Business value of Geospatial Standards

GeoBuiz: Standards, Law and Practices in the Geospatial Industry

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Business value of Geospatial Standards

- Standards promote worldwide trade and quality assurance.
- Establining Geospatial standards
- The value of OGC Compliant Products

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What is a Standard?

- "*An agreed way of doing something*"

EC: Practical standards guide for researchers - en

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What is a Standard?

- "*An agreed way of doing something*"
- **Standards are distilled wisdom** of people with expertise in their subject matter and who know the needs of the organizations they represent – people such as manufacturers, sellers, buyers, customers, trade associations, users or regulators.
- **Standards are knowledge**. They are powerful tools that can help drive innovation and increase productivity. They can make organizations more successful and people's everyday lives easier, safer and healthier.

EC: Practical standards guide for researchers - en

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German DIN Study

- Standards promote worldwide trade, encouraging rationalization, quality assurance and environmental protection, as well as improving security and communication. Standards have a greater effect on economic growth than patents or licenses.
- "Economic Benefits of Standardization"
- Benefits to German economy of 17 billion Euros in 2010!

Image Courtesy Sensorpedia/ORNL

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NASA and BAH standards report

Standards make the distribution of geospatial information understandable – not just for government technologists, managers, and decision support analysts, but for all stakeholders, including industry partners.

NASA study key findings

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Why Open Standards?

- Prevents a single, self-interested party from controlling a standard
- Lower systems and life cycle costs
- Encourage market competition
  - Choose based on functionality desired
  - Avoid "lock in" to a proprietary architecture

„What OGC brings to the table is…everyone has confidence we won't take advantage of the format or change it in a way that will harm anyone"

Michael Weiss-Malik, Google KML product manager

- Stimulates innovation beyond the standard by companies that seek to differentiate themselves.

Source: Open Standards, Open Source, and Open Innovation: Harnessing the Benefits of Openness, April 2006. Committee For Economic Development.

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What is an OGC Standard?

- **A document, established by consensus, approved by the OGC membership (balance of interest, all members have an equal vote)**
- **Provides, rules, guidelines or characteristics**
- **Implementable in software**
- **Open standards does not mean open source software (Free Software). OGC/OSGeo Paper on Open Source Software and Open Standards: http://wiki.osgeo.org/wiki/Open_Source_and_Open_Standards**
- **OGC standards are *Open Standards***
  - **Freely and publicly available**
  - **No license fees**
  - **Vendor neutral**

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The OGC Mission

To serve as a global forum for the collaboration of developers and users of spatial data products and services, and to advance the development of international standards for geospatial interoperability.

Urban Model of Berlin based on OGC CityGML

Source: www.3d-stadtmodell-berlin.de

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OGC Services Architecture

Visualization / Decision Tools and Applications

GeoAPI

OpenLS

Data Models and Encodings

GML | IndoorGML | NetCDF | GMLJP2 | GeoSparql | SLD | KML | WMC

CityGML | WaterML | GeoXACML | FE | SE | OpenGeoSMS | GeoPackage

Other Services
Workflow, Alerts, Security

Processing Services

TJS | WPS | WCPS | OpenMI

Discovery Services

CSW | OpenSearch Geo | ebRIM

Access Services

WFS | WMTS | Simple Features Access | WCS | WMS

Sensor Web Enablement

SPS | SensorML | O&M | SOS

Geospatially Enabled Metadata

Discover | Task | Access

Geospatial Feature Data

Geospatial Browse/Maps

Geospatial Coverage Data

Other Data

Puck

Sensors

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OGC Data Models and Encodings

Geospatial Feature Data	Geospatial Coverage Data	Geospatial Browse/Maps	Geospatial Metadata	Other Data
GML	NetCDF	KML	Filter Encoding	GeoPackage
CityGML	GMLJP2	Style Layer Descriptor	WCPS Language	Context
O&M	(GeoTIFF)	Symbol Encoding	GeoSPARQL	GeoXACML
WaterML	OpenGeo SMS	WKT/ WKB	Common Query	
Moving Features	SensorML			

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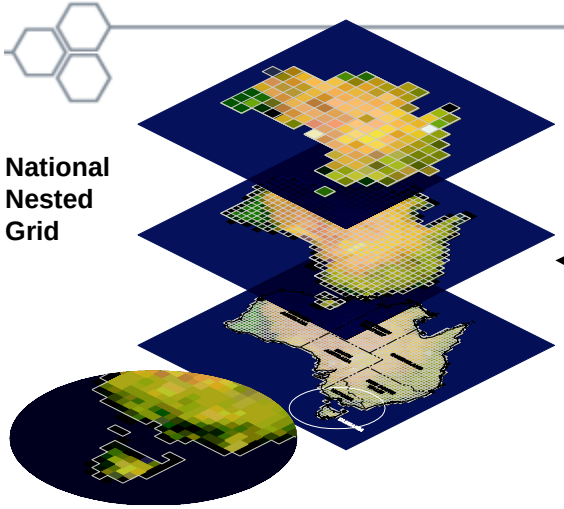
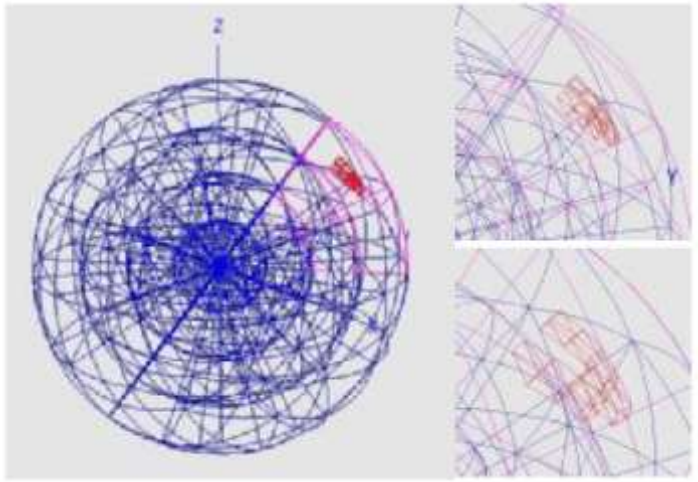
Discrete Global Grid Systems

National Nested Grid



Earth System Spatial Grid



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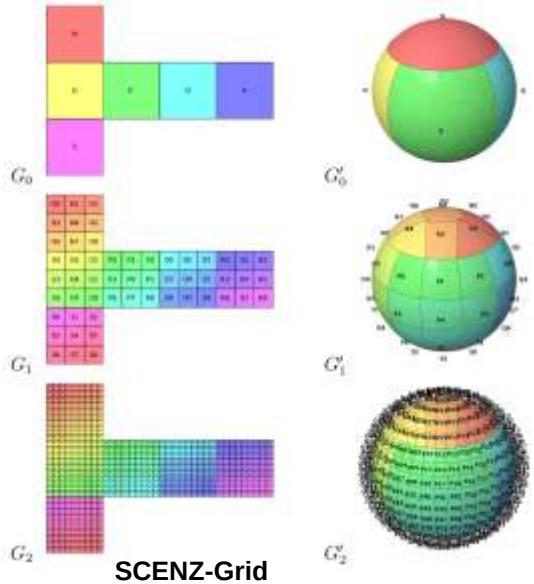
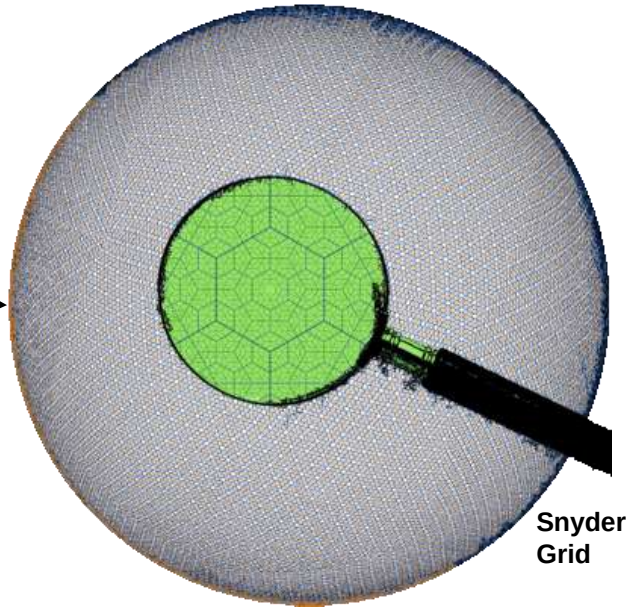


SCENZ-Grid



Snyder Grid

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Source: Matt Purss, Geoscience Australia

Discrete Global Grid System (DGGS) Standards Working Group (SWG)

- Develop common criteria that will define conformant DGGSs
  - Considering Goodchild criteria
- Develop conceptual standard to facilitate data fusion between DGGSs using OGC Standards
  - to make them interoperable – with conventional and other DGGS data
  - to standardize operations on them
- Engage stakeholders to encourage new use cases and adoption of interoperability through DGGSs

Criteria in Goodchild (1994)
1. Each area contains one point
2. Areas are equal in size
3. Areas exhaustively cover the domain
4. Areas are equal in shape
5. Points form a hierarchy preserving some (undefined) property for m < n points
6. Areas form a hierarchy preserving some (undefined) property for m < n areas
7. The domain is the globe (sphere, spheroid)
8. Edges of areas are straight on some projection
9. Areas have the same number of edges
10. Areas are compact
11. Points are maximally central within areas
12. Points are equidistant
13. Edges are areas of equal length
14. Addresses of points and areas are regular and reflect other properties

http://www.opengeospatial.org/projects/groups/dggsswg

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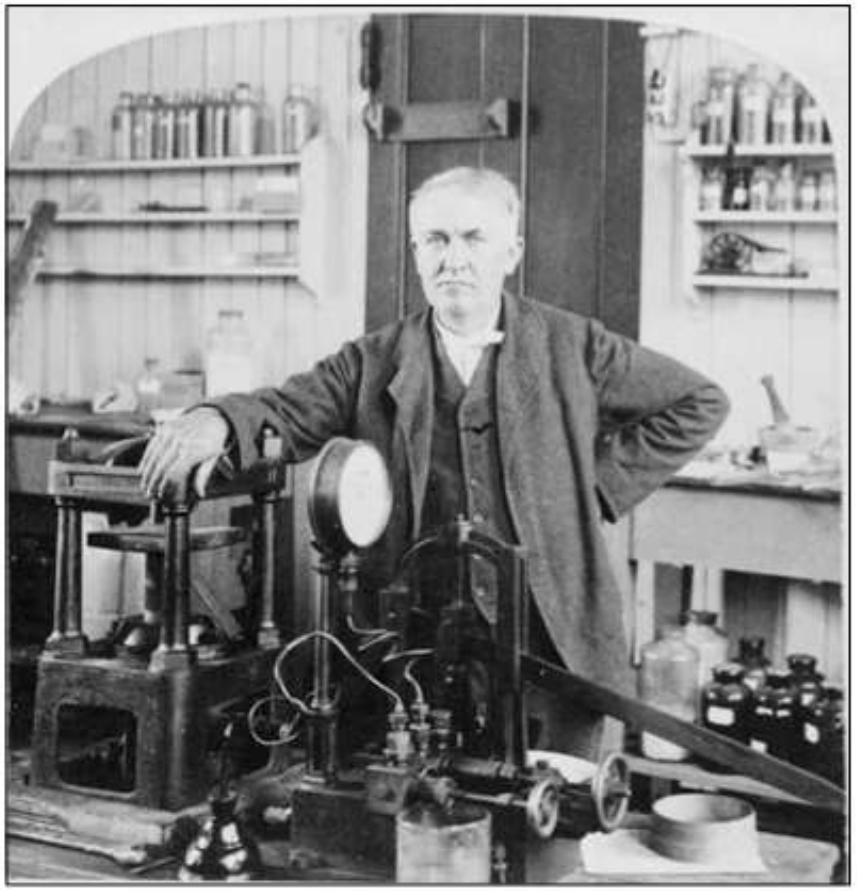
Innovation



I have not failed, I've just found 10,000 ways that won't work.

Thomas Edison

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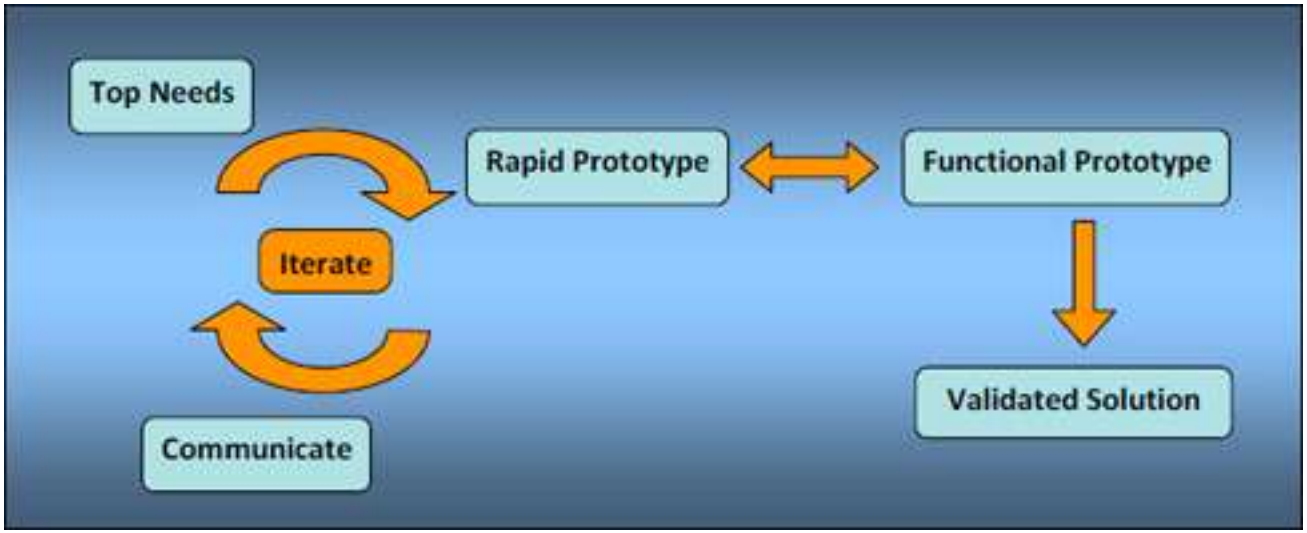
Innovation through prototyping

As a rule, the more prototypes and prototyping cycles per unit of time, the more technically polished the final product.

Serious Play, M. Schrage



Agile, Scrum Iterative, Evolutionary Development

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OGC Interoperability Program

COLLABORATION	• *Aligns technology users and providers to work collaboratively*
INNOVATION	• *Agile development environment to develop, test, and validate standards under marketplace conditions and foster innovation in the community*
SHARED COSTS	• *Effective way to share the costs of developing well-crafted standards that provide concrete foundations for future enterprise architectures*
REPEATABLE PROCESS	• *Repeatable process for building & exercising private-public partnerships* to drive global trends in technology and interoperability

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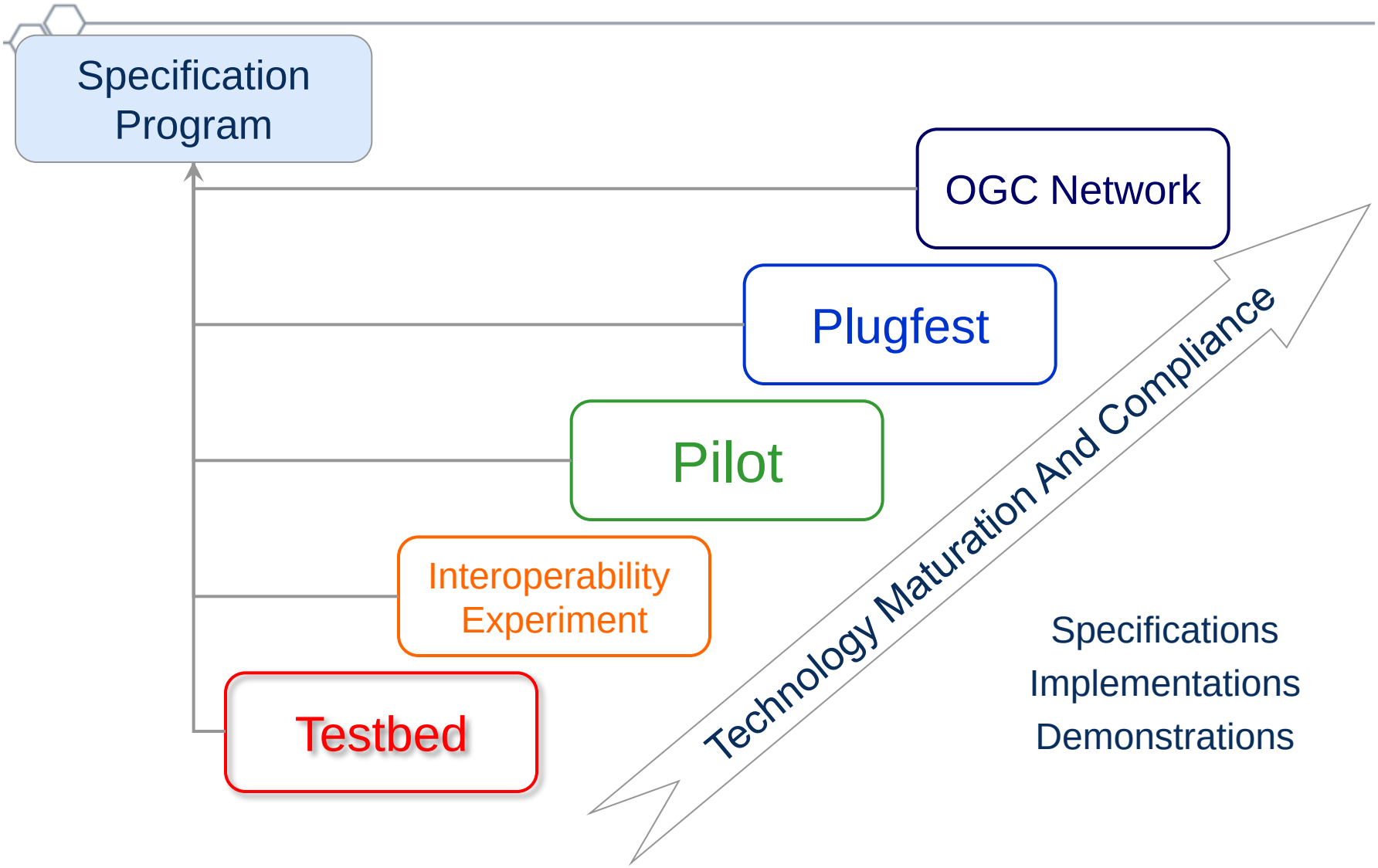
The Interoperability Program Continuum



Types of Interoperability Program Initiatives

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OGC Standards from the Interop Program

- Of 42 OGC standards, 14 originated in an OGC-IP initiative
  - first draft of the OGC standard was written as a report in an OGC-IP Initiative.
- The 14 OGC Standards initiated in the OGC-IP are
  - Web Map Service (WMS)
  - Web Map Tile Service (WMTS)
  - Web Feature Service (WFS)
  - Web Coverage Service (WCS)
  - Web Coverage Processing Service (WCPS)
  - Geography Markup Language (GML)
  - Sensor Model Language (SensorML)
  - Sensor Observation Service (SOS)
  - Sensor Planning Service (SPS)
  - OWS Context
  - Styled Layer Descriptor (SLD) Profile of the WMS
  - Symbology Encoding (SE)
  - Filter Encoding
  - GeoPackage

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Effectiveness of Prototyping to Standards

- One-third of OGC standards - those initiated in OGC-IP - account for 80% of the implementations and 67% of the compliant products.
- These statistics indicate the additive value of the OGC-IP process towards implementations of OGC standards.

	Implementing	Compliant
All OGC Standards	6653	784
14 OGC Standards Initiated in OGC-IP	5292	521
Percentage of all Implementations	80%	67%

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OGC Compliance

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Implementations can get OGC Certified

The OGC compliant Mark

Related to a specific product and standard

Granted to an organization as proof of proper implementation of an OGC Standard

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For Users: Proof that a solution works

Organizations procuring technology solutions

Purchasers of Software

Users of Open Source Software

search

There are: 794 Implementing Products and 210 Compliant Products

The OGC Implementation database

Total = Number of implementations. **Comp** = Number of compliant products.

Total	Comp.	Specification / Version	Abrv / Version
502	121	Web Map Service (1.1.1)	WMS 1.1.1
323	66	Web Feature Service (1.0.0)	WFS 1.0.0
320	91	Web Map Service (WMS) Implementation Specification (1.3.0)	WMS 1.3.0
289	0	Web Map Service (1.0)	WMS 1.0
253	54	Web Feature Service (WFS) Implementation Specification (1.1.0)	WFS 1.1.0
252	0	Web Map Service (1.1)	WMS 1.1

verify compliance

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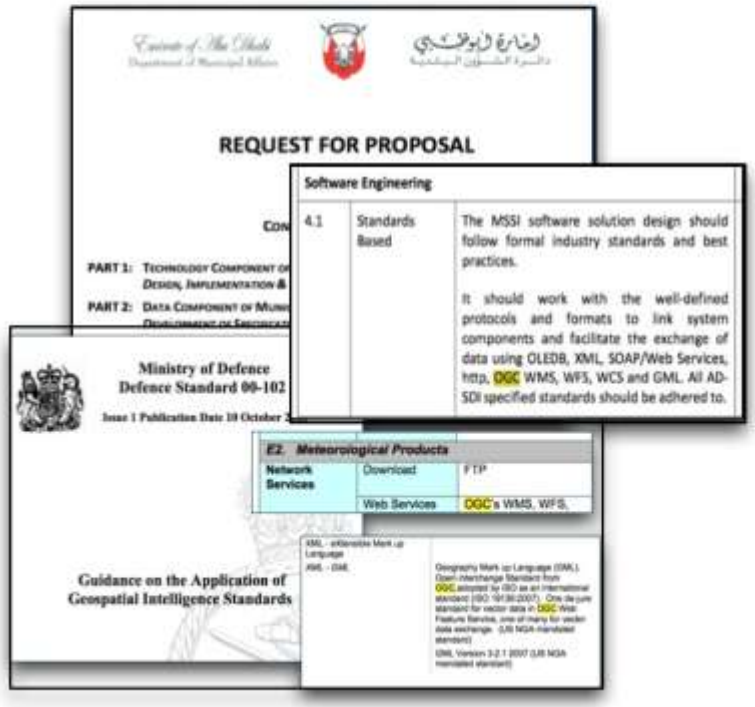
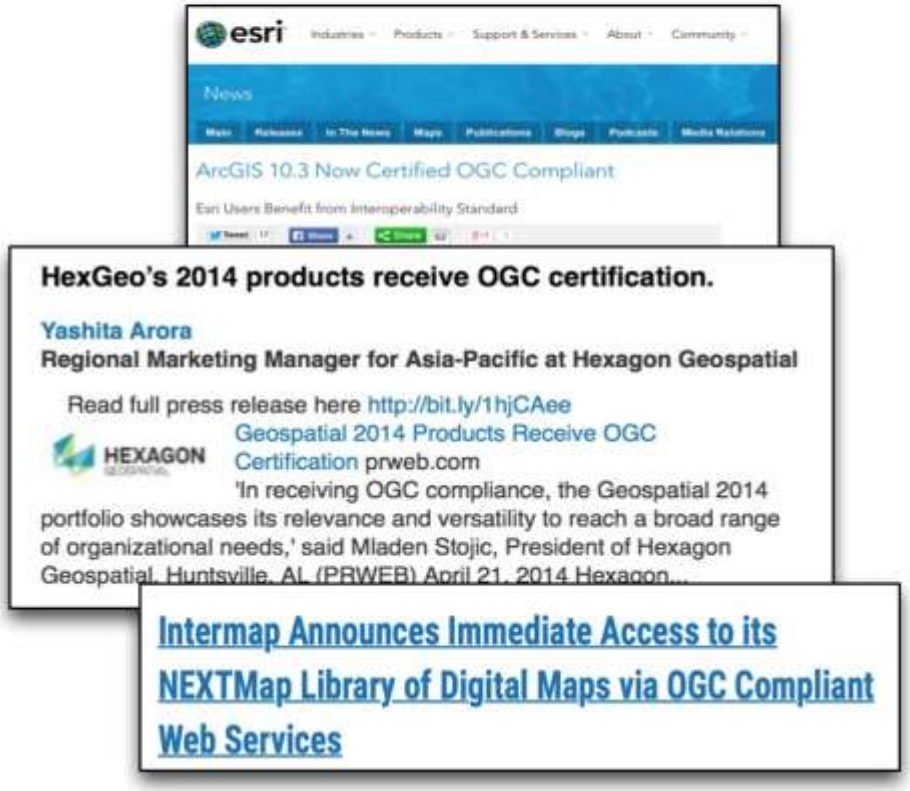
For implementers: Get more business

Respond with confidence to RFQ/RFP



Promote their product



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How does it work?

1. Test in the OGC Free testing Facility

2. Apply for certification online

3. Pay for use of license $160 - $11,200

4. Product appears as compliant in the OGC database

5. Organizations Promote their certification

CERTIFIED OGC COMPLIANT

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Available and Expected Tests in 2015

Available Tests	Version
Catalogue Service - Web (CSW)	2.0.2
Geography Markup Language (GML)	3.2.1
OGC KML	2.2
Sensor Observation Service (SOS)	1.0.0
Sensor Observation Service (SOS)	2.0
Sensor Planning Service (SPS)	1.0
Sensor Planning Service (SPS)	2.0
Simple Feature Access - SQL (SFS)	1.1
Simple Feature Access - SQL (SFS)	1.2.1
Web Coverage Service (WCS)	1.0.0
Web Coverage Service (WCS)	1.1.1
Web Coverage Service (WCS)	2.0.1
Web Feature Service (WFS)	1.0.0
Web Feature Service (WFS)	1.1.0
Web Feature Service (WFS)	2.0
Web Map Service (WMS)	1.1.1
Web Map Service (WMS)	1.3.0

Proyected in 2015	Version
Catalogue Service - Web (CSW)	3.0
WFS (Basic)	1.1
WMS Client	1.3
WMTS	1.0

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Help and questions

cite-forum@
lists.opengeospatial.org

About 300 members







OG

Business Value Subcommittee

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Interoperability: Communicating Value

CxO:
- Staff development through knowledge and knowhow gains
- Increased market exposure/understanding leading to new business
- Technology risk reduction protecting business continuity
- Link organisational vision to long-term industry development

IS/IT Director:
- Recognize technology lifecycle cost savings
- Align IS/IT strategy with policy and technology shifts: agility and responsiveness to change
- Drive research or innovation agenda

Project Manager:
- Effective budgeting through software reuse
- Technology risk reduction for project lifecycle
- Be able to swap out software if required
- Reduce time and cost of integration

Enterprise Architect
- Resilient design patterns
- Flexible systems choice
- Support new/emerging user requirements
- Adapt easily to rapidly changing IT world

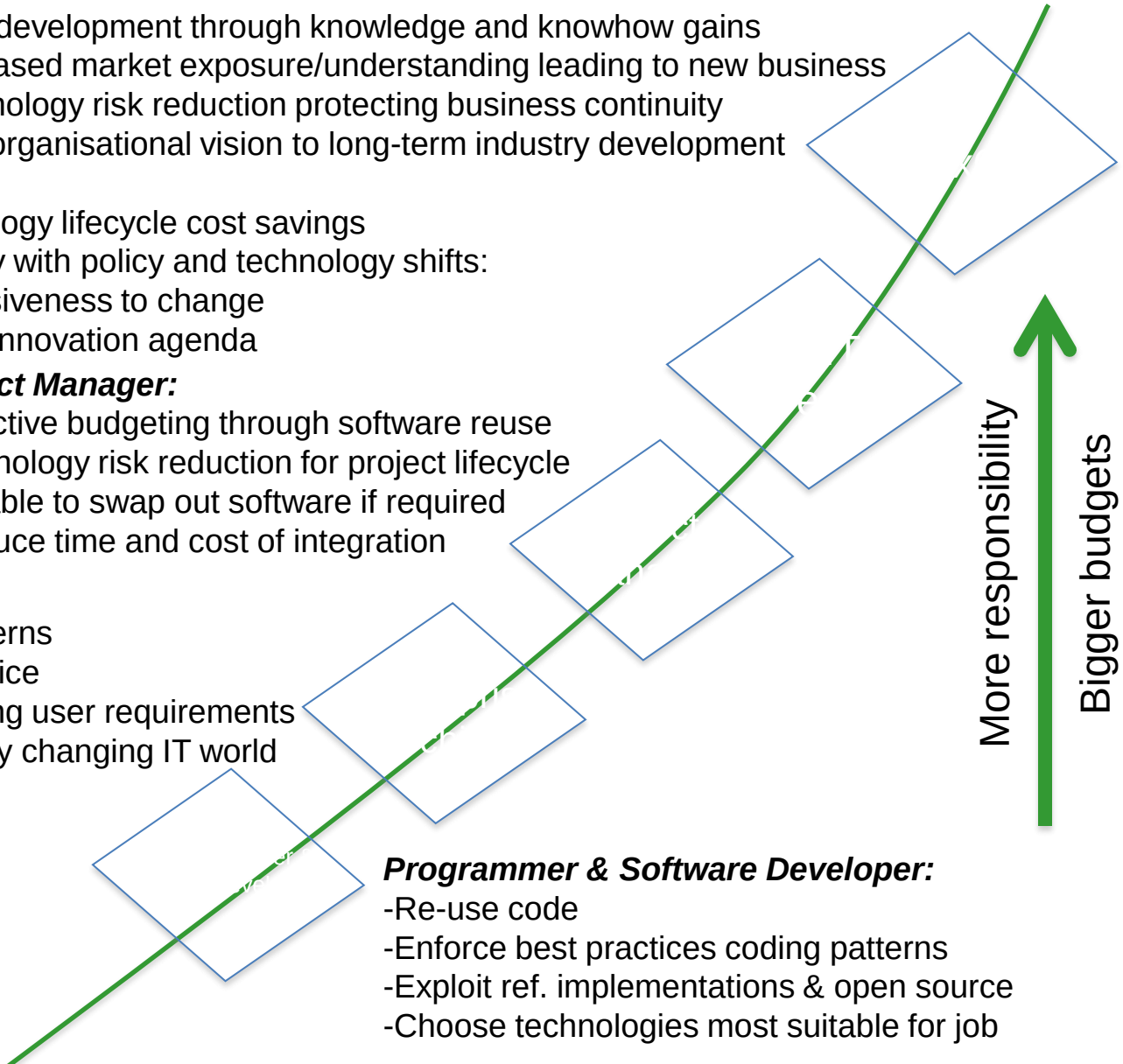
Programmer & Software Developer:
- Re-use code
- Enforce best practices coding patterns
- Exploit ref. implementations & open source
- Choose technologies most suitable for job

More users

Lower budgets

More responsibility

Bigger budgets



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“Civilization advances by extending the number of important operations we can perform without thinking of them.”
- Alfred North Whitehead

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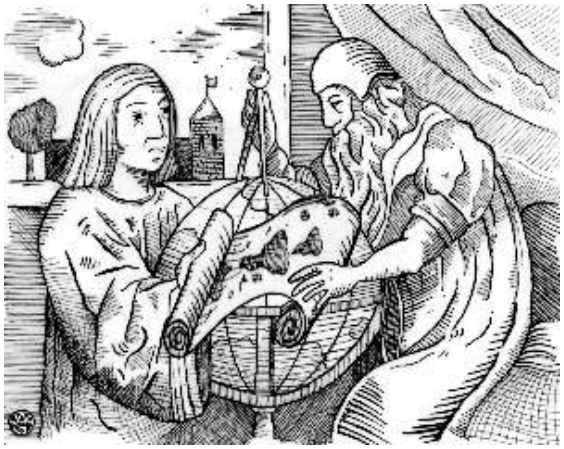
For More Information

Open Geospatial Consortium
www.opengeospatial.org

OGC Standards - freely available
www.opengeospatial.org/standards

OGC on YouTube
http://www.youtube.com/user/ogcvideo



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