Collaborative Modeling for Interoperability Standards

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Overview

- The Value of Modeling in Standards
- Collaborative Modeling
  - What does it involve?
  - Examples in Utilities, Geospatial and beyond…
- Challenges, Tools and Techniques
  - Team-based modeling: What are the challenges?
  - Dealing with performance and concurrency
  - Extracting value: communicating the model

- Q & A
The Value of Modeling in Standards

- Manage complexity
- Plan and mitigate risk
- Facilitate communication
UML: Unified Modeling Language

“...provide[s] system architects, software engineers, and software developers with tools for analysis, design, and implementation of software based systems as well as for modeling business and similar processes.” – UML Specification

Graphical language, not a methodology!

- Has syntax rules
- Profiles provide extensibility

Current version: 2.3

- First UML spec in 1997
- Object Management Group (OMG)

More Info

- Sparx Tutorials: http://www.sparxsystems.com/resources
Modeling Open Standards: UML

UML supports 14 diagrams to visualize:
- Structure (Package, Class, Component etc.)
- Behavior (Use Case, Activity, State Machine)
- Interaction (Sequence, Timing etc.)

UML structural diagrams used for information models:
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Team based modeling – the challenges

- Widely distributed teams
- Shared development of standards
- Big models and wide scope
- Change control, merging work, revisions etc
Example of Global Model Deployment
Multi-site Models – How?

- Ideal Scenario: Single, Shared (Master) Repository

  Assumes good connectivity between each site
Multi-site Models – How?

Alternative Scenario: Local Replicas

Allows broad replication even across slow links
Collaborative modeling and open standards

**Interoperability standards typically:**

- Use models and abstractions to:
  - Manage complexity – size and scope
  - Communicate to widely distributed audiences
  - Reduce risk of technology obsolescence

- Use open modeling standards:
  - Often OMG’s Unified Modeling Language (UML)
  - For example IEC’s Common Information Model (CIM),
  - OGC’s Reference Model (ORM)

- Involve many collaborating stakeholders and editors
  - Widely dispersed geographically
  - Numerous and varied member organizations
Collaborative modeling and open standards

Examples:

- ISO/TC 211’s HMMG (maintains the ISO 19100 models)
- JRC, INSPIRE
- GeoSciML
- International Electrotechnical Commission (IEC) CIM
- UN/CEFACT’s Modeling Methodology (UMM)
- Many others…
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Q & A
Performance: Big models, complex info

Information Models can be HUGE!

Complete domain models yield 10,000’s of elements!

Need robust, scalable solutions…
Performance: Big models, complex info

- Use a Database Repository
  - Robust modeling tools use a DBMS!
  - Supports concurrent users + master view

- Load on Demand (‘Lazy Load’)
  - Only give me *what* I need *when* I need it!

- Network optimization (‘WAN Optimizer’)
  - Widely distributed environment must *reduce the network chatter*

Getting teams connected is a first step, having them work effectively is another matter…
How to maximize parallel work SAFELY

- **Multiple distributed editors**
  - Consider: Who uses the model?
  - For what purpose?
  - Approaches must:
    - Enable *concurrency*
    - *Reduce risk of ‘collision’*

- **Managing concurrent access**
  - Role-based Security
  - Version Control procedures
Safe parallel work: Role-Based Security

- Shared models, concurrent editors ...
  - Access controls needed!
  - Individual user and group permissions

- Role-based security:
  - Require individuals or groups to login to the model repository
  - Restricted editing privileges based on role
  - Locking granularity: View, Package or Element level
Extracting Value: Communicating

- **HTML Output:** Includes model structure, diagrams, project info for online distribution (requires browser only, not model editor)

- Model navigation via project explorer frame and diagram hot-spots

- Automate generation process via API to update online doco regularly (HTML output not synched with model data in real-time)

- Numerous organizations publish standards models in HTML form:
  - ISO/TC 211: [http://www.isotc211.org/hmmg/HTML](http://www.isotc211.org/hmmg/HTML)
  - Datex II: [http://www.datex2.eu/?q=node/23](http://www.datex2.eu/?q=node/23)
  - XML and RTF outputs also possible.
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Thank You