Common Warehouse Metamodel (CWM): Extending UML for Data Warehousing and Business Intelligence

OMG First Workshop on
UML in the .com Enterprise: Modeling CORBA, Components, XML/XMI and Metadata

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Chang, Poole -- CWM: Extending UML for Data Warehousing and Business Intelligence
Speakers

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Objectives

• Overview of CWM concepts
• Use of UML by CWM
• UML lessons learned from CWM
• Discuss moving forward
What is CWM?

- A complete specification of syntax and semantics that Data Warehousing and Business Intelligence tools can leverage to successfully interchange shared metadata.
- A language or framework for specifying the external representation of data warehouse metadata for purposes of interchange.
CWM Provides...

• A standard **language** for defining the structure and semantics of metadata in a formal way (UML / OCL)

• A standard **interchange mechanism** for sharing metadata defined in the standard language (XML / XMI)

• A standard **specification** (interface) for access to, and discovery of, the metadata defined in the standard language (IDL)
CWM Design Rationale

- Extend the UML metamodel with Data Warehousing and Business Intelligence domain objects
- Standardize on MOF semantics
- Yields a MOF-compliant metamodel (M2 level) for constructing DW & BI models of data (metadata)
- Effectively defines a UML-aligned language for specifying DW & BI metadata
CWM and UML

- UML is the modeling language (syntax) of CWM (metamodels and instance alike)
- UML is the base metamodel for CWM
- UML is also co-opted by CWM as the metamodel for object-oriented data resources
- UML/MOF-oriented modeling and authoring tools are used in the deployment of CWM
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**UML 1.3**
(Foundation, Behavioral Elements, Model Management)

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UML as Modeling Language

• Structural and typing in UML (versus MOF)
• Notational conventions and usage
• OCL for precise modeling
• UML as modeling language versus UML as metamodel
UML as Base Metamodel

- Packaging structure and modularity
- Core metamodel and extended metamodels
- Representing instances
- Traversal of modeling abstraction hierarchy
UML Tools

- UML conformance
- Profile for UML / MOF
- Metadata repositories
- Metadata bridges/adapters
UML Issues and Proposed Solutions

- UML & MOF alignment
- Specification and use of explicit references
- Representation of data and instances
- Ordering of model elements
- Association subtyping
- OCL as a model navigation language
- OCL extensions

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Summary

• Brief overview of CWM
• CWM and UML
• UML as Modeling Language
• UML as Base Metamodel
• UML Tools
• UML Issues and Proposed Solutions
• Information Sources
CWM Information Sources

• OMG home page CWM link
• CWM Forum home page
  ─ Other misc. info (presentations, papers, links)
  ─ http://www.cwmforum.org/
Java Community Process
Related Efforts

• Java Metadata Interface (JMI)
• Java OLAP Interface (JOLAP)
• Java Data Mining API (JDMAPI)

(http://java.sun.com/aboutJava/communityprocess/)