



# The Importance of Interoperability and Standards for setting up Spatial Data Infrastructures

Open GIS Consortium, Inc.

Seminario "Interoperabilità nelle Infrastrutture di Dati Territoriali"

26-27 February 2004, Roma

Guenther Pichler, Managing Director, OGC Europe

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# Overview

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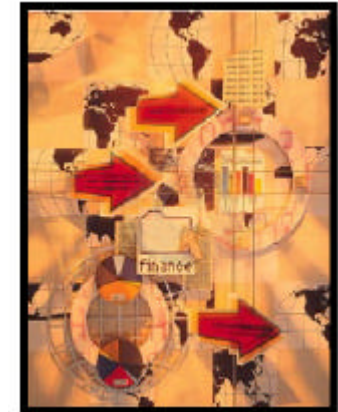
- The Value of Standards: A Delphi Group Study
- OGC und OGC Europe:  
Organisation, Vision, Mission und Processes
- Interoperability and OpenGIS®
- OGC Compliance
- Information about OGC: Where can I find what?
- OpenGIS® Reference Model and SDIs



# The Value of Standards: A Delphi Study (1)

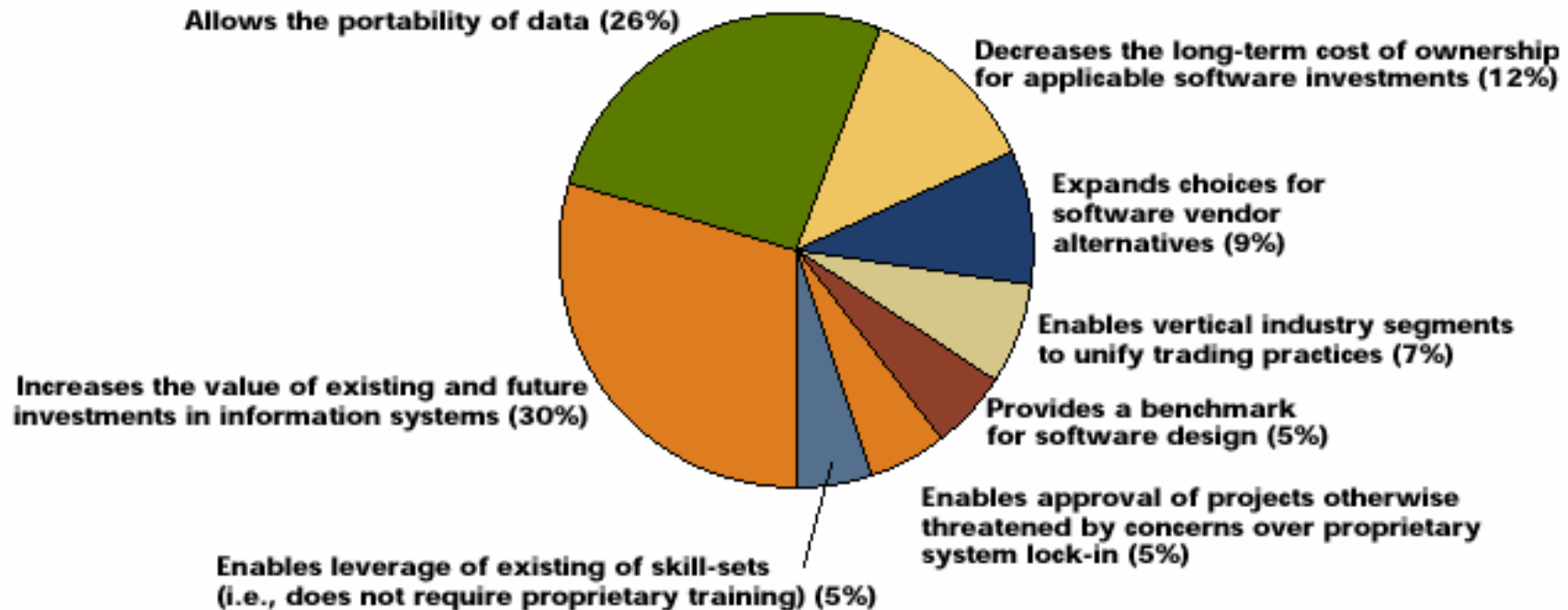
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- Delphi Group Study “The Value of Standards”
- June 2003
- 800+ end users, software vendors, and service providers identified the current attitudes and expectations for software standards
- **Standards = Liquidity**
  - “There is a clear and sudden shift in attitudes towards software standards. The climate of economic constraint and risk aversion along with the mandate to integrate systems on both sides of the firewall has created a sea change in the sense of imperative to adopt software standards.”
  - “In this climate standards create liquidity -- the ability to leverage IT investment in unforeseen ways.”



# The Value of Standards: A Delphi Study (2)

**Which of the following do you believe to be the single greatest benefit offered by approved standards in software development?**



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# What is the OGC?

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- **The Open GIS Consortium (OGC)**
  - Not-for-profit, international consortium
  - 250+ industry, government, and university members (about 1/3 from Europe)
- **Specification Development Program (since 1994)**
  - similar to other Industry consortia like W3C, OMG, etc.
  - Class A liaison with ISO/TC211
- **Interoperability Program (since 1999)**
  - a global, innovative, hands-on engineering and testing program designed to accelerate interface development and bring interoperability to the market
- **Outreach and Community Adoption Program (since 2002)**
  - awareness raising, education and training, encourage take up of OpenGIS® interfaces, business development
  - Subsidiaries: **OGC Europe**, OGC Australia, ...

## OGC Vision

**A world in which everyone benefits from geographic information and services made available across any network, application or platform.**

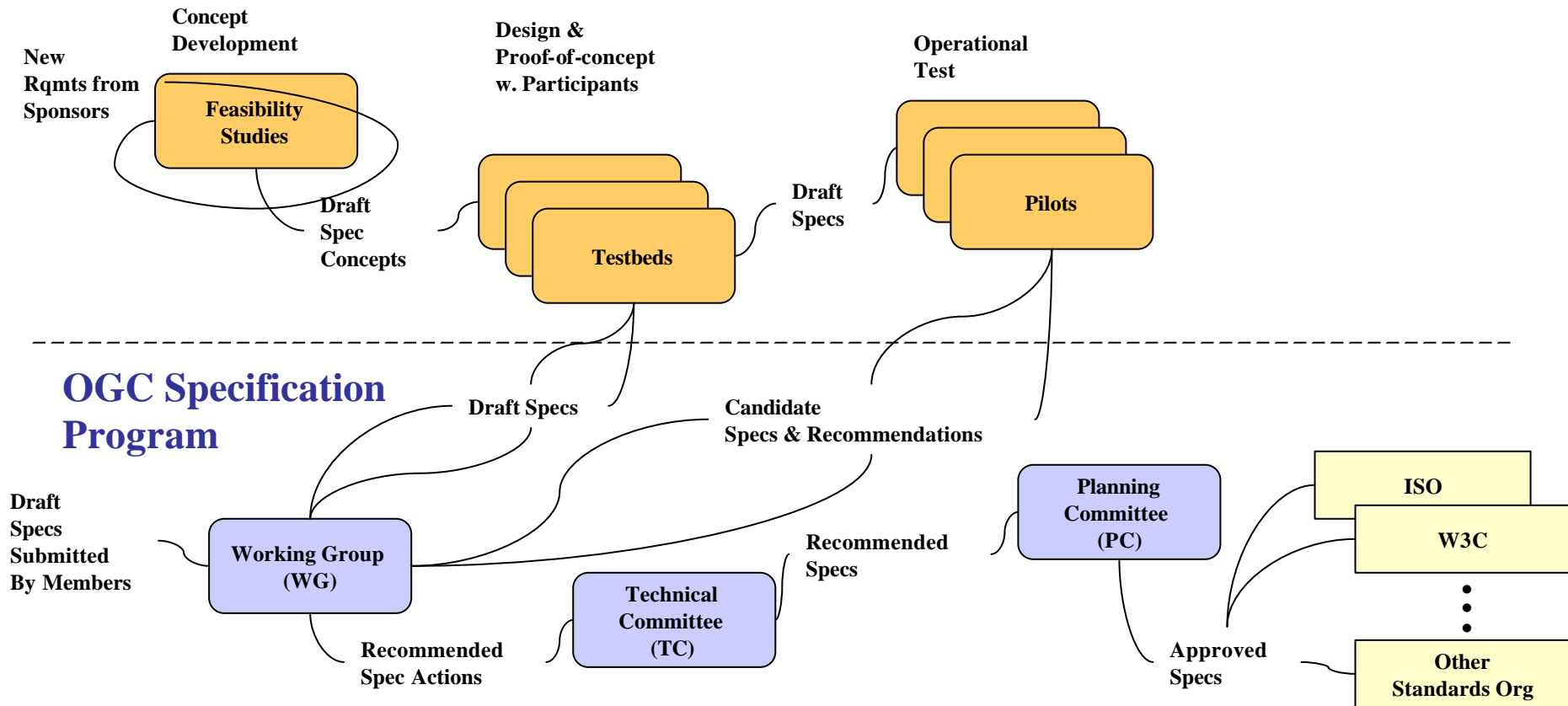
## OGC Mission

**Our core mission is to deliver spatial interface specifications that are openly available for global use.**



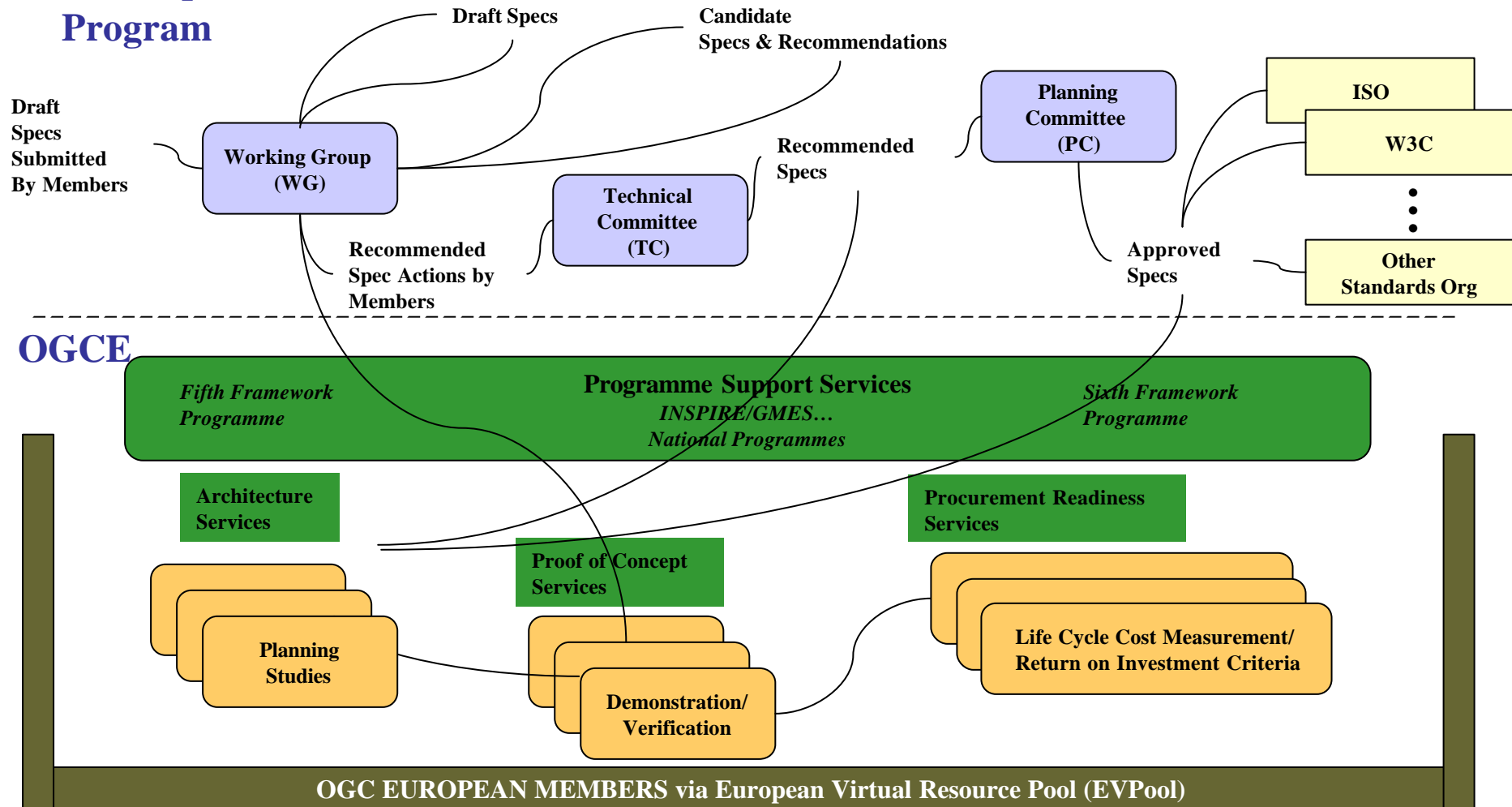
# OGC's Mission: OpenGIS® Specification Development

## OGC Interoperability Program



# OGCE's Mission: Take up and Adoption of OpenGIS® Specifications

## OGC Specification Program





# OGC Works Closely With Standards Organizations and Consortia in the Technology Community

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- International Organisation for Standardisation (ISO) TC 211 and 204
- World Wide Web Consortium (W3C)
- Internet Engineering Task Force (IETF)
- OASIS
- Automotive Mobile Information Consortium
- Open Mobile Alliance
- Initiating discussions with CEN 287



# Interoperability and Services

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**Interoperability** =

Ability of locally managed and heterogeneous systems to exchange data and instructions in real time to provide services

**Service** =

Activity performed by a server component on behalf of a client component

Source: The Importance of Going “Open”  
OGC White Paper, [www.opengis.org](http://www.opengis.org)

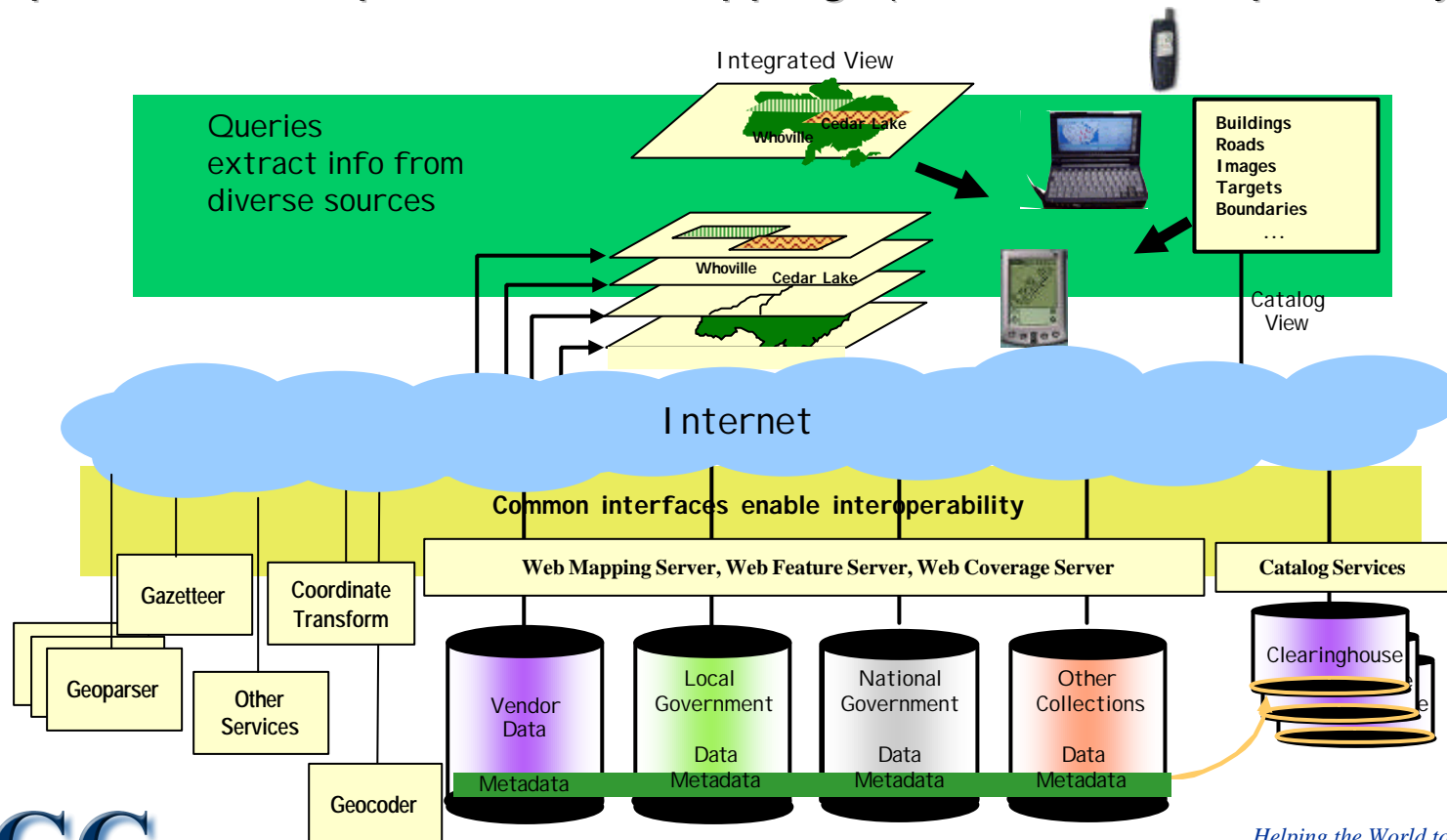
# Flavours of Interoperability

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- **Data Interoperability**
  - create a generic intermediate data format that allows different systems to share data
- **Software Interoperability**
  - send a service request, in a known format, and receive a reply
  - get a service response in a known format
- **Information or Semantic Interoperability**
  - help systems “understand” that two items with different names represent the same object in the real world
  - decipher equivalences and shades of differences

# OpenGIS® Architecture-by-Interface: Interoperable Web Services

- Easier access to multiple online information sources and services
  - Use and reuse different vendor solutions
- OpenGIS® compliance via “wrapping” (Software Interoperability)



# OGC Home Page (new since October 2003)

OGC New Website version 1.0 - Microsoft Internet Explorer

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### Join an Initiative

Help shape the future of geoprocessing in the Interoperability Program testbeds, pilot projects, pre acquisition studies, etc.!

[View initiatives](#)

### Welcome to OGC

The Open GIS Consortium, Inc. (OGC) is a member-driven, non-profit international trade association that is leading the development of geoprocessing interoperability computing standards. OGC works with government, private industry, and academia to create open and extensible software application programming interfaces for geographic information systems (GIS) and other mainstream technologies. **Adopted specifications** are available for the public's use at no cost. [Learn More.](#)

### Recent News

- » [OGC Prepares the United States Census Bureau for a New Era](#)
- » [OGC Seeks Sponsors for Emergency Mapping Symbology Initiative](#)
- » [OGC News - 30 September 2003](#)
- » [OGC User Magazine - September 2003](#)
- » [More...](#)

### Upcoming Events

- » [October '03 TC/PC Meetings](#)
- » [Spain Interoperability Day](#)
- » [96th Annual CIG Geomatics Conference: Geomatics for Industry](#)
- » [More...](#)

### Current Requests and Initiatives

- » [OGC Seeks Sponsors for Emergency Mapping Symbology Initiative](#)
- » [OGC Issues Request for Technology for Web Services Initiative](#)
- » [OGC Seeks Sponsors for Property and Land Initiative](#)

### Find a Document

#### Search by Metadata

All OpenGIS Specifications

keywords - comma separated

[Advanced Document Search](#)

Committed to GEO-Intelligence Solutions

### OpenGIS® in Action

View an OGC interoperability **demonstration**, or test drive one of our member's **product implementations**:

### Registered Products

OGC's **compliance testing program** verifies compliant products built using



# Compliance & Interoperability Testing & Evaluation Initiative (CITE)

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- **Guideline Documents**

- OpenGIS Simple Features for **SQL**, Revision 1.1
  - [ 627KB ] [ [Word Version](#) ]
  - [ 95KB ] [ [Portable Document Format Version](#) ]
- OpenGIS Simple Features for **OLE/COM**, Revision 1.1
  - [ 509KB ] [ [Word Version](#) ]
  - [ 124KB ] [ [Portable Document Format Version](#) ]
- OpenGIS Simple Features for **CORBA**, Revision 1.0
  - [ 525KB ] [ [Word Version](#) ]
  - [ 723KB ] [ [Portable Document Format Version](#) ]
- OpenGIS Catalog Services Interface Specification
  - [ 271KB ] [ [Word Version](#) ]
  - [ 182KB ] [ [Portable Document Format Version](#) ] Version ]
- OpenGIS Coordinate Transformation
  - [ 57KB ] [ [Word Version](#) ]
  - [ 121KB ] [ [Portable Document Format Version](#) ]
- OpenGIS Gridded Coverages
  - [ 55KB ] [ [Word Version](#) ]
  - [ 137KB ] [ [Portable Document Format Version](#) ]
- OpenGIS Web Map Service Interface Specification
  - [ [On-line version](#) ]
- OpenGIS Web Feature Service Interface Specification
  - [ [On-line version](#) ]



# Compliance Testing and Interoperability Testing

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- Compliance Testing
    - Software fulfils all mandatory elements of an OpenGIS® Implementation Specification
    - Implementation of optional components possible
  - Interoperability Testing
    - Software having implemented an OpenGIS® Implementation Specification is interoperable with other components of the same Implementation Specification
- ➔ Formal testing process
- ➔ Result = Certificate





OGC Resources - Microsoft Internet Explorer von AOL

Adresse <http://www.opengis.org/resources/?page=products> Wechseln zu

Links [Kostenlose Hotmail](#) [Links anpassen](#) [Windows](#) [Windows Media](#)

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Open GIS Consortium

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**Resources**

- FAQ's
- Internship Project
- OGC Network
- Compliance Testing
- Email Lists
- Glossary
- OGC Cookbooks
- Demos
- OGC Public Forum
- Registered Products >>**

## Resources - Registered Products

[View All](#)
[Statistics](#)
[By Spec](#)
[By Organization](#)
[Manage Products](#)

**Trademark & Certification Mark Guidelines.**

This is the registry for

- **Compliant Products**, that is, software products that comply to OGC's OpenGIS® Specifications. When a product has been tested and certified as compliant through the OGC Testing Program, the product is automatically registered as "compliant" on this site.
- **Implementing Products**, that is, software products that implement OpenGIS Specifications but have not yet passed a compliance test. (Compliance tests are not available for all specifications.) Developers can register their products as implementing draft or approved specifications. (OGC reserves the right to review and verify each entry.)

For information on how to register your product, click on "Manage Products" in the menu above.

Additional information on the [OGC Compliance Testing Program](#)

### Products Compliant to or Implementing OGC Specs or Interfaces.

Implementing or Compliant
  Implementing Only
  Compliant Only

Click the column headers to sort the table.  
 Mouse over OGC Spec for full specname (most browsers)  
 Click on an Organization for website --- Click on a Product for details --- Click on a Contact to email

| Organization | Product               | OGC Spec  | Type | Contact | Date |
|--------------|-----------------------|---|------|---------|------|
|              | owsview Viewer Client | CAT 1.0, Filter 1.0.0, Gaz 0.8, GML 2.0, GML 2.1, |      |         |      |

Internet



OGC Resources - Microsoft Internet Explorer von AOL

Adresse <http://www.opengis.org/resources/?page=products>

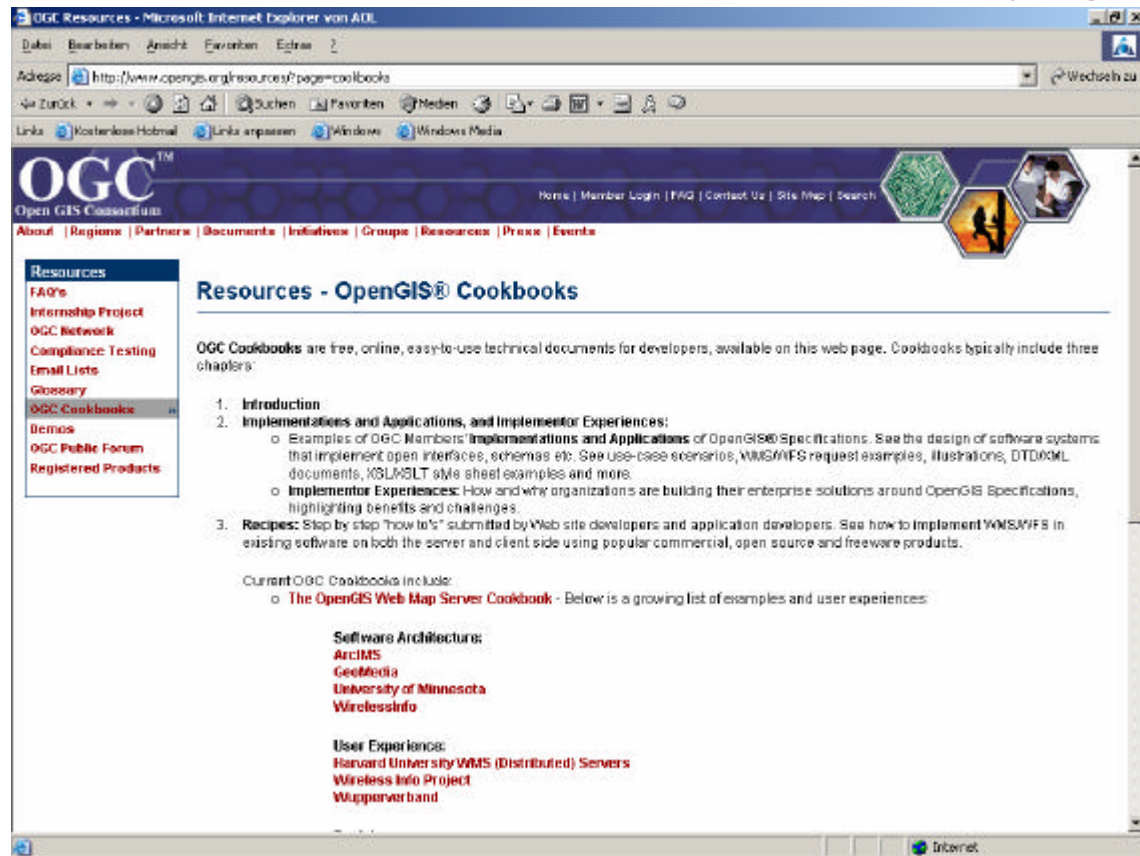
Links [Kostenlose Hotmail](#) [Links anpassen](#) [Windows](#) [Windows Media](#)

| Cadcorp Ltd.                                  |   |                    |                   |            |  |
|---|---|--------------------|-------------------|------------|--|
| Cadcorp SIS Terrain Server 6                  | WTS 0.3.2   | Server             | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Map Server 6                      | WMS 1.1.0   | Client (Applet)    | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Active Server Component VB.1      | Filter 1.0.0, Gaz 0.8, WFS 0.0.13, WFS 0.0.14, WFS 1.0.0 (compliant), WMC 1.0, WMS 1.0.0, WMS 1.1.0, WMS 1.1.1 (compliant), WTS 0.3.2 | Server             | Daly, Martin      | 2003-11-20 |  |
| Used in Cadcorp SIS 5.2                       | SFO 1.1 (compliant)   | COM Object Library | Daly, Martin      | 2000-10-26 |  |
| Used in Cadcorp apSIS 6                       | GC 1.0 (compliant), CTO 1.0 (compliant)   | COM Object Library | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Terrain Server 6                  | WTS 0.3.2   | Client (HTML)      | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Map Server 6                      | WMS 1.1.0, WMS 1.0.0, WMC 1.0, WMS 1.1.1  | Server             | Daly, Martin      | 2002-10-16 |  |
| Cadcorp SIS OLE DB Provider 6                 | SFO 1.1 (compliant)   | OLE DB Provider    | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Terrain Server 6                  | WTS 0.3.2   | Client (Applet)    | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Map Server 6                      | WMS 1.0.0, WMS 1.1.0, WMS 1.1.1   | Client (HTML)      | Daly, Martin      | 2001-10-16 |  |
| Cadcorp SIS Active Server Component 6         | WMS 1.1.1, WMS 1.1.0, WMS 1.0.0, WMC 1.0, WFS 1.0.0, WFS 0.0.14, WFS 0.0.13, Gaz 0.8, Filter 1.0.0, WTS 0.3.2                         | Server             | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Map Server 5.2                    | WMS 1.0.0   | Server             | Daly, Martin      | 2000-10-26 |  |
| Cadcorp SIS Map Server VB.1                   | WMC 1.0, WFS 1.0.0 (compliant), WFS 0.0.14, WFS 0.0.13, WMS 1.0.0, WMS 1.1.0, WMS 1.1.1 (compliant)                                   | Server             | Daly, Martin      | 2003-11-20 |  |
| Cadcorp SIS 6                                 | WMS 1.1.0, WMS 1.0.0, WMC 1.0, WFS 1.0.0, WFS 0.0.14, WFS 0.0.13, GML 2.1, GML 2.0, Gaz 0.8, Filter 1.0.0, WMS 1.1.1                  | Client             | Daly, Martin      | 2002-11-01 |  |
| Cadcorp apSIS 6                               | WMS 1.0.0, WMS 1.1.0, WMS 1.1.1   | Client             | Daly, Martin      | 2002-11-01 |  |
| Cadcorp SIS Feature Server 6                  | WFS 0.0.13, Gaz 0.8, Filter 1.0.0, WFS 0.0.14, WFS 1.0.0  | Server             | Daly, Martin      | 2002-11-01 |  |
| Cadcorp GeognoSIS.NET VB.1                    | WFS 0.0.13, WFS 0.0.14, WFS 1.0.0 (compliant), WMS 1.0.0, WMS 1.1.0, WMS 1.1.1 (compliant)  | Server             | Daly, Martin      | 2003-11-20 |  |
| Cadcorp SIS 5.2                               | SFS 1.1, WMS 1.0.0  | Client             | Daly, Martin      | 2000-10-26 |  |
| Used in Cadcorp SIS 6                         | GC 1.0 (compliant), CTO 1.0 (compliant)   | COM Object Library | Daly, Martin      | 2002-11-01 |  |
| Used in Cadcorp apSIS 1                       | CTO 1.0 (compliant), GC 1.0 (compliant), SFO 1.1 (compliant)  | COM Object Library | Daly, Martin      | 1999-09-13 |  |
| CARIS   |   |                    |                   |            |  |
| CARIS Spatial Fusion 2.5.1                    | WMS 1.1.0, WMS 1.0.0  | Server             | DesRosiers, Denis | 2001-04-15 |  |
| CARIS Spatial Fusion Web Feature Server 1.0   | WFS 0.0.13  | Server             | DesRosiers, Denis | 2001-09-17 |  |
| CARIS Spatial Fusion Cascading Map Server 1.0 | WMS 1.0.0, WMS 1.1.0  | Server             | DesRosiers, Denis | 2001-09-17 |  |
| CARIS Spatial Fusion 3.0                      | WMS 1.1.0, WMS 1.0.0  | Server             | DesRosiers, -     | 2002-09-30 |  |

Internet

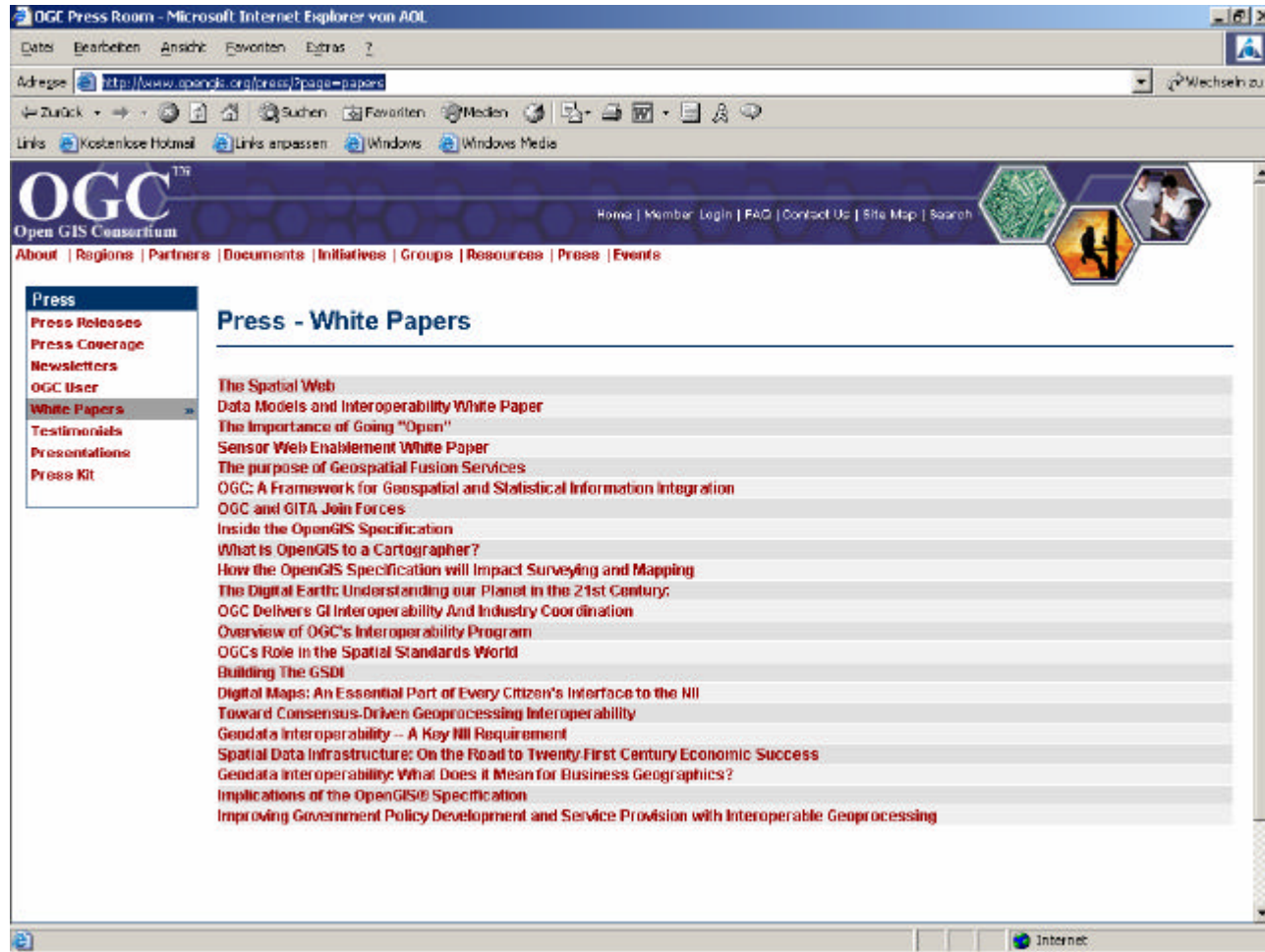
# OpenGIS® Cookbooks

- OpenGIS® Web Map Server Cookbook (available at <http://www.opengis.org/resources/?page=cookbooks>)
- OpenGIS® Web Feature Server Cookbook (in preparation)



# OGC White Papers

- <http://www.opengis.org/press/?page=papers>





# Information about OGC

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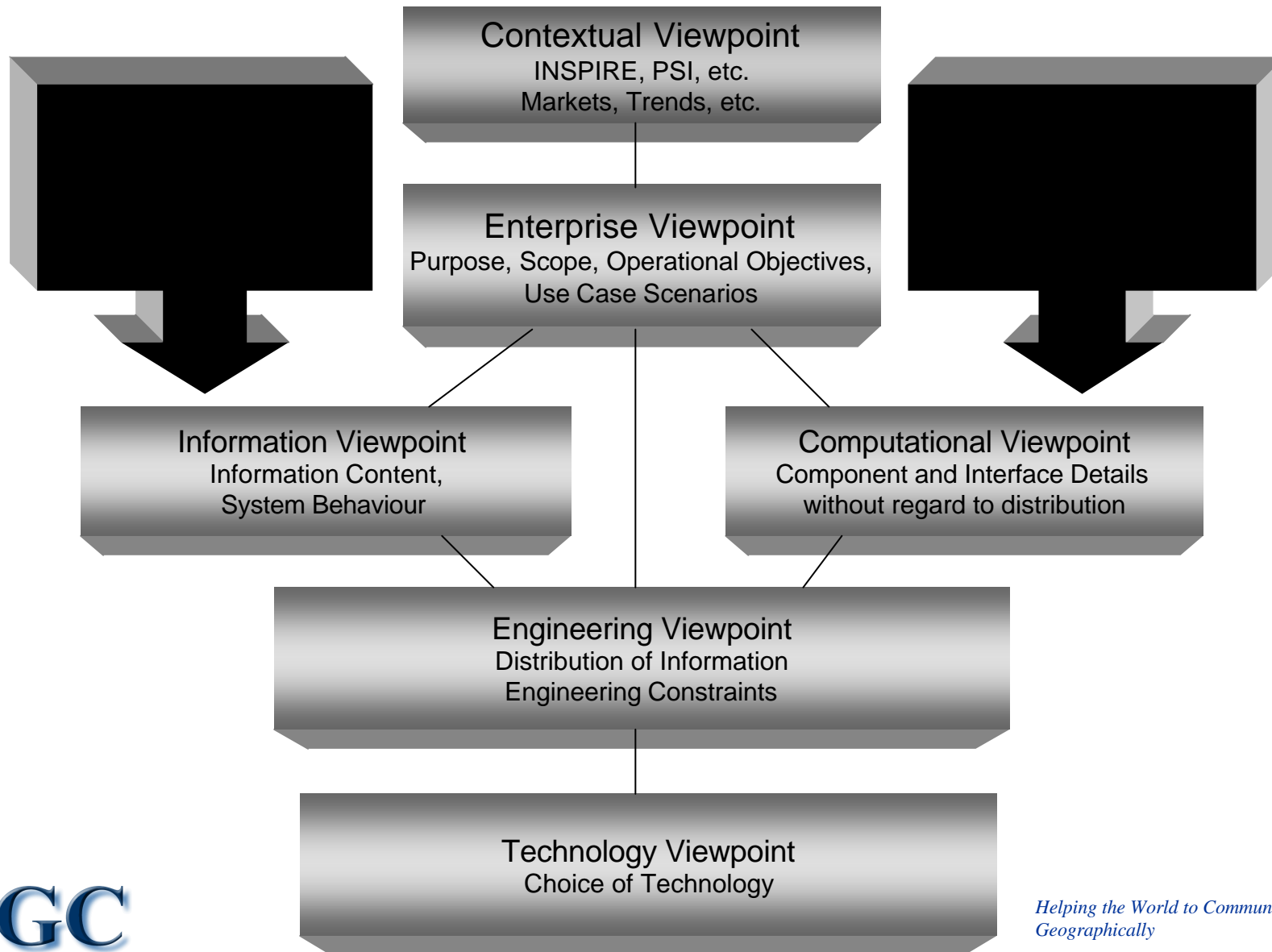
- OGC News\* (monthly, English)
  - News and general information
  - Text or HTML
- OGC User\* (monthly, English)
  - Documents implementations that involve OpenGIS® Specifications
  - Aimed at a broad range of readers around the world and is written in conversational, rather than technical
  - Examples:
    - [Copenhagen: Managing Process with Web Map Service](#)
    - [Sharing Forestry Data: The Canadian Forestry Service's Distributed Interoperability Solution](#)
    - [New South Wales Taps OpenGIS Web Feature Service Specification to Share Natural Resources Information](#)
    - [Policy, Open Standards and GIS: The Open GIS Story in Arkansas](#)
- \* Sign up at [www.opengis.org](http://www.opengis.org) for automatic email subscription to these publications (free of charge)

# OpenGIS® Reference Model

- Abstraction of ISO Reference Model for Open Distributed Processing (RM-ODP)
  - a way of thinking about architectural issues in terms of fundamental patterns or organising principles
  - a set of guiding concepts and terminology
- Five viewpoints enable ‘separation of concerns’:

|               |  |
|---------------|--|
| Enterprise    | Focuses on the purpose, scope, operational objectives and policies for a system                                    |
| Information   | Focuses on the information content and system behaviour (data models, semantics, schemas)                          |
| Computational | Captures component and interface details without regard to distribution  |
| Engineering   | Exposes the distributed nature of the system and provides standard definitions to describe engineering constraints |
| Technology    | Focuses on the choice of technology  |

# OpenGIS® Reference Model and SDIs



# OpenGIS® Reference Model and OGC Technical Document Baseline

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OpenGIS® Reference Model

[www.opengis.org/docs/03-040.pdf](http://www.opengis.org/docs/03-040.pdf)


OGC Technical Document Baseline

[www.opengis.org/docs/03-053r1.xls](http://www.opengis.org/docs/03-053r1.xls)

Open GIS Consortium Inc.

Date: 2003-03-04  
Referencenumber: **OGC 03-040**  
Version: 0.1.2  
Category: OpenGIS® Reference Model  
Editor: Kurt Buehler

**OpenGIS® Reference Model**



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# Conclusion: A Quote from the EC

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- Commissioner Erkki Liikanen, DG Information Society  
"The role of ICT Investment in Solving Europe's Economic Problems"  
(TeliaSonera Executive Customer Event 2003,  
Stockholm, 26 September 2003)
- "We need to promote the use of the Internet by stimulating the creation of new content, applications and services. People do not buy technologies. They buy services. Here government must concentrate on areas where it can make a real difference: eHealth, eLearning and eGovernment."
- "To properly ensure access to Information Society services, interoperability between services and devices must be ensured, preferably through open standards."
- "At a European level, we have been concentrating on eGovernance areas such as eGovernment, eHealth, and eLearning as drivers of ICT investment. We have chosen these three areas, because here government can make a difference, and together they account probably for almost 40% of national budgets."
- "Our strategy has been to diffuse the best practices of eHealth and eGovernment solutions that work in practice and which have been accompanied by back-office reform. The time for pure vision or pilot-projects is over. Now we need real action and political commitment."

# Thank you very much for your attention!

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[www.opengis.org](http://www.opengis.org)

Louis Hecht

[lhecht@opengis.org](mailto:lhecht@opengis.org)

Guenther Pichler

[gpichler@opengis.org](mailto:gpichler@opengis.org)

Martin Klopfer

[mklopfer@opengis.org](mailto:mklopfer@opengis.org)