



**GEO**  
INFORMATION

# Standardization in GIS

## A journey spanning 3 decades

**Univ.-Prof. Dr. Norbert Bartelme, TU Graz**

ISO/TC 211 Plenary  
Standards in Action Workshop  
Vienna, 11-may-2022

Introduction: 30 years...

Geographic Information, the beginnings of standardization

The first ISO/TC 211 plenaries

Austrian Standards International

CEN - ISO Vienna agreement, OGC cooperative agreement

Embedding and liaisons

Conclusion

## Generations:

- Family
- Social: Baby Boomers, 68-ers, Millennials, ...
- GIS Generations:
  - in terms of devices: 1st, 2nd, 3th, 4th generation: mainframe, desktop, mobile...
  - in terms of connectivity: stand-alone, connected, fully web-based...
  - in terms of usage: single use, web services, fully interoperable...
- Standardization Generations:
  - awareness
  - provider-client agreement
  - formal specification
  - standards

# 30 years, a generation?



31 years Vienna Agreement between  
ISO (International Standards) and CEN (European Standards)

30 years of CEN/TC 287 “Geographic Information”

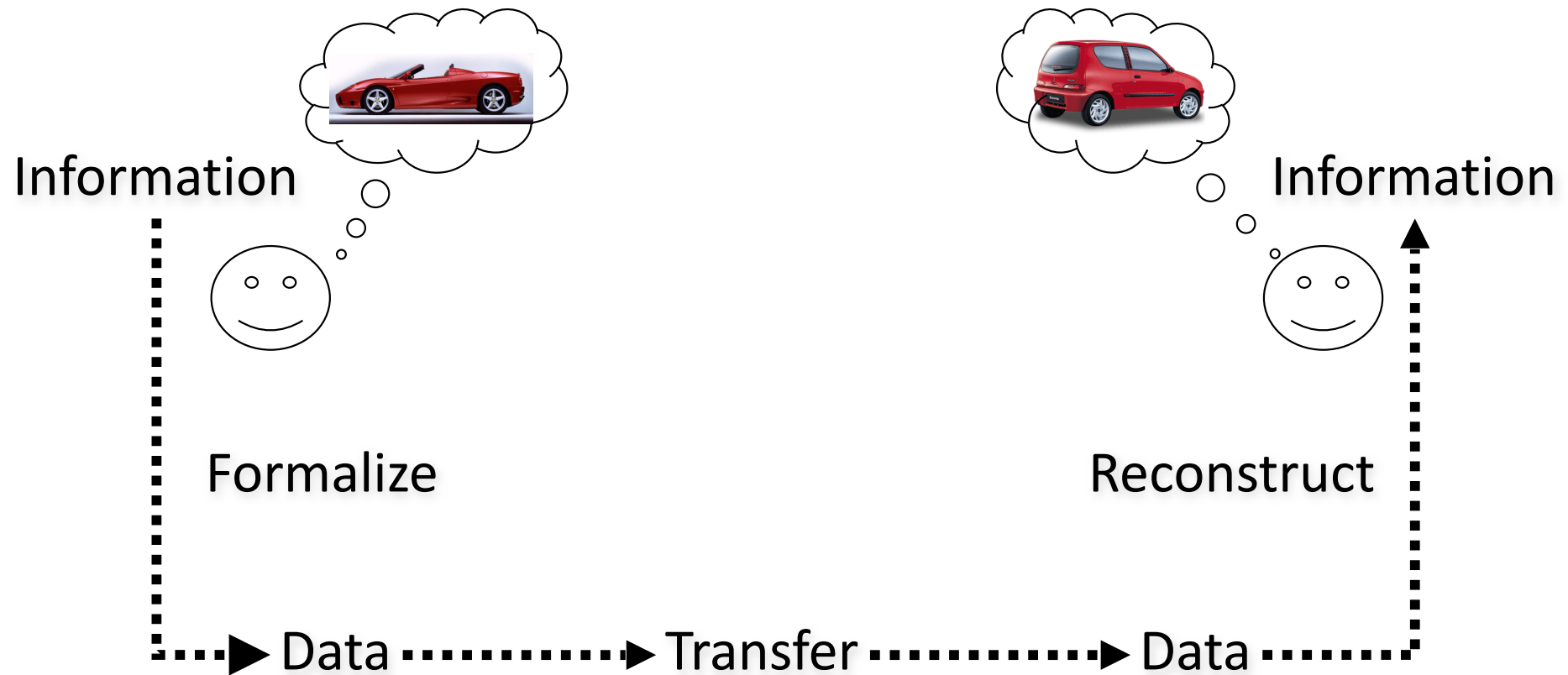
Almost 30 years of ISO/TC 211 “Geographic Information/Geomatics”

Almost 30 years of OGC „Open GIS / Geospatial Consortium“

30 years of personal experience in standardization



# Common thread: Information? Data?





# Geographic Information? Geographic Data?





30 years ago

Oct 1992, Bardøla Hotel, Geilo, Norway  
1st meeting of CEN/TC 287 WG2  
Convenor: Olaf Østensen



[www.geilo.com](http://www.geilo.com), [www.bardola.no](http://www.bardola.no)

28 years ago

Nov 1994, Oslo, Norway  
1st plenary of ISO/TC 211  
Convenor: Olaf Østensen  
Secretary: Bjørnhild Sæterøy



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Bjørnhild Sæterøy



# The first 15 years of ISO/TC 211



- |                                 |                                |
|---------------------------------|--------------------------------|
| 01 1994 Oslo, Norway            | 14 2002 Bangkok, Thailand      |
| 02 1995 Reston, USA             | 15 2002 Gyeongju, South Korea  |
| 03 1996 Seoul, South Korea      | 16 2003 Thun, Switzerland      |
| 04 1997 Sydney, Australia       | 17 2003 Berlin, Germany        |
| 05 1997 Oxford, UK              | 18 2004 Kuala Lumpur, Malaysia |
| 06 1998 Victoria, Canada        | 19 2004 Pallanza, Italy        |
| 07 1998 Beijing, China          | 20 2005 Stockholm, Sweden      |
| <b>08 1999 Vienna, Austria</b>  | 21 2005 Montreal, Canada       |
| 09 1999 Kyoto, Japan            | 22 2006 Orlando, USA           |
| 10 2000 Cape Town, South Africa | 23 2006 Riyadh, Saudi Arabia   |
| 11 2000 Reston, USA             | 24 2007 Rome, Italy            |
| 12 2001 Lisbon, Portugal        | 25 2007 Xian, China            |
| 13 2001 Adelaide, Australia     | 26 2008 Copenhagen, Denmark    |

...

**54 2022 Vienna, Austria**

# The first 15 years of ISO/TC 211

1996, Seoul, South Korea  
3rd plenary of ISO/TC 211

The Resolution Committee:

Olaf Østensen (N)

Bjørnhild Sæterøy (N)

François Salgé (F)

John Rowley (UK)

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Bjørnhild Sæterøy



# The first 15 years of ISO/TC 211

1997, Sydney, Australia  
4th plenary of ISO/TC 211

Ken Bullock (AU)

Comment

Bjørnhild Sæterøy:  
„We still used land lines“

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Bjørnhild Sæterøy



Currently:

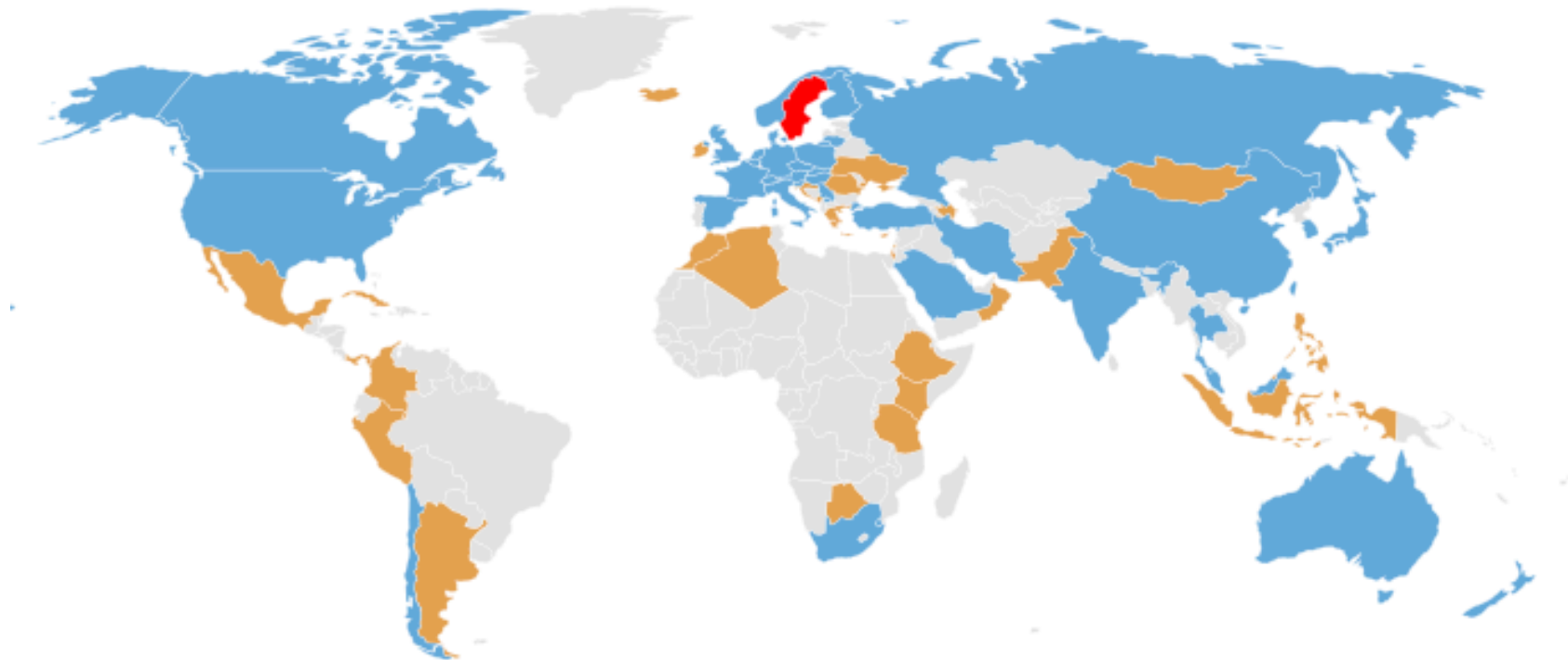
90 Published standards

23 standards under development

37 Participating members

33 Observing members

Secretariat: SIS Swedish Standards Institute



<https://www.isotc211.org>





MEMBERS

**ASI**  
**Austria**

MEMBERSHIP: MEMBER BODY

**Austrian Standards International – Standardisation and Innovation (A.S.I.)** is a non-profit, non-governmental organization (association), founded in 1920.

It provides an impartial platform for the creation of standards and specifications and is gateway for Austrian experts to participate in international and European standardization (ISO and CEN).

Some 4,100 experts from companies, authorities, science, inspection bodies and non-governmental organisations participate in some 150 national Technical Committees with about 260 Working Groups.

They take part in the work of nearly 90 per cent of ISO/ and CEN/TCs.

<https://committee.iso.org/member/1529.html>



Austrian standards are identified as ÖNORM standards.

However, numerous other standards and specifications are developed in Austria to make life easier for everybody.

Austrian Standards (ÖNORM) are part of / take part in

- ISO International Organization for Standardization
- CEN European Committee for Standardization

<https://www.austrian-standards.at/en>

To celebrate the 30th anniversary of the Vienna Agreement, the leaders of the international standardization organizations and around 160 interested people from all over the world took part in a hybrid conference on 11-Oct-2021.

AUSTRIAN  
**STANDARDS**



STANDARDIZATION

Search...



## VIENNA AGREEMENT IS COMPASS FOR FUTURE

High-level online conference on visions and responsibility of international standardization

<https://www.austrian-standards.at/en/innovation/standards-innovation/30-years-vienna-agreement>

Vienna Agreement objective: ensuring that European and international standards are not in conflict with each other but rather are as consistent with each other as possible.

The motto: "One standard, one test – accepted everywhere"

- Advantages in everyday life, for the economy and climate protection
- Standards: common language, common objective: one out of three European standards is identical with an ISO standard
- Sustained impetus to the economy:  
from energy efficiency to artificial intelligence

<https://www.austrian-standards.at/en/innovation/standards-innovation/30-years-vienna-agreement>

Oct. 2021:

Under the title "From global to local: Joining forces to help global standards create local impact", they discussed opportunities and visions in standardization and highlighted the major role that standards play for a sustainable future.

Photo from left to right:

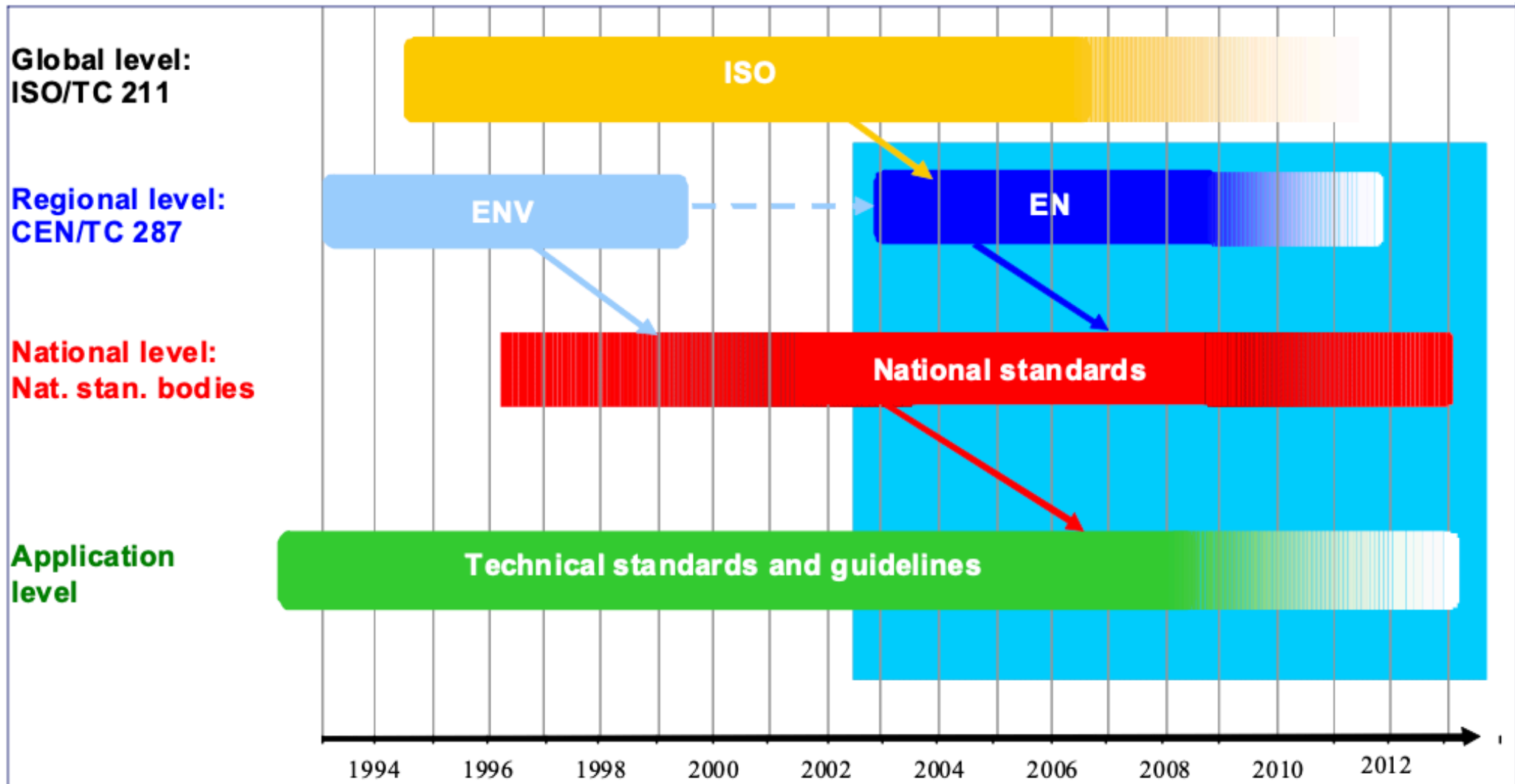
Eddy Njoroge  
(President ISO)

Elisabeth-Stampfl-Blaha  
(Dir. Austrian Standards)

Vincent Lafleche  
(President CEN)



<https://www.austrian-standards.at/en/innovation/standards-innovation/30-years-vienna-agreement>





TC 211

Geographic information/Geomatics

Geographic technology standard models & schemas

ISO/TC 211 and OGC collaborate on geoprocessing standards

*Wayland, Massachusetts, USA and Oslo, Norway*

*May 14, 1997*

The **Open GIS Consortium, Inc. (OGC)** and the International Organization for Standardization Technical Committee 211 Geographic information/Geomatics (ISO/TC 211) announced today that OGC and ISO/TC 211 have begun to work closely together to converge and match their respective work plans to avoid duplicate or divergent work.

<https://www.isotc211.org/press/1997/05/14/tc211-ogc-collaborate-on-standards.html>



ISO 19101 *Geographic Information -- Reference model*

ISO/TS 19103 *GI -- Conceptual schema language*

ISO/TS 19104 *GI -- Terminology*

ISO 19105 *GI -- Conformance and testing*

ISO 19106 *GI -- Profiles*

ISO 19107 *GI -- Spatial schema*

ISO 19108 *GI -- Temporal schema*

ISO 19109 *GI -- Rules for application schema*

ISO 19110 *GI -- Methodology for feature cataloguing*

ISO 19111 *GI -- Spatial referencing by coordinates*

ISO 19112 *GI -- Spatial referencing by geographic identifiers*

ISO 19113 *GI -- Quality principles*

ISO 19114 *GI -- Quality evaluation procedures*

ISO 19115 *GI -- Metadata*



# As time goes on...

1998, Victoria,  
Canada  
8th plenary of  
ISO/TC 211

„More and  
more  
laptops“

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Services

Portrayal

Encoding

Imagery and Gridded Data

Schema for Coverage Geometry and functions

Simple Feature Access

Geodetic Codes and Parameters

WMS Interface

Sensor Models

Location Based Services

Procedures for Item Registration

GML Geography Markup Language

Schema for Moving Features

WFS Interface

Filter Encoding

Classification Systems

Cross-Domain Vocabularies

Linear Referencing

GeoREL Rights Expression Language

Ontology

Land Administration Domain Model

Ubiquitous Public Access

Place Identifier Architecture

Observations and Measurements

Addressing

Indoor Feature Model

BIM to GIS Conceptual Mapping

....



## As time goes on...

1999, Vienna,  
Austria  
9th plenary of  
ISO/TC 211

„Everyone had a  
laptop...”

Well,  
almost everyone!

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Is there any information that cannot be related to a place on earth?

Transport, Climate, Economy, Agriculture, Property, Politics ...

-> GI is ubiquitous!

-> Many contacts, overlaps, common interests with other fields

-> Numerous „liaisons“

- Information technology, Computer graphics, Image processing
- Buildings and civil engineering works (BIM)
- Geodetic and surveying instruments, unmanned aircraft systems
- Intelligent transport systems, road traffic safety management
- Environmental management, agricultural electronics
- Space systems operation and management
- Artificial intelligence
- Sustainable cities, smart community infrastructures
- Security and resilience
- Blockchain technologies
- ...

- ESA European Space Agency
- EUROGI European Umbrella Organisation for GI
- FAO Food and Agriculture Organisation of the UN
- FIG International Federation of Surveyors
- IAG International Association of Geodesy
- ICA International Cartographic Association
- IHO International Hydrographic Organisation
- ISPRS International Society for Photogrammetry and Remote Sensing
- OMG Object Management Group
- OSGeo Open Source Geospatial Foundation
- UPU Universal Postal Union
- WMO World Meteorological Organisation
- W3C World Wide Web Consortium
- ...



# Standardization work: Is it dull?

2003, Thun,  
Switzerland  
16th plenary of  
ISO/TC 211

*Dull?*

*Certainly not!*

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Standardization work is alive and lively!

It is not the end point of a technological advancement,  
rather it goes hand in hand with it,  
often also providing an impetus for the search for new horizons.

Technological developments tend to leap ahead of our mental  
disposition for making good use of them.

Standardization helps us to ascertain control of technological  
terrain that we have won.

And based on these, we can plan new adventures!



1999, Vienna,  
Austria

9th plenary of  
ISO/TC 211

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