October 2002

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OMG News

THE ARCHITECTURE FOR A CONNECTED WORLD

The Importance of Being Integrated

This month OMG would like to share with readers a special guest interview on the topic of enterprise integration with Tim Sloane, Research Director within Aberdeen Group's Enterprise and Internet Infrastructure practice where he researches Web Service Gateways (WS Gateway), Business Model Collaboration, and Simulation technologies with a specific focus on how these solutions will impact Information Technology (IT), business managers, and technology suppliers. Aberdeen Group has been an active OMG analyst member for several years.

Sloane has 30 years of IT industry experience in development, product management, and marketing and he was a founder of Tilion (an ASP-based business-to-business (B-to-B) supply chain analytic supplier).

Tim Sloane

He will be speaking at OMG's Integrate 2002 show scheduled for November 19-20th in Washington, DC (see complete details in the story below). In order to get a brief preview of his Integrate 2002 presentation entitled, XMI & UML: Liberating Hijacked Process Models For Improved Collaboration and Reuse, we asked Tim a few questions about the integration process.

Tell us about yourself and work background, goals for future.
With a two-year old daughter at home I

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OMG Gears Up for Integrate 2002

November 19-20 event in Washington, DC is first of new series

The Object Management Group™ (OMG™) extends an invitation to all, to its upcoming Integrate 2002 event being held in Washington, DC, November 19-20, 2002. Integrate 2002 is the first event in a new series hosted by OMG that will address the constant churn in the technological landscape and how this affects enterprise application integration strategy.

Solutions for integrating corporate assets, measuring the ROI of IT integration projects and addressing everyday system integration problems in an era of shrinking budgets will be addressed. Aimed at senior level IT managers and executives, the 2-day technical event will provide a rigorous curriculum consisting of lectures and group discussion around the topics of Web Services, Enterprise Data Integration and Model Driven Architecture™, among others.

In October of last year, OMG Japan successfully ran Integrate 2001 in Tokyo, Japan. OMG anticipates an even greater response and rate of success for its first Integrate event in the U.S. Participation and attendance at Integrate 2002 will target senior level technical managers who address organizational issue concerning integration. Integrate 2002 will be jointly located with the Washington, DC OMG Technical Meeting.

"The next giant leaps in cross-enterprise Internet computing are rolling out as we speak. Integrate 2002 provides the forum to help companies navigate

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Sloane

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can safely rule out an early retirement! I want to apply my thirty years of experience to assist business and IT leaders in extracting the full value from Web Services and OMG's Model Driven Architecture™ (MDA™).

After establishing the Internet Infrastructure practice at Aberdeen Group in 1994 I left in 2000 to become a founder of Tilion, a supply chain analytics ASP. As Vice President of Technology and Product Management at Tilion I had to resolve two key problems. First, lower the costs associated with accessing enterprise data and second, assure customers that Tilion reports were accurate, which meant validating the data captured, analyzed and presented. While I addressed these problems at Tilion, they remain two key issues every enterprise must face when integrating applications, whether internally or across business partners.

Can you describe why these are the key obstacles in solving the integration problem?

Purchased enterprise applications and custom software are designed to implement processes that solve specific departmental problems. They are not designed to make the data collected easy to access or distribute outside that solution. While these enterprise applications implement processes that improve efficiency, the exact processes implemented are typically poorly documented or unavailable programmatically. The lack of open interfaces and process documentation make these applications expensive to access and makes it hard to discover the correct meaning of the data even when it is easily available.

Most integration efforts today are an effort to provide customers, suppliers, and investors, access to appropriate enterprise information. But these integration efforts eventually produce a complex web of connections that reaches deep into complex business processes to extract the data considered relevant to the requesting application. As the connections multiply and the data is re-used, the semantic inconsistencies begin to surface.

How do we begin to leap over these hurdles?

The adoption of XML and SOAP begins to help because these two standards lower the cost of connectivity when used to expose data, but they don't resolve the semantics of the data. To derive the full benefits promised by Web Services our industry must introduce a mechanism that documents the semantics of data based on the process that generated it, and this semantic information must be made available programmatically. A huge step in the right direction for IT professionals is to create applications with tools that adhere to the Object Management Group's Model Driven Architecture (MDA). MDA guarantees that processes are properly documented and that the documentation can be made available in a universally accessible digital format—through the UML standard.

What type of integration strategy are companies currently employing?

The majority of companies that have a serious integration effort underway are responding to specific initiatives, which are most commonly focused on providing a better view of internal processes to customers and/or suppliers. This typically requires the integration of data from across multiple departments. These initiatives are focused on providing data that will assist the external entity in better understanding status of the internal processes. This in turn often drives some internal rationalization effort. But realistically these efforts continue to drive point-to-point connectivity. When the right data isn't available for the external view either the data is eliminated from the solution or inappropriate data is exposed.

What changes in the future do you foresee regarding this strategy, if any?

What is needed is a much larger rationalization effort. The enterprise should identify all the key events that take place within each process, and then rationalize these events relative to each critical data consumer—including customers, investors, suppliers, and internal audit and compensation plans. By focusing on key events, the number of integration points can be significantly lowered, semantics more closely managed, data accuracy and timeliness improved, and overall integration costs lowered.

How does the presence of industry standards help with integration strategy?

As enterprise applications adopt XML and Web Services, the cost of connecting to corporate data will be significantly reduced. But as already described, determining what data is being accessed requires better documentation of existing processes and events. Otherwise data will be distributed in a point-to-point fashion and costs will be driven higher and higher as semantic confusion increases. Documenting business processes in the UML standard is the only known implementation-independent mechanism available today that enables a business process to be effectively communicated programmatically. Additionally, the UML model, or approved subsets of the model, can be output using XML and/or XMI to almost any other environment, including BPMI, XLANG, or to a software development workbench.

What work should be done to improve on these standards?

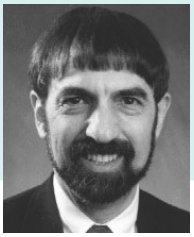
IBM, Microsoft and Sun have all focused on producing business process languages that can provide process control to Web Services. But because these companies are focused on runtime implementations, they are producing specifications that tightly couple the process language to the technology that will implement that process. This shortcoming forces businesses to document business processes in a language that is tightly coupled to the technology that will implement the process. As that technology matures—and technology always matures—the business process information becomes hostage to the runtime.

Instead, the industry must focus on a broader set of business action semantics. The business process can then be modeled using this rich set of semantics, and that process model can then be exported to any appropriate technology. If the technology cannot support the semantics used by the business model, then either code must be written to extend that technology, new technology deployed, or the business model simplified. Regardless, this approach guarantees that the business logic is re-usable as new technologies are introduced. This is the concept embodied in the emerging MDA standard and what I will expounding upon at Integrate 2002 in November.

Why should high-level IT professionals attend Integrate 2002? What benefits do you see?

IT executives who want the greatest possible benefit from Web Services adoption in the shortest possible time, without being held hostage by existing technologies or supplier implementations should attend Integrate 2002. ■

The Siegel Guide



Jon Siegel, Ph.D.

Vice President, Technology Transfer

Object Management Group

Using OMG's Model Driven Architecture (MDA) to Integrate Web Services

Originally proposed to enable enterprises and individuals to interoperate using an open software services marketplace, Web Services (WS) are currently restricted to corporate intranets due to immature security and other "growing pains" of this emerging technology. Nevertheless, WS still elicit excitement in the industry and enjoy enough support that major vendors plan to overcome these shortcomings fairly soon.

Several characteristics distinguish WS from other middleware, and make them suitable for certain types of inter-application integration:

WS are discovered and addressed using information from a registry.

- Unlike software components working together in a server, WS are coarse-grained and self-contained. Client applications are unlikely to build up a single service from many fine-grained WS, although they might use two or three as they execute an extended application function.
- Transmitting data in XML using the SOAP transport, WS messages are expressed in human-readable ASCII text (a popular format) and pass through firewalls alongside HTML using Port 80.

Three Architectural Levels

In the WS world, an enterprise with an established IT department will probably have three distinct levels of application and infrastructure:

- Monolithic legacy applications, providing basic business functionality (accounting, sales/stock/shipping, etc.) to company staff
- Object or component-based applications servicing browser or computer-equipped sales staff or customers, or possibly engineering or production facilities and staff
- Web Services, composed from functions in the first two categories plus new capabilities added specifically for the WS market

WS are self-contained functions that are invoked, do something useful enough to be paid for, and return the result, all in an atomic interaction. The invoking application must shop for the service that it wants, possibly selecting an instance from a list returned by the registry, and retrieve a service identifier in a preliminary step. It must then invoke the service, typically via a loosely-coupled asynchronous transport.

A B2B WS Scenario

Figure 1 shows a WS provided by Company B, being invoked by a client in Company A. Company A's WS client is driven by some combination of legacy and component-based applications. You may have thought of WS as called mainly by GUI-driven clients, but this will surely not be the case: computer-driven clients can invoke so rapidly that their interactions will dominate the network no matter how diligently your children and their friends spend their allowances on WS-enabled shopping sites. For example, Company A may run a factory that produces 1,000 automobiles and trucks per day (one about every 90 seconds), and its WS client may order parts from a supplier, Company B.

Integrating WS into Your Architecture

This scenario shows that WS applications typically involve integration of multiple legacy applications on multiple middleware platforms. What is the best way to evaluate the overall integration problem, so that we can visualize and design the best solution? We would like to use the same set of tools for the overall problem that we do for each individual part, even though many parts use different middleware platforms.

OMG's Model Driven Architecture (MDA), adopted as its base architecture by the group in late 2001, can do this and it's an industry standard implemented in multiple tools from many vendors. Here is a high-level description of the MDA; to fill in details, read the white papers and presentations linked on OMG's web page www.omg.org/mda.

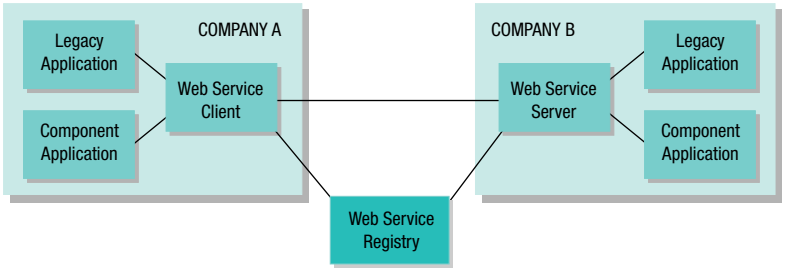


FIGURE 1: Typical B2B WS Application Configuration

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SUCCESS STORY: MDA

Swisslog Software AG

Company:
Swisslog Software AG

Application:
Supply Chain Management System

Technology:
Component-based distributed CORBA® system, implemented in CORBA, IDL C++

Tools Used:
Software through Pictures (StP)/Unified Modeling Language™ (UML™) Architecture Component Development (ACD), TAO Orb, SNiFF+

Description:
Swisslog is a global provider of integrated supply chain solutions that cover the entire value creation process from procurement and production to delivery. Swisslog's solutions optimize the intra- and inter-company flow of information and materials, significantly increasing its customers' flexibility, reaction capability, productivity and quality of service, while minimizing logistics costs and tied-up capital.

Problem:
Swisslog faced a major challenge when they embarked upon the development of a new generation of Supply Chain Management Systems. With a track record for success in this marketplace, they needed to provide a more flexible and adaptable system with increased scope and functionality required a major re-think of the software architecture and development strategy.

It was clear to the project team that simply putting the business and application requirements into UML™ models would not be an effective and efficient utilization of the resources, both from a technical and business perspective. Current round trip methods are not suited to this approach, since such an approach creates models containing implementation details that map to the code on a one to one basis and that lack a separation of application and technology requirements. Therefore, the round trip methods were ruled out as solutions.

Solution:
OMG's Model Driven Architecture™ (MDA™) defines an approach, which separates the system functionality specification from its implementation on any specific technology platform. This way you increase the level of abstraction in the models and you can have an architecture that is language, vendor, and middleware neutral.

Swisslog wanted a set of business and domain models that were separate from the technology and implementation domain, giving them freedom to more easily adapt to new technologies and platforms. This separation of the "what" from the "how" was critical to the efficient and effective use of the project staff and enabled Swisslog to leverage appropriate domain, technical, architectural, and implementation expertise.

Aonix® Software through Pictures® (StP) was selected to address the needs for a repository-based development environment supporting UML™ and MDA™. The repository-based environment thus allowed the distributed development team to collaborate while maintaining consistency and quality across each of the development phases. Architecture Component Development (ACD) is the powerful transformation engine of the StP product family, which allows the mapping of UML™ models in the target environment.

Additionally, the Aonix® solution provided UML™ and tools training, consulting, and customization services that allowed Swisslog and their development partners to quickly get started and meet their time to market objectives.

Benefits:
Effective and efficient utilization of resources. The separation of domain and technical aspects allowed a very efficient utilization of resources. Only a few technology specialists developed the architectural concepts and defined the mapping rules between the models. Since there was no need for the application specialists to understand the middleware in detail, they were able to devote more time and effort to focusing on the business view.

Increased productivity and ROI. Application generation technology was destined to play a key role. Swisslog was not in favor of pouring a large amount of

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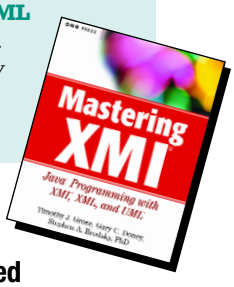
OMG Press

Presented by Wiley Computer Publishing

Mastering XMI: Java Programming with XMI, XML and UML
Timothy J. Grose, Gary C. Doney, Stephen A. Brodsky
ISBN: 0-471-38429-1
April 2002, US $50.00



Create more powerful, flexible applications using a new XML-based standard

XMI (XML Metadata Interchange) is an advance in XML technology that enables you to represent objects in XML, exchange those objects with other software tools, and exploit modeling technology in your XML applications. Mastering XMI includes examples written in Java that demonstrate practical techniques for using XMI with both XML and UML. Also included is a discussion of how IBM is using XMI in its latest software development tools.

The authors cover the basics first, detailing the essential XML and UML concepts that you need to know to understand XMI. In addition to XMI fundamentals, they explain how XMI works with the Model Driven Architecture (MDA), a new software development approach.

After learning how XMI works, you will then learn how to:

- Use XMI to express your object-oriented software models in XML
- Generate Java implementation classes from your models using the XMI Framework
- Create and read XMI documents in Java with standard XML APIs (DOM and SAX) and the XMI Framework
- Reverse engineer models from XML documents, DTDs, and schemas

The CD-ROM includes:

- The XMI Framework
- IBM® XML4J XML Parser
- A trial version of IBM® WebSphere® Studio Application Developer
- Java programs covered in the book

The companion Web site includes tips and updates for the XMI Framework and the Java examples in the book. ■

Integrate 2002

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through the sea of competing specifications and quickly produce results for faster application development, easier maintenance, enormous scalability and reusable software solutions,'' said Dr. Richard Soley, Chairman and Chief Executive Officer of the OMG. ''Over two days, software professionals and corporate IT leaders will analyze case studies, learn the best industry practices and share success stories.''

Highlights of the program include:

Keynote: CIO Roundtable

Nobody ever said integration was easy, but everybody agrees it's critical to get your assets working together in defense of your company's goals. Three CIO's who have ''been there and done that,'' will share their experience in getting organizational strategies and ROI measures in place to make integration successful in tough economic circumstances. Kevin Tyson of Ocean Power, Louis Pellicori of Sun Bank, and William Vass of Sun Microsystems will be on hand to discuss their ideas in a roundtable discussion format.

"Integrate 2002 provides the forum to help companies navigate through the sea of competing specifications and quickly produce results for faster application development, easier maintenance, enormous scalability and reusable software solutions…"

.Net vs. J2EE: Implementing Web Services Right

As the industry moves in the direction of Web Services, debate rages on about what the right underlying infrastructure is to ''get Web Services right.'' Does .Net supply a solid range of tools to get the job done quickly? Will J2EE give sufficient flexibility to ensure that we can move implementation from platform to platform? Which approach is more open? What standards matter? An open, debate-style panel with Ed Julson of Sun MicroSystems and David Goodhand of Microsoft Corporation will approach these questions as well as those from attendees.

XMI & UML: Liberating Hijacked Process Models for Improved Collaboration and Reuse

Every enterprise has a huge investment in processes models that reside within custom software, ERP, CRM, workflow, portals, and other runtime oriented systems. In addition, every enterprise is being challenged today with expressing those process models in XML in the mad rush to integrate. The Object Management Group has established standards that will profoundly change how this process-oriented intellectual capital is managed. XML Metadata Interchange (XMI) format can convert models to an XML dialect for interchange between systems while the Unified Modeling Language (UML) has already been adopted as the universal standard for modeling. Participants interested in learning more about how these two standards complement each other are encouraged to attend this lecture by Tim Sloane of the analysis firm Aberdeen Group.

Web Services—Surviving the Transition

We hear claims that Web Services are ''simple'' and yet, it appears we're going to need some training after all. However, the most exciting thing about Web Services is how widely the new set of standards is being adopted across the industry. Questions have arisen such as; where do I start? what are XML, UDDI, WSDL and WSFL? This session by Peter Herzum of Herzum Software will demystify all the new terminology and help you decide how to leverage the new Web Services infrastructure to support your existing systems and your IT goals.

For complete program information and to register for Integrate 2002, visit www.integrate2002.com. Sponsorship and exhibiting opportunities are currently available; please contact Nicole Glazen at nicole@omg.org. More information about OMG is located at www.omg.org. ■

What's Happening

Upcoming OMG Technical Meetings, Workshops and Conferences/Exhibits

October 9-11, 2002
Corba in Accelerators Workshop, the European Synchrotron Radiation Facility
Grenoble, France

October 21-24, 2002
Third Workshop on UML for Enterprise Applications: Model Driven Solutions for the Enterprise
San Francisco, CA USA
Co-sponsored by Rational Software & Togethersoft

October 29-30, 2002
Web Services Architecture 2002
Le Meridien Palace Hotel, Manchester, UK
20% discount for OMG members

November 18-22, 2002
OMG Technical Meeting
Washington, DC USA
Sponsored by IONA

November 19-20, 2002
INTEGRATE 2002
Washington, DC
Register at www.integrate2002.com.

December 3-4, 2002
Model Driven Architecture in Practice (Implementation and ROI)
Darmstadt, Germany
Andrew Watson, Vice President and Technical Director, OMG will present ''Model Driven Architecture: Integration in the New Millennium.'' Visit www.managerakademie.de for more details.

January 27-31, 2003
OMG Technical Meeting
West Coast, USA location TBA
Sponsorship available

February 10-13, 2003
Web Services Workshop
European location TBA
Sponsorship available

OMG Life Sciences Group Presents Objects in Bio- & Chem-Informatics 2002 (OiBC-2002)

Conference will focus on Sharing Best Practices for Implementing Object-based Systems for Life Sciences Research

The OMG Life Sciences Research Domain Task Force (LSR DTF) announces its next Objects in Bio- & Chem-Informatics conference scheduled for November 18-19, 2002 at the Washington, DC OMG Technical meeting. Following in the tradition of the successful "Objects in Bio-Informatics (OiB)" conferences held in Hinxton, UK in 1997 and '98 and in San Jose, California in 1999, and OiBC-2001 in Danvers, Massachusetts, Objects in Bio- & Chem-Informatics 2002 will focus on the role of object-oriented technology, reusable software components, design patterns, and distributed computing in life sciences research. The conference is aimed at those who are interested in, are developing, or have developed object-oriented software that will be of use to the biological and chemical research community in both academia and industry. The overall theme of the conference is sharing best practices for implementing object-based systems for life sciences research.

OiBC-2002 will include lectures and poster sessions on the application of the rapidly expanding and developing fields of object-oriented software and distributed computing to bio- and chem-informatics from both academic and industrial perspectives. Organizers expect there to be demonstrations of interoperability in systems using components from two or more sources, either as posters or as platform talks.

"We are looking forward to another successful conference. The location in Washington is convenient for the many pharmaceutical and academic life scientists in the region, and we are developing a stimulating agenda with a variety of speakers from industry, academia, and government. There is also a great deal of interest right now in applying IT solutions to problems in the life sciences," said Karl Konnerth, Director, Technical Architecture of Incyte Genomics, Inc., who is one of the event organizers.

Typical but not exclusive topics of interest include:

- Bioinformatics and Genomics
- Cheminformatics
- Combinatorial libraries and drug design
- Computational chemistry
- Functional genomics
- Macromolecular structure
- Molecular sequence analysis
- Pharmacogenomics and Clinical genomics
- Proteomics and Transcriptomics, including Gene Expression
- Systems biology
- Biological pathways and networks
- Laboratory information management and Electronic laboratory notebooks
- Information and data management for high-throughput experimental biology
- Algorithms and Object-Oriented Modeling, Design, and Ontologies for these disciplines
- Efficient object and data repositories for any of the disciplines listed above
- Grid technology and distributed computing in the life sciences
- Open source efforts in bio- and chem-informatics
- Development and application of open standards for data and software interoperability
- Advantages and return on investment of object-oriented technologies

Immediately following OiBC-2002, at the Object Management Group Technical Committee Meeting (at the same location), the OMG Life Sciences Research (LSR) Domain Task Force will hold a technical meeting where efforts will continue in adoption of domain standards. OiBC participants are welcome to attend these (and other) meetings of the LSR. To learn more about the initiatives underway within OMG's LSR DTF, see lsr.omg.org.

Konnerth added, "Judging from the overwhelmingly positive response from over 200 attendees last year from around the world, we expect this year's event to be just as informative and well received. We are excited to again have the opportunity to showcase objects in the life sciences." ■

Bitpipe's Provides Exclusive Offer to OMG Members

OMG announces a special offer to its membership through Bitpipe. Dubbed the FastStart Program, Bitpipe's deal to members includes (please note that the offer is only available to new Bitpipe customers who are OMG members):

- OMG members may advertise up to 15 white papers for 60 days for the annual posting cost of one document ($5,850).
- Bitpipe will provide monthly activity reports to show activity on each white paper that is submitted.
- At the end of the 60 days, participants can analyze traffic activity and then decide which paper to leave on Bitpipe for the remainder of the year.

OMG encourages its members to take advantage of this unique offer!

About Bitpipe

Bitpipe Inc. (http://www.bitpipe.com) is the leading syndicator of in-depth information technology (IT) content. Bitpipe distributes content from over 3,500 leading IT vendors and over 60 top analyst firms including Gartner, IDC, Aberdeen Group, Meta Group, and Yankee Group via the Bitpipe Network. The Bitpipe Network reaches over 21.7 million unique visitors through agreements with Yahoo!, CNET, ZDNet, *InformationWeek*, COMDEX, ITworld, *Computerworld*, TechRepublic and over 60 other leading IT and business-related websites (http://www.bitpipe.com/partners). ■

OMG MDA™ Enjoys Continued Industry Validation and Growth

The Object Management Group's™ (OMG™) Model Driven Architecture™ (MDA™), now a year and a half out of the starting gate, has won universal industry-wide acceptance as the business strategy standard of choice for addressing the complete lifecycle of requirements that capture, design, implementation, integration, test, maintenance and management of applications and data.

Unveiled in March 2001 as the new direction for the software standards organization, OMG MDA™ is a platform-independent solution to integration challenges. Enterprises now have a powerful new tool to help integrate industry-standard applications or facilities on one platform with legacy applications on another, through the support of MDA-based tools in the development process. The result is significant reduction of cost, development time and long-term maintenance, starting from an application architecture that can last decades.

Industry Support and Recognition

Major industry players including IBM, Sun, IONA, Borland, Unisys, Rational and HP have already publicly stated their support for the MDA Initiative in shipping deployed products, once again underlining the fact that MDA has gained acceptance throughout the software development community of IT professionals. OMG expects the momentum of industry-wide validation to increase as this year progresses. In fact, in the Pricewaterhouse-Coopers 2002-2004 Technology Forecast, OMG MDA is named as a top influential trend that will affect the future of software development.

"It is gratifying to see the rapid pace with which the industry has adopted Model Driven Architecture," said Richard Soley, Chairman and CEO of the OMG. "We had already seen deployed, working systems with substantial code generation from UML-based architectural descriptions when we started the MDA Initiative, and these proofs-of-concept are convincing more companies on a daily basis to adopt this approach. The bottom line is the need to integrate what you've built, with what you're building, with what you will build—in the face of the fact that you don't know what next year's hot new technology will be."

The next planned event featuring education on MDA and enterprise integration strategy will be at Integrate 2002. See the cover of this issue for more details.

For all information pertaining to OMG Model Driven Architecture, please visit www.omg.org/mda. ■

Swisslog AG

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effort and time into a set of models for which very little could be automatically transformed into the application. Only the ACD approach with Software through Pictures provided the desired application and implementation separation. Compact domain models were produced, and significantly more source code was automatically generated.

Increased quality and standards consistency. A mechanism to implement cross-project standards such as interprocess communication, class persistence, and quality standards was needed, alongside a clear objective to have complete control over what is automatically generated from the models. ACD provided this flexibility through a series of templates that captured the architecture, interfaces, and technical implementation details. Swisslog's experiences with StP and the ACD template-based approach to code generation are that the quality of the software is much higher. The whole team is focused on quality.

Since a large part of the application is automatically generated and common aspects such as persistence, interprocess communication, and implementation-language details are captured in ACD™ templates, there is greater consistency. The entire team uses the technology in the same way. Fewer bugs are therefore introduced. Project and company standards are easier to implement and can be automatically adhered to since the generation ensures conformance.

The end result for Swisslog is a new system that now enables faster, more cost-effective deployment of their application. The new "AutomationManager" is a set of real-time control systems that provides all the components of warehouse logistical automation. The system can be tailored with configuration, rather than customization, and is designed to be extremely flexible. An XML-based rules mechanism enables the system to be configured to meet customer specific requirements.

"The MDA™ approach made it much easier to put new people onto the project with different skills and become more productive more quickly. It was the only way to get that many people with all the new technologies up to speed in a short space of time."

A three man month deployment now takes just one month. The new system is more user and customer focused. Largely because the domain models are uncluttered, smaller, easier to maintain, and simpler to update. Other platforms and databases are being considered.

"The MDA™ approach made it much easier to put new people onto the project with different skills and become more productive more quickly. It was the only way to get that many people with all the new technologies up to speed in a short space of time," said a Swisslog company representative .

For additional information, please visit: www.aonix.com or www.swisslog.com. ■

Web Services

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OMG's Model Driven Architecture

OMG's MDA unifies and simplifies modeling, design, implementation, and integration of applications—including large and complex ones—by defining software fundamentally at the model level, expressed in OMG's standard Unified Modeling Language (UML). An MDA application's base model specifies every detail of its business functionality and behavior in a technology-neutral way; in MDA terminology this is the application's Platform-Independent Model (PIM).

Working from the PIM, MDA tools follow an OMG-standard mapping to generate an intermediate Platform-Specific Model (PSM), tailored to the intended target platform. This intermediate product builds in non-business, computing-related details "marked up" on the PIM by your architects.

In the final development step, working from the PSM, MDA tools generate the application itself: interface definitions, application code, makefiles, and configuration files for the PSM's middleware platform.

This architecture supports multi-platform implementations of an application, and inter-platform interoperability, by design.

Modeling Integration with the MDA

By deriving UML models from existing applications, we can bring them into our MDA environment and integrate them easily with each other, and with our new WS applications. Suppose we start by doing this for the legacy and component applications shown in Figure 1.

To generate the WS Client and Server applications (working separately at companies A and B, of course), business experts start by designing their functionality and behavior into PIMs. As they work, they integrate the new PIMs with PIMs of the other applications that they interoperate with.

Then, when the WS applications are generated via the MDA process that we just described, they include cross-platform interoperability pathways where needed. Faster, better, cheaper—this is the way to build Web Services applications!

Conclusions

Web Service applications, typically intended to interact across the firewall to an enterprise's customers and suppliers, are inherently multi-platform and broadly integrated. By designing these complex applications in the MDA, and letting MDA-enabled tools build them with help from skilled architectural and programming staff, the computer-savvy enterprise can move into the world of Web Services better, faster, and cheaper than by doing it any other way.

References

An expanded version of this paper appears at www.omg.org/mda/mda_files/MDA-WS-integrate-WP.pdf. For more information on the MDA, see www.omg.org/mda; for information on OMG see www.omg.org. To contact the author, send email to siegel@omg.org. ■

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Model Driven Architecture: Applying MDA to Enterprise Computing
David S. Frankel, forward by Michael Guttman
ISBN: 0-471-31920-1
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Model Driven Architecture (MDA) is a new methodology from OMG that uses modeling languages like UML along with programming languages like Java to build software architectures. PriceWatersCoopers' prestigious Technology Center just predicted that MDA will be one of the most important methodologies in the next two years. Written by the lead architect of the specification who provides inside information on how MDA has worked in the real world. Describes MDA in detail and demonstrates how it can work with existing methodologies such as UML, MOF, CWM, and Web services. ■

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