



Architecture-Driven Modernization Workshop

“A Model-driven Approach to Modernizing IT Systems”

March 22-24, 2004 - Chicago, IL, USA

Workshop Program

Monday, March 22, 2004

0900 - 1230 **Tutorial 1: *Application Modernization Study: Leveraging Existing Software Assets***

William Ulrich, President, Tactical Strategy Group, Inc.

Existing application environments are plagued by years of patchwork changes piled upon aging architectures. Yet many of these systems retain business value because they contain business logic that cannot be re-specified in cost or time effective ways. Understanding, upgrading, migrating, deconstructing and / or redeploying these systems, collectively called modernization, begins where from-scratch development and non-invasive integration fall short. This half-day tutorial tackles difficult application challenges head on. Application knowledge reclamation and transformation play a key role in business systems analysis, integration, systems development, package selection and deployment, and a variety of other priority initiatives. Attendees will learn how to more effectively meet time-critical business requirements by leveraging existing application assets. The tutorial will provide cost effective options to business and IT project teams crafting integration, enhancement, replacement, package deployment and Web-based solutions through the use of application modernization techniques and tools.

Topics include: Overview & Taxonomy, Existing Application Challenges, Legacy Environments vs. Emerging Technologies, A Modernization Framework & Strategy, Application Meta-Data Management, Enterprise & Application Area Assessments, Application & Data Migration, Structuring & Rationalization, Architecture Transformation & Redeployment , Enabling Tools & Technologies, Modernization Scenarios.

1030 – 1100 Morning Refreshments

1230 – 1330 Lunch

1330 – 1500 **Tutorial 2: *Managed Architecture of Existing Software as a Practical Transition to MDA***

Nikolai Mansurov, Chief Scientist and Chief Architect, Klocwork

This tutorial is intended as a hand-on demonstration of the basic techniques for managing existing code at the model level rather than at the code level. The tutorial provides the required background: the problem of adopting MDA for projects with existing code; the challenges of maintenance and evolution of existing systems; architecture erosion. It introduces the concept of managed architectures and how to make a transition from managing source code to managing architecture. Then the tutorial focuses on how to excavate architecture models. A comprehensive case study is used. Then the tutorial introduces the concept of an Architecture Rule and demonstrates, how architecture rules can be enforcement. Different strategies for architecture rule enforcement are discussed (rule checking, initiated by developer; integration into ClearCase for automatic checking at check-in time; integration into the software build for automatic checking during the build of the complete product). The tutorial concludes by discussing why managed architectures can be a good practical step of transition towards MDA. This tutorial is targeted at the general audience of software development practitioners and software development managers.

1500 – 1530 Afternoon Refreshments

1530 – 1700 **Tutorial 3: *How to Harvest Reusable Components in Existing Software***

Nikolai Mansurov, Chief Scientist and Chief Architect, Klocwork

The objective of this tutorial is to introduce basic concepts of architecture re-factoring, with the emphasis on re-factoring to isolate reusable components. The tutorial provides a general introduction into the process of harvesting of reusable components and the corresponding challenges, such as architecture erosion and cyclic dependencies between components. Then the tutorial focuses on how to use an architecture model of existing code to identify components and re-factor to introduce proper component scope by tracking dependencies between subcomponents. The presentation is accompanied by detailed demonstration of the methodology steps using a case study. Tutorial is targeted at a broad audience of software development practitioners.

1700 – 1730 **Special Session:**

OMG Architecture-Driven Modernization Platform Task Force Report

William Ulrich, President, Tactical Strategy Group, Inc. - Task Force Co-Chair

Tuesday, March 23, 2004

0830 - 0840 ***Workshop Welcome and Opening Remarks***

Program Committee Chair:

Fred Waskiewicz, Director of Standards, Object Management Group

ADM Technical Approaches

Moderator: James Rhyne, Distinguished Engineer, IBM

This track presents methodologies, techniques, processes and tools supporting system architecture analysis and modernization activities.

0840 - 1040 ***Session 1***

0840 – 0910 **Model Driven Legacy Migration**

Krupa Benhur, Patrick DJ Kulandaisamy, Venugopal Subbarao
Comfactory, SETLabs, Infosys Technologies Limited

This presentation will bring out the significance and value of models in legacy application migration. Core models define the platform, application, and data layer concepts in unambiguous terms. Another important concept elaborated here is migration map that encompasses all the aspects for a successful migration. Consistency and broader perspective in migration projects are the direct benefits of using these models.

0910 – 0940 **Domain Driven Modernization of Legacy Systems**

Vladimir Bacvanski & Petter Graff, Vice Presidents, InferData Corporation

Modernization of legacy systems is a common problem in an enterprise. The modernization or replacement of the legacy systems is often performed suboptimally, achieving replicated or just enhanced functionality. MDA is viewed as a vehicle to increase the efficiency of the modernization process. However, the full benefit is achieved by rooting the modernization approach in the domain models. This allows for aligning the modernized system with the business, supporting families of systems in product lines and making the tacit knowledge explicit. The talk describes the process and modeling techniques for domain driven, MDA based modernization of legacy systems.

0940 – 1010 **Effects of Scale on Methodology and Tools for ADM**
James Rhyne, Distinguished Engineer, IBM

Current fine grained analysis tools are based on "greedy" and "depth first" analysis heuristics that do not scale. This report will focus on other heuristics and methodologies for information collection and analysis that can address the scalability problem. Many of these heuristics will produce some important and relevant results quickly with other results taking longer. Because of the "no free lunch" principle, the full analysis may take longer than in the greedy and depth first cases. This creates a need for tooling that can run unattended and report its results as asynchronous events. There are tactical engineering considerations to be deal with. Most of today's fine grained analysis tools are based on greedy and depth first heuristics. These tools are not likely to be rewritten. To resolve this, we will need to create a model of large scale, coarse grained analysis tools into which the fine grained analysis tools can be plugged.

1010 – 1040 Session 1: Q & A and Discussion

1030 – 1730 *Demonstration Area Open*

1040 – 1110 Morning Refreshments

1110 – 1230 *Session 2*

1110 – 1140 **Software Architecture Mining in Realized DBMSs**
Bernd G. Wenzel, Vorarlberg University

Many operational application systems today use relational database management systems (RDBMSs) to store their persistent data. This is relevant in the context of ADM for several reasons including: Architecturally relevant objects in a software system are more likely to be persistent than transient. As a consequence any ADM methodology should analyze the databases of systems to be modernized. RDBMSs have an active data dictionary containing information about the tables it stores, their columns, constraints, keys, relationships, views, etc. This presentation will offer ideas, how the data dictionary information in an RDBMS can be used to compile a reasonable approximation of the static model underlying the application to be modernized.

1140 – 1210 **Klocwork Architecture Excavation Methodology**
Nikolai Mansurov, Chief Scientist and Chief Architect, Klocwork

Existing software systems, over time evolve into conflicting or challenging designs that require laborious manual coding methods and often resist evolution due to factors that are not exclusively related to functionality. Common examples of such factors include a system's inability to be understood or maintained cost-effectively and its dependence on undesired architectures, caused by architecture erosion. In this presentation we will show you how you can use architecture excavation tool-assisted process to recover architecture model. The excavated model is precise with respect to the existing code. Precise excavated model of the existing system allows managing existing system at the model level, rather than at the code level, which is an important step in transition towards model-based techniques.

1210 – 1230 Session 2: Q & A and Discussion

1230 – 1330 Lunch

1330 – 1500 **Session 3**

1330 – 1400 **Extending the Life of Software Assets through Componentization**

Charles Dickerson, VP of Marketing & Product Management, Relativity Technologies Inc.

Time pressures and technical compromises often cause the code quality of enterprise applications to degrade - jeopardizing the functionality and stability of the system. This presentation will examine automated techniques and algorithms that can reduce the complexity and improve the technical and business performance of an application portfolio.

1400 – 1430 **Stage of Legacy Application Modernization**

Barbara Errickson-Connor, Sr. Director - Product Management, Allen Systems Group, Inc.

With the growing recognition that modernizing legacy applications may make more sense than completely rewriting them, what are the consequences if we don't recognize the truth about the steps we should take?

Transitioning by Stages:

- Understand code and clean coding anomalies, dead code, dead data
- Restructure code – mine business logic as component methods and/or business rules
- Transform code to new languages and/or to new technologies and platforms
- Manage modernized & discovered reusable software

This presentation will cover expected steps within these 4 stages.

1430 – 1500 Session 3 Q&A and Discussion

1500 – 1530 Afternoon Refreshments

1530 - 1700 ***Panel: OMG's ADM Standardization Effort: Solution or Dilution?***

Moderator: Fred Waskiewicz, Director of Standards, Object Management Group

OMG's ADM activity seeks to revitalize existing applications, making them more agile and leading to successful modernization. Yet criticisms have been leveled against such work, claiming it strives to do too much; isn't cost effective; produces minimal gains; some programming languages deserve to die; and that existing tools already do an admirable job. This panel of ADM experts tackles these criticisms point-by-point.

Panelists: TBA

1800 – 2000 ***WORKSHOP RECEPTION hosted by:***



Wednesday, March 24, 2004

Practice & Experience

Moderator: Fred Waskiewicz, Director of Standards, Object Management Group

This track explores ADM in action: experience reports and best practices summaries offering advice and guidance in ADM technical approaches and project management.

0830 – 1030 ***Session 1***

0830 – 0900 **ADM in Air Traffic Control and Safety Critical Systems**
Emmanuel Fuchs, Chief Architect, THALES ATM (Air Traffic Management)

This presentation will address current plans and requirements for ADM usage in THALES to modernize aeronautical safety critical products. For the ATC domain, ADM leverages the reuse of well proven robust legacy software enabling secure investment in today's technologies with an open end to the future. The main issue in the safety critical domain is the migration from Ada code base to C, C++ and Java language. This domain also faces the migration to new middleware technologies such as RT CORBA and CORBA Component Model (CCM). The ultimate usage of ADM is to build a domain model from the existing code and expert knowledge. This talk presents the three steps proposed to apply ADM in safety critical system: short term: code base optimization, medium term: application migration, long term: domain model extraction from existing code base. The THALES experience will be used to provide requirements for industrial ADM tools for safety critical domain such as transportation, power, and health.

0900 – 0930 **Asset-based Software Engineering**
Charles Stack, Founder and CEO, Flashline

In today's complex, interconnected world the business value of information is too easily lost in software and systems that have become increasingly and unnecessarily complex. The solution lies in modernizing, managing and reducing the complexity of the mission-critical software and systems by managing software as an enterprise-wide portfolio of strategic assets. This presentation introduces Asset-based Software Engineering (ASE), a set of best practices to help any IT organization reduce complexity, improve productivity, and create the agility required to compete in today's ever-changing business climate. The presenter will discuss the business value of software assets, and how to use this information as the foundation for architectural, critical business alignment, governance, and cost reduction programs throughout IT. Strategies for exploiting asset value to improve the efficiency of IT efforts will be explored.

0930 – 1000 **How to Minimize the Risks of Launching Modernization Projects**
Norm Rajala, VP of Professional Services, Klocwork

Modernization of existing software has certain business aspects that to a large extent determine how modernization projects are performed. We discuss the triggers and the cost factors of modernizations, such as the cost of deploying modernization tools and the cost of understanding the existing system. One-time modernization, triggered by external factors, can have high cost, and is usually considered having high risk. We show how the risk of modernization can be significantly lowered if incremental architecture-driven modernization is integrated into the day-to-day software development process. We show how incremental modernization increases the return on investment in extending the useful life of existing software by reducing architecture erosion and leveraging the cost of modernization tools.

1000 – 1030 **Session 1 Q&A and Discussion**

1030 – 1100 **Morning Refreshments**

1030 – 1530 ***Demonstration Area Open***

1100 –1200 ***Sponsor Presentations***

Charles Dickerson, VP of Marketing & Product Management, Relativity Technologies Inc.

Norm Rajala, VP of Professional Services, Klocwork

Barbara Errickson-Connor, Sr. Director - Product Management, Allen Systems Group, Inc.

1200 – 1300 Lunch

1300 – 1500 ***Session 2***

1300 – 1330 **MDA Legacy Modernization Case Study**

Christopher C. Armstrong, Chief Science Officer, ATC Enterprises, Inc. &
Bobbi Underbakke, President/CEO, Adaptive Team Collaboration, Inc.

The State of Wisconsin, Department of Workforce Development, Unemployment Insurance (UI) Division is completely replacing its legacy platform for managing the disbursement of UI benefits. The Enhanced Automated Benefits Legal Enterprise Services project issued a request for proposal (RFP) in four months based on UML models and an MDA framework. The contract was awarded in 2003 to a vendor with an existing package based on a J2EE platform. The package includes a UML-based reference model and leverages Rational Rose for capturing the software design. From the UML model, considerable levels of functional software are automatically generated. The speaker will provide an update on the status of this project and discuss how it is one of the first large-scale projects based on MDA delivering real business value (\$30 million business reengineering & legacy retirement project).

1330 – 1400 **The Consequences of Legacy Application Modernization Choices**

Barbara Errickson-Connor, Sr. Director - Product Management, Allen Systems Group, Inc.

There is a growing recognition that modernizing legacy applications may make more sense than completely rewriting them. What are the consequences of the choices we make as we manage the transition from monolithic legacy applications to a more agile environment where we can mix and match business logic into new applications while maintaining business rule consistency and correctness? What can we do to remediate the impact of choices we make and the results of choices made by others in the legacy code ?

1400 – 1430 **Best Practices for Enterprise Architecture**

Sharon Fay, Chief Productivity Strategist, Flashline, Inc.

Documenting and exposing enterprise architecture turns out to be one of the most difficult challenges faced by IT architects. Join us as we discuss the efforts of Fortune 500 organizations to define and document their Enterprise Architecture as a starting point for identifying redundancy, consolidating functionality, migrating to a service oriented architecture, and modernizing their systems. We will focus on the management practices and infrastructure requirements, and the value of these efforts in terms of charting and communicating strategic direction, and driving architectural compliance.

1430 – 1500 Session 2 Q&A and Discussion

1500 – 1530 Afternoon Refreshments

1530 – 1700 **Panel: *Towards the Next Generation of Modernization Tools***

Moderator: Nikolai Mansurov, Chief Scientist and Chief Architect, Klocwork

This panel will discuss requirements for the next generation modernization tools. The panel is targeted at both the tool vendors and the users of modernization tools. The objective of the panel is to discuss the outlook of the software transformation industry and the ways in which the forthcoming OMG specifications of the Architecture-Driven Modernization Platform Task Force can change the landscape. Integrations of existing tools and cross-pollination between existing methodologies can be discussed. The users of modernization tools are encouraged to present their views on the desired direction for the next generation tools.

Panelists: TBA

1700 – 1715 ***Closing Remarks***

Fred Waskiewicz, Director of Standards, Object Management Group

WORKSHOP PROGRAM COMMITTEE

Kevin Loughry, Object Management Group

Cyrus Montakab, SoftwareMining

James Rhyne, IBM

Roberto Sasso, ArtinSoft

William Ulrich, TSG, Inc.

Fred Waskiewicz, Object Management Group (Chair)