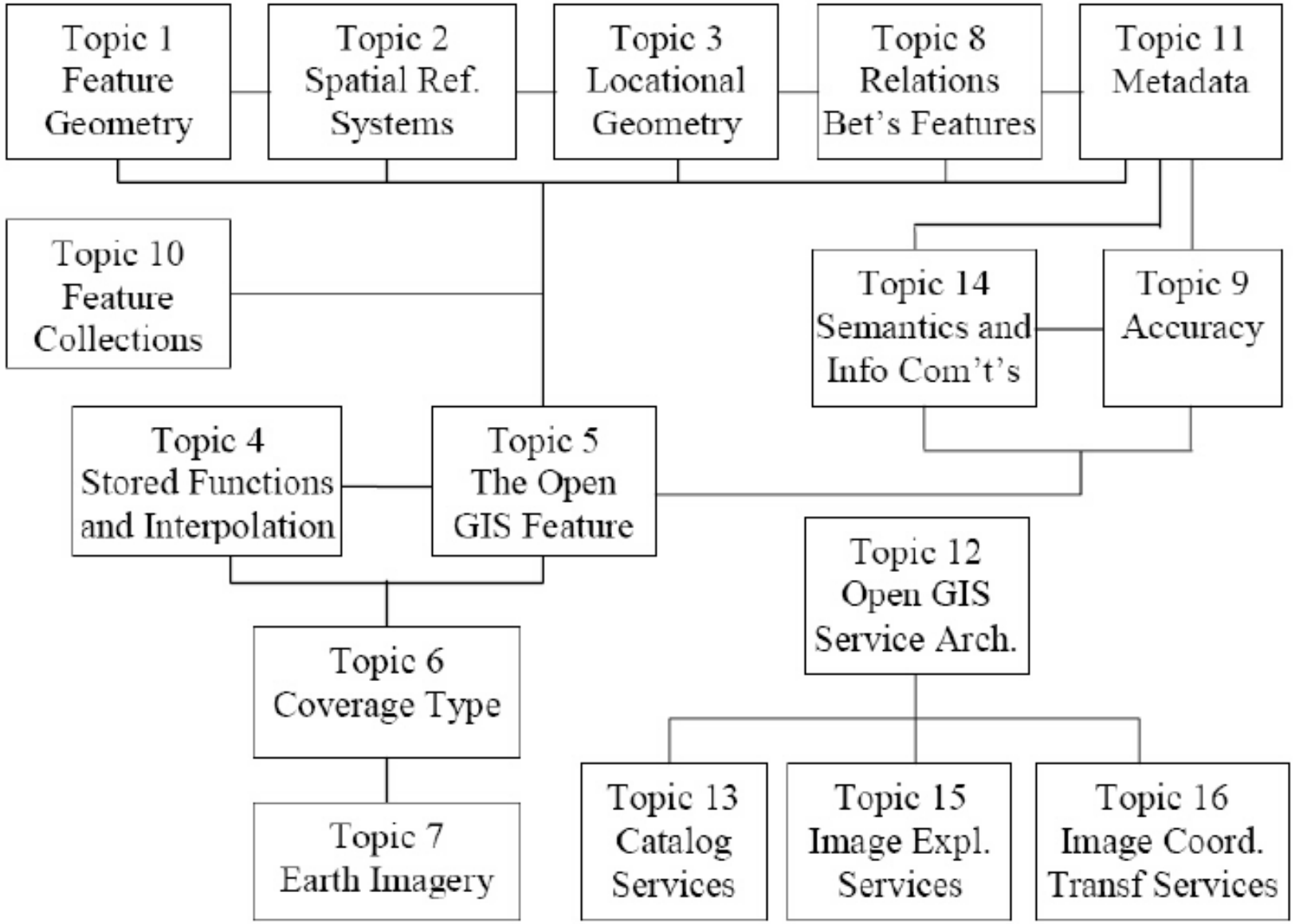
OpenGIS Specifications

- OpenGIS – Open and interoperable geoprocessing, or the ability to share heterogeneous geodata and geoprocessing resources transparently in a networked environment. "The highest level of the interoperability specification."
- OpenGIS Specification ("OGIS"). A software specification that enables geodata sharing and geoprocessing interoperability. An interface standard for interoperable geoprocessing.
- Open GIS Consortium, Inc. A member-based consensus forum dedicated to the development of OpenGIS technologies and the integration of geoprocessing into enterprise computing.

OGC®
Open Geospatial Consortium, Inc.

F.A.I.R

OpenGIS Specifications Abstract

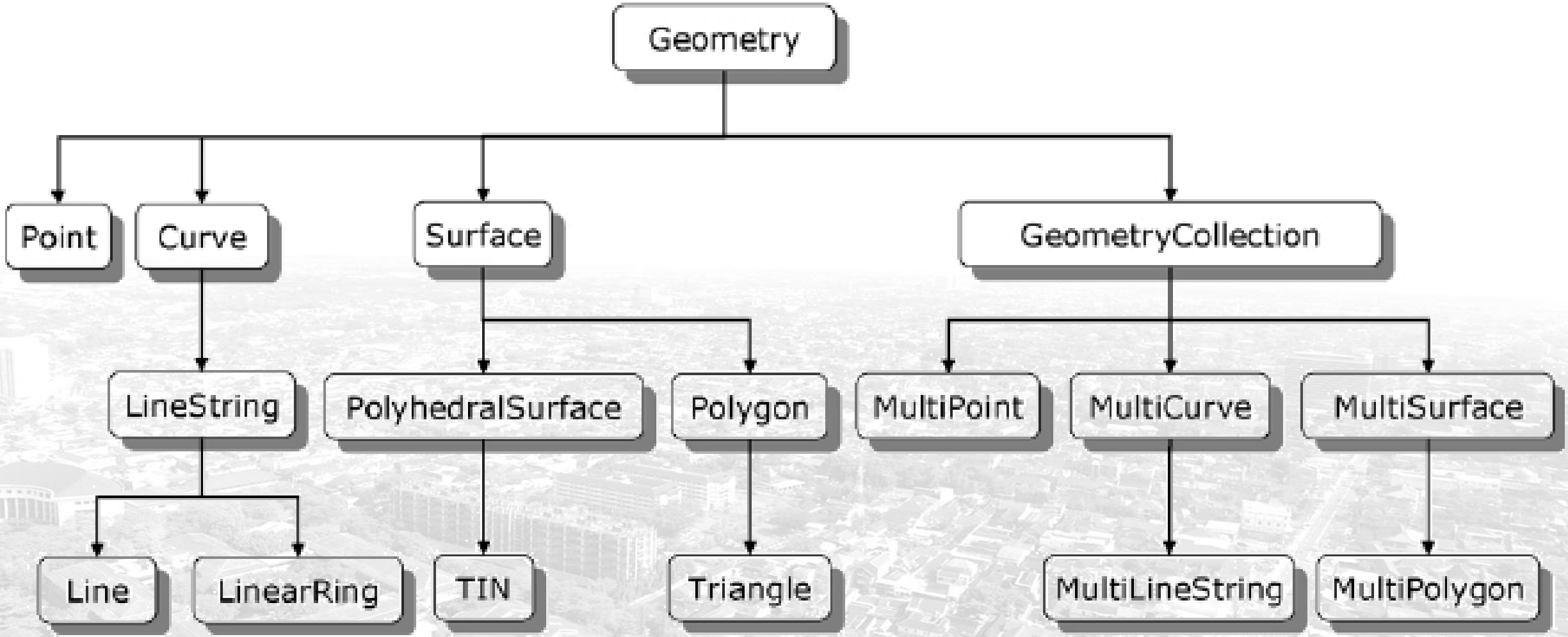


Standar untuk format, protocol dan metode akuisisi serta pencarian data spasial pada web dengan menjamin prinsip FAIR

OpenGIS Specifications Implementation

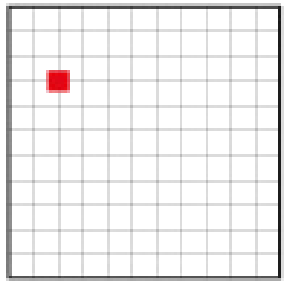
OpenGIS Simple Features Specification (for OLE/COM,CORBA,SQL)
OpenGIS Catalog Services Implementation Specification
OpenGIS Grid Coverages Implementation Specification
OpenGIS Coordinate Transformation Services Implementation Specification
OpenGIS Web Map Service Interfaces Implementation Specification
OpenGIS Geography Markup Language Implementation Specification
OpenGIS Web Feature Service Implementation Specification
OpenGIS Filter Encoding Implementation Specification
OpenGIS Styled Layer Descriptor Implementation Specification

Simple Feature Types

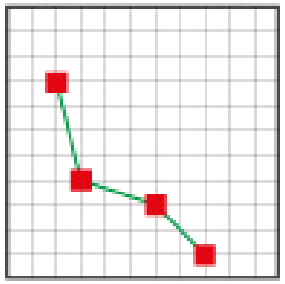


Simple Feature Types

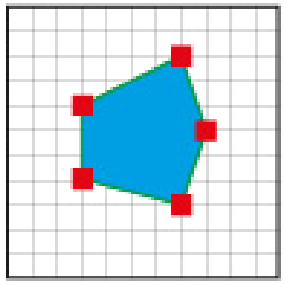
POINT(2 3)



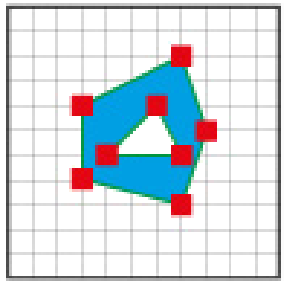
LINESTRING(2 3, 3 7, 6 8, 8 10)



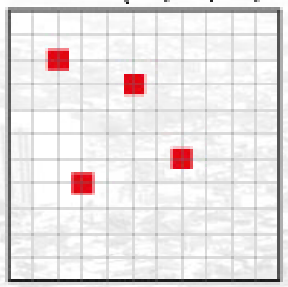
POLYGON ((3 4, 3 7, 7 8, 8 5, 7 2, 3 4))



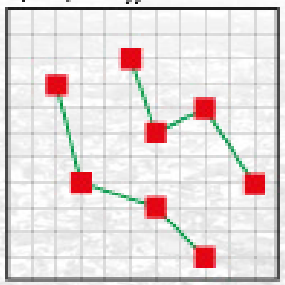
POLYGON ((3 4, 3 7, 7 8, 8 5, 7 2, 3 4), (4 6, 7 6, 6 4, 4 6))



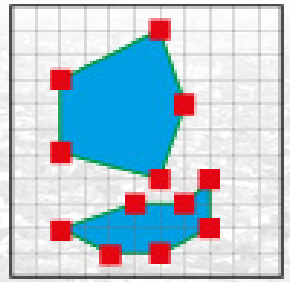
MULTIPOINT(2 2, 5 3, 7 6, 3 8)



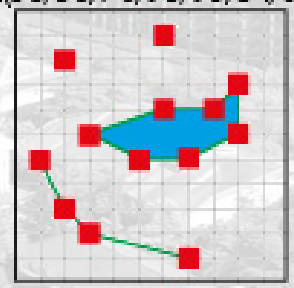
MULTILINESTRING((2 3, 3 7, 6 8, 8 10), (5 2, 6 5, 8 4, 10 7))



MULTIPOLYGON((6 1, 7 4, 6 7, 2 6, 2 3, 6 1), (2 9, 3 10, 5 10, 7 9, 7 7, 6 8, 4 8, 2 9))



GEOMETRYCOLLECTION(POINT(2 2), POINT(6 1), LINESTRING(1 6, 2 8, 3 9, 7 10), POLYGON(3 5, 5 6, 7 6, 9 5, 9 3, 8 4, 6 4, 3 5))



Primitives:

– POINT: a single coordinate pair

– LINESTRING: a set of coordinates connected

– POLYGON: set of coordinates connected and closed that make a polygon

Multiples:

– MULTIPOINT: more than one POINT

– MULTILINESTRING: more than one LINESTRING

– MULTIPOLYGON: more than one POLYGON

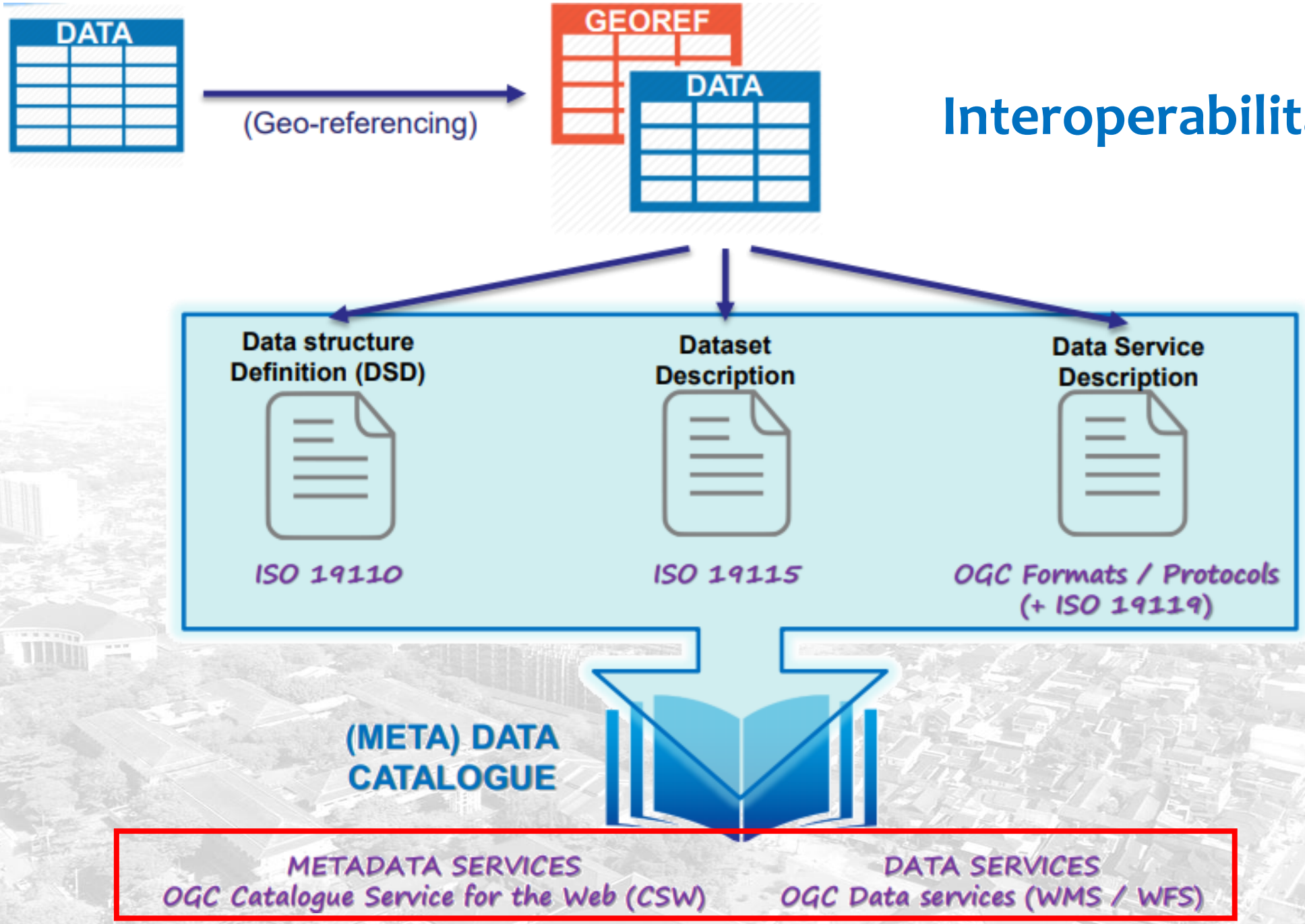
Collection:

– GEOMETRYCOLLECTION: an objects collection of any type

Next Week's Discussion

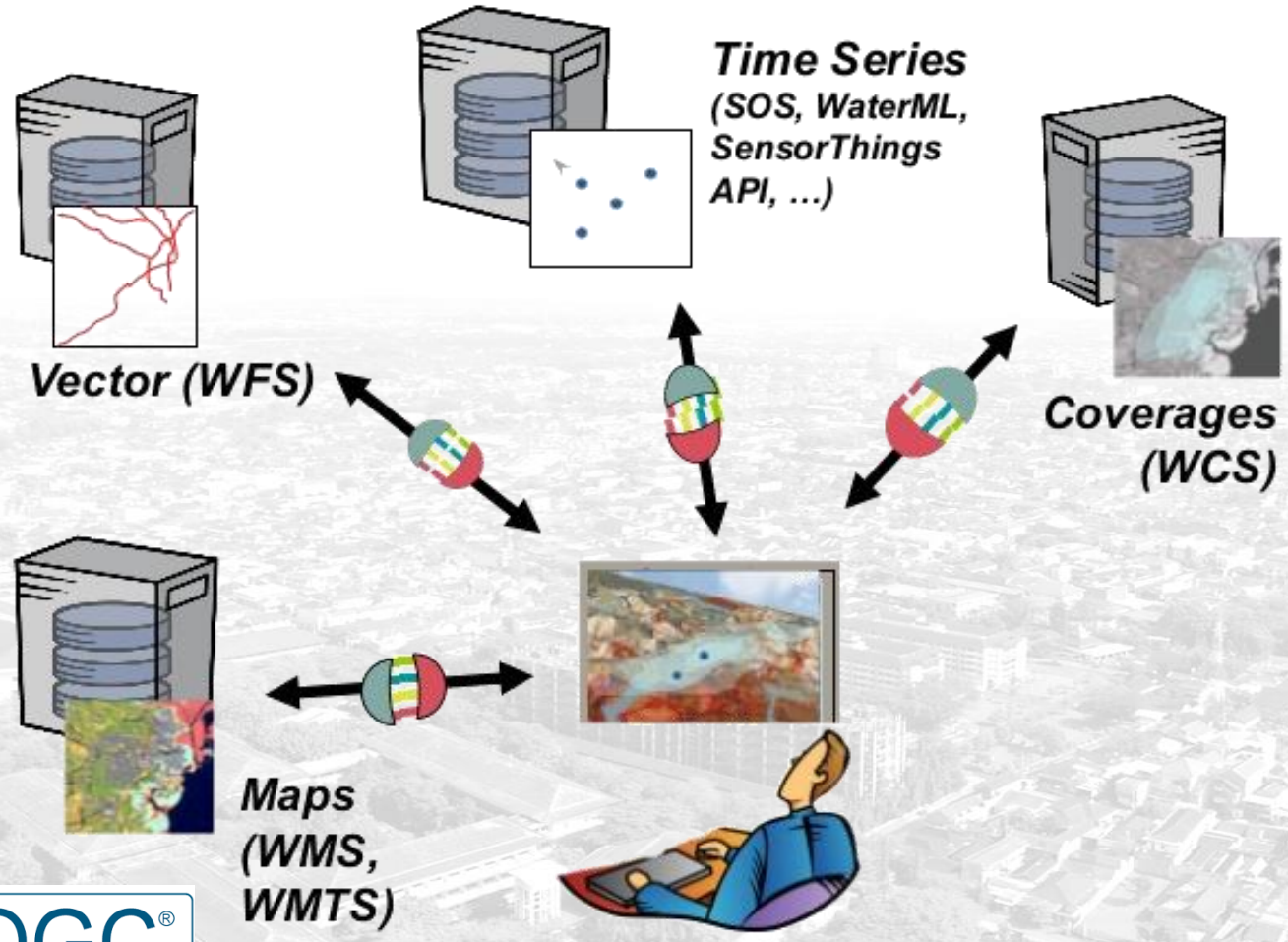
Implementasi Spesifikasi OpenGIS

Interoperabilitas Data Spasial



Findable
Accessible
Interoperable
Reuseable

Interoperabilitas Data Spasial



Standar:
ISO/TC211

Implementasi:
OGC Services

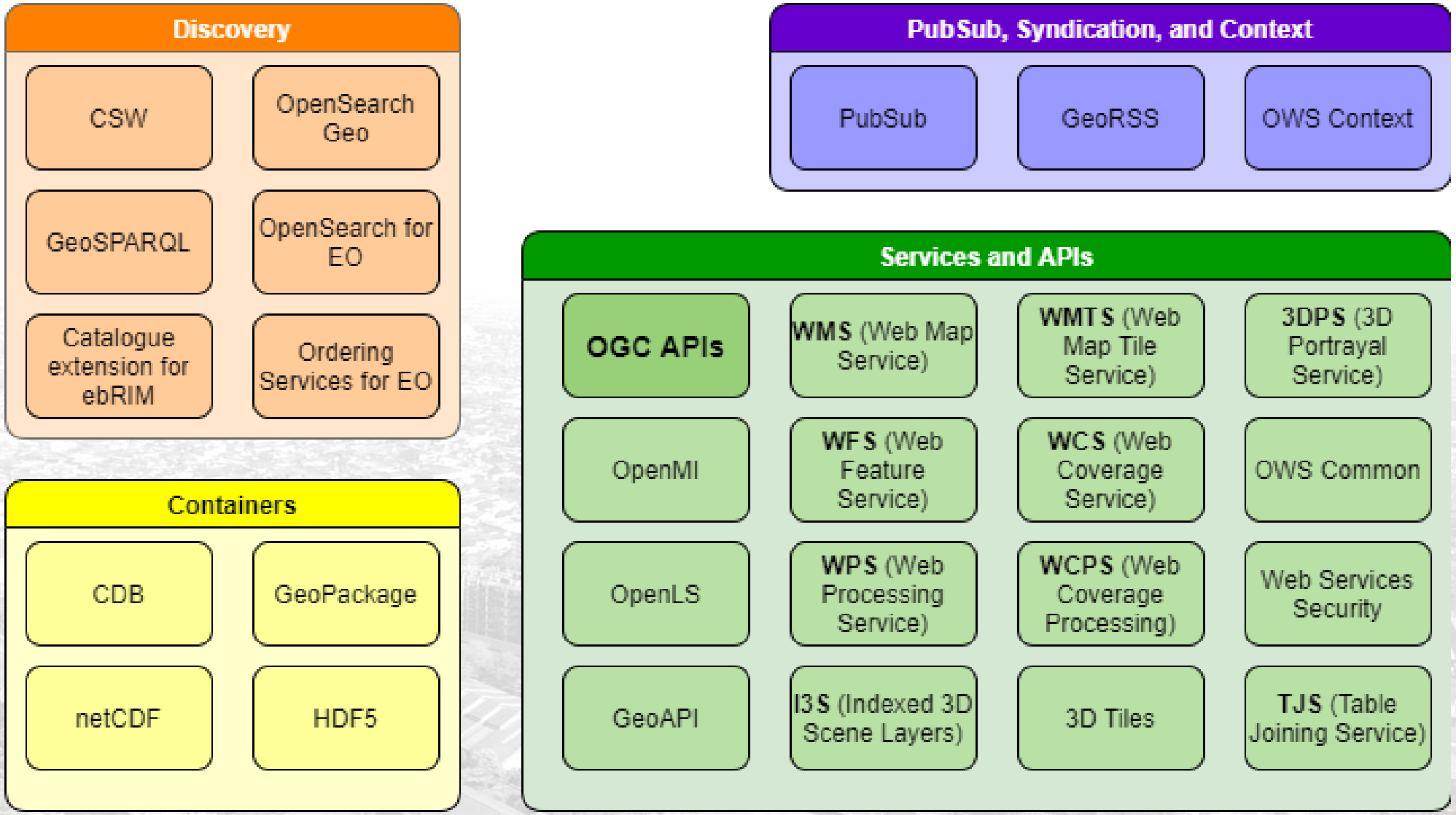
Aplikasi, e.g.:
GeoServer

OpenGIS Implementations: OGC Standards (as of 2020)

3D Tiles
3dP
ARML2.0
Cat: ebRIM App Profile: Earth Observation Products
Catalogue Service
CDB
CityGML
Coordinate Transformation
EO-GeoJSON
Filter Encoding
GML in JPEG 2000
GeoAPI
GeoPackage
GeoSciML
GeoSPARQL
Geography Markup Language
GeoRSS
Geospatial eXtensible Access Control Markup Language (GeoXACML)
Geospatial User Feedback (GUF)
GeoTiff
GroundwaterML
HDF5
I3S
IndoorGML
KML
LandInfra/InfraGML
LAS
Location Services (OpenLS)
Moving Features
NetCDF
Observations and Measurements
OGC API - Features
Open GeoSMS
OpenMI
OpenSearch for EO
OpenSearch Geo
Ordering Services Framework for Earth Observation Products
OWS Context
OWS Security
PipelineML
PubSub
PUCK
SWE Common Data Model
SWE Service Model
Sensor Model Language
Sensor Observation Service
Sensor Planning Service
SensorThings
Semantic Sensor Network (SSN)
Symbology Core
Simple Features
Simple Features CORBA
Simple Features OLE/COM
Simple Features SQL
Styled Layer Descriptor
Symbology Encoding
Table Joining Service
Time Ontology in OWL
TimeseriesML (tsml)
Two Dimensional Tile Matrix Set
WaterML
Web Coverage Processing Service
Web Coverage Service
Web Feature Service
Web Map Context
Web Map Service
Web Map Tile Service
Web Processing Service
Web Service Common
WKT CRS

https://www.ogc.org/docs/is

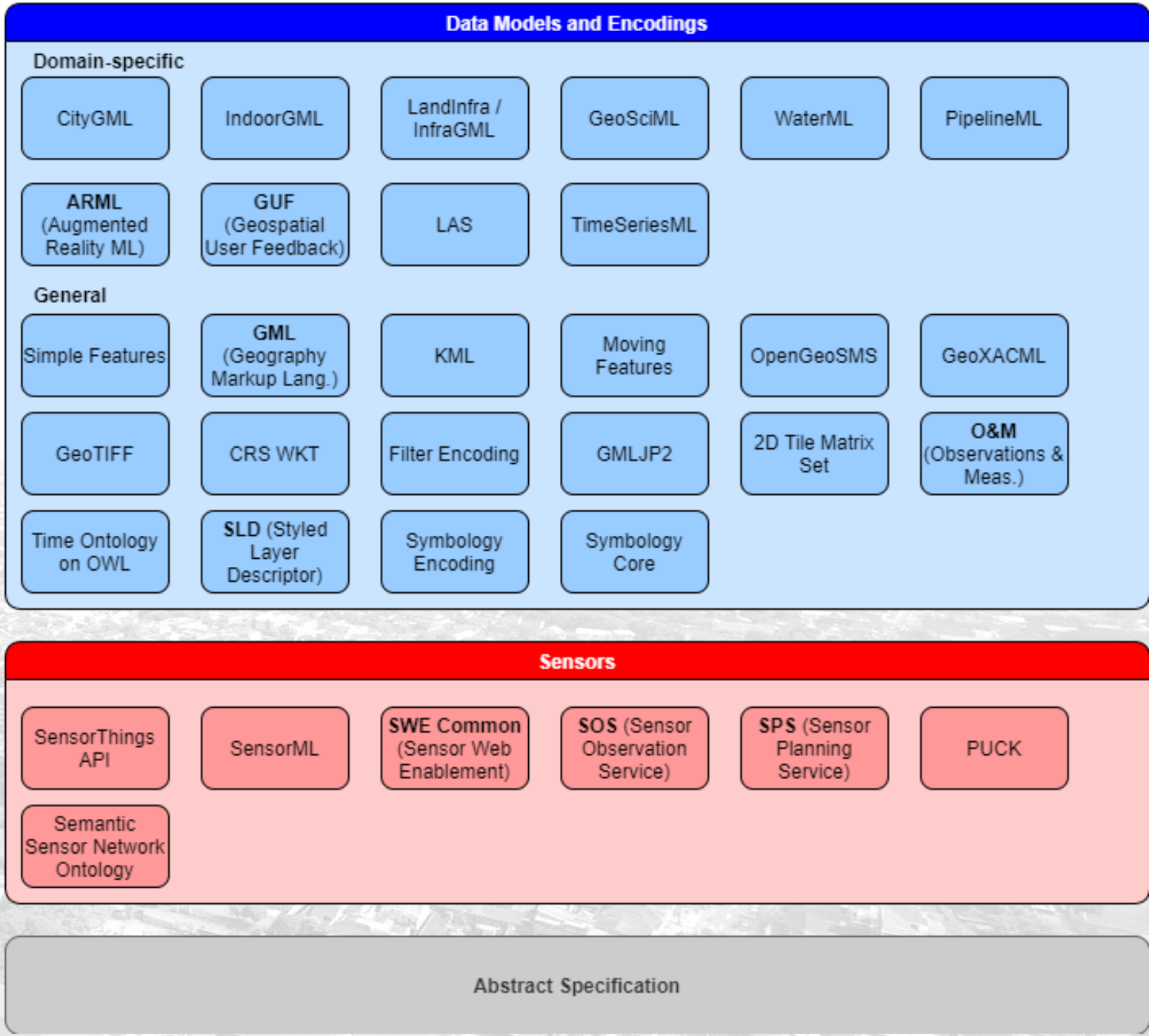
OpenGIS Implementations



https://www.ogc.org/docs/is

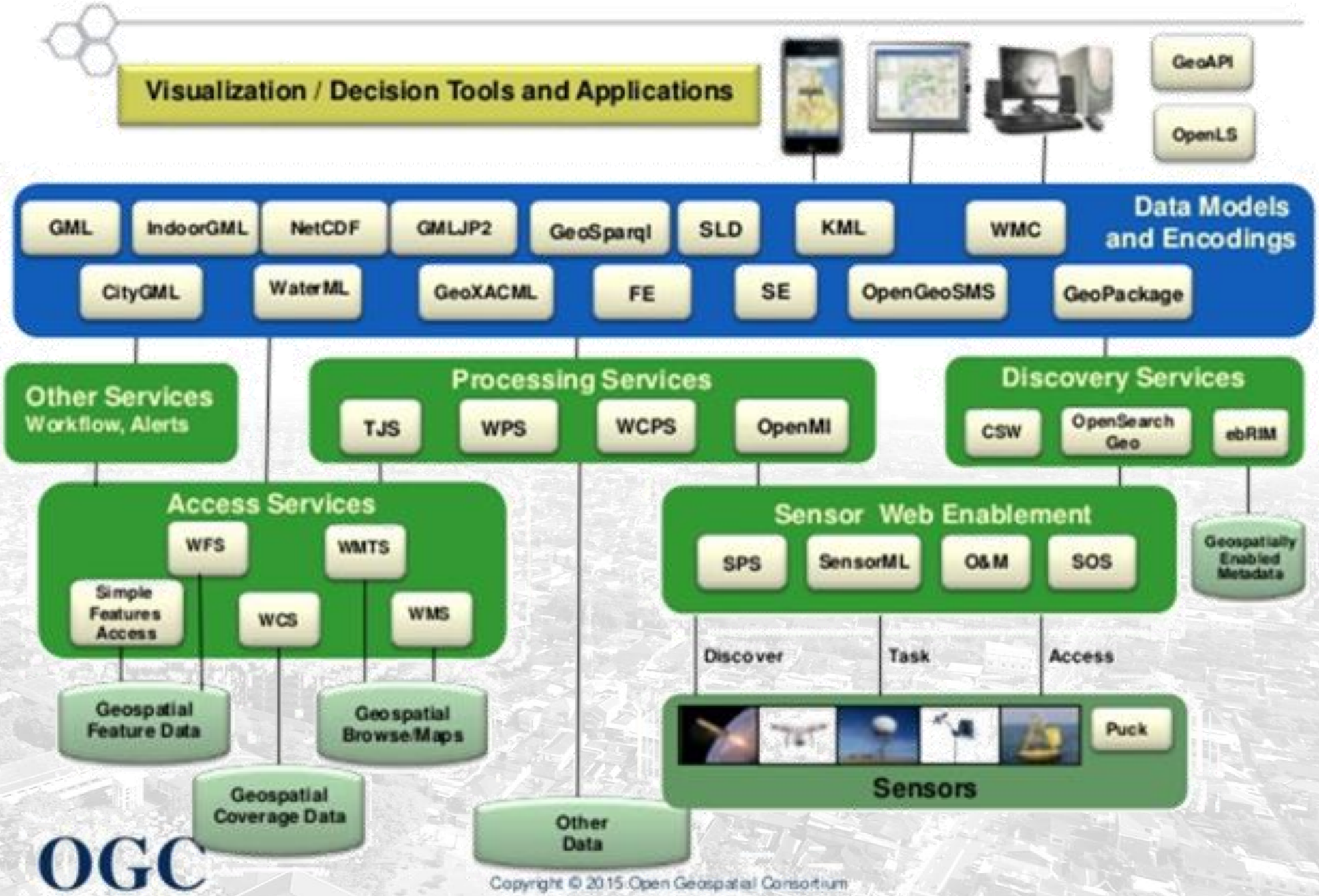
OpenGIS Implementations

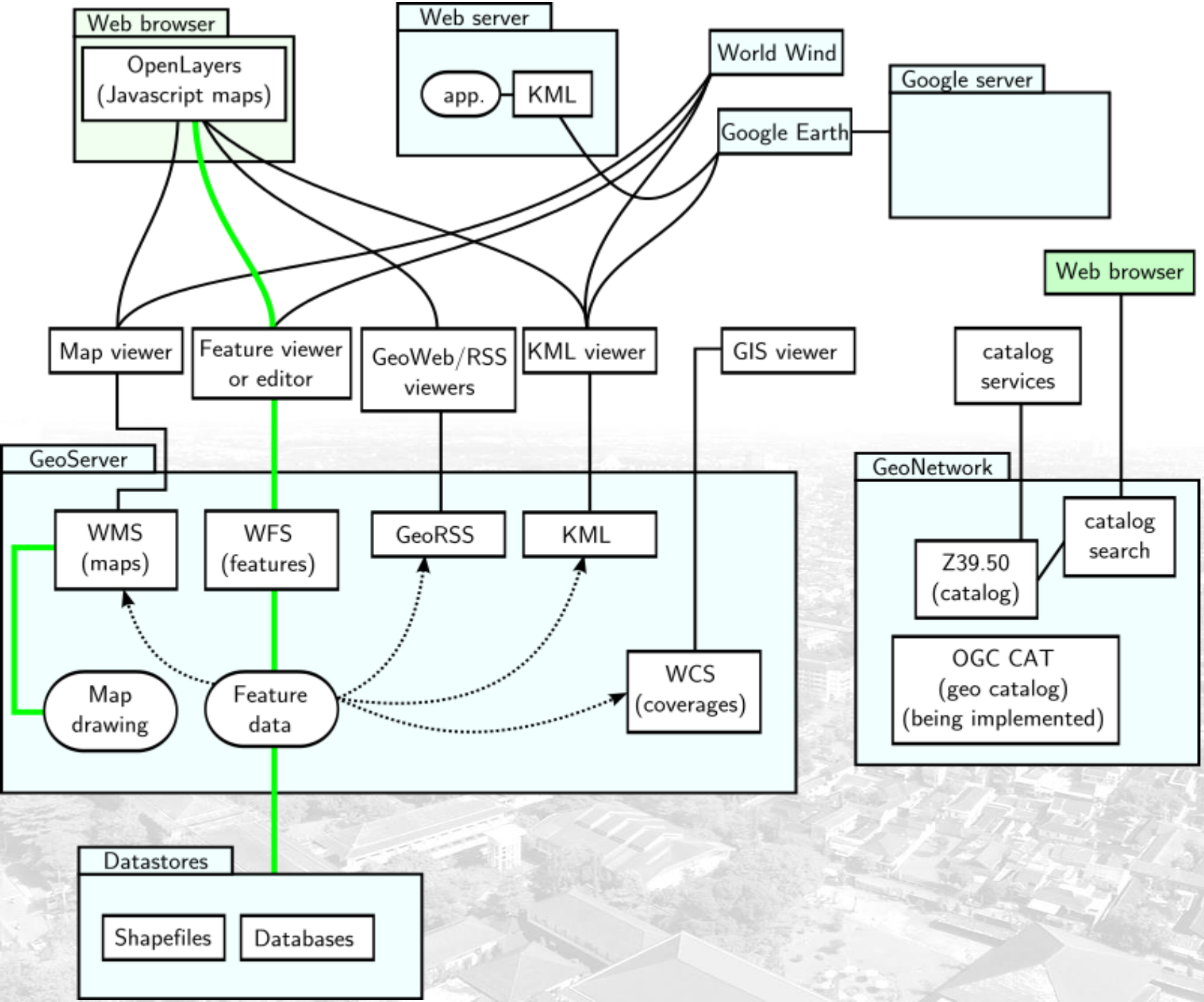
Standar untuk format, protokol dan metode akuisisi serta pencarian data spasial pada web dengan menjamin prinsip FAIR



https://www.ogc.org/docs/is

Ekosistem Standar OGC





Ekosistem OGC+FOSS4G = AWESOMENESS!

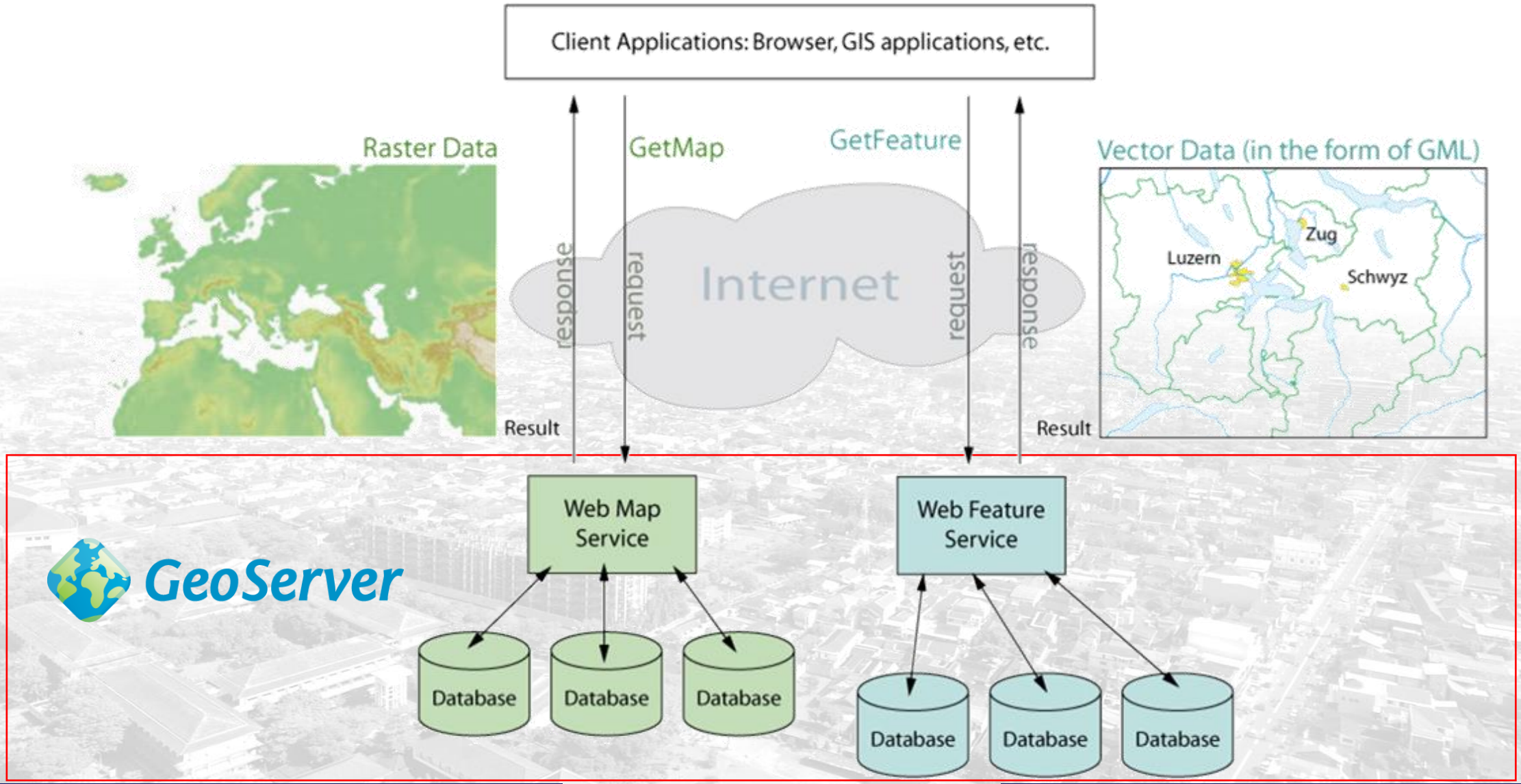
Some ‘famous’ OGC Standards

A Web Map Service (WMS) is a standard **protocol** for serving georeferenced **map images** over the Internet that are generated by a map server using data from a GIS database

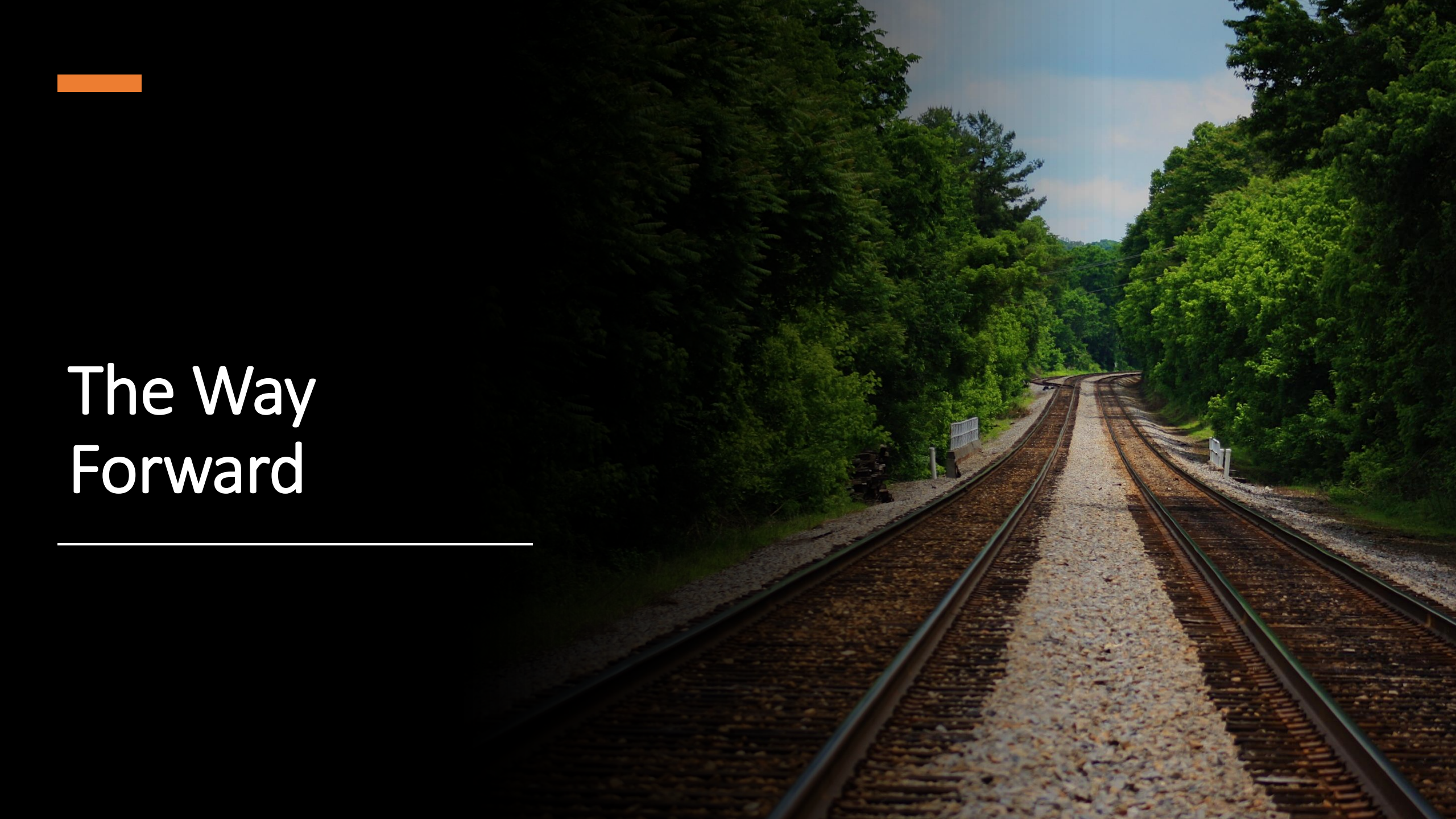
Web Feature Service Interface Standard (WFS) provides an interface allowing requests for **geographical features** across the web using platform-independent calls

Web Coverage Service Interface Standard (WCS) defines Web-based retrieval of **coverages** – that is, digital geospatial information representing space/time-varying phenomena

Standar OGC untuk Menjamin Interoperabilitas



The Way Forward



“Spatial Data on the web Best Practices”

Best Practice 1	Use globally unique persistent HTTP URIs for spatial things	Best Practice 2	Make your spatial data indexable by search engines
Best Practice 3	Link resources together to create the Web of data	Best Practice 4	Use spatial data encodings that match your target audience
Best Practice 5			t the right level n, and size
Best Practice 7			values are en-
Best Practice 9			ation types to link spatial things
Best Practice 11	Provide information on the changing nature of spatial things	Best Practice 12	Expose spatial data through ‘convenience APIs’
Best Practice 13	Include spatial metadata in dataset metadata	Best Practice 14	Describe the positional accuracy of spatial data

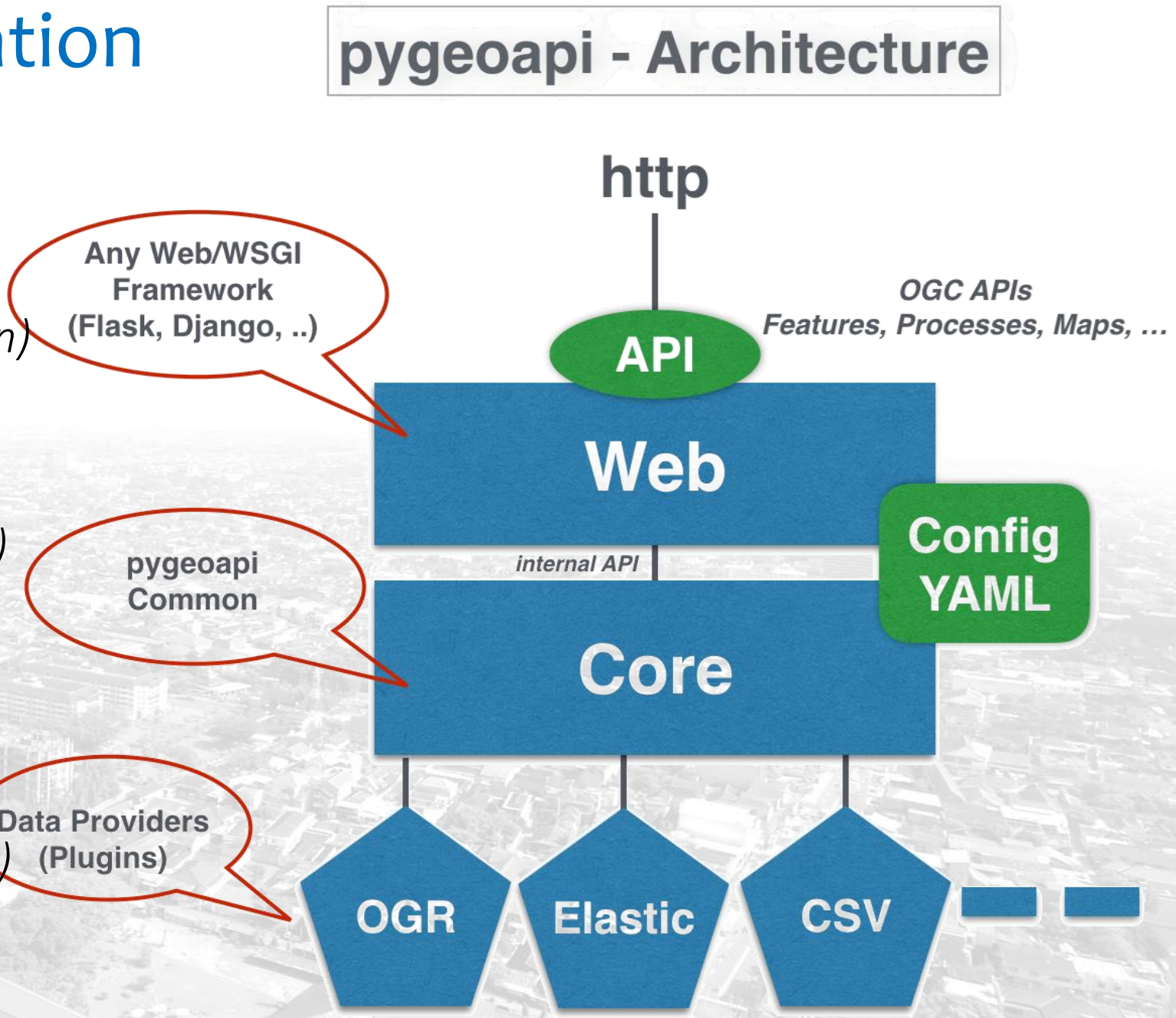
Spatial data is **no longer ‘Special’**

(van den Brink et al., 2019)

OGC-API Implementation

pygeoapi

- *OGC API - **Common** (OWS Common)*
- *OGC API - **Features** (former WFS)*
- *OGC API - **Coverages** (former WCS)*
- *OGC API - **Maps** (former WMS)*
- *OGC API - **Tiles** (former WMTS)*
- *OGC API - **Processing** (former WPS)*
- *OGC API - **Records** (former CSW)*



OGC-API: A RESTFul API for Geospatial Data

Table 1. Overview of resources, applicable HTTP methods and links to the document sections

Resource	Path	HTTP method	Document reference
Landing page	`/` information about the API	GET	7.2 API landing page
API definition	`/api`	GET	7.3 API definition
Conformance declaration	`/conformance`	GET	7.4 Declaration of conformance classes
Feature collections	`/collections` a dataset with a sub-division into named collections of features	GET	7.12 Feature collections
Feature collection	`/collections/{collectionId}`	GET	7.13 Feature collection
Features	`/collections/{collectionId}/items`	GET	7.14 Features
Feature	`/collections/{collectionId}/items/{featureId}`	GET	7.15 Feature the features

http://docs.opengeospatial.org/DRAFTS/17-069r1.html#tldnr

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