

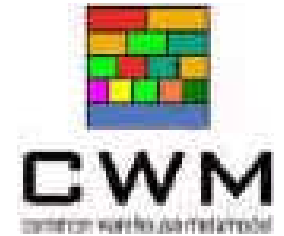


Common Warehouse Metamodel (CWM): Extending UML for Data Warehousing and Business Intelligence

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

November 6-9, 2000, Palm Springs, CA

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



Speakers

Daniel T. Chang

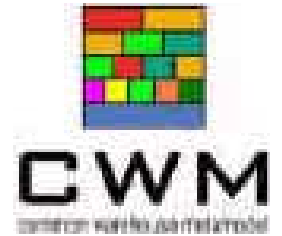
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Objectives

- Overview of CWM concepts
- Use of UML by CWM
- UML lessons learned from CWM
- Discuss moving forward



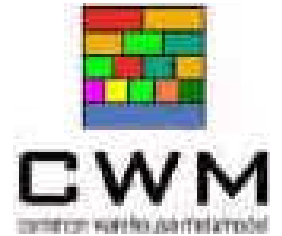
What is CWM?

- 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)



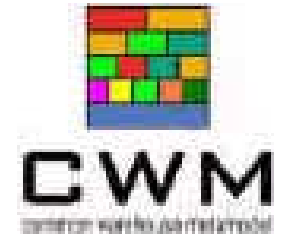
CWM Design Rationale

- 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



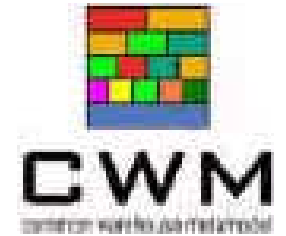
CWM and UML

- 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 as the metamodel for object-oriented data resources
- UML/MOF-oriented modeling and authoring tools are used in the deployment of CWM



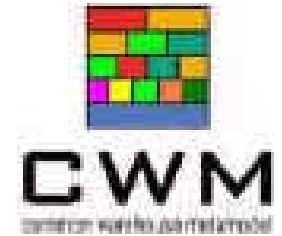
Management	Warehouse Process			Warehouse Operation		
	Transformation	OLAP	Data Mining	Information Visualization	Business Nomenclature	
Resource	Object (UML)	Relational	Record	Multi Dimensional		XML
	Business Information	Data Types	Expressions	Keys Index	Type Mapping	Software Deployment
Foundation	<p align="center">UML 1.3 (Foundation, Behavioral_Elements, Model_Management)</p>					

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



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



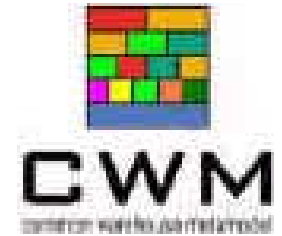
UML Tools

- UML conformance
- Profile for UML / MOF
- Metadata repositories
- Metadata bridges/adapters



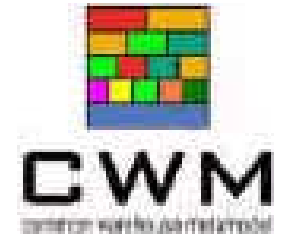
UML Issues and Proposed Solutions

- 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



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/>)