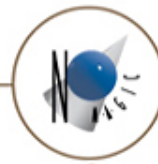# A CACI Distinction: Model-Driven Design and Implementation (MDDI)

A CACI and No Magic Innovation

Powered by SIMPROCESS and Cameo Enterprise Architecture

Presentation Outline

- The Enterprise Problem

- Vision

- What is MDDI?

- Technical Capabilities:

  - Cameo Enterprise Architecture

  - SIMPROCESS

- Project Accomplishments

- Benefits

- Demonstration

- Questions

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Enterprise Problem

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The Enterprise Problem

- No common organizational vision which results in misaligned structures, processes and technology.

- Lack of a structured approach to business process reengineering.

- Too many unused studies and analysis.

- Unrelated and ungoverned implementation.

- Enterprise-wide issues:

  - Non-integrated, redundant, and conflicting <u>systems</u>.

  - Non-integrated, redundant, and conflicting <u>services</u>.

  - Conflicting, redundant, and unrelated <u>data</u>.

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Vision

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Changing Landscape of BPR and Software Development

- Business process reengineering and software development are taking the form of a quick-reacting, highly flexible project methodology.

  - Instead of taking very big projects and moving them bit by bit from an "As-Is" to a "To-Be" state (a process that takes months), organizations' IT teams are looking to deliver continuous improvements every six to eight weeks.

  - To deliver this kind of speedy and agile service, companies are changing the way they organize their IT departments.

  - Instead of having teams in silos based on technologies or software applications, many IT departments are organizing themselves by business processes.

- MDDI allows software developers to utilize enterprise architecture and simulation in ways they couldn't before.

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Vision: Bridging the Gap from Problem to Solution

Use MDDI to bridge the gap from business analysis to business automation, which will align organizational structures, processes, and technology.

Model-Driven Design and Implementation (MDDI)

Current Problems	Our Solution
• Unrealized needs	• Integrated requirements
• Misaligned organizations and processes	• Enable BPR through end-to-end integration of processes and implementation
• Wasted resources and opportunities	• Provides visibility into existing resources
• Proprietary and stovepipe solutions	• Conforms to open standards
• Duplication of efforts	• Integrated repository enables visibility into all organizational efforts.
• Projects over budget and behind schedule	• Facilitates reuse of existing project assets to lower risk, reduce cost and meet schedule.

Connecting Vision to Solution

Seamless Integration

MDDI SIMPROCESS Integration Plan_2013 Presentations_001
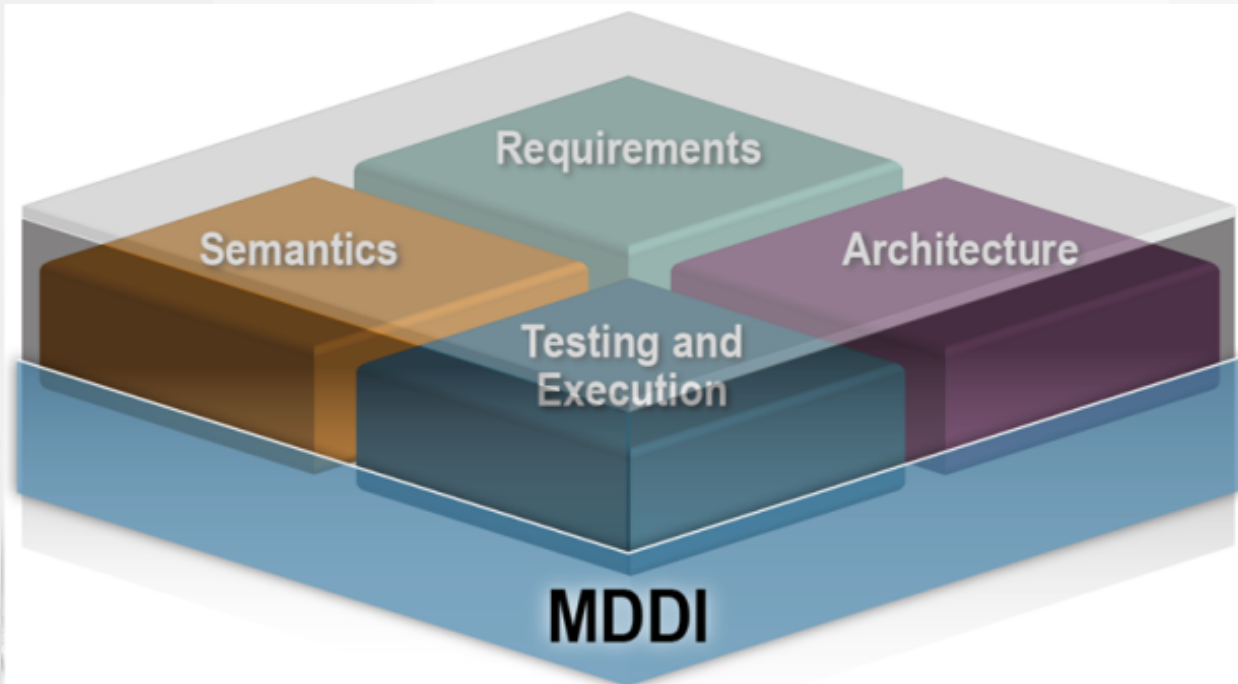
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Implementing the Vision

- Introducing the ability to envision and imagine before physical implementation.

- Providing the ability to optimize organizational structures and processes through simulation before committing resources.

- Improving the ability to document, improve, and test end-to-end business processes.

- Monitoring process execution with SIMPROCESS and adjusting processes to meet changing missions.

- Reduces the time, effort, and risk associated with the design development and reengineering of current and new organizational capabilities.
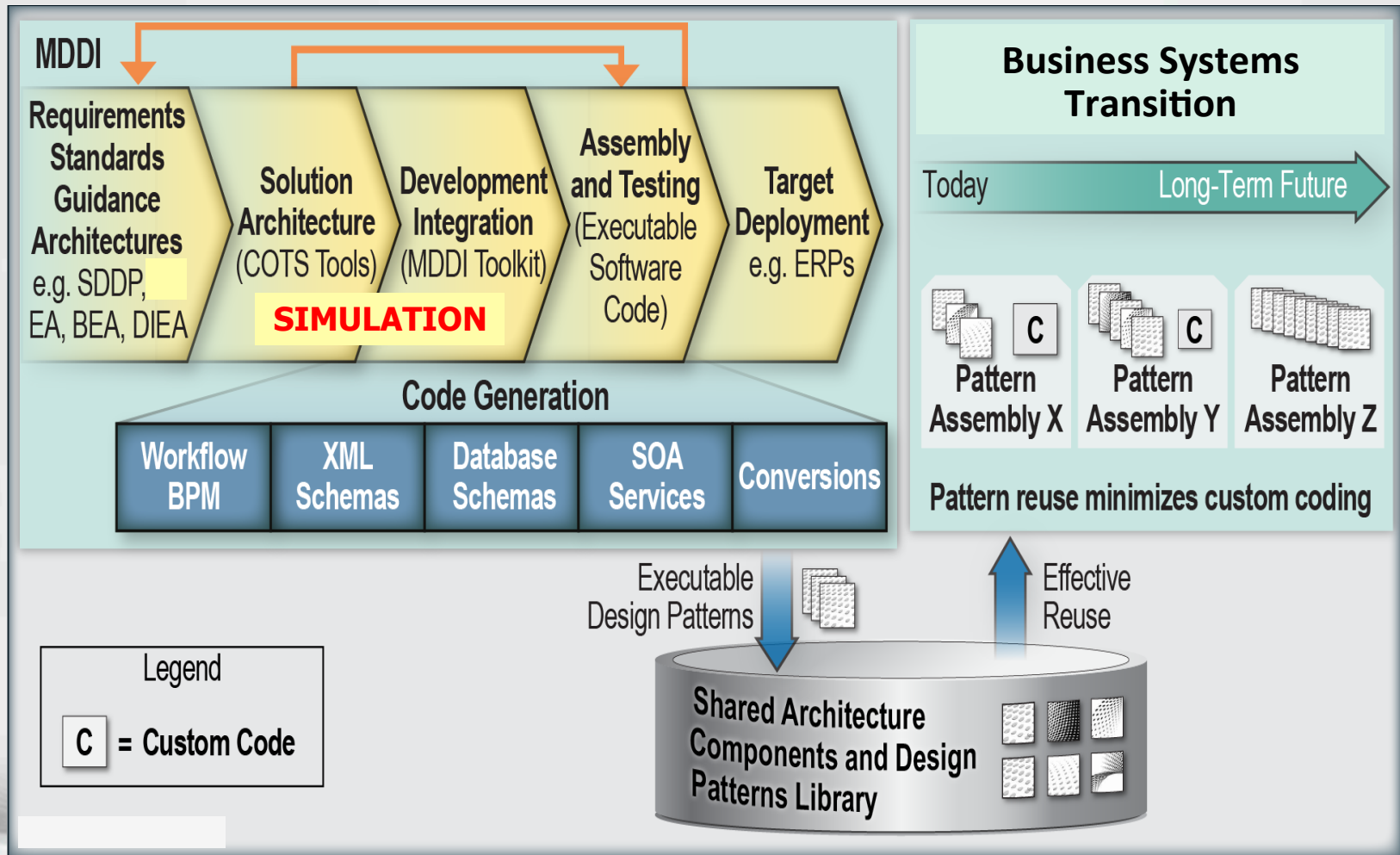
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What is MDDI?

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MDDI

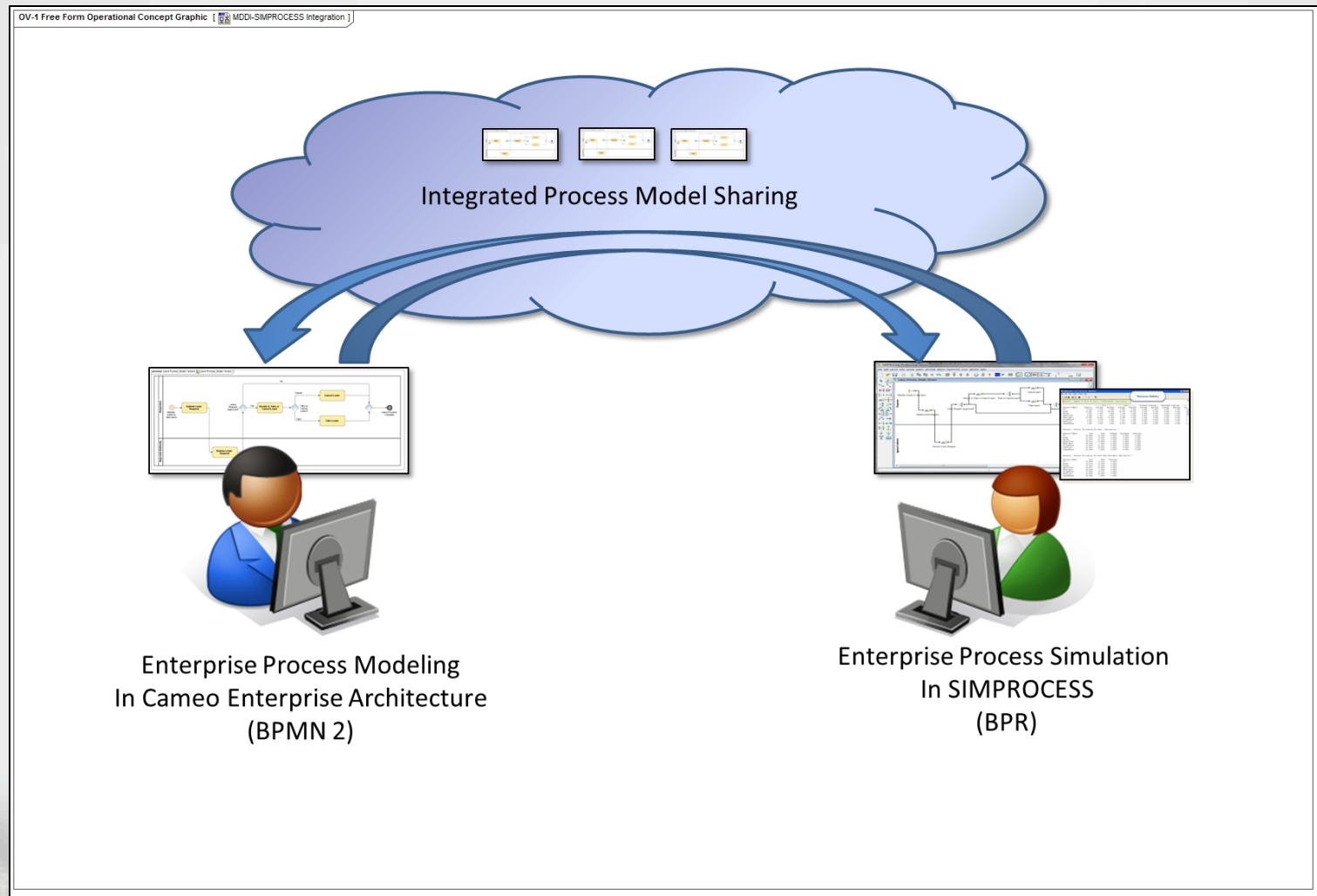**Model- Driven Design and Implementation (MDDI)** is an architecture-centric standards-based, repeatable methodology that accelerates the delivery of solutions by integrating business and mission objectives, requirements, architecture, design, testing, semantics, and executable code in a shared model allowing client visibility and development agility.

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MDDI is a Process

MDDI

Requirements Standards Guidance Architectures e.g. SDDP, EA, BEA, DIEA

SIMULATION

Solution Architecture (COTS Tools)

Development Integration (MDDI Toolkit)

Assembly and Testing (Executable Software Code)

Target Deployment e.g. ERPs

Code Generation

| Workflow BPM | XML Schemas | Database Schemas | SOA Services | Conversions |

Business Systems Transition

Today → Long-Term Future

Pattern Assembly X   Pattern Assembly Y   Pattern Assembly Z

Pattern reuse minimizes custom coding

Executable Design Patterns

Effective Reuse

Shared Architecture Components and Design Patterns Library

Legend

C = Custom Code

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Integration CONOPS

OV-1 Free Form Operational Concept Graphic [MDDI-SIMPROCESS Integration]

Integrated Process Model Sharing

Enterprise Process Modeling
In Cameo Enterprise Architecture
(BPMN 2)

Enterprise Process Simulation
In SIMPROCESS
(BPR)

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Technical Capabilities

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# Technical Capabilities

- The seamless transfer of business processes models between:

  - Architecture repository or design/modeling tool to the simulation repository for process improvement/reengineering analysis.

  - Simulation repository to any architecture repository or design/modeling tool for requirements specification, requirements mapping, and automation.

- Provides true open-standards compliance and enables integration with:

  - Other content management information services (CMIS).

  - Architecture compliant software systems.

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Technical Components

- Cloud-based infrastructure that supports project execution across multiple phases and teams.

- Cloud-based model repository:

  - Alfresco Open Source Content Management Platform

  - Web-service access to the repository

- Architecture/design development:

  - Cameo Enterprise Architecture

- Simulation/BPR capability:

  - SIMPROCESS

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Define the Capability Requirements

CV-2 Capability Taxonomy [CV-2 MDDI Architecture and Simulation Integration]
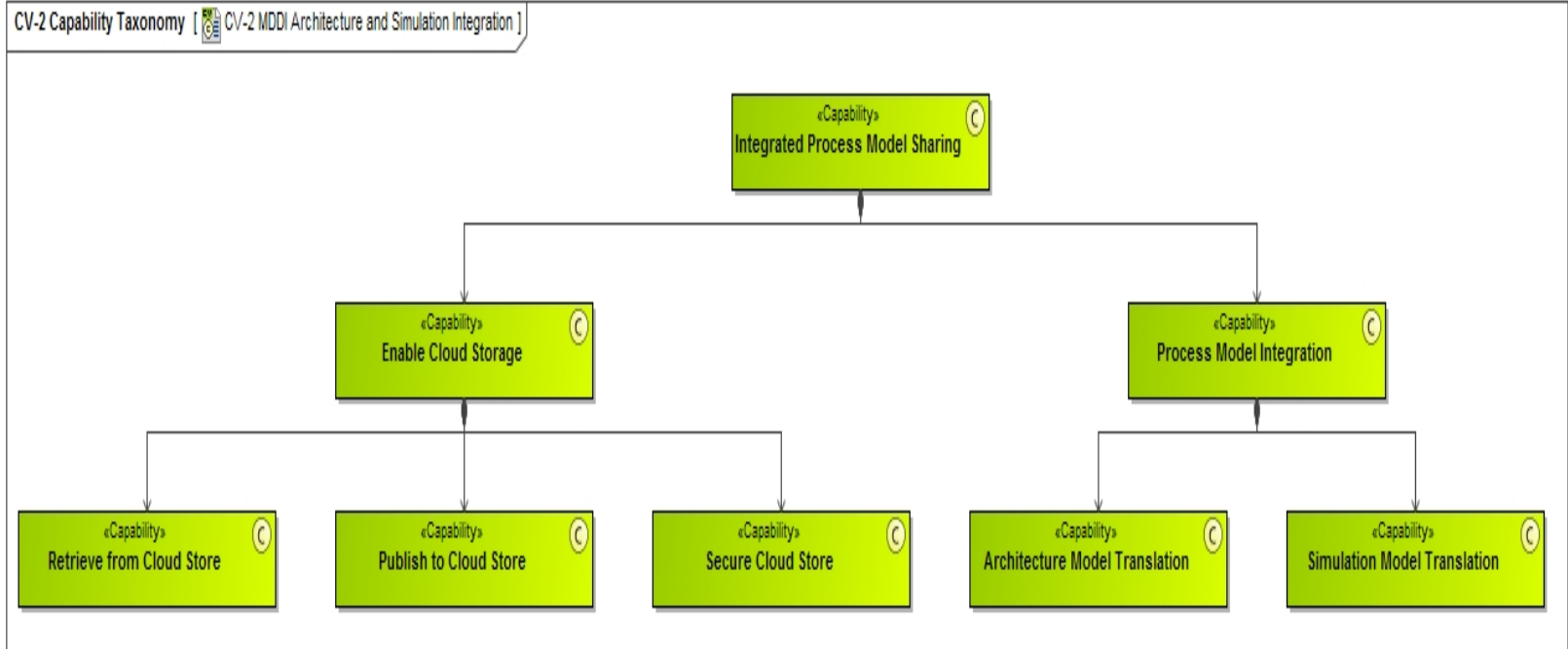
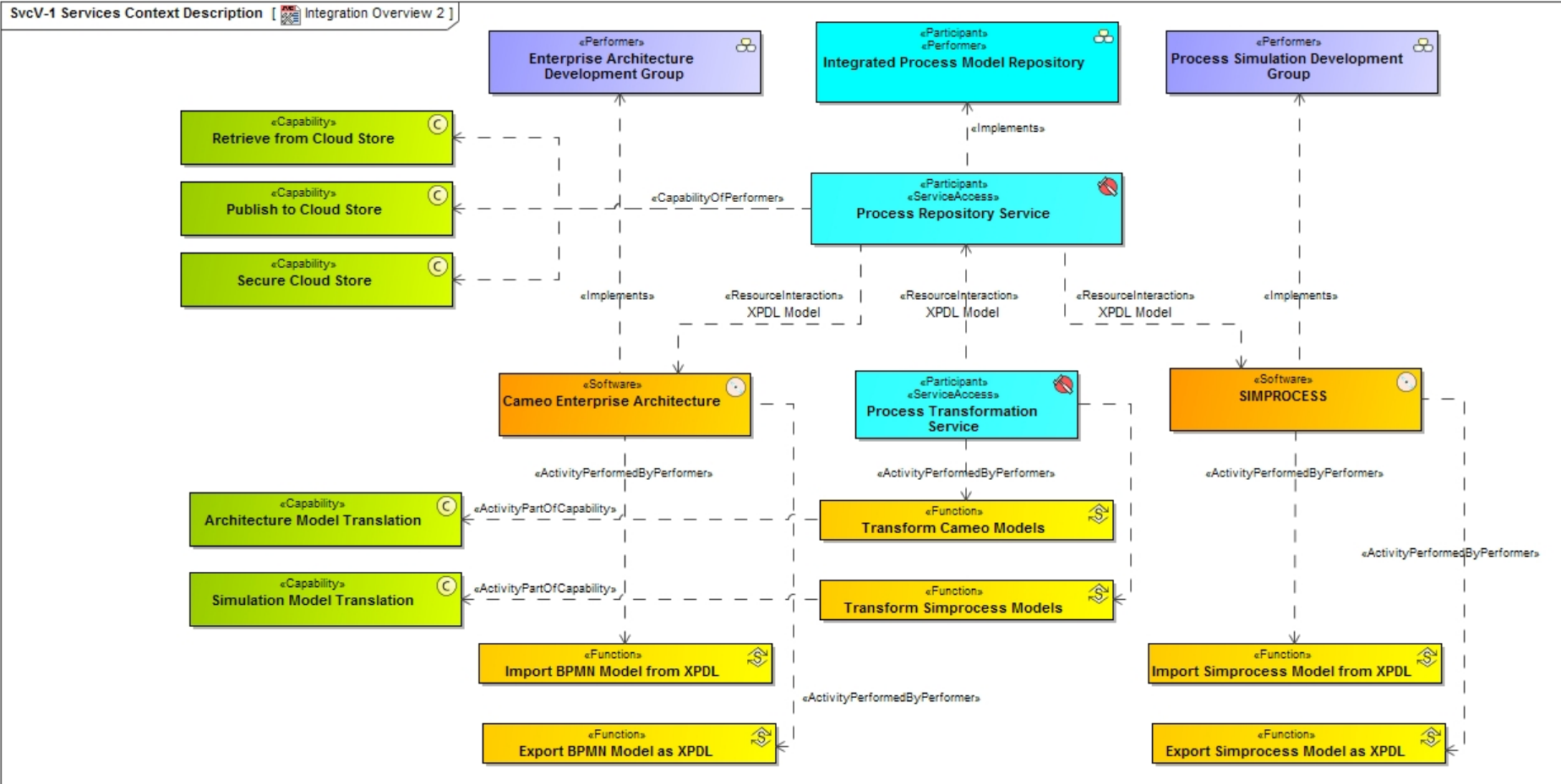**These models leverage UML and UPDM Standards**

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Toolset

- **Cameo Enterprise Architecture:**

  - Based on No Magic's core product MagicDraw and offers the most robust standards compliant DoDAF 2.0, MODAF and NAF 3 via a UPDM standardized solution.

  - Fully supports all architectural framework products.

- **SIMPROCESS**:

  - Hierarchical modeling tool that combines process mapping, discrete-event simulation, and Activity Based Costing in a single interface.

  - Provides ready-made building blocks for constructing dynamic business process models, while the underlying expression language incorporates more complicated business logic.

  - Creates synergy with MDDI design and implementation.

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Define the Component Vision for Software

▪*The Truth is in the Models* ™

Cameo Enterprise Architecture

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Cameo Enterprise Architecture

- **Cameo Enterprise Architecture** is based on No Magic's core product MagicDraw and offers the most robust standards compliance via a UPDM standardized solution.

- The product specializes in:

  - Mining available data, measuring and visualizing architecture and overall success factors resulting in improved mission results.

  - Providing accountability including the enablement of net-centric processes and architectures, flexibility and responsiveness.

  - Facilitating the efficient and effective deployment of IT resources.

  - Examining "what-if" scenarios to confirm and calculate mission success criteria.

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Cameo Enterprise Architecture (cont.)

- Product features:

  - Support of Technologies (UPDM, DoDAF, MODAF, NAF, and more).

  - Usability / User Interface

  - Adjustments / Tailoring

  - Distributed Use / Parallel Development

  - Configuration Management

  - Security

  - Interoperability

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SIMPROCESS

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What is SIMPROCESS?

- **SIMPROCESS** is a discrete-event process modeling and analysis tool that combines:

  - Flowcharting

  - Simulation

  - Statistical analysis

  - Visual reporting (plots, charts, graphs, etc.)

  - Activity Based Costing

- SIMPROCESS is designed for professionals of industrial and service enterprises who need to reduce the time and risk it takes to service customers, fulfill demand, and develop new products.

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An Industry Leader in Predictive Analytics

The **3 capability levels** when developing and deploying a simulation model:

User involvement   **MORE**

Desktop

Model

Capability Level 1:
Desktop simulation model used by <u>modelers</u> to support operational analysis and process improvement.

Decision

Support

Tool

Capability Level 2:
Web-based operational analysis tools available to a community of <u>functional analysts.</u>
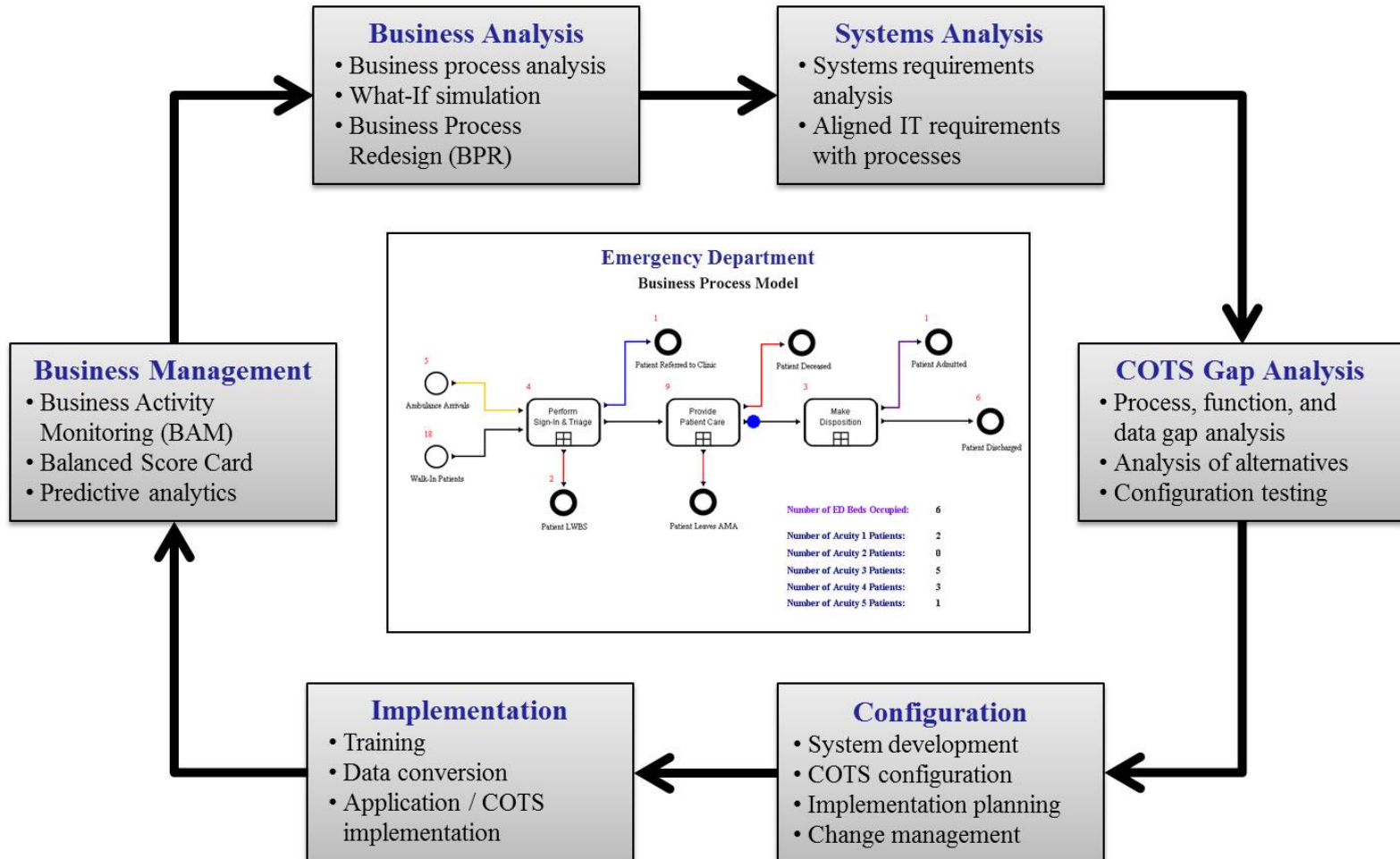
Predictive

Analytics

Capability Level 3
Near-real-time predictive Business Activity Monitoring *(BAM)* for proactive operations management by <u>administrators and line managers.</u>

LESS

Triggered by live events and data.

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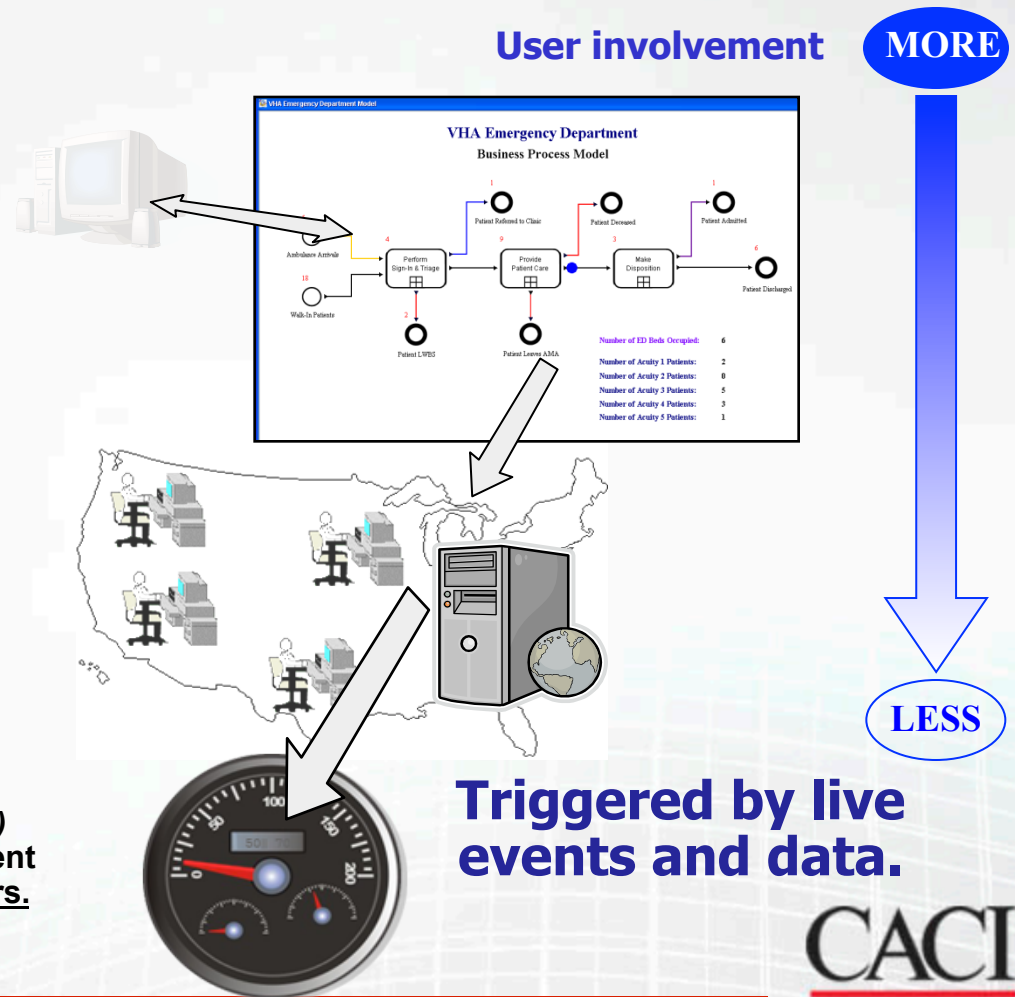
SIMPROCESS in Business Transformation

Application of Simulation Models in Business Transformation

Business Analysis
- Business process analysis
- What-If simulation
- Business Process Redesign (BPR)

Systems Analysis
- Systems requirements analysis
- Aligned IT requirements with processes

Business Management
- Business Activity Monitoring (BAM)
- Balanced Score Card
- Predictive analytics

COTS Gap Analysis
- Process, function, and data gap analysis
- Analysis of alternatives
- Configuration testing

Implementation
- Training
- Data conversion
- Application / COTS implementation

Configuration
- System development
- COTS configuration
- Implementation planning
- Change management

Emergency Department
Business Process Model

Number of ED Beds Occupied:	6
Number of Acuity 1 Patients:	2
Number of Acuity 2 Patients:	0
Number of Acuity 3 Patients:	5
Number of Acuity 4 Patients:	3
Number of Acuity 5 Patients:	1

Project Accomplishments

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Project Accomplishments

- Developed a open standards XPDL-based integration capability between Cameo and SIMPROCESS.

- Developed a comprehensive "end-to-end" process design, simulation and test through the MDDI methodology.

- Enhanced the functionality of MDDI's automated software code generation.

- Developed a cloud-based open source model repository.

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Benefits

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Benefits

- Streamlined, repeatable methodology for organizational change that is flexible and scalable.

- An integrated model-driven process to new requirements development, system design, and implementation.

  - Shortens the design/redesign process.

  - Automates system modeling, requirements, design, testing and implementation.

  - Reduces the risk before implementation.

- Brings the architecture to life by moving from a "static" to a "dynamic" environment through analysis of "what-if" scenarios.

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Benefits (cont.)

- Produces an integrated enterprise architecture that the clients own and use to drive transformation.

- Uses open-standards (XPDL, BPMN, and UPDM).

- CACI: Integrates two leading CACI capabilities to provide better service to our clients, win new business, and facilitate organic growth.

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Development Scenarios

- The Cameo-SIMPROCESS integration capability supports the following scenarios:

    1. **New business opportunities**: "End-to-end" business processes improvement with Enterprise Architecture (EA) integration, solution architecture development, and system development.

    2. **Existing EA analysis**: Analyze and simulate existing Enterprise and solution architectures for improvement, optimization and systems integration/development.

    3. **Process reengineering efforts**: Provide business process simulation and content analysis for EA environments.

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Demonstration

(Video removed because of size restrictions)

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Presentation Summary
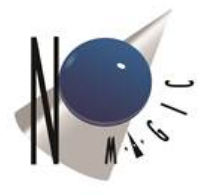
Current Problems

- Unrealized needs
- Misaligned processes and organizations
- Wasted resources and opportunities
- Proprietary and stovepipe solutions
- Duplication of efforts
- Projects over budget and behind schedule.

End-to-End Transformation

- The **MDDI Methodology** and **supporting toolkit** bridges all the typical gaps in transitioning through the lifecycle phases of complex software-centric systems, from business process reengineering through system requirements, architecture, design auto-generation of code, testing and deployment.

- The MDDI Methodology provides the **processes, tools, and techniques** needed to imagine the end-state and apply the MDDI Effect to reach it, on time and in budget.

The MDDI Effect

- **Incorporates** inputs of key stakeholders in user friendly views and provides rigorous, fully integrated specifications of the current environment and the desired end-state.
- **Provides** rapid delivery of a functional domain architecture, technical architecture and user-driven system requirements.
- **Shortens** system development schedules: manual software coding is virtually eliminated: executable code is generated for efficient testing directly from design specs.
- **Reduces** total cost of ownership: implemented code is maintained and enhanced directly from the integrated architecture design repository.

Questions?

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Company Capabilities Profiles

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MDDI allows companies to imagine, design, and test optimum processes before physical implementation. It provides powerful new capabilities through integrated innovation of process modeling, simulation, system design and implementation and streamlines requirements definition. MDDI facilitates the implementation of workflow/process automation from a shared common standards-based process modeling methodology (BPMN).

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SIMPROCESS is a hierarchical modeling tool that combines process mapping, discrete-event simulation, and Activity Based Costing in a single interface. It provides ready-made building blocks for constructing dynamic business process models, while the underlying expression language incorporates more complicated business logic. SIMPROCESS creates synergy with MDDI design and implementation.

Cameo Enterprise Architecture provides the very first in the industry extendable model execution framework based on OMG fUML and W3C SCXML standards. This framework extends MagicDraw to validate system behavior by executing, animating, and debugging Activity models and UML 2 State machine and in the context of realistic mock-ups of the intended user interface.

The Truth is in the Models ™

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MagicDraw is an award-winning business process, architecture, software and system modeling tool. Designed for Programmers, Business Analysts, and Software Analysts this dynamic and versatile development tool facilitates analysis and design of Object Oriented (OO) systems and databases. It provides the industry's best code engineering mechanism as well as database schema modeling, DDL generation and reverse engineering facilities.

NOTE: SIMPROCESS is a registered trademark of CACI, Inc. Cameo Suite and MagicDraw are registered trademarks of No Magic, Inc. OMG and other trademarks belong to their respective owners.

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