Hans Knoop, Germany
Technical University of Braunschweig
ISO/TC211 and CEN/TC287: Co-Chair, Advisory Groups on Outreach
Head of German Delegations of DIN • German Institute for Standardization
Representative of ISPRS to ISO/TC211

‘Roadmap’ as a Further Impulse for Standardisation in Africa by Geoinformation-Standards-ISO-Workshop in Nairobi 2004

ISO Strategic Plan 2005-2010 (1)

FOLLOWING A BROAD CONSULTATION OF MEMBERS AND STAKEHOLDERS
ADOPTION OF SEVEN KEY OBJECTIVES
1. Developing a consistent multi-sector collection of globally relevant International Standards
2. Ensuring the involvement of stakeholders
3. Being open to partnerships for the efficient development of International Standards
4. Raising awareness and capacity in developing countries
5. Promoting the use of International Standards as a substitute or support to technical regulations
6. Being the neutral provider of a complete range of IS and guides for conformity assessment
7. Providing efficient procedures and tools for the development of a coherent and complete range of deliverables

ISO Strategic Plan 2005-2010 (2)
The German Standardization Strategy starts with a vision:

Standardization in Germany helps business and society strengthen, develop and open up regional and global markets

**Goal 1:** Standardization secures Germany’s position as a leading industrial nation (1)

- Increase awareness among decision-makers in business, politics and society
- Establish and develop networks between standards bodies, business, associations and politics
- Establish priority sectors with the highest development and growth potential for the German economy

**Goal 1:** Standardization secures Germany’s position as a leading industrial nation (2)

- Integrate standardization in research and development
- Promote the European model for adopting International Standards
- Work to establish the European standardization system emerging economies and new and future EU member states

**Goal 2:** Standardization as a strategic instrument supports a successful society and economy

- Increase targeted marketing
- Create networks for public relations and information activities
- Improve the flow of information on standardization in companies
- Intensify education and training in standardization

**Goal 3:** Standardization is an instrument of deregulation

- Seek dialogue with political decision-makers
- Make a clear distinction between standardization and legislation
- Improve the implementation of the New Approach
- Expand into new sectors

**Goal 4:** Standardization and standards bodies promote technological convergence

- Develop standards for systems
- Identify scope for action in converging technologies
- Optimize structures
- Transfer to European and international levels
The joint research project on the "Economic benefits of Standardization" was initiated by DIN, the German Institute for Standardization, and the German Federal Ministry of Economic Affairs and Technology (BMWi) in 1997 and completed in May 2000.

The study have been undertaken by the Technical University Dresden (TUD) and Fraunhofer Institute of Systems and Innovations (ISI).

The following organizations and companies also contributed to the financing of the project: DaimlerChrysler, Siemens AG, Hans L. Merkle Stiftung, ThyssenKrupp AG, German Electonical Commissions in DIN and VDE (DKE), the Austrian Standardization Institute (ON) and the Swiss Standard Association.

The benefit to the national economy amounts to more than US $15 bn per year.

Standards contribute more to economic growth than patents and licences.

Companies that participate actively in standards work have a head start on their competitors in adapting to market demands and new technologies.

Transaction costs are lower when European and International Standards are used.

Research risks and development costs are reduced for companies contributing to the standardization process.
Standards

Worldwide Need for Clarification

Definitions

<table>
<thead>
<tr>
<th>German</th>
<th>English/Internationally</th>
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<tbody>
<tr>
<td>Norm</td>
<td>Standard</td>
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<tr>
<td>Standard</td>
<td>&quot;Defacto&quot;-Standard</td>
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</tbody>
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Authorized Standardization Bodies

DIN, ... — CEN — ISO


Cairo, 16-21 April 2005

User Communities

CEOS, Committee on Earth Observation Satellites
DGIWG, Digital Geographic Information Working Group
EPSG, European Petroleum Survey Group
FIG, International Federation of Surveyors
GSDI, Global Spatial Data Infrastructure
IAAS, International Association of Geodesy
IGC, International Geodetic Association
ICAO, International Civil Aviation Organization
IEEE, Geoscience and Remote Sensing Society
IHB, International Hydrographic Bureau
ISCGM, International Steering Committee for Global Mapping
ISPRS, International Society for Photogrammetry and Remote Sensing
JRC, Joint Research Centre, European Commission
OGC, Open GIS Consortium

All these enumerated user communities are the external liaison organizations to ISO/TC 211 Geographic Information / Geomatics

Standards & Spatial Data Infrastructure

National - Regional - Global

Standards Infrastructure

Spatial Data Infrastructures

Federal Government

State

County

City


Cairo, 16-21 April 2005

User Communities

PCGIAP, Permanent Committee on GIS Infrastructure for Asia and the Pacific
UNECE, Economic Commission for Europe, Statistical Division
UNFAO, Food and Agriculture Organization
UNGEGN, United Nations Group of Experts on Geographic Names
UNGWIW, United Nations Geographic Information Working Group
WMO, World Meteorological Organization
PCIDEA, Permanent Committee on Spatial Data Infrastructure for the Americas
SCAR, Scientific Committee on Antarctic Research
CEN/TC 287, Geographic information...
Location based services standards

ISO 19132 – Location based services possible standards (Review Summary)

ISO 19133 – Location based services tracking and navigation

ISO 19134 – Multimodal location based services for routing and navigation

ISO/TC 211 Imagery

Review Summary 19124 - recommended several TC211 standards to address Imagery and Gridded data

Framework

Sensor & Data Models

Metadata

Part 2

Reference Model

ISO/TC 211 Advisory Group on Outreach

Mission

Promote the awareness, adoption, and advocacy of ISO/TC 211 standards in user communities.

ISO/TC 211 & OGC

1994

• ISO/TC 211 - de jure formal standards technical committee
• OGC - de facto industry technical specifications
• 1999 - OGC - ISO/TC 211 Class A Liaison status
• ISO/TC 211 & OGC Joint Advisory Group (JAG)
• ISO standardization of OGC specifications: Simple Features Access, Web Mapping Server Interface
• Jointly develop the Imagery & gridded data Reference Model, Framework, and the OGC Sensor Markup Language
• Geography Markup Language (GML)

Open Geospatial Consortium (OGC)

“Our core mission is to deliver interface specifications that are openly available for global use”

OGC is an international industry consortium of companies, government agencies and universities participating in a consensus process to develop publicly available geoprocessing specifications.
ISO Metadata Registry

Cross-reference to other ISO Metadata Profiles e.g.,

- UN Geographic Information Working Group (UNGIWG)
- UNFAO GeoNetwork
- other non-governmental organizations

UNFAO - UN/Food and Agricultural Organisation

LCCS
Land Cover Classification System

GLCN
Global Land Cover Network

Adoption of ISO Standards

Asia Pacific Region
Permanent Committee on GIS Infrastructure for Asia and the Pacific (PCGIAP)

International Steering Committee for Global Mapping (ISCGM)

Regional Activities

European New Activities

- INSPIRE
- EUROGEOGRAPHICS
- CEN/TC 287 reestablished
  10./11. November 2003 Plenary
  1 Working Group
  Advisory Group on Outreach

Implications of Standards

Initial International Interoperability

INSPIRE
Infrastructure for Spatial Information in Europe

European Spatial Data Infrastructure
ISO/TC 211 & Open Geospatial Consortium standards & specifications
Europe - initial interoperability testing ground

History CEN/TC 287

CEN/TC 287 first period 1992-1999

- Secretariat (France, AFNOR, chair François Salgé)
- became dormant in 1999-2003
  under secretariat of SNV, Schweizerische Normen-Vereinigung
History CEN/TC 287

CEN/TC 287 first period results
- 8 ENVs:
  - Reference Model, Spatial Schema, Quality, Metadata, Transfer, Geographic Identifiers, Position, Rules for Application Schema
- 4 reports:
  - Query and Update: Spatial Aspects, Overview, Vocabulary, Conceptual Schema Language

CEN/TC 287 - Continuation
- Proposal JRC of EU (November 2002)
- CEN enquiry spring 2003
- Result
  - CEN/TC287 revived
  - Secretariat: NEN, the Netherlands
  - First meeting of revived CEN/TC287 in Delft, the Netherlands, on 10-11 November 2003
  - Chair: Prof. In. Henri Aalders
  - Updated scope
  - Revised business plan
  - Enquiry for WG1, Spatial Data Infrastructures
  - Co-chair Advisory Group on Outreach: Prof. Dr. Hans Knoop
  - Withdrawal of CEN/TC287 ENVs
  - and other Resolutions

ISO/TC 211 - CEN/TC 287

Differences ISO - CEN
- P and O members
- DIS → FDIS → IS
- Voluntary standards
- Conflicting national standards possible
- All member bodies voting obligation
- Enquiry → Formal Vote → EN
- Compulsory standards
- Withdrawal of conflicting national standards

Agenda

Implementation: Geobasisdata and GSDI
- Example: Development in Germany

Traditional Land Records

Real Estate Cadastre
- Inventory of all real estate, valuation
- Geometric (illustrative) data, boundaries, descriptive data, land use, data on ownership, topographic features...
  - in ALS parcel-related
  - in ALK layer-structured

State Survey
- Data on the whole state territory
- with topographic items and
  - information on terrain
  - in ATKIS object-related: settlements, traffic, waters, vegetation, areas, land forms

Paradigm Shift

Since 1997: Concept of AdV for Modelling of Geoinformation of the Official Surveying and Mapping
- Integration of Cadastre Map and Register (ALK and ALB)
- Harmonisation of Cadastre and Topographic Mapping (ALKIS-ATKIS)

Cornerstones
- Integrated maintenance of graphic data and descriptive data
- Constant object view
- Data maintenance without redundancies
- User profile according to data protection legislation
- Focus on customers
- Economicalness of the concept
**Target System**

Uniform geospatial base datasets for Germany

Only one data model for

- Spatial Reference System ➔ AFIS
- Real Estate Cadastre ➔ ALKIS
- Topography ➔ ATKIS

3A - base schema, one 3A - application schema

NAS - standard-based data exchange format

Co-ordinated data capture, maintenance and supply/delivery

Geospatial Base Data Information Management (GIM)

Implementation (stage-wise realisation)

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**3A - Framework**

- Project of the AdV
- Involvement of GIS industry (Workshops)
- Integration of customers interests
- Use of draft ISO-standards and OGC-specifications
- Use of GI-Systems available on the market
- System-independent data exchange format for AFIS/ALKIS/ATKIS: **NAS**

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**Derivation of the NAS encoding rules**

ISO 19100 - Using

- 19103 Conceptual schema language
- 19107 Spatial schema
- 19109 Rules for application schema
- 19110 Feature cataloguing methodology
- 19111 Spatial referencing by coordinates
- 19112 Spatial referencing by geographic identifiers
- 19113 Quality principles
- 19114 Quality evaluation procedures
- 19115 Metadata
- 19116 Encoding
- 19123 Schema for coverage geometry and functions

---

ISO 19100 - Using

- 10105 Conformance and testing
- 19108 Temporal schema
- 19127 Geodetic codes and parameters
- 19135 Registry
- 19136 GML
- 19138 Data quality measures
- 19139 Metadata implementation
ISO 19100 – using in future

- 19117 Portrayal
- 19121 Imagery and gridded data
- 19124 Imagery and gridded data components

New Requirements

Use of Modern Communication Structures
- Internet services
- E-Commerce
- E-Government

Networking
- Nation-wide, uniform structure
- Integrated approach
- Federal Government - States - Local Authorities - Administration - Business

Digital World
- Data models
- Object catalogues
- Data exchange formats

Coordination/Standards
- Coordinating bodies
- Standards
- Industry Standards

Geodata Management

Relief from Digital Terrain Models
- Buildings from Real Estate Maps (ALK)
- Additional cartographic information

Topography from Digital Landscape Models

Agenda

Development in Africa

- African Standards generating Bodies
- South African Standards
- Other Activities

African standards generating bodies

- African Regional Organization for Standardization (ARSO)
  - Not active in geographical information
- Southern African Development Community Cooperation in Standardization (SADCSTAN)
  - In April 2004 agreed to adopt standards for geographical information
  - Starting with the relevant South African standards
- National standards bodies
South African standards

- Standards South Africa (StanSA)
  - Administrative support for standards development
  - Community develops the standards
- “Overprint” ISO standards
  - SANS 19115, Geographic information – Metadata
- Develop South African standards
  - SANS 1878, South African spatial metadata standard
- Work done within Technical Committees
  - TC 169, Applications of statistical methods
  - TC 71: Information technology
    - SC 71E: Geographical information

SANS 1876, Feature instance identification standard
- Committee Draft being balloted
- Unique identifiers of feature instances in core data sets
SANS 1877, A Standard land-cover classification scheme for remote sensing applications in South Africa
- Published 2004
- Implementation of Africover
SANS 1878, South African spatial metadata standard
- Committee Draft being revised
- Profile of ISO 19115
SANS 1880, South African Geospatial Data Dictionary (SAGDaD) and Its Application
- Committee Draft being revised
- Implementation of ISO 19110

CSIR Guidelines for Data Content Standards in Africa
Authors: Antony K Cooper and Bongani Majeke
Prepared by:
CSIR
Centre for Logistics and Decision Support (CLDS)
Satellite Applications Centre
Unit of Water, Environment and Forestry Technology (Environmentek)
Initiated by:
United States Agency for International Development (US AID)
Eros Data Center (EDC) of the United States
Geological Survey (USGS)
EIS-Africa
March 2005

ISO-Workshops on GIS at AARSE
in Nairobi 17th – 22nd October 2004

- Geoinformation- Standards-ISO-Workshop
- Spatial Data Standards and Specifications
  ISO/EIS-Africa/ ECA/USGS/RCMRD
- Resolutions and Recommendations

Agenda

Moderator: Hans Knoop, Co-Chair ISO/TC 211 Advisory Group on Outreach
Registration 08.30 – 09.00
Opening Remarks Wilter Ottichilo 09.00 – 09.05
Status of ISO Standardisation Hans Knoop 09.05 – 09.35
Status of Standardisation of Geographic Information in Africa Antony Cooper 09.35 – 10.00
Coffee Break 10.00 – 10.30
Land Cover Classification System (LCCS) Introduction John Latham 10.30 – 11.15
Land Cover Classification System (LCCS)
Technical Overview Antonio Di Gregorio 11.15 – 12.00
Lunch Break 12.00 – 13.30
Panel 13.30 – 14.30
Coffee Break 14.30 – 15.00
Discussion and Results 15.00 – 16.00

Geoinformation- Standards-ISO-Workshop

Convener
Hans Knoop, Germany
ISO/TC211 Geographic Information/Geomatics
Co-Chair, Advisory Group on Outreach, Head of German Delegation (DIN)
Representative of ISPRS to ISO/TC211
Technical University of Braunschweig
Spatial Data Standards and Specifications
ISO/EIS-Africa/ECU/USGS/RCMRD

Convenor
Hans Knoop, Germany
ISO/TC211 Geographic Information/Geomatics
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Technical University of Braunschweig

Agenda
Spatial Data Standards and Specifications
21th October 2004, NAIROBI, 15.30 -17.00 h

Chair: Jide Kufoniyi, Executive Director RECTAS
Moderator: Hans Knoop, Co-Chair ISO/TC 211 Advisory Group on Outreach Open

Opening Remarks
Jide Kufoniyi
Hans Knoop

Status of Global Standardisation (ISO/TC211)
Hans Knoop
Antony Cooper

Land Cover Classification System (LCCS)
John Latham

African Standardisation Roadmap
Action Plan & The Way forward for GI
Hans Knoop
Panel

Resolutions and Recommendations
of the Geoinformation-Standards-ISO-Workshop
of 17th October 2004, held during 5th AARSE Conference at RCMRD, Nairobi

Realising the importance of standards in geospatial data infrastructure initiatives at national and regional levels, the ECA and other international organisations, such as ICA, ISPRS, FIG, GSDI have put in a lot of efforts towards ensuring the development and implementation of geospatial standards in Africa. Such initiatives include the ECA & ICA -organised workshop on standards in Darbutan, August 2003.

In furtherance of the above, ISO/TC211 Advisory Group on Outreach in collaboration with AARSE organised a Pre-conference Workshop on Geoinformation Standards on 17th October 2004, hosted by RCMRD. The workshop attracted over 50 participants from many African countries as well as other interested geoinformation practitioners from outside Africa.

Chair:          Jide Kufoniyi, Executive Director RECTAS
Moderator:  Hans Knoop, Co-Chair ISO/TC 211 Advisory Group on Outreach Open

Panel: Antony Cooper, John Latham, John Latham, Hans Knoop

Co-Chair, Advisory Group on Outreach, Head of German Delegation (DIN)
Representative of ISPRS to ISO/TC211
Technical University of Braunschweig

Resolutions and Recommendations
of the Geoinformation-Standards-ISO-Workshop
of 17th October 2004, held during 5th AARSE Conference at RCMRD, Nairobi

Recognising the need for geospatial standards in Africa, this forum (workshop) called for the establishment of a dedicated Working Group. However the forum noted that the Executive Working Group of CODI-GEO has a working group on Geospatial data standards, which is being coordinated by EIS-AFRICA and therefore resolved to work closely to support this WG in achieving its objectives.

The forum consequently recommended to the WG that the TOR should include the following issues while ensuring that the development of Geospatial Standards on the continent should be driven demand:

- Access to funding
- Building critical mass of human and institutional capacities
- Standards should not be limited to data alone
- Recognise standards of supporting technologies (ICT etc.)
- Identify and encourage pilot projects
- Education and awareness
- ISO Geo-information Standards as component in GIS/EIS
tertiary syllabus must be considered. Education in Geoinformation Science must include the fundamentals and not just the application of Geographic Information Systems!
- Recognition of the Global Land Cover Network (GLCN) of UNFAO as a facilitating mechanism to support capacity development
- Adoption and Implementation of Land Cover (LC) mapping standards at national and regional levels in Africa
- Recognition of LCCS as an evolving ISO -Standard and common tool for LC harmonisation in Africa which can also be used as an example for improving the situation in Standardisation and other GIS related fields
- LC as a core layer of the development of SDI globally
- Workshops combining LCCS/GLCN and Geo-information Standards (such as ISO/TC211) are an optimal method for introducing these concepts.
Resolutions and Recommendations
of the Geoinformation-Standards-ISO-Workshop
of 17th October 2004, held during 5th AARSE Conference at RCMRD, Nairobi

This WG is encouraged to report back at GSDI 8 2005 Conference in Egypt, Africa GIS 2005 in South Africa, etc.
The WG is further encouraged to apply for Class-A Liaison status to ISO/TC211.

Finally the forum expressed its gratitude to ISO/TC 211, AARSE, RCMRD, UNFAO and other partners for facilitating and hosting this ISO/TC211 – Outreach Workshop (convened by Prof. Hans Knoop, Co-chair of ISO/TC211 Advisory Group on Outreach).

Questions & Discussion
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