**OMG's Second Annual Architecture-Driven Modernization Workshop:**
*A Model-driven Approach to Modernizing IT Systems*

**October 24-27, 2005 – Alexandria, VA  USA**

# Program

# Monday, October 24, 2005

## *Tutorials*

0900-1230     ***Architecture-Driven Modernization: Concepts, Strategies & Justification***
William Ulrich, President, Tactical Strategy Group, Inc.

Architecture-driven modernization or ADM offers effective options to help organizations realign and reinvent themselves and their existing systems. Modernization takes over where other IT options fall short. This seminar will outline practical modernization options for business and IT analysts and architects. It discusses ways to leverage ADM analysis, refactoring and transformation techniques and tools to augment traditional replacement, migration, integration and package deployment strategies. The emphasis of this introductory session is to provide a comprehensive overview of ADM options, tools, techniques, project scenarios and justification strategies. The scenario discussions will be further enhanced through the sharing of actual modernization experiences.
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1030-1100     Morning Refreshments

1230-1330     Lunch

1330-1700     ***Knowledge Discovery Metamodel (KDM)***
Nikolai Mansurov, Chief Scientist, Klocwork

Nikolai Mansurov, a leading contributor to the OMG's Architecture-Driven Modernization PTF, will present a half-day tutorial on the work of the ADM Task Force related to Knowledge Discovery Metamodel (KDM).  The tutorial will present the fundamentals of KDM and its place within overall ADM effort. The tutorial will cover the status of the KDM specifications, their business significance, relationships with other OMG standards, meta-models and related technologies.

1500-1530     Afternoon Refreshments

# Tuesday, October 25, 2005

## *Tutorials*

0900–1215     ***Abstract Syntax Tree Metamodel (ASTM)***
                Philip Newcomb, CEO, The Software Revolution, Inc.

It has long been observed that although there are many differences between the statements in programming languages there is a very large set of statements that are common across most languages. The Architecture Driven Modernization Task Force has issued an RFP for the Abstract Syntax Tree Meta Modeling standard. The ASTM seeks to establish a single comprehensive set of modeling elements for capturing how many software languages represent the same software language constructs and concepts. Software analysis and transformation tools that use the ASTM will achieve broader applicability through software language independence at the model level. This tutorial will present the vision of the ASTM, its business significance, its relationship to other OMG standards, including the Knowledge Discovery Metamodel (KDM), the OMG Model Driven Architecture (MDA) and Unified Modeling Language (UML). The perspectives of the ASTM submission teams, and their progress towards a unified definition for the ASTM standard will be presented by members of the ADM Task Force.

1030-1100     Morning Refreshments

1215-1230     ***Sponsor Presentation - ASG***

1230-1330     Lunch

1330-1345     ***Sponsor Presentation - Unisys***

1345-1715     ***Automated Program and Model Transformation Technology***
                Ira Baxter, CEO, Semantic Designs
                Jeff Gray, Jeff Gray, Assistant Professor, University of Alabama at Birmingham

Successful software systems have long lives, yet change continuously. At various stages in their life, massive changes are required to rearchitect or replatform such systems, which is extremely costly and risky to implement by conventional manual methods. Automated transformation technology has become mature enough for such massive changes to be reliably carried out with predictable, yet economical, budgets and schedules. Transformations can be applied at the code level, and the architecture and design level. This tutorial will cover the maturing technology of program transformation, and the nascent technology of model transformation and their interplay.

1500-1815     ***Demonstration Area Open***

1500-1530     Afternoon Refreshments

1715-1815     ***Demonstration Area Reception***   hosted by:

# Wednesday, October 26, 2005

0900-0915    *Welcome & Opening Remarks* – **Program Committee Chair**
Fred Waskiewicz, Director of Standards, Object Management Group

0915-1000    *Keynote Presentation*
**George Thomas, Chief Architect, OCIO Enterprise Architecture Group, General Services Administration**

1000-1030    Morning Refreshments

1000–1600    *Demonstration Area Open*

1030-1230    **Session 1** - *Architecture-Driven Modernization PTF Roadmap*
Session Chair: Jeff Gray, Asst. Professor, University of Alabama at Birmingham

The three presenters in this session share their 60 years of collective software development experience by outlining some of the key challenges of modernization. The session will focus on issues such as program analyses that are applied across different domains, new security concerns arising from migration of legacy code into modern execution platforms, and reverse engineering of business rules by extracting key domain concepts and relations from legacy code. Like any good roadmap, this session will also identify potential obstacles (including technical, social, and business concerns) while undergoing a modernization effort.

1030-1110    **Software Modernization as a Path to Secure Software**
Djenana Campara, CTO, Klocwork

Security vulnerabilities and unsafe coding practices are becoming ripe for exploitation by malicious code attacks. The challenge for software development organizations is that they must simultaneously reduce software vulnerabilities while keeping operational costs in check. In addition, any new strategy is expected to be applicable across geographically distributed teams and across in-house and COTS components. While new development can be better controlled to prevent security threats, existing software needs to undergo carefully planned modernization. This session will introduce steps, best practices and tools needed for successful modernization.

1110-1150    **Data Model of the Compass/VB Analysis Tool and its Relation to KDM**
Netta Aizenbud-Reshef, Jonathan Bnayahu, Nurit Dor, Sara Porat, Avi Yaeli, IBM

The COMPASS (Code Migration Planning and Assessment Workbench) framework was developed in IBM Haifa Research Lab  to provide a common infrastructure for analysis and assessment tools. Such tools help service practitioners or individual developers to understand applications and to identify potential migration obstacles. The framework was designed to provide generic support for program analysis and to be extensible to specific domains. This session presents the generic data model of the framework and how it was extended to support the Visual Basic domain. We compare and map the COMPASS data model and its extension mechanism with KDM, and address lessons learned.

1150-1230    **A Standards-based Approach to Extracting Business Rules**
Ira Baxter, Semantic Designs and Stan Hendryx, Hendryx & Associates

Businesses operate with policies and procedures often characterized as "business rules".  Being able to articulate and change these rules are key to success in the modern, dynamic world. Legacy software systems implement business rules implicitly in the source code, making the rules difficult to identify, let alone modify.  Documenting business rules in source code is a first step in modernizing software.  This talk sketches shortcomings in traditional business rules extractions, and describes the upcoming OMG specification for business rules. It also discusses how business experts working in an interactive process can extract such rules using automated analysis and transformation tools.

1230-1330    Lunch

1330-1500    **Session 2 -** *Modernization in Healthcare*
(Co-located with Healthcare Interoperability Workshop)
Session Chair: Fred Waskiewicz, OMG

In meeting the needs of modern healthcare services, providers do not necessarily have the luxury of developing new systems from scratch. Many services are provided by existing systems that somehow must be brought up to date to provide the interoperability of function and data they were never designed to offer. This session draws upon the experience of modernization experts who will share their insight into modernization best practices.

1330-1400    **Systems Consolidation: A Claims System Consolidation Scenario**
William Ulrich, Tactical Strategy Group Inc

Healthcare insurers have undergone a series of mergers and acquisitions in recent years. This presents the challenge of how to cost effectively consolidate common business functions, customers and data. Effectively consolidating and streamlining these key aspects of their business result in more a competitive, efficient provider and better service to common customers. This session will overview the issues and approaches of addressing such a consolidation with examples drawn from a number of healthcare providers. The discussion will utilize architecture-driven modernization concepts in presenting an approach on how to achieve phased consolidation of core business information assets.

1400-1430    **What CMS is doing to Stimulate Modernization of 51 Medicaid Management Information Systems**
William Branch, CSC and Kathleen Connors, Fox Systems, Inc.

This presentation provides an overview of the Medicaid Information Technology Architecture (MITA). MITA is intended to foster integrated business and IT transformation nationally. It will establish national guidelines for technologies and business processes to enable improved program administration for state Medicaid enterprises. Collectively, state Medicaid enterprises share common goals and objectives for of the outcomes of the Medicaid program. The MITA initiative includes an architecture framework, processes, and planning guidelines for enabling state Medicaid enterprises to meet common objectives within the framework while supporting unique local needs.

1430-1500    **Case Study: A On-line and Real-time Claims Processing Modernization Project**
Mike Oara, Relativity Technologies

This presentation draws on an experience with a health insurance organization. The project was run approximately four years ago and involved a major re-architecting effort directed towards moving from a batch to an on-line environment. The project went to a number of phases, which came in natural order. The invasive phase of the project used two important techniques. The first one consists in a "horizontal" split of large programs along types of transactions. The second technique involves "vertical" slicing, such that modules are reduced in size and specialized on particular functions. The result of the project was a new configuration of the programs, which allowed the continuous use in batch mode, while greatly facilitating the assembling of new versions adapted for on-line processing. As a result, the company was able to validate and process certain categories of claims on-line and in real-time.

1500-1530    Afternoon Refreshments
*(Located with Technology Demonstrations)*

1530-1700 **Panel -** *Transforming the Enterprise*
(Co-located Healthcare Interoperability Workshop)
Moderator: Fred Waskiewicz, OMG

Building upon what we learned in the previous session on modernization best practices, this panel of experts will offer advice in response to audience questions on what issues may be faced in modernization efforts and how they may be addressed.

Panelists: William Branch, CSC
David Cardenas, LA DHS
Keith Cox, VHA
Philip Newcomb, The Software Revolution
Peter van der Grinten, dbMotion
William Ulrich, Tactical Strategy Group Inc.


1730-1930 *Workshop Reception* hosted by:

# Thursday, October 27, 2005

0900-0945    *Keynote Presentation*
    **Joe Jarzombek, Director for Software Assurance,**
    **National Cyber Security Division, Department of Homeland Security**

0945-1200    **Session 3** - *Tools and Methodologies:*
    *Twin Engines Driving Modernization Initiatives*
    Session Chair: William Ulrich, President, Tactical Strategy Group, Inc.

Central to any modernization effort are two key elements: tools and methodologies. This workshop session includes three presentations that focus on the role of tools and methodologies in ADM initiatives. Tools are essential in an ADM project because they can quickly and reliably analyze and / or transform systems. Methodologies, on the other hand, provide the context, processes and guidelines needed to leverage ADM tools on projects. The presentations, and discussion that follows, offer an excavation methodology overview, an SOA modernization discussion and a guide on how to minimize risks on modernization projects. This important session will offer attendees an opportunity to hear from the individuals that develop and implement ADM methodologies and tools on critical ADM projects.

0945-1025    **Architecture Excavation Methodology**
    Nikolai Mansurov, Chief Scientist, Klocwork

One of the challenges of the modernization of existing software is the architecture erosion - undesired coupling between modules due to uninformed changes. Architecture excavation is a tool-assisted process of recovering the original architecture model to allow detection of anomalies as well as intelligent communications about its intent and suggested modifications. Excavated model allows managing existing system at the model level, rather than at the code level - an important step in the transition towards model-based techniques. The presentation introduces the techniques of architecture excavation, its models, metrics and operations.

1025-1105    **Legacy Modernization to SOA using Compass/VB**
    Netta Aizenbud-Reshef, Alex Akilov, Jonathan Bnayahu, Nurit Dor, Sara Porat, Avi Yaeli, IBM

The Service Oriented Architecture (SOA) approach considers all business systems and applications as services. SOA brings flexibility, ability to adjust to changing business priorities and to reuse services. Many modernization scenarios aim at converting legacy applications to SOA. IBM was involved in an engagement with a large bank, where the legacy architecture consisted of a Visual Basic rich-client containing many business processes, and a proprietary back-end. The target was an SOA back-end and a thin, web-based client. The session presents how a program analysis tool, like Compass/VB, can assist in isolating the business components in the code towards SOA.

1105-1120    Morning Refreshments

1120-1200    **How to Minimize the Risks of Launching Modernization Projects**
    Norm Rajala, VP Client Services, Klocwork

Modernization is rarely considered as an investment, but rather as the cost to prevent a critical business failure. The disadvantage of such approach is that the overall quality of the system is often sacrificed and any knowledge, recovered during modernization is not retained to improve the long-term capability of the organization. Changes in software development processes and focus on short-term returns on the investment into on-going modernization are required to de-risk modernization of existing software and turn it into a day-to-day practice.

1200-1230    *Sponsor Presentation - Klocwork*

| 1230-1330 | Lunch |
|---|---|

**1330-1450** *Session 4 - Case Studies:*
*Paths To Transforming, Rearchitecting or Targeting ADM*
*Architectures: Meeting the Modernization Challenge*
Session Chair: Eric Didier, Vice President of Sales, ASG

**1330-1410** **EOSS Modernization Pilot for the Navy E-Business Office**
Philip Newcomb, CEO, The Software Revolution, Inc.

As the Navy adopts a single secure enterprise network, many legacy systems are undergoing costly modernization to meet the stringent security requirements of NMCI. Under the auspices of the Navy E-Business office TSRI undertook a pilot to demonstrate the benefits of using automated modernization to reduce these costs. TSRI's Janus[tm] technology, an adaptable multi-source-multi-target language model-driven transformation framework, was applied to achieve near 100% automated transformation of EOSS, a VMS VAX BASIC legacy system into an NMCI compliant Java/J2EE system. This presentation will discuss the findings and recommendations from the E-Business Office's independent assessment report, as well as how TSRI used Architecture Driven Modernization (ADM) best methods and practices to carry out this project.

**1410-1450** **Automated Rearchitecting of Avionics Mission Software**
Ira Baxter, CEO, Semantic Designs

Rearchitecting software is sometimes needed to meet new requirements, but manual approaches are often cost and schedule prohibitive. This talk presents an automated re-architecting of Boeing's Boldstroke mission avionics software, a large C++ component based software system. Boldstroke ran on a proprietary OS, but Boeing desired to switch to realtime CORBA. It was estimated to take some 500 man-years to restructure the software manually. Software tools for rearchitecting the software, requiring massive reshaping of the architecture and the code itself were implemented to achieve this change. Automatically converted components have been successfully flown in Unmanned Aerial Vehicles.

**1450-1515** *OMG Architecture-Driven Modernization Platform Task Force*
 *"State of the Task Force"*
William Ulrich, OMG ADM PTF Co-Chair

| 1515-1530 | Afternoon Refreshments |
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**1530-1700** *Panel: ROI of Modernization Strategies*
Moderator: Vitaly Khusidman, Architecture Director, Unisys

The goals of this panel include:
- Discussing modernization strategies within the ADM field
- Providing a definition of "ROI of a Modernization Strategy"
- Discussing the differences of ROI for enterprise vs. product modernization strategies
- Sharing experiences in using economical evaluations for modernization strategies and projects

Panelists: Howard Hess, Distinguished Engineer, IBM
Ricardo Jorge Lopez, Principal Engineer, Qualcomm
Trina Alexson, Director Engineering, Cisco

# *Program Committee*

Ira Baxter, Semantic Designs

Djenana Campara, Klocwork

Chris Caputo, BluePhoenix

Donal Daly, Oracle

Barbara Errickson, EDS

Jeff Gray, Univ. Alabama Birmingham

Kevin Loughry, OMG

Philip Newcomb, TSRI

Mike Oara, Relativity Technology

Sara Porat, IBM

Fred Waskiewicz, OMG (Chair)

William Ulrich, TSG