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How Architecture-Driven Modernization Is Changing the Game in Information System Modernization

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Why Modernize Legacy Systems?

Doing Nothing Is The Pathway To Decline

- ❑ Half Trillion Lines of Code Written in Obsolete Legacy Languages
- ❑ Massive Drain on National Productivity
- ❑ Many times more Costly to Maintain and Operate Than Modern Applications
- ❑ Hindering Progress And Innovation In Every IT Sector

Choosing The Wrong Pathway Is Perilous

- ❑ Massive Waste On Misguided and Poorly Executed Approaches.
- ❑ Past Replacement Efforts Have A Shocking 63% Failure Rate^{*}
- ❑ Historic Modernization Failures Cited Time and Again
- ❑ Past Failure Should Never Be A Justification For Doing Nothing

***according to Forster**

Why Architecture Driven Modernization?

- ❑ ADM Is A Body of Management Practices That Work
- ❑ Backed By the Object Management Group (OMG)
- ❑ The Only Formally Defined Set Of Modernization Standards
- ❑ Establishes Routine Predictable Repeatable Practices
- ❑ If Followed, ADM Delivers:
 - ❖ High-Quality Modernized Systems
 - ❖ Fraction The Time and Cost Of Past Methods,
 - ❖ Handles All Combinations of Source And Target Languages,
 - ❖ Applicable To All Sectors: Military, Government, Commercial
- ❑ ADM Is The Best Path To Moving Aging Systems To Agile Methods

ADM Works!!

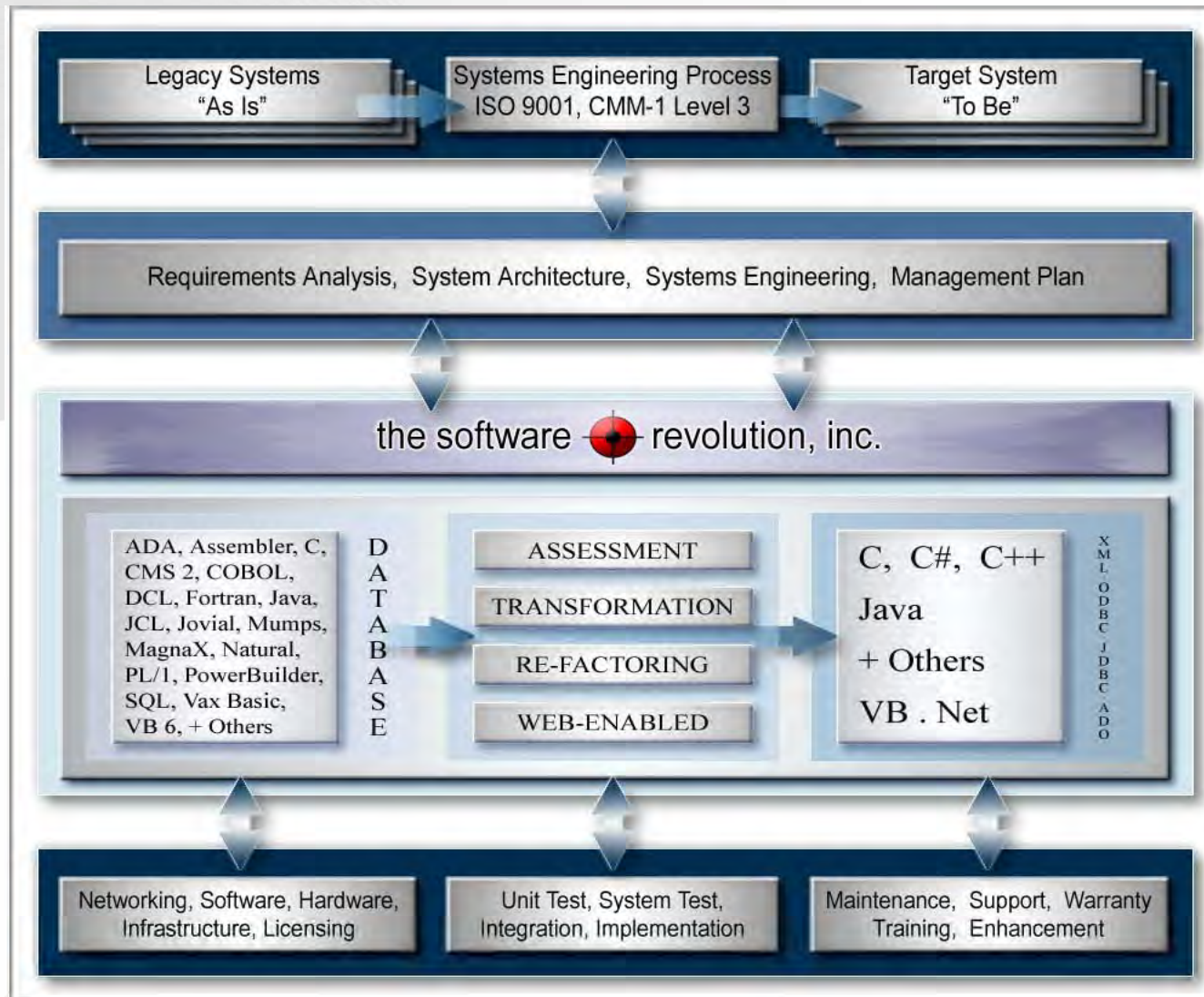
ADM Works Across All Legacy Languages, Platforms and Applications

Legacy Source Code	System Application
COBOL (4 Dialects)	- Administration - Logistics - Health Maintenance - Finance
ADA	- Aircraft Display - Satellite Terminal - Mission Planning
Assembler	- Strategic Missile Defense
Jovial	- Satellite Tracking - Aircraft Control - Command & Control
CMS-2	- Tactical Weapons Display
Fortran	- Weather Tracking - Strategic Missile Defense - Strategic Warfare Planning
C	- Homeland Defense - Strategic Missile Defense
VAX Basic	- Shipboard Engineering
MUMPS	- Hospital Operations
PowerBuilder	- Healthcare Services
Magna-X	- Healthcare Services

ADM Works at a Fraction of the Cost and Time

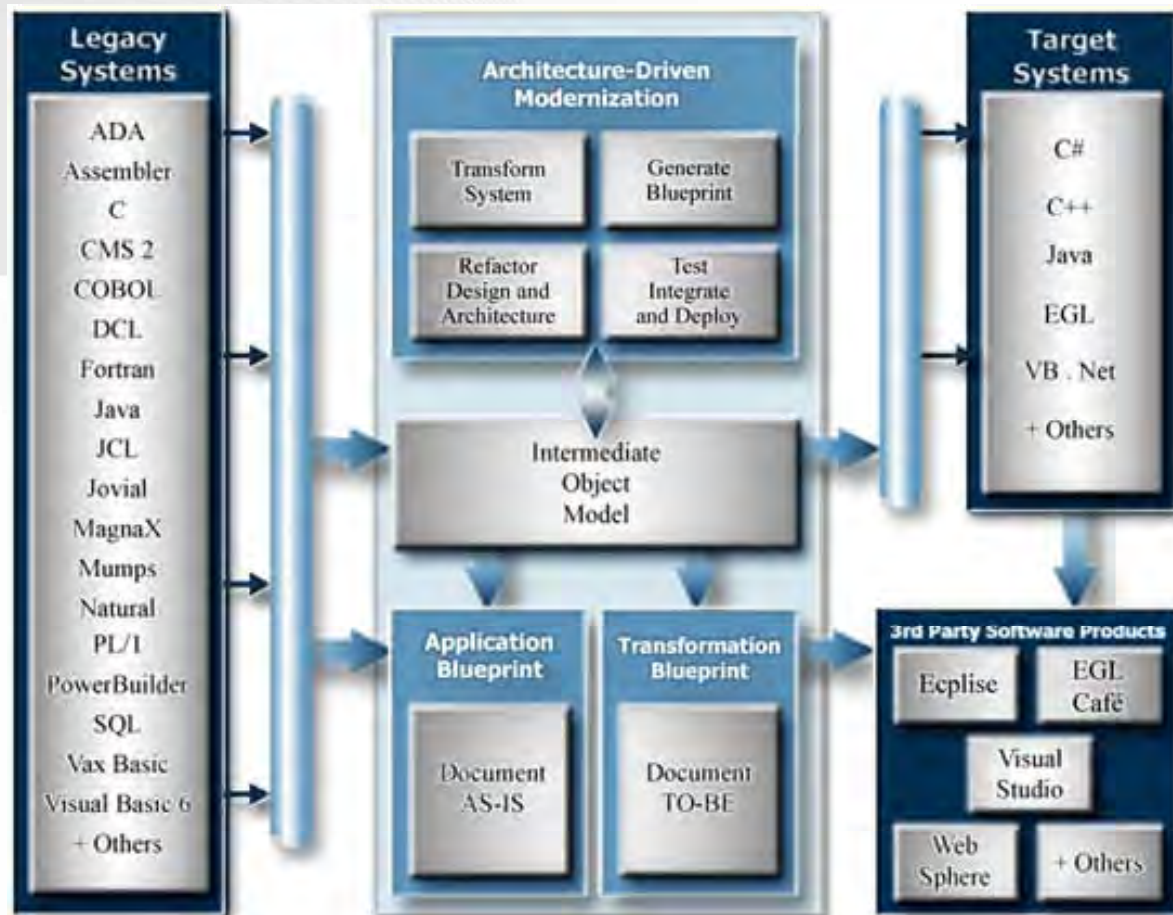
	Integrator	System	Code	SLOC	TTC
Civilian	Navigant	Health Car Service Corp.	PowerBuilder & Magna X to Java	170K	On-Going
	Premiera Blue Cross	Automated Doc. Assembly System	COBOL to C++	44K	3 mo.
	AETNA	Proof-of-Concept	COBOL DOCS & Re-Fact.	92K	3mo.
	Thales Air Systems	French Air Traffic Management	Ada to Java	495K	12 mo.
	Thales Air Systems	Nordic Air Traffic Management	Ada to Java	541K	9 mo
	Thales Air Systems	Australian Air Traffic Management	Ada to Java	638K	9 mo
	Unisys	NY State Dept. of Criminal Justice	COBOL Documentation	308K	2 mo.
	NEA	Grant & Business Systems	COBOL to C++	656K	7 mo.
	SAIC	Veteran's Health Administration	MUMPS to Java	300K	4 mo.
	State of OR	Employee Retirement System	COBOL to C# .Net	250K	4 mo.
	State of WA	Off. of Super of Public Instruct.	COBOL to C# .Net	191K	5 mo.
	TriGeo	Sim v4.0 (Internal Product)	Java Docs & Re-Fact.	370K	2 mo.
	EDS	Proof-of-Concept	P/L 1 to Java	50K	7 mo.
	CSC	Bureau of Immigration	COBOL to C++	17K	3 mo.
	Boeing	ALCA - Czechoslovakia	Jovial to C++	9K	2 mo.
Military	LMCO	P-3C	Ada - C++	656K	14 mo.
	ITT	BMEWS - Cobra Dane	Ada/Fortran - C++	380K	8 mo.
	Raytheon	Satellites	Ada/Fortran - C++	284K	5 mo.
	L-3	VTT	Ada - C++	77K	3 mo.
	LMCO	SAC Strategic Planning System	Ada - C++	40K	2 mo.
	DSR	E-2C ACFT	Ada - C++	20K	5 mo.
	USAF	CAMS	COBOL Docs	1M	6 mo.
	NGC	REMIS	COBOL - C++	400K	7 mo.
	DynCorp	WCSRS	COBOL - C++	90K	5 mo.
	ITT	BMEWS - ROSA	Fortran/C Docs	2M	4 mo.
	Raytheon	Patriot Missile	Fortran - C++	200K	6 mo.
	Litton PRC	Strategic Air Command	Fortran - C++	50K	4 mo.
	Raytheon	WDAC	Fortran - C++	40K	1 mo.
	SAIC	EOSS	VAX Basic - Java	38K	5 mo.
	TRW	MILSTAR	Jovial to C++	143K	1 mo.
	USAF	F-16 Decis	Jovial to C++	50K	4 mo.

ADM Works with Prevailing Engineering Processes



ADM is A Rigorous Agile Method –

Component-Oriented, Model-Based, Architecture-First, UML Design
All Change Is Iterative Accomplished By Rules Applied To Models



Role Of The OMG

- ❑ The OMG (Object Management Group) chartered the ADM Task Force in 2003
- ❑ To Extend UML-Based MDA practices and standards to existing systems.
- ❑ The OMG ADM TF Mission, Goals and Benefits
 - ❖ Create Specifications/Promote Industry Consensus on Modernization of Existing Applications
 - ❖ Leverage Existing OMG Modeling Standards and the MDA Initiative
 - ❖ Consolidate and Promote Best Practices Leading to Successful Modernization
 - ❖ Improve ROI in Existing Software by Extending Useful Life of Existing Applications
- ❑ ADM Practices are documented via ADM Scenarios
 - ❖ A Set of Guidelines for Applying ADM In Practice In Different Scenarios
- ❑ ADM Standards are documented via ADM Roadmap
 - ❖ A Set of OMG Modeling Specifications that Promote Interoperability between modernization tools and service providers
- ❑ More Information is available at the OMG's ADM Website:

<http://adm.omg.org/>

MDA Meets ADM

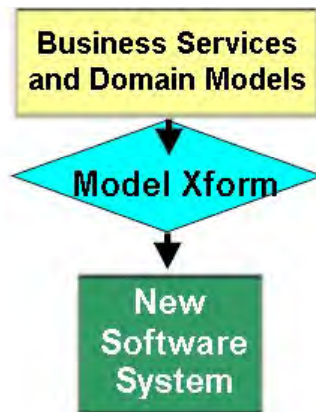
Model Driven Architecture (MDA) is generally green-field top-down model-driven process for new system development.

- ❑ Architectural models and tools (e.g. IBM Rational Eclipse) support agile development

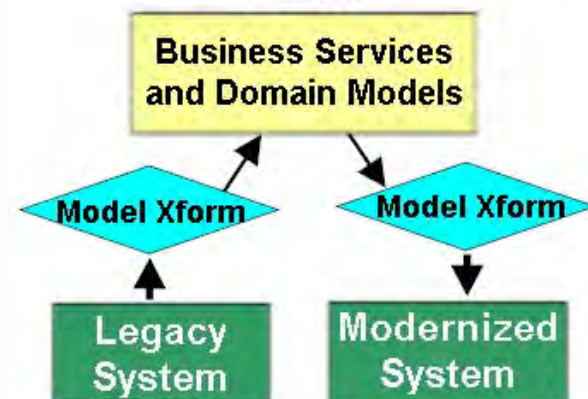
Architecture Driven Modernization (ADM) top-down + bottom-up

- ❑ Bottom-up extraction of software and architectural models, followed by
- ❑ Top-down reuse for modernization.
- ❑ Delivered Modernized Systems are Agile, MDA-enabled

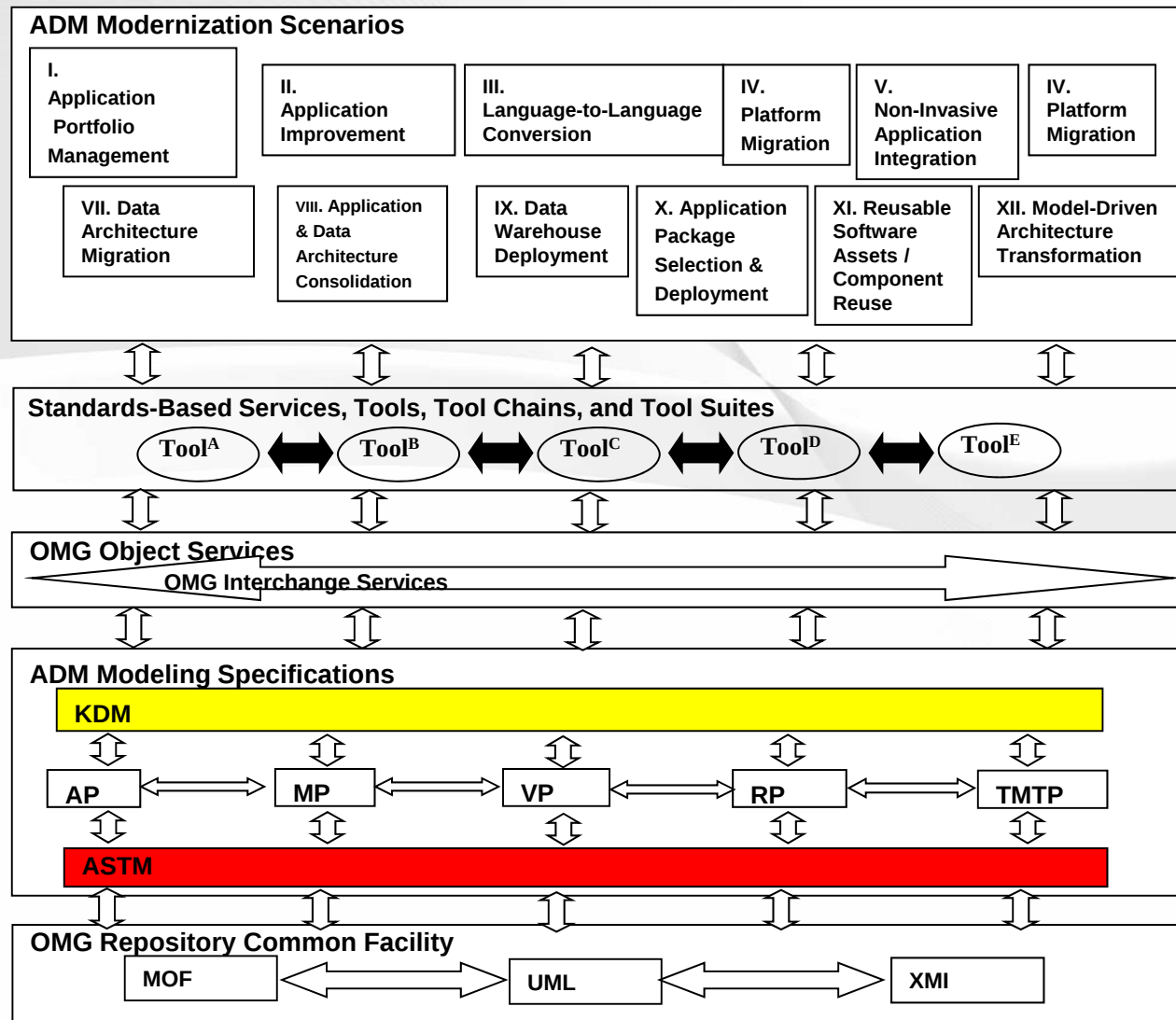
THEN (before ADM)



NOW (MDA + ADM)



ADM Scenarios, Specifications, Tools & Methods – How it all fits together

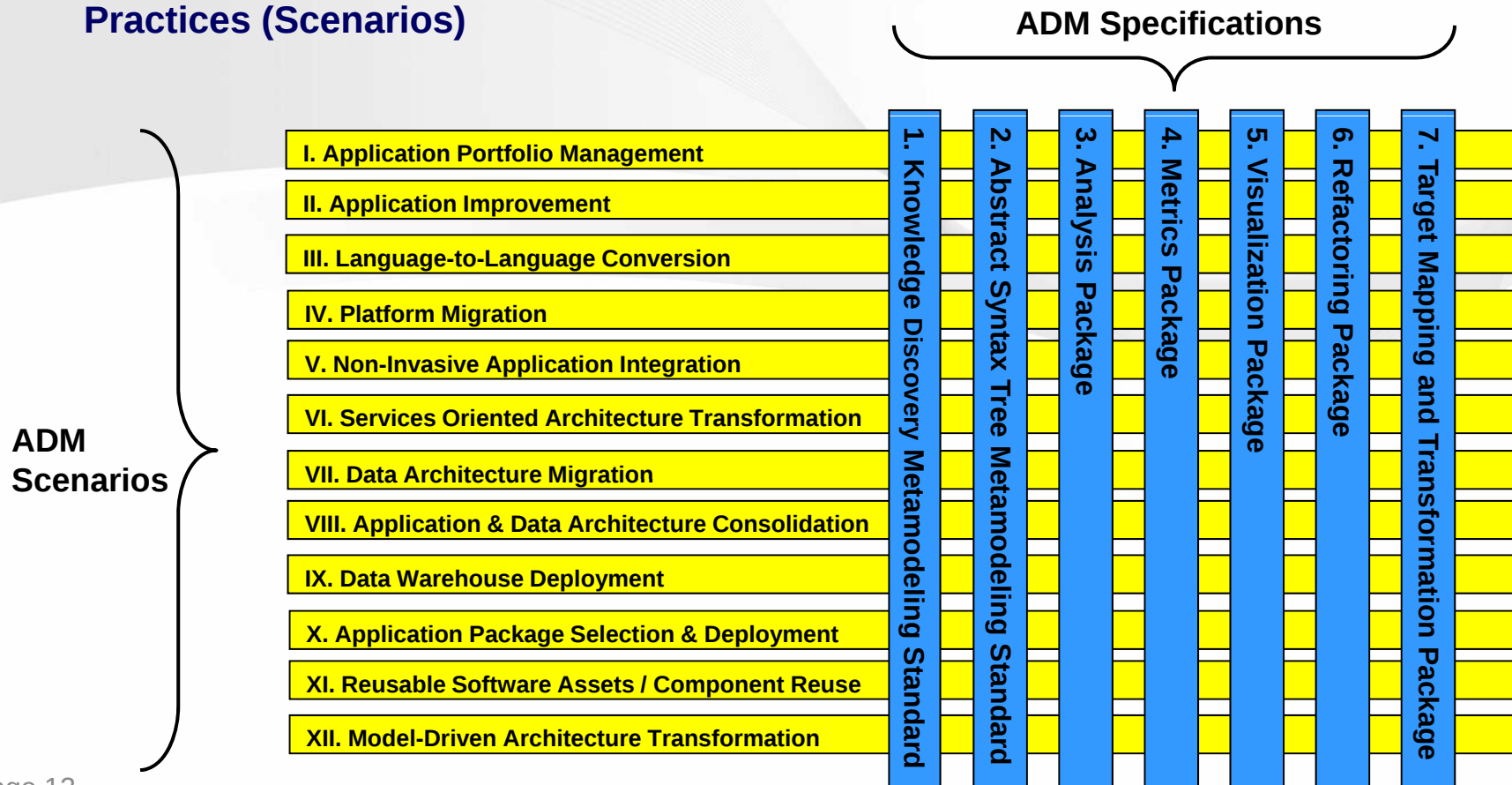


Why define ADM Scenarios?

- ☐ Helps envision all potential ADM applications.
- ☐ Helps a user determine the tasks, tools and use of the ADM.
- ☐ Provides templates for crafting project objectives, plans and related deliverables.
- ☐ Defines tasks necessary to complete a given modernization initiative and omits unnecessary tasks that would not apply to such a scenario.
- ☐ Allows a user to pinpoint the types of tools necessary to perform these tasks.
- ☐ Identifies the universe of modernization scenarios and tasks and provides a guide as to the role of the ADM within modernization in general.

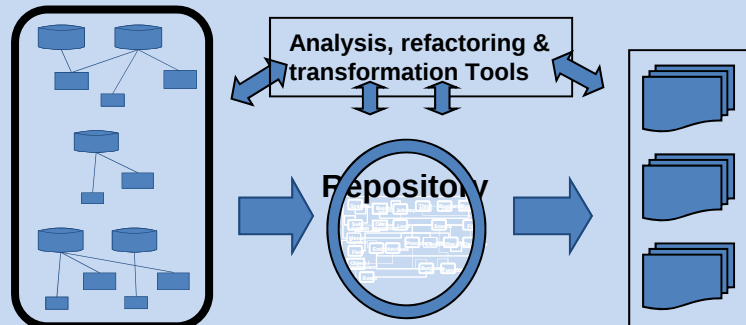
ADM Scenarios and Specifications

- ❖ Modernization Projects Involve Collaborative Geographically Dispersed Teams
- ❖ ADM Projects Are Tool And Technology Intensive
- ❖ Tool Interoperability Enables More Comprehensive Solutions For Complex Problems
- ❖ To Interoperate Tools Need To Interchange Standardized Models
- ❖ To Collaborate Effectively Vendors and Customers Need Agreed Upon Practices (Scenarios)



Scenario I. Application Portfolio Management

Objective: Establish multi-dimensional knowledge base for managing & transforming applications.

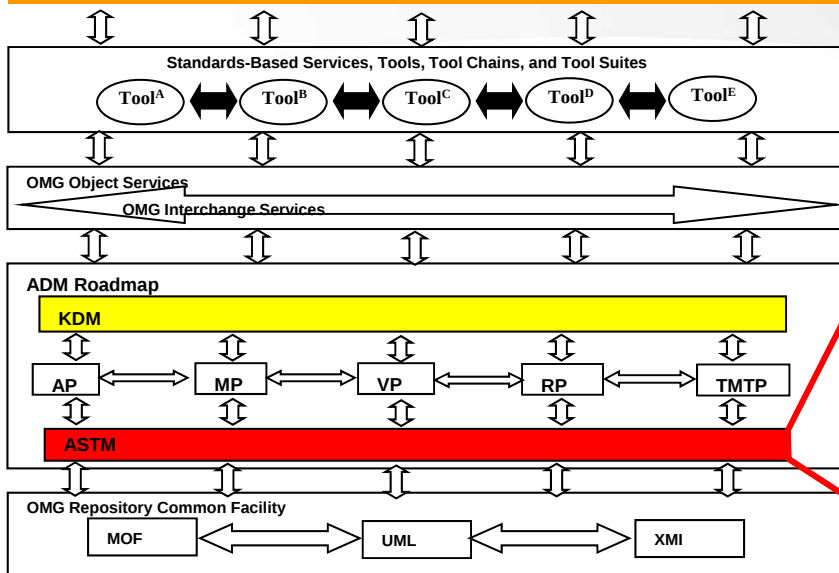


Application & business environment

Existing Systems Meta-Model

Queries, metrics & reports

Courtesy Bill Ulrich



Vertical Product-Lines for Scenario I

Catalog Application Inventory, Structure and Relationships between Components

Catalog Architecture of Application Layers, Flow and Interactions among Components and Application Boundaries

Catalog Dead Code, Obsolete Code and Dead-End Code

Catalog Definitions, Facts and Rules about Data

Catalog Derivation, Triggering and Validation Rules

Catalog Business Processes and Usage Scenarios

Catalog Flaws and Vulnerabilities

Group Applications with Like Data, Functionality and Requirements

Create Portfolio with Step-By-Step Migration Scenario and Roadmap, Work Break Down Structure, Rough Order of Magnitude Estimates and Cost Estimates.

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM

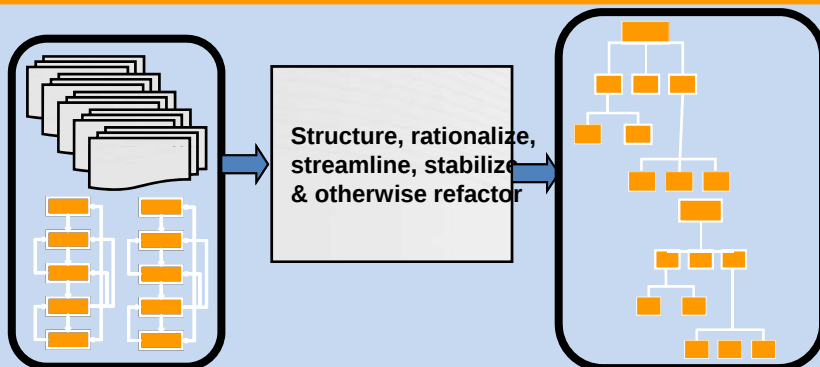
GASTM : Language Neutral Support

SASTM : Horizontal Language Support

C++	Java	Ada	C#	VB .Net	C	COBOL	FORTRAN	Jovial	VMS VAX BASIC	MUMPS	PL/1	JCL	Etc.
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Scenario II. Application Improvement

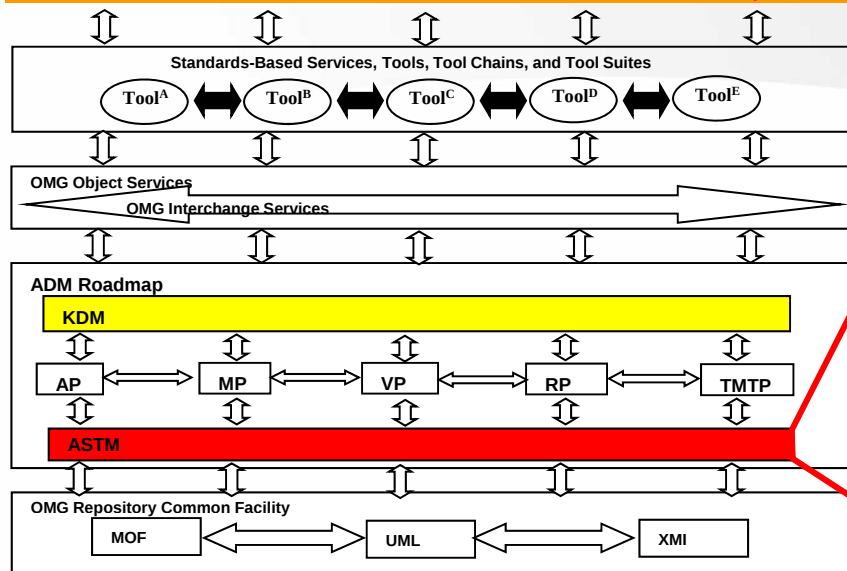
Objective: Create a stable foundation for managing, enhancing or modernizing systems. Reduce application fragility, increase quality.



Redundant / poorly defined data & process definitions

Rationalized, structured streamlined source code

Courtesy Bill Ulrich



Vertical Product-Lines for Scenario II

- Remove Dead and Redundant Code
- Restructure Poorly Structured Code
- Clean-up Poorly Structured Data
- Evaluate Coupling and Refactor
- Evaluate Cohesion and Refactor
- Evaluation Modularity and Recomponentize
- Evaluate Software Flaws and Vulnerabilities and Refactor

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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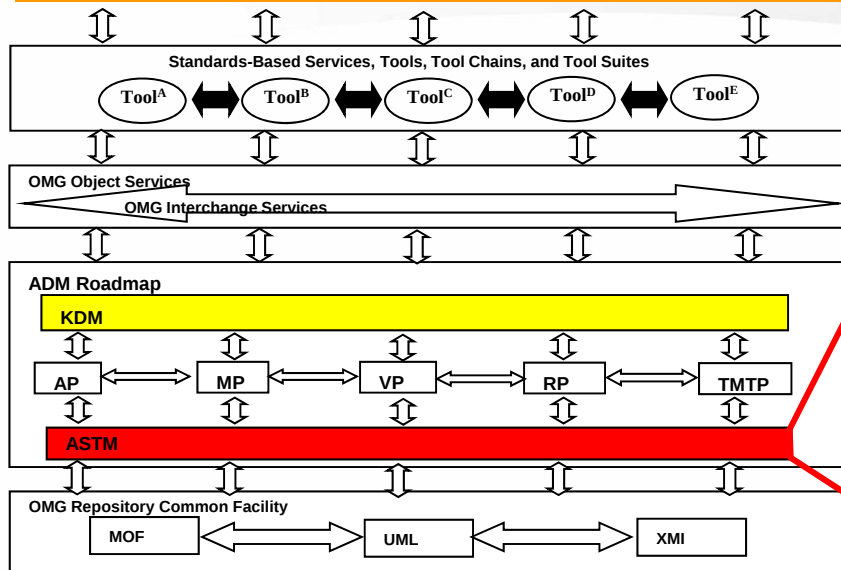
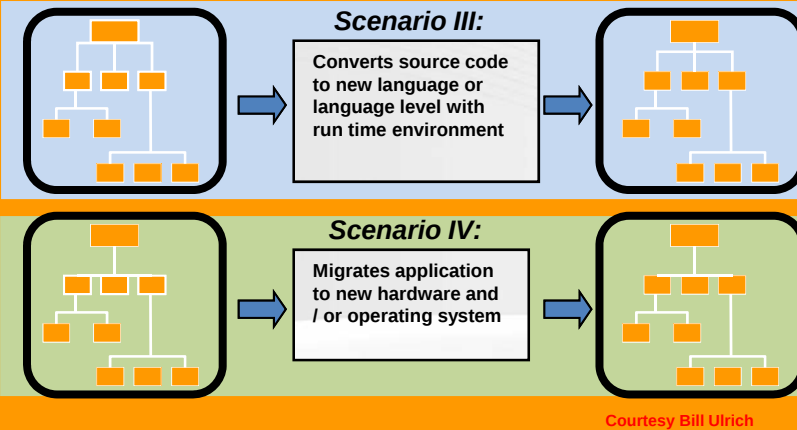
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Scenario III. Language-to-Language Conversion & Scenario IV. Platform Migration

Objective: Convert applications to new language and / or run time platform. Scenarios can be performed separately or together.



Vertical Product-Lines for Scenario III

Top Down Language To Language (L2L) Conversion Scenarios

5GL to 4GL		
5GL to 4GL to 3GL	4GL to 3GL	
5GL to 4GL to 3GL to 2GL	4GL to 3GL to 2GL	3GL to 2GL

Bottom Up Language To Language (L2L) Conversion Scenarios

2GL to 3GL		
2GL to 3GL to 4GL	3GL to 4GL	
2GL to 3GL to 4GL to 5GL	3GL to 4GL to 5GL	4GL to 5GL

Vertical Product-Lines for Scenario IV

to .NET	to CORBA	to Websphere
to J2EE	to GCSS	to MOF/XMI/SOA

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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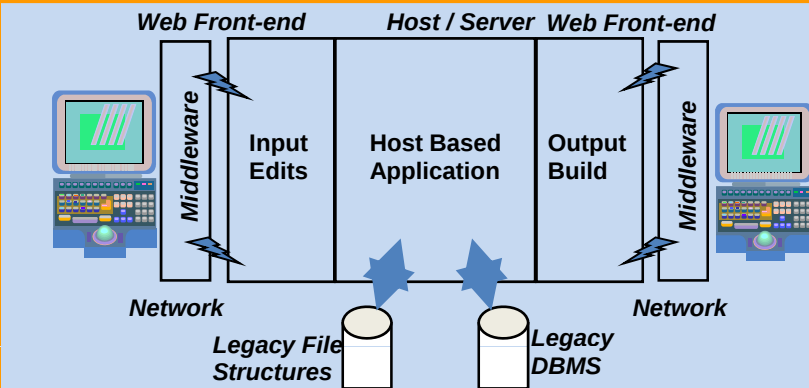
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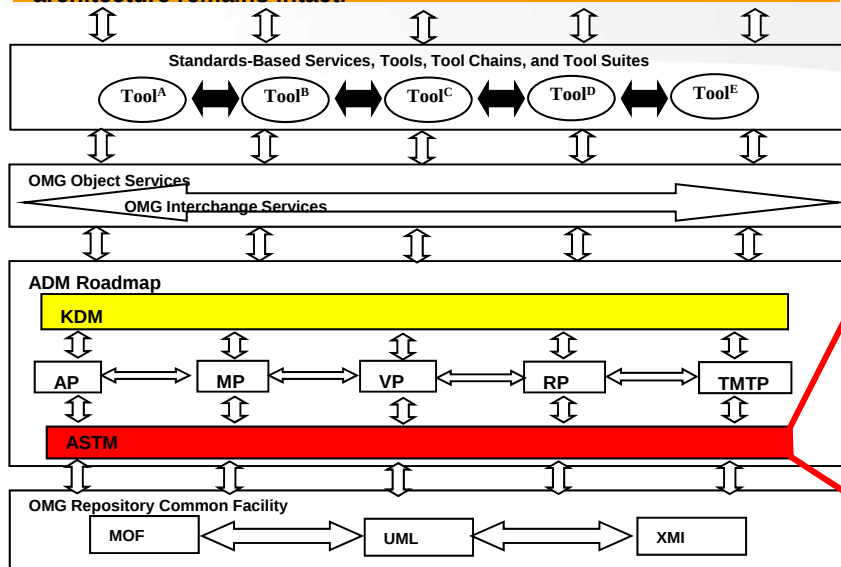
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Scenario V. Non-Invasive Application Integration

Objective: Create the option of accessing host applications & data via Web-based interfaces*.



*** Non-invasive approach only impacts front-ends. Underlying architecture remains intact.** Courtesy Bill Ulrich



Vertical Product-Lines for Scenario V

Partition by Product (what system produces)

Wrap Functions that Create Products with SOA Interfaces

Partition by Application Layer

Wrap Application Layers with SOA Interfaces

Partition by Business Process

Wrap Functions supporting Business Process with SOA Interfaces

Partition by Data Sets

Wrap Legacy Data Bases with SOA Interfaces

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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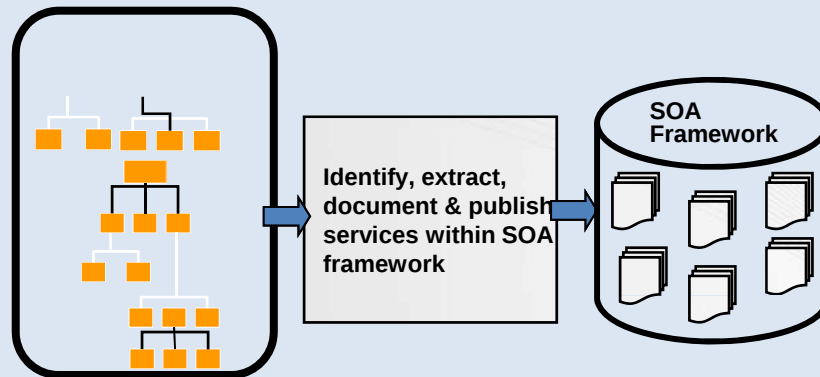
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Scenario VI. Services Oriented Architecture (SOA) Transformation

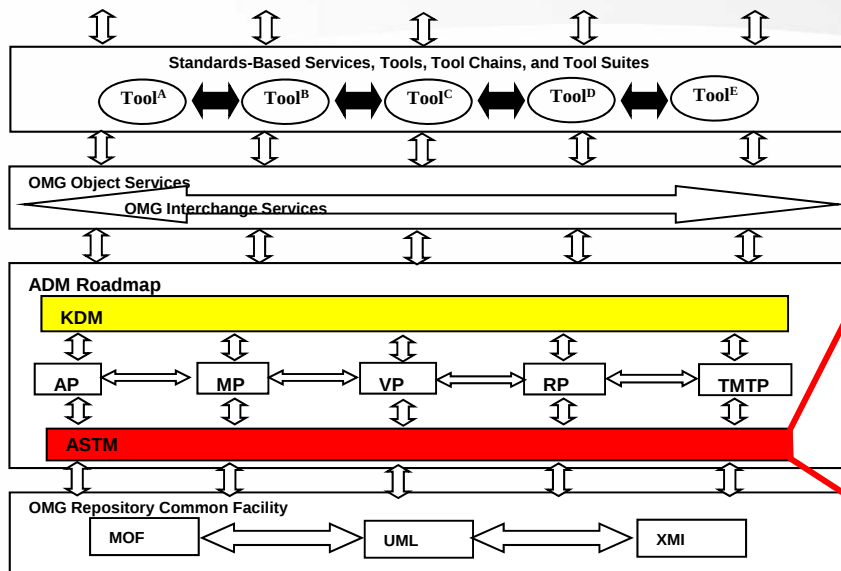
Objective: Create a framework for constructing and interlinking back-end systems with the goal of making applications more agile.



Existing applications

Courtesy Bill Ulrich

Repository identifying reusable services



Vertical Product-Lines for Scenario VI

Transform by Product Lines (what system produces)

Modernize Functions that Create Products into SOA

Transform by Application Layers (how system is layered)

Modernize Application Layers into SOA

Transform by Business Process

Modernize Functions supporting Business Process into SOA

Transform by Business Rules

Modernize Application Logic into Business Rule Engines and SOA

Transform by Data Sets (how data is organized)

Map Legacy Data Bases into SOA Enabled Repositories

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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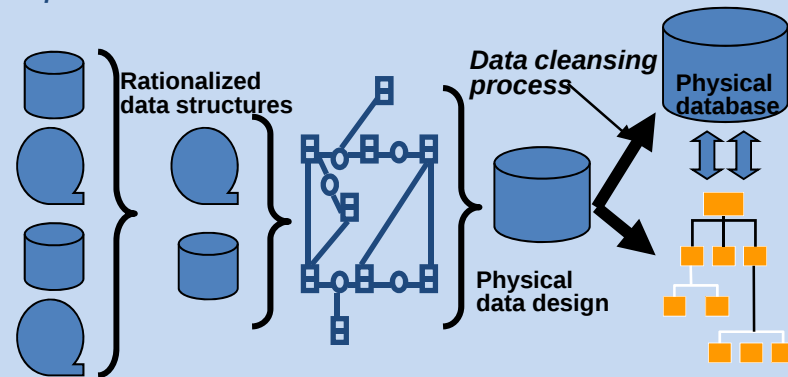
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Scenario VII. Data Architecture Migration

Objective: Consolidate, cleanse, redesign & migrate existing data structures to relational database. Refactor applications as required.



Vertical Product-Lines for Scenario VII

Model Existing Data Files and Database Formats

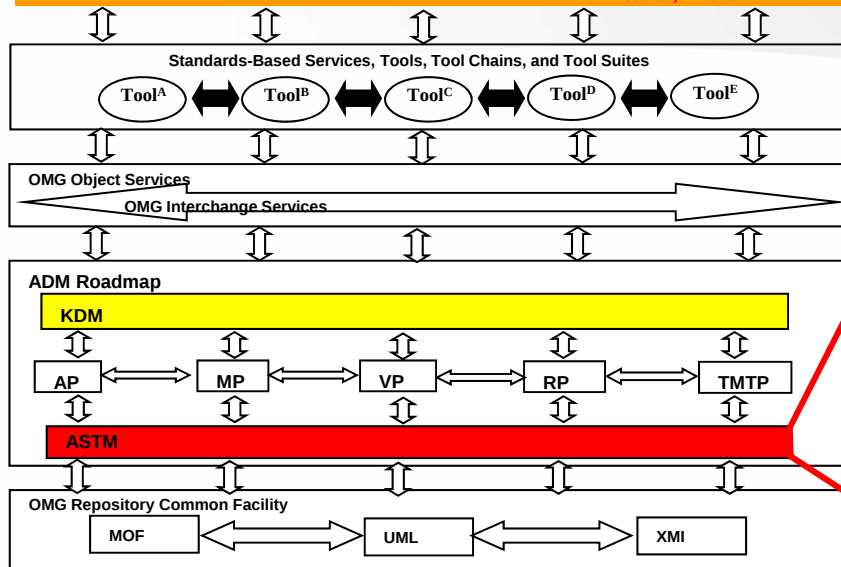
Map to Modern RDBMS & Rationalize and Normalize Schema

Map Legacy Data To Modern RDBMS Repository

Cleanse Data to Remove Duplication & Standardize Formats

Refactor Data Manipulation Code in Application To Use Modern RDBMS

Existing data file / database formats Relational data model Refactored applications



Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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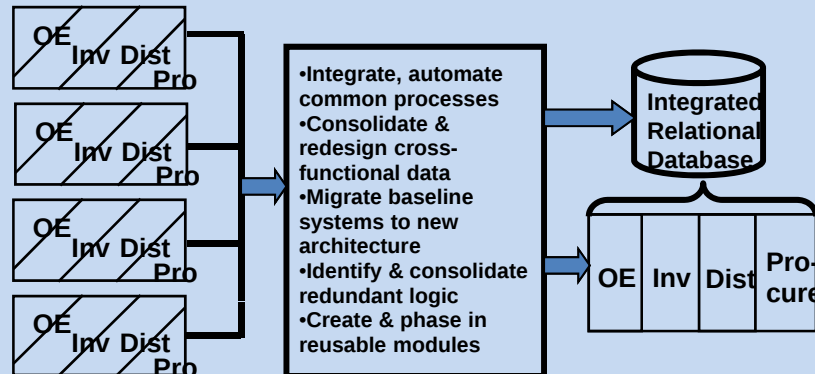
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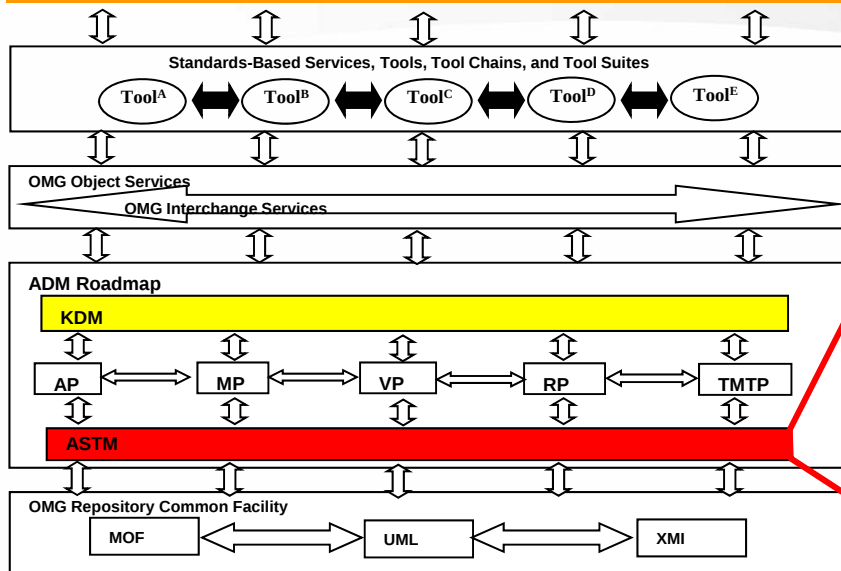
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Scenario VIII. Application & Data Architecture Consolidation

Objective: Consolidate multiple redundant or related systems into a common data & application architecture.



Existing Applications **Consolidation tasks** **Consolidated data & application architecture**



Vertical Product-Lines for Scenario VIII

Identify Like-Applications Requirements, Data and Functions

Rationalize Data and Functions To Facilitate Comparison

Score Card Similar & Redundant Functionality & Data

Define Consolidation Scenario and Roadmap, Work Break Down Structure, Rough Order of Magnitude Estimates and Cost Estimates.

Modernize Best-Of-Breed Baseline System

Cherry-Pick and Modernize Useful Logic and Data From Weakest Links and Integrate with Best-of-Breed Baseline

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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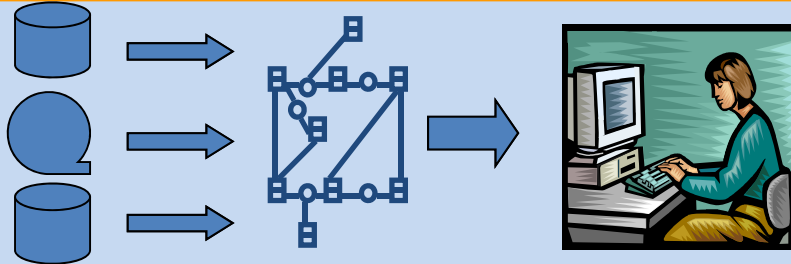
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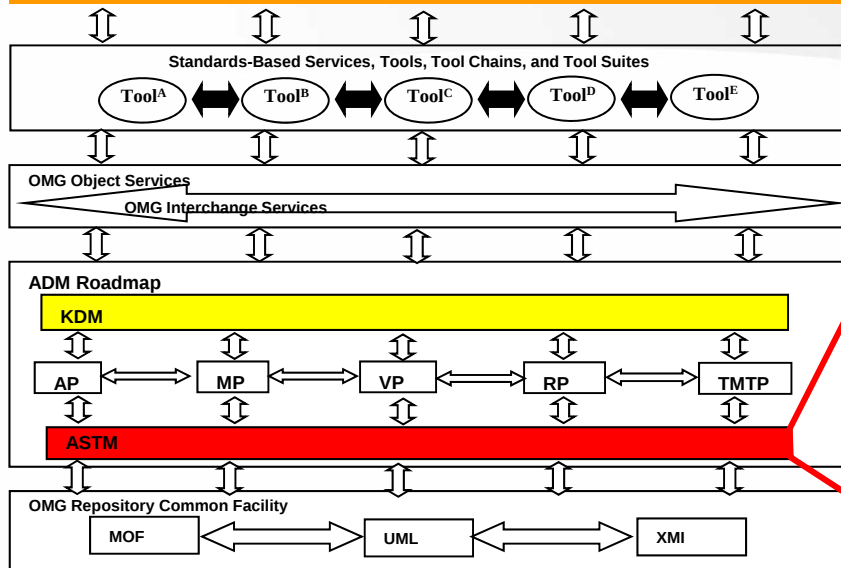
Scenario IX. Data Warehouse Deployment

Objective: Create non-operational, consolidated view of data & make this data available to business users in ad hoc formats.



Extract, analyze, transform validate & load Integrated, rationalized, relational view of abstracted data End user access to cross-functional data

Courtesy Bill Ulrich



Vertical Product-Lines for Scenario IX

Model Existing Data Files and Database Formats

Map Model of Existing Data Formats To Consolidated, Standardized Warehouse Model

Map Existing Data To Common Warehouse Metamodel Repository

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SW/A	VP	RP	TMTP	KDM
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C++	Java	Ada	C#	VB .Net	C	COBOL	FORTRAN	Jovial	VM S VAX BASIC	MUMPS	PL/1	JCL	Etc.
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Scenario X. Application Package Replacement

Application Package Selection & Deployment – phase one

Objective: Provide objective analysis of how well various packages meet strategic information requirements.

Functionality of Proposed Packages

Strategic Requirements

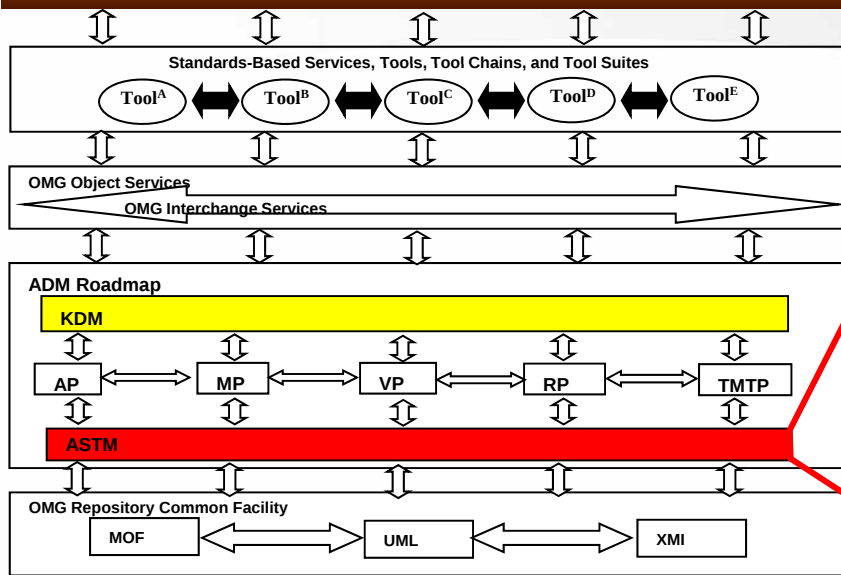
Package Assessment

Legacy Application Functionality

Package Selection Results & Plan

Source Bus Function	R E Q	P K 1	P K 2	P K 3	L E G
Func a	X	X	X	X	X
Func b	X	X			X
Func c	X	X	X	X	--
Func d	X	X		X	X
Func e	X	X			X
Func f	X			X	X
Func g	X	X	X	X	X
.....	X	X		X	X
.....	X	X	X	X	--

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Vertical Product-Lines for Scenario X

Identify Like-Applications Requirements, Data and Functions

Rationalize Data and Functions To Facilitate Comparison

Score Card Similar & Redundant Functionality & Data

Define Application Replacement Scenario and Roadmap, Work Break Down Structure, Rough Order of Magnitude Estimates and Cost Estimates.

Install COTS as Baseline

Cherry-Pick and Modernize Useful Logic and Data From Existing Application and Integrate with COTS Baseline

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SWIA	VP	RP	TMTP	KDM
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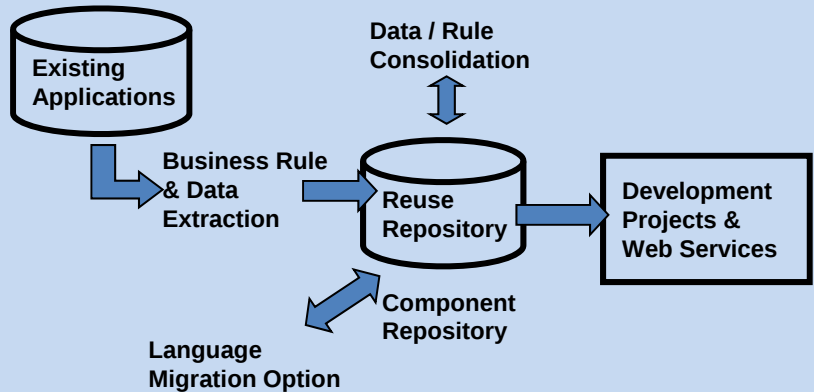
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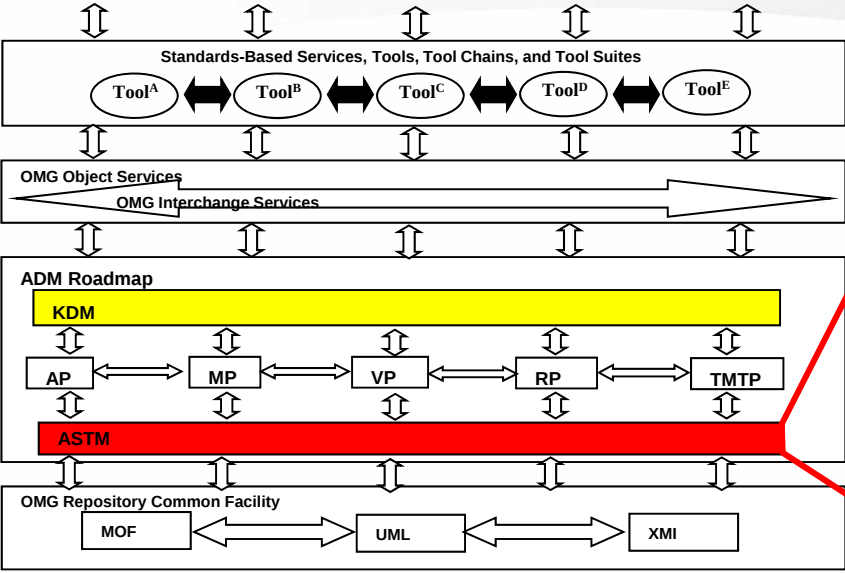
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Scenario XI. Reusable Software Assets/Component Reuse

Objective: Create a repository of reusable components.



Courtesy Bill Ulrich



Vertical Product-Lines for Scenario XI

Mine Applications For Reusable Requirements, Data and Functions

Rationalize Data and Functions To Facilitate Comparison

Score Card Similar & Redundant Functionality & Data

Define Migration Scenario and Roadmap, Work Break Down Structure, Rough Order of Magnitude Estimates and Cost Estimates.

Transform Selected Functions, Logic and Data From Existing Applications and Integrate Into Reuse Repository expressed as Componentized Intermediate Language, Modern Code, or as Rule Sets.

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SWIA	VP	RP	TMTP	KDM
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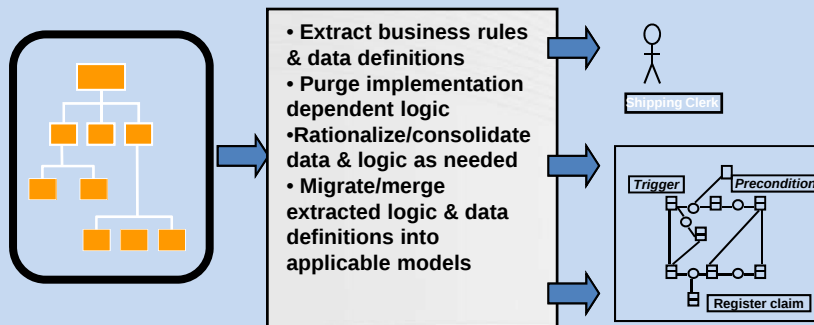
GASTM : Language Neutral Support

SASTM : Horizontal Language Support

C + +	J a v a	A d a	C #	V B . N e t	C	C O B O L	F O R T R A N	J o v i a l	V M S V A X B A S I C	M U M P S	P L /1	J C L	E t c .
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Scenario XII. Model-Driven Architecture Transformation

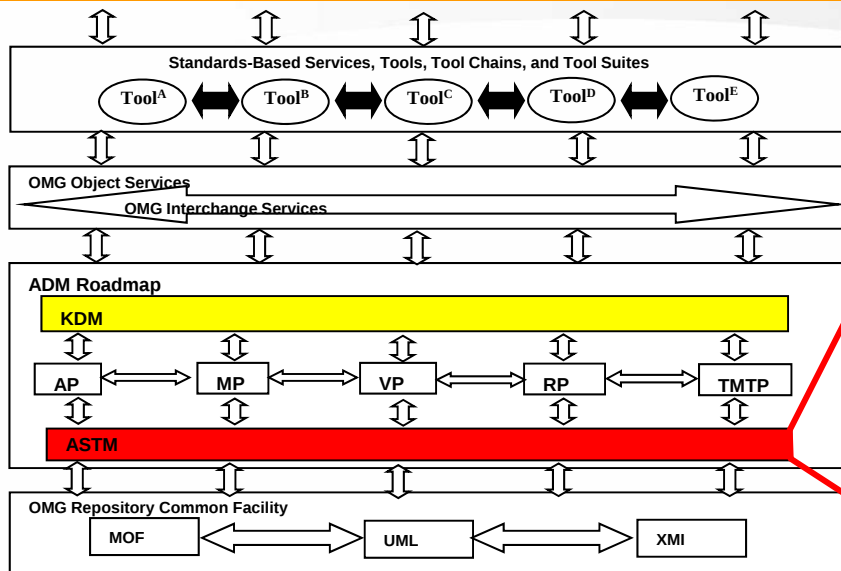
Objective: Migrate existing applications to an environment in which systems are maintained in models.



Existing applications & data definitions

Sample models

Courtesy Bill Ulrich



Vertical Product-Lines for Scenario XII

Document Application Requirements, Data and Functions as UML 2.0, BSBR or other Applicable OMG models

Transform and Refactor Application To Cleanse and Modernize Application Code, Data & Logic and Validate In Target Implementation

Separate "Business" From "Technical" Models via Domain Analysis

Generate Application (in whole or piecewise) from Architecture-Level Models

Validate Accuracy of Architecture Models By Comparing To Transformed Code (where applicable).

Vertical Product-Line Support

ADM Repository Technologies

ASTM	AP	MP	SWIA	VP	RP	TMTD	KDM
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GASTM : Language Neutral Support

SASTM : Horizontal Language Support

C++	Java	Ada	C#	VB .Net	C	COBOL	FORTRAN	Jovial	VM S VAX BASIC	MUMPS	PL / 1	JCL	Etc .
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Architecture Driven Modernization

Standardization

- ❑ **Standards-Based Tools**
 - ❖ Store and Access Models in Industry Standard Formats (XMI™)
 - ❖ Manage IT Artifacts as High Fidelity Models in Repositories.
 - ❖ Interoperate With Other Tools By Interchanging Models
- ❑ **Standards-Based Tool Chains**
 - ❖ Series of Tools will Cooperatively Produce A Work Product
 - ❖ Cooperate By Interchanging Models.
- ❑ **Standards-Based Tool Suites**
 - ❖ Collections of Tools that Interoperate Using Models
- ❑ **Standard-Based Service Providers**
 - ❖ Offer Services Based Upon Tools, Tool Chains and Tool Suites
 - ❖ Collaborate with Customers and Other Services Providers Via Interchange of Industry Standard Models (e.g. Eclipse, MOF™, XMI™, UML™)
- ❑ **Standard-Based Enterprise**
 - ❖ IT Artifacts (such as Data and Applications) are Managed In Repositories As Standards-Based Models
 - ❖ IT Artifact Management employs Service Providers, Standards-based Tools, Tool Chains, and Tool Suites



Ten Groundbreaking Architecture Driven Modernization Projects Case Study Overviews

TSRI Case Study: ITT Corporation SENSOR



Project Contacts:

Upon Request

Project Summary

ITT Corporation awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the COBRA DANE Radar Calibration System (SCRS) of the Ballistic Missile Early System (BMEWS) under the Air Force's System Engineering & Sustainment Integrator (SENSOR) program.

Services

- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration, Testing & Implementation
- Final "To-Be" Documentation

Results

- Project successfully completed in 8 months
- *Created a new JANUS™* Ada parser
- *JANUS™* rules engine parser was tuned to address the SENSOR Ada & Fortran
- Fully modernized 380,300 LOC of highly complex mission-critical Ada & Fortran to C++ & Java

TSRI Case Study: Raytheon Corporation TCS/MCS



Project Contacts:

Upon Request

Project Summary

Raytheon awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the Navy's Terminal Control and Modem Control (TCS & MCS) satellite system modules.

Services

- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration & Test Support

Results

- Project successfully completed in 5 months
- **JANUS™** rules engine parser was tuned to address TCS' & MCS' Ada & Fortran, respectively
- Fully modernized the 190,772 LOC of Ada & 91,949 LOC of Fortran
- Met stringent Raytheon/Navy coding standards
- Received Raytheon & U.S. Small Business Administration awards of excellence

TSRI Case Study: Lockheed Martin P-3C



Project Contacts:
Upon Request

Project Summary

Lockheed Martin Corporation awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the Acoustic Signal Processing Suite aboard the Navy's P-3C submarine hunting aircraft.

Services

- Legacy "As-Is" Documentation
- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration, Testing & Implementation
- Final "To-Be" Documentation

Results

- Project successfully completed in 14 months
- JANUS™ rules engine parser was tuned to address the P-3C's Ada
- Fully modernized 650,000+ LOC of highly complex mission-critical Ada to C++

TSRI Case Study: Thales EATMS

The Thales logo is displayed in a white box. It consists of the word "THALES" in a bold, purple, sans-serif font. A small blue dot is positioned above the letter "A".

Project Contacts:

Available Upon Request

Project Summary

Thales awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for a modernization of several modules of the European Air Traffic Management System (EATMS).

Services

- Legacy “As-Is” Documentation
- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration & Test Support
- Final “To-Be” Documentation

Results

- Addressed the Flight Profile Library, Minimum Safe Altitude Warning System, and Air-Ground Data Processor modules of EATMS
- **JANUS™** rules engine parser was tuned to address the legacy Ada code of these EATMS modules
- Fully modernized nearly 250,000 LOC of Ada code to both C++ & Java
- Effort included extensive re-factoring to meet precise, mission-critical coding standards
- Ultra High Assurance Air Traffic Control Software

TSRI Case Study: Raytheon Patriot Missile



Project Contacts:
Upon Request

Project Summary

Raytheon awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for a modernization of several modules of the Patriot Missile.

Services

- Legacy “As-Is” Documentation
- Code Transformation
- System Integration & Test Support
- Final “To-Be” Documentation

Results

- Addressed the Fire Platoon Simulation System Preprocessor, and the Battalion Simulation Support System and its preprocessor (PRED) modules of the Patriot Missile
- **JANUS™** rules engine parser was tuned to address the legacy Fortran code of these missile modules
- Fully modernized nearly 600,000 LOC of Fortran code to C++

TSRI Case Study: SAIC EOSS



Project Contacts:

Upon Request

Project Summary

Science Application International Corporation (SAIC) awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the Navy's Engineering Operational Sequencing System (EOSS).

Services

- Legacy "As-Is" Documentation
- Target Architecture & Interface Design
- Code Transformation
- Automatic Re-Factoring
- Database Conversion
- System Integration, Testing & Implementation
- Final "To-Be" Documentation
- Support to DoN "Opportunity Analysis for Legacy System Modernization"

Results

- Project successfully completed in 5 months
- **JANUS™** rules engine parser was created to address the EOSS VAX-Basic
- Design new target architecture & fully modernized 37,483 LOC of highly complex mission-critical VAX-Basic to Java
- Converted EOSS database structure from multi-ISAM ASCII to Oracle 9i
- Navy calculated that effort provided a 2.47:1 ROI with much higher ROI expected for languages already addressed by TSRI

TSRI Case Study: SAIC VHA



Project Contacts:

Upon Request

Project Summary

Science Application International Corporation (SAIC) awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the Voluntary Time Keeping module of the Veterans Health Administration's (VHA's) VistA system.

Services

- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration, Testing & Implementation
- Final "To-Be" Documentation

Results

- Project successfully completed in 4 months
- *Created a new JANUS™ MUMPS parser*
- *JANUS™ rules engine parser was tuned to address the VHA MUMPS*
- Fully modernized 300,000+ LOC of highly complex MUMPS to Java

TSRI Case Study: TRW Milstar Satellite



Project Contacts:
Upon Request

Project Summary

TRW awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the Advanced Extremely High Frequency module of the Milstar satellite

Services

- Code Transformation
- Semi-Automatic Re-Factoring
- System Integration & Test Support

Results

- Project successfully completed in 1 months
- **JANUS™** rules engine parser was tuned to address MILSTARS' Jovial
- Fully transformed the 143,000 LOC of J3 Jovial
- Replaced 16-Bit Big-Endian with 32 Bit Little Endian Environment
- Code fully integrated into Milstar & awaiting final system launch

TSRI Case Study: National Endowment for the Arts



Project Contacts:
Upon Request

Project Summary

The National Endowment for the Arts (NEA) awarded a sole-source contract to The Software Revolution, Inc. (TSRI) for modernization of the NEA's business systems (Financial Management – Grants Management – Automated Panel Bank)

Services

- Legacy “As-Is” Documentation,
- Code Transformation
- Automatic Re-Factoring,
- Semi Automatic Re-Factoring
- System Integration, Testing & Implementation
- Final “To-Be” Documentation
- Future System Enhancement Development
- Database Conversion: OpenVMS RMS Flat Files to a Microsoft SQL environment

Results

- Project successfully completed in 3 fiscal phases over 24 months
- TSRI performed successfully after another contractor using a manual approach had failed & wasted \$1.6M
- *JANUS*TM rules engine parser was tuned to address NEA's Wang COBOL
- Fully modernized the 656,000 LOC of Wang-COBOL & RMS flat files to C++ & SQL Server environment & 3,270 screens into a MS Windows environment

TSRI Case Study: Northrop Grumman REMIS



Project Contacts:
Upon Request

Project Summary

Northrop Grumman awarded three separate sole-source contracts to The Software Revolution, Inc. (TSRI) for a transformation demonstration and subsequent modernization of the Increments 1 & 3 of the Air Force's REMIS system

Services

- Legacy "As-Is" Documentation
- Code Transformation
- Automatic Re-Factoring
- Semi-Automatic Re-Factoring
- System Integration & Test Support
- Final "To-Be" Documentation

Results

- Transformation demonstration & Increment 1 successfully completed in 1 month & 7 months respectively, with Increment 3 currently on-going
- JANUS™ rules engine parser was tuned to address REMIS' Tandem COBOL code
- Fully modernized over 400,000 LOC of Tandem COBOL to both C++ & Java code
- Supported development of the API layer to allow system interface to the Air Force GCSS Integration Framework



- **Offices in Kirkland, Washington**
- **Technology Rooted in Early Artificial Intelligence Projects**
 - ❑ 1983 USAF Knowledge Based Software Assistance (KBSA) Program
 - ❑ 1988-1994 Boeing Artificial Intelligence Lab
- **Member company OMG Architecture Driven Modernization ADM Task Force participating in:**
 - ❑ Abstract Syntax Tree Meta-Modeling (ASTM)
 - ❑ Knowledge Discovery Meta-Modeling (KDM)
 - ❑ Structured Metrics Meta-Model (SMM)
- **Industrial Awards**
 - ❑ Northrop Grumman “Small Business of Year” Award 2002
 - ❑ Raytheon “Supplier of Value” Award 2005
 - ❑ Small Business Administration’s 2005 “Administrators Award of Excellence”
- **Over 75 Automated Modernization Projects since 2000**
 - ❑ 100% Project Successfully Completed
 - ❑ References Upon Request