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The book you now hold, Common Warehouse Metamodel Developer’s Guide, is your complete and authoritative guide to developing datawarehousing and business intelligence applications via the Common Warehouse Metamodel (CWM) framework. Written by several of the core developers of the CWM standard, the book will show you all the steps you’ll need for planning and implementing a CWM-enabled datawarehousing environment. The authors provide you with detailed guidelines and in-depth code examples that will allow you to put the Common Warehouse Metamodel to work in your business.

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Advance Praise for
Common Warehouse Metamodel Developer’s Guide

“CWM Developer’s Guide breaks new ground by providing an in-depth overview of Model Driven Integration for the data warehouse and Business Intelligence tool chain using innovative meta data design patterns. The use of UML and MOF to define platform-independent models while simultaneously targeting both XML and Java-based meta data management using XMI and JMI is supported with numerous examples. Software architects, CTOs, systems integrators, and vendors grappling with the complexity of tool, data, and application integration can learn firsthand the power of OMG Model Driven Architecture from this pioneering book.”

Sridhar Iyengar
IBM Distinguished Engineer, OMG Architecture Board

“The first CWM book, Common Warehouse Metamodel: An Introduction, has become a great complement to the CWM specifications. This follow-on book delves even deeper into the implementation world, which is critical to the success of any standard. This developer’s guide establishes a key transition from ‘paper standards’ to actual adopted standards for tool integration.

Common Warehouse Metamodel Developer’s Guide is not only well written, but also well focused on applications related to the standards. I highly recommend this second book to anyone who wants to transform standards into reality in their product strategy.”

Christian H. Bremeau
President and CEO, Meta Integration Technology, Inc. (MITI)
**Advance Praise**

“Common Warehouse Metamodel Developer’s Guide is a highly practical guide to a powerful new way of integrating systems in the data warehousing and business analysis domains. By leveraging this new standard for modeling and exchanging application, tool, and instance meta data, the authors show how representing common business and domain concepts as higher-level abstractions can solve complex, real-world integration problems. Model-based development has the potential to vastly simplify the increasingly complex issues faced by developers in building integrated solutions in today’s distributed, heterogeneous environments, and CWM is the leading example of the success of this approach.”

Chuck Mosher  
*Staff Engineer, Market Development Engineering, Sun Microsystems*

“This book illustrates how CWM is used not only to describe complex data warehousing systems, but also to facilitate interoperability and integration. It is an excellent guide for anyone interested in developing platform-independent domain models and leveraging domain models for integration and information exchange.”

Ravi Dirckze  
*JMI 1.0 Specification Lead and Senior Software Engineer, Unisys Corporation*
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The Object Management Group (OMG) is an open membership, not-for-profit consortium that produces and maintains computer industry specifications for interoperable applications. To achieve this goal, the OMG specifies open standards for every aspect of distributed computing from analysis and design, through infrastructure, to application objects and components defined on virtually every enterprise middleware platform. OMG’s membership roster includes virtually every large company in the computer industry, and hundreds of smaller ones. Most of the companies that shape enterprise and Internet computing today are represented on OMG’s Board of Directors.

OMG’s flagship specification, and the basis for future OMG specifications, is the multi-platform Model Driven Architecture (MDA). Unifying the modeling and middleware spaces, the MDA supports applications over their entire lifecycle from Analysis and Design, through implementation and deployment, to maintenance and evolution. Based on normative, platform-independent Unified Modeling Language (UML) models, MDA-based applications and standards may be expressed and implemented, equivalently, on multiple middleware platforms; implementations are produced automatically, for the most part, by MDA-enabled tools, which also generate cross-platform invocations making for a truly interoperable environment. Because the UML models remain stable as the technological landscape changes around them over time, MDA-based development maximizes software ROI as it integrates applications across the enterprise, and one enterprise with another. Adopted by members as the basis for OMG specifications in September 2001, the MDA is truly a unique advance in distributed computing. To learn more about the MDA, see www.omg.org/mda.

OMG’s modeling specifications form the foundation for the MDA. These include the UML, the MetaObject Facility (MOF), XML Metadata Interchange...
(XML), and the Common Warehouse Metamodel (CWM). The industry’s standard for representation of analysis and design, the UML defines Use Case and Activity diagrams for requirements gathering, Class and Object diagrams for design, Package and Subsystem diagrams for deployment, and six other diagram types. The MOF defines a standard metamodel for applications, allowing UML models to be interchanged among tools and repositories; and XMI standardizes the format for these interchanges. Finally, CWM establishes metamodels in the field of data warehousing, completing OMG’s standardization in the modeling space.

The Common Object Request Broker Architecture (CORBA) is OMG’s vendor-neutral, system-independent middleware standard. Based on the OMG/ISO Interface Definition language (OMG IDL) and the Internet InterORB Protocol (IIOP), CORBA is a mature technology represented on the market by more than 70 ORBs (Object Request Brokers) plus hundreds of other products. Scalable to Internet and Enterprise levels, CORBA more than meets business computing requirements through its robust services providing directory, distributed event handling, transactionality, fault tolerance, and security. Specialized versions of CORBA form the basis for distributed Realtime computing, and distributed embedded systems.

Building on this foundation, OMG Domain Facilities standardize common objects throughout the supply and service chains in industries such as Telecommunications, Healthcare, Manufacturing, Transportation, Finance/Insurance, Biotechnology, Utilities, Space, and Military and Civil Defense Logistics. OMG members are now extending these Domain Facilities, originally written in OMG IDL and restricted to CORBA, into the MDA by constructing UML models corresponding to their underlying architecture; standard MDA procedures will then produce standards and implementations on such platforms as Web Services, XML/SOAP, Enterprise JavaBeans, and others. OMG’s first MDA-based specification, the Gene Expression Facility, was adopted less than six months after the organization embraced the MDA; based on a detailed UML model, this specification is implemented entirely in the popular language XML.

In summary, the OMG provides the computing industry with an open, vendor-neutral, proven process for establishing and promoting standards. OMG makes all of its specifications available without charge from its Web site, www.omg.org. Delegates from the hundreds of OMG member companies convene at week-long meetings held five times each year at varying sites around the world, to advance OMG technologies. The OMG welcomes guests to their meetings; for an invitation, send your email request to info@omg.org or see www.omg.org/news/meetings/tc/guest.htm.

Membership in OMG is open to any company, educational institution, or government agency. For more information on the OMG, contact OMG headquarters by telephone at +1-781-444-0404, by fax at +1-781-444-0320, by email to info@omg.org, or on the Web at www.omg.org.
John: To Robert J. Flynn, teacher and friend.

Dan: To Don Haderle and Jo Chang, without whose vision and support CWM would not exist.

Doug: For my parents, Ken & Jeanetta, who started all this for me.

David: To my wife Michelle, my daughter Marie, my mother Annette, and my sister and brother, Debbie and Roger.