

‘Feature/Object Data Models’ – a Report on the EuroSDR/EuroGeographics Workshop, 24-25 April 2006

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Workshop Objectives

- To understand the rationale and business benefits of feature/object data models
- To evaluate current experience and establish current best practice/state of the art in design and implementation
- To understand the current status and future plans for moving to feature/object data models
- To identify outstanding research and development issues
- To facilitate interoperability at the data model level

'Feature/Object' Data Models Workshop

Munich, 24-5 April 2006

- Follow-on to 'e-Delivery and Feature Serving' Workshop, Feb 2005, reported last year
- 44 delegates from 15 countries and marine community
- In support of INSPIRE Data Specifications Drafting Team
 - Proceedings input into DT meeting next day
 - Good response from the DT
- Proceedings on www.eurocdr.net, and to appear in EuroSDR Publication No. 49



'Feature/Object' Data Models Workshop Presentations

- Two countries with well-established feature/object data models:
 - Great Britain, Switzerland
- Two currently launching new data models:
 - Germany, Netherlands
- Four at planning stage:
 - Sweden, Northern Ireland, Catalunya, Estonia
- Three harmonisation projects:
 - INSPIRE, MOTIIVE, RISE
- Two key data model interoperability technologies
 - Model driven architectures, schema translation

Framework for Presentation of Data Models

- General Description
- Use of Standards (ISO, OGC, other)
- Data Model Description
- Data Classification
- Object Identity
- Complex Objects and Relationships between Objects
- Portrayal
- Data Modelling Tools
- Wider Context
- Spatial Data Infrastructure
- Costs and Benefits
- *N.B. 'Feature' and 'Object' found to be effectively synonyms*

A common understanding of 'Feature/Object Data Models?'

- Organisational aspects
 - Users' expectations are often limited by current providers' products. There is a need to balance complexity, future flexibility and apparent simplicity to gain adoption (MUST be simple for end users)
 - Some form of national coordination is necessary to gain traction.
 - Pragmatism is paramount – small steps in a converging direction
 - Systems suppliers will exploit any lack of vision with their own models – but will also support national initiatives if users are seen to support them
 - It is still too early to fully assess benefits but reuse, better information and interoperable information MUST benefit several stakeholders. Often the benefits are to the national purse (e.g. elimination of duplication across several public bodies).

'Feature/Object' Data Models – Technical Aspects

- Agreement on terminology is key
- Readable feature catalogues still essential
 - Should be automatically generated from models.
 - Proposed improvements to ISO19110 will be useful
- The general principles of identifiers are quite well understood and followed, with minor variations in syntax
- Temporal and change updates should match users expectations and only reflect real change.
 - Several approaches are possible.
 - Sequences of incremental changes need regular integrity checks

Feature/Object Data Models – Technical Aspects (cont.)

- UML is very widely used but needs in addition natural language descriptions and guidelines
- OCL for rules is only partly sufficient and not yet well supported
- Support for 3D is still unusual although new models support ‘under/over’ or relative vertical positioning
- The Dutch example (NEN 3610) using generic classes extensible to different domains is very interesting.

Recommendations on Standards, Techniques and Tools

- Improve accessibility to standards
 - Don't intimidate potential users
 - Avoid standards as a specialist discussion
 - Guidelines, guidelines, guidelines
 - Role for EuroGeographics
 - GI Standardisation for Dummies!!
 - Information about INSPIRE Drafting Teams
 - Get involved in INSPIRE
 - Parallel push to system vendors – having tools based on standards available will drive the process forward (whether free, open source or COTS)
 - Feedback process, iterate changes back to the standards

Recommendations on Standards, Techniques and Tools

- We have (mostly) what we need for technical (syntax) interoperability, but not for semantic interoperability
- Workshop recommendations – an annual update is highly desirable – the dissemination role is very important and change is very rapid

Recommendations on Standards, Techniques and Tools

- Suitability of standards. Key factors are:
 - Stability in the future (UML 2.0, XML will change). With standards where we do not have any control, should we freeze the versions?
 - Confidence in standards, many other follow the same way, we need tested tools, tutorials for practical usage: some of these are lacking
 - We must use common IT standards before implementing own GI standards, no 'GI island'
 - CASE tools for UML->GML conversion are useful, but different UML tools are not compatible

Recommendations on Research Needs (not all academic)

- Mapping between different classifications of the real world (semantic and syntactic interoperability), ontologies
- Semantic web technologies
- Dynamic models and mapping between them pose difficult issues
- Testing deployments and implementations of the standards (testing and refining existing standards)
- Need for a European persistent interoperability testbed (e.g. AGILE, Eurogeographics, EuroSDR)

Recommendations on Research Needs (not all academic)

- New generation of data model – maintenance and quality control of the data model (where much of the costs will be incurred)
- INSPIRE context: demanding time frame, how to implement and keep an operational infrastructure not in a project environment but in practice; useful infrastructure
- Land-Sea - new requirements for standardisation and harmonization
- Note – this is a rather conservative list, reflecting the organisations present. However **INNOVATION IS NEEDED!**

Future Activities

- Research into Ontologies in the Geospatial Domain – successor Workshop to follow that held in April 2004
- Request for annual Workshop on ‘current best practice’ across SDI’s and modern geospatial information delivery:
 - Standards
 - Service based architectures
 - Data modelling and data harmonisation
 - Electronic delivery and DRM
 - Schema translation
 - Generalisation and multi-scale

Collaboration between Land and Marine Communities?

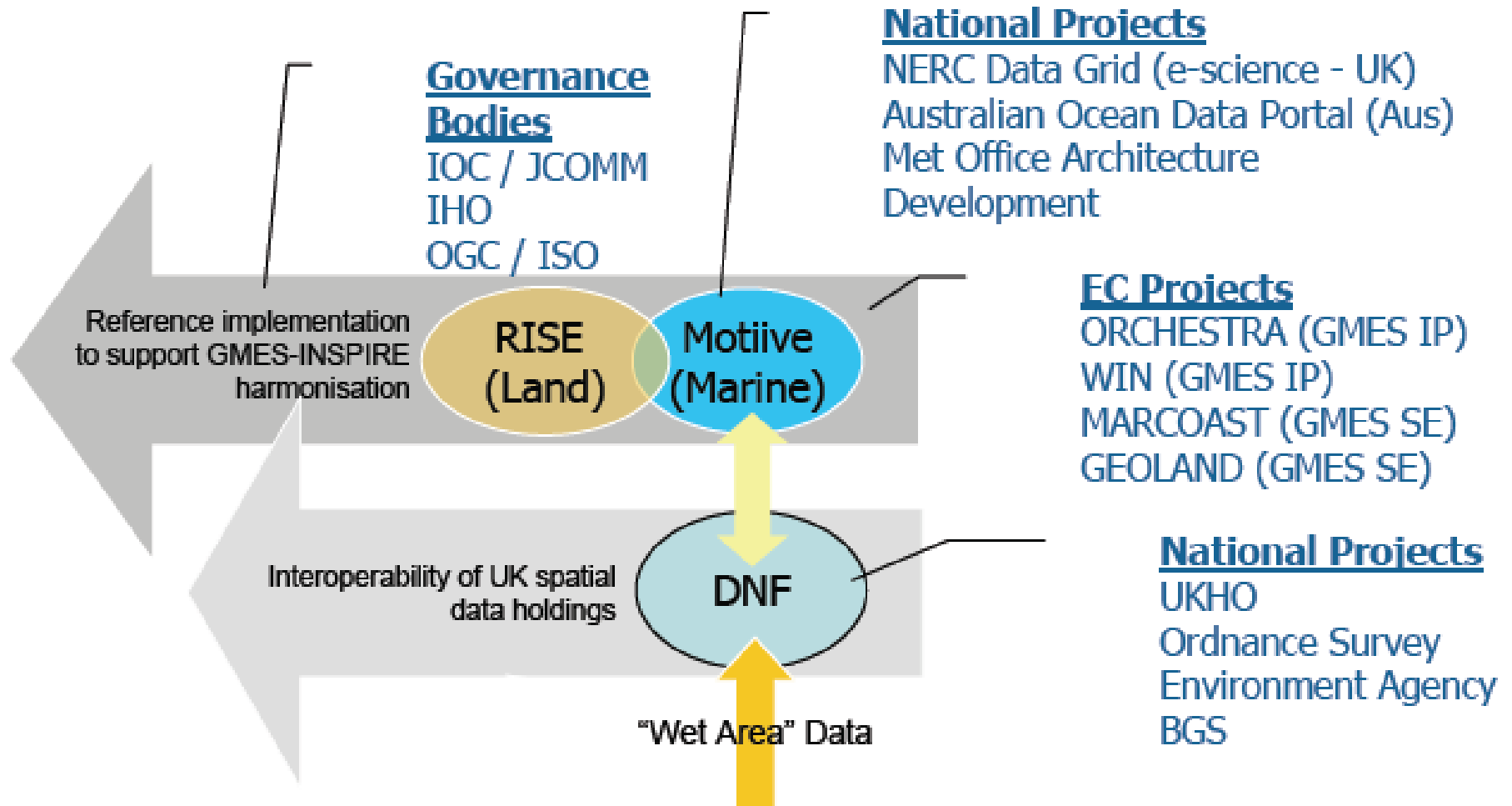
- Positive factors:
 - Integration of land and marine information is of increasing importance for economic and environmental reasons and becoming critical as climate change is accelerating.
 - New generation of data models in both communities.
 - General principles and standards have much in common
 - Move from carto/charting to information, wider thematic content
 - A new technical approach is underway, based on continuous models of land and seabed, with a superimposed tidal model:
 - Horizontal datum registration across land and sea is well established and work is in hand (VORF project at UCL) to establish vertical datum registration at least in NW Europe.
 - There are significant initiatives within Europe (and internationally) to harmonise data and to achieve interoperability (E.g. the RISE and Motiive projects)



Session 6

Data Model Interoperability (cont.)

Chair, John Pepper



Summary

- New data models represent real world features/objects with persistent identifiers not the graphics of maps or charts
- Design principles have a substantial degree of commonality
- Content has considerable overlap with INSPIRE themes, but there are gaps
- Formal methods are increasingly used
 - UML is nearly universal, but needs natural language supplementation
 - ISO and OGC standards are increasingly followed
- The major research area is in Ontologies and improved mappings between different classification schemes.
- Best practice advice and guidelines are much needed

Thank you for your attention

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