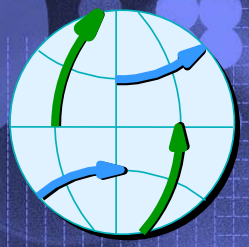
Business Consulting Services

The Architecture of Business

DOI Executive Workshop on Enterprise Geospatial Systems



Presentation Context

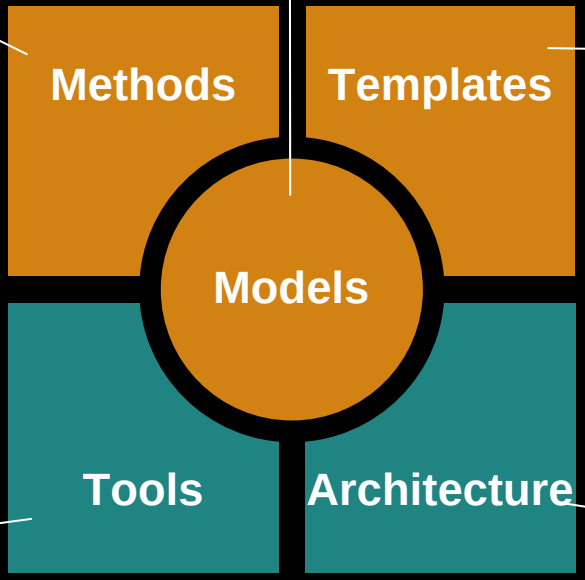
- Hord Tipton / Karen Siderelis spoke about the notion of "enterprise" and linking IT to business goals …
- Colleen Coggins spoke about developing an actionable architecture that supports DOI's "lines of business" …
- The "Architecture of Business" presentation takes the strategic intent and direction discussed earlier and provides a detailed methodology of how the DOI can achieve these goals.
- The methodology is applicable to any enterprise system – including geospatial information systems.

Modeling the Business

Methods, Models, Tools, Templates and Architecture

linked models of business & IT semantics support methodologies and business-IT alignment

repeatable, scalable, consistent methods to guide stakeholders through transformation steps and decisions

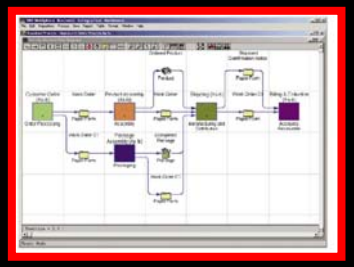


templates of solution models support reuse

tools support methodologies through design and analysis of transformation models and related artifacts

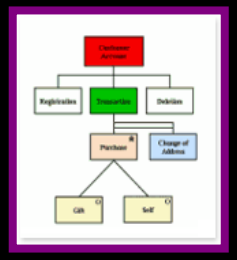
model-driven components for adaptive process choreography, monitoring & management in a service-oriented architecture

Evolution of Software Modeling



Business Strategy Modeling

Business Operations Modeling



Business Process Modeling

Object Oriented Analysis and Design

Structured Analysis & Design

Flowcharts

Business Semantics

Time

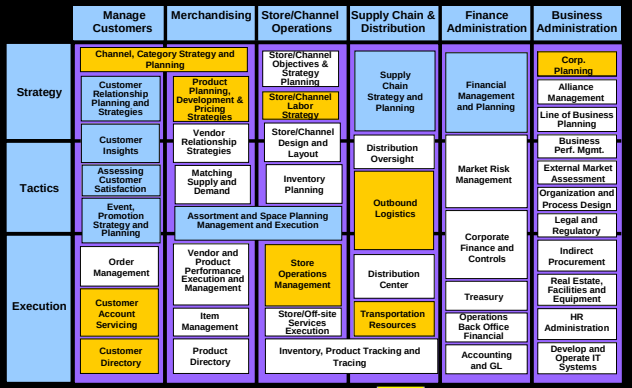
Multi-Level Models in Business Transformation Consulting

"3-Layer Conversation"

PRM
BRM
TRM

Business Strategy
Business Process
IT

Logical Model of the Business



Select Horizontal Services

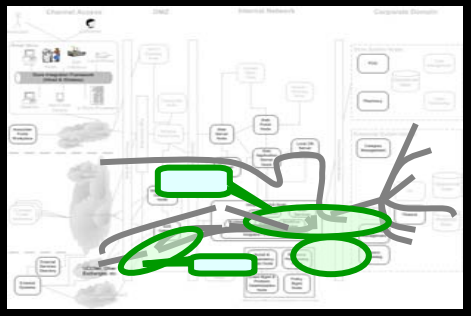
Order Management

Event, Promotion, Strategy and Planning

Assessing Customer Satisfaction

SRM

"As-Is" and "To-Be" Process Models



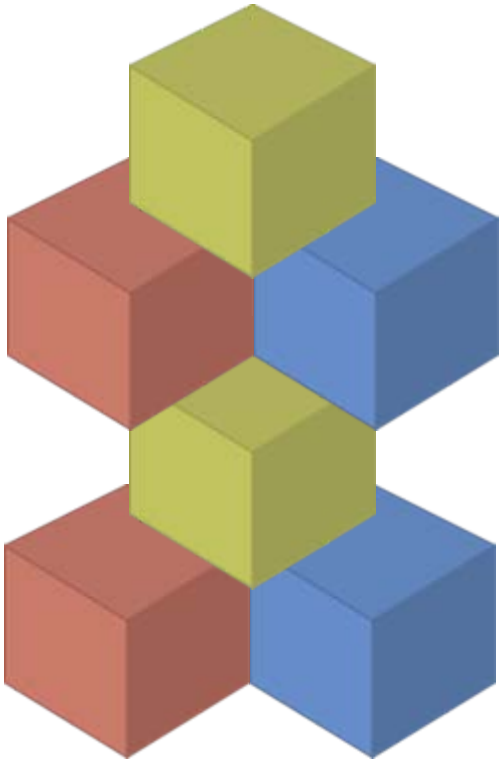
Implementation

ROI

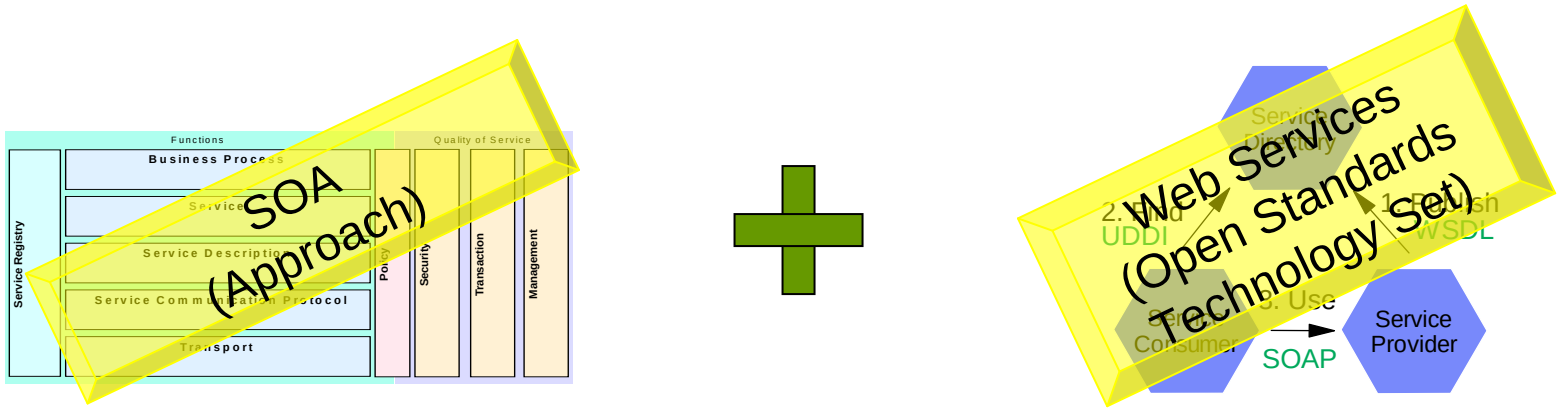
What is a Service Oriented Architecture?

- An **approach** for **building** distributed systems that deliver application functionality as **services** to either end-user applications or other services

- It defines :
  - An architecture that leverages open standards to represent software assets as services.
  - Provides a standard way of representing and interacting with software assets
  - Individual software assets become building blocks that can be reused in developing other applications
  - Shifts focus to application assembly rather than implementation details
  - Used internally to create new applications out of existing components
  - Used externally to integrate with applications outside of the enterprise

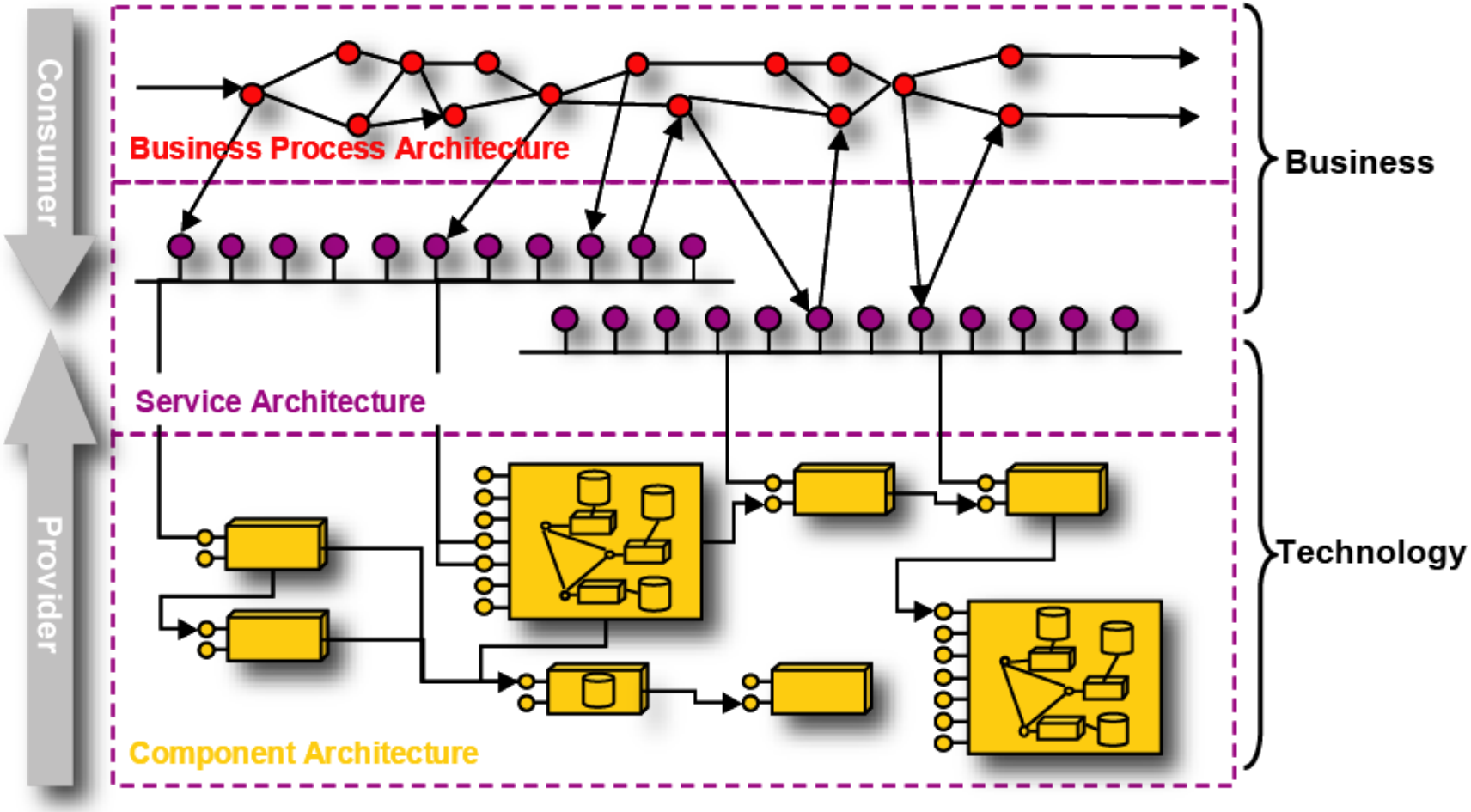


While SOA is an architectural approach, Web Services are enabling technologies. They are not the same thing.

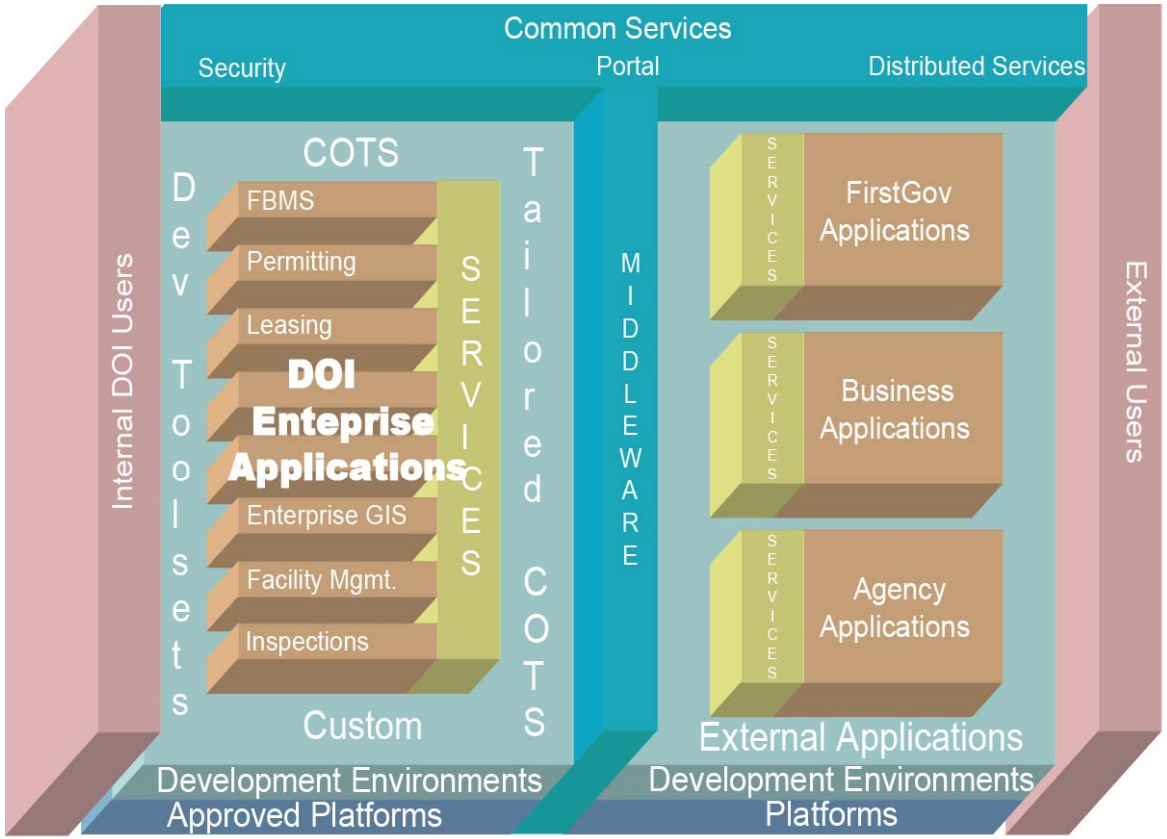


- SOA is a way of thinking
  - SOA proposes an advancement in the Programming Model
  - It is the next step in software engineering from Object Oriented Design & Component Based Development
- Web Services and SOA are not the same thing:
  - Most of today's production SOAs don't primarily use Web Services - they are built on Message Oriented Middleware (MoM)
  - Not all deployed WebService based systems necessarily embrace all the guiding principles of SOA

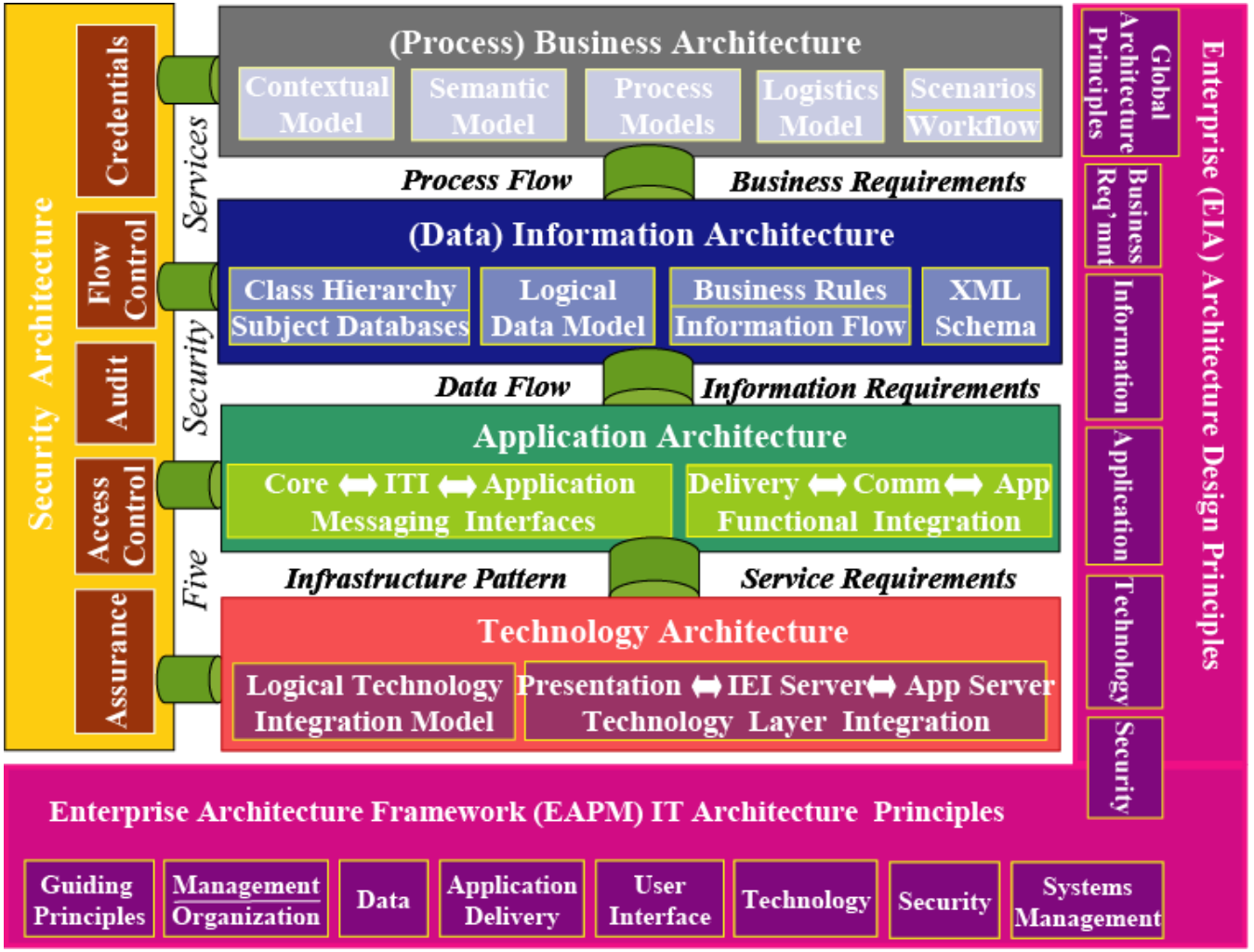
The business functionality aspect and technology aspect overlap and SOA facilitates closing the business / IT gap



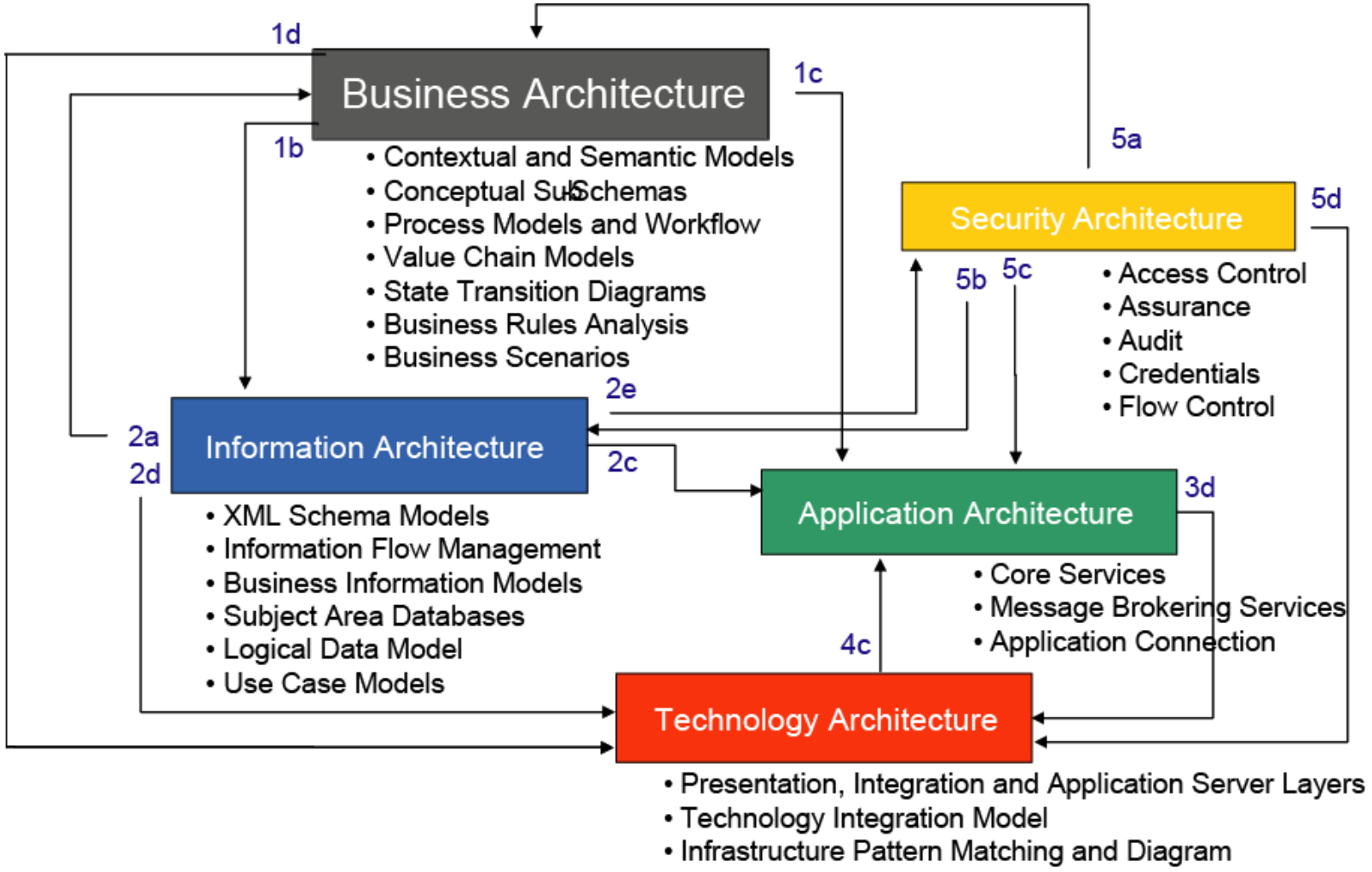
DOI Proposed Conceptual Service-Oriented Architecture



Taking another look at the DOI Process, Data, Application, Technology, Management PDATM domains …



Interaction Between Business Architecture and Other PDATM domains …



Relationship Matrix Among Domain Architectures

From \ To	Business a	Information b	Application c	Technology d	Security e
Business 1	*constructs business views and value chains*	identifies business contextual and process workflow information	specifies service transaction and performance requirements	specifies service management and integration requirements	refers to security policies and standards (incl. privacy)
Information 2	provides references to Business info models	*defines logical data model, class hierarchy, subject databases, etc.*	defines XML messages and sources of information flow	defines flow of transaction and configuration of server tiers	specifies data classes, flow, communication and retention
Application 3	refers to business processes and workflow	refers to logical information model data flow, and XML schema	*identifies communication protocols and service adapters*	provides key performance metrics for infrastructure	maps messaging to security zones of control and services
Technology 4	refers to business and application transactions	refers to logical information model data sources and repositories	supports service transactions and logical nodes of applications	*matches key infrastructure patterns and service levels*	adheres to security zones, rules and requirements
Security 5	provides security policies and standards	classifies data, specifies data exchange and flow control	guides security implementation of XML message and adapter interfaces	guides security implementation for infrastructure components	*defines and implements 5 services in 4 zones of control*

Model Driven Architecture

Model Driven Architecture (MDA)

- The MDA is a new way of writing specifications and developing applications, based on a platform-independent model (PIM). A complete MDA specification consists of a definitive platform-independent base UML model, plus one or more platform-specific models (PSM) and interface definition sets, each describing how the base model is implemented on a different middleware platform.
- MDA is widely regarded as the next great leap in systems and software development enabling companies to manage more complex applications
- MDA aims to bridge the gap between models and code and specifies a way of generating executable code for multiple platforms from one single Platform Independent Model (PIM).

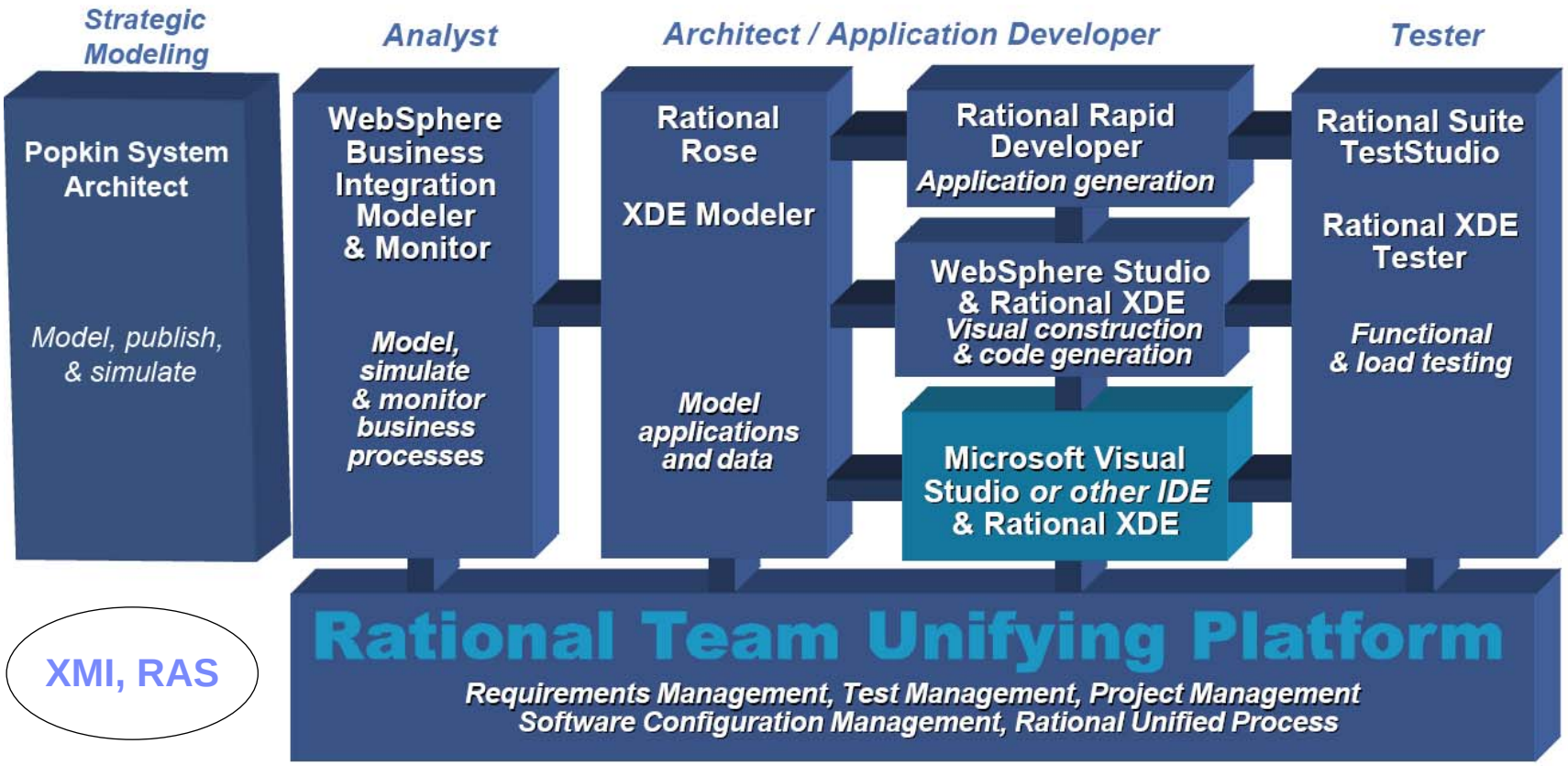
Model-Based Architecture Goals

- Define business processes using technology independent models (UML, IDEF0, IDEF3, BPMN)
- Create a system from loosely coupled “enterprise components” that can evolve independently
- Provide well defined interfaces and interaction points between these enterprise components
- Make each enterprise component a reusable asset that can serve many business processes
- Build the information system as a community of interacting enterprise components
- Utilize open standards such as Web Services, EJB and Corba to integrate the enterprise components

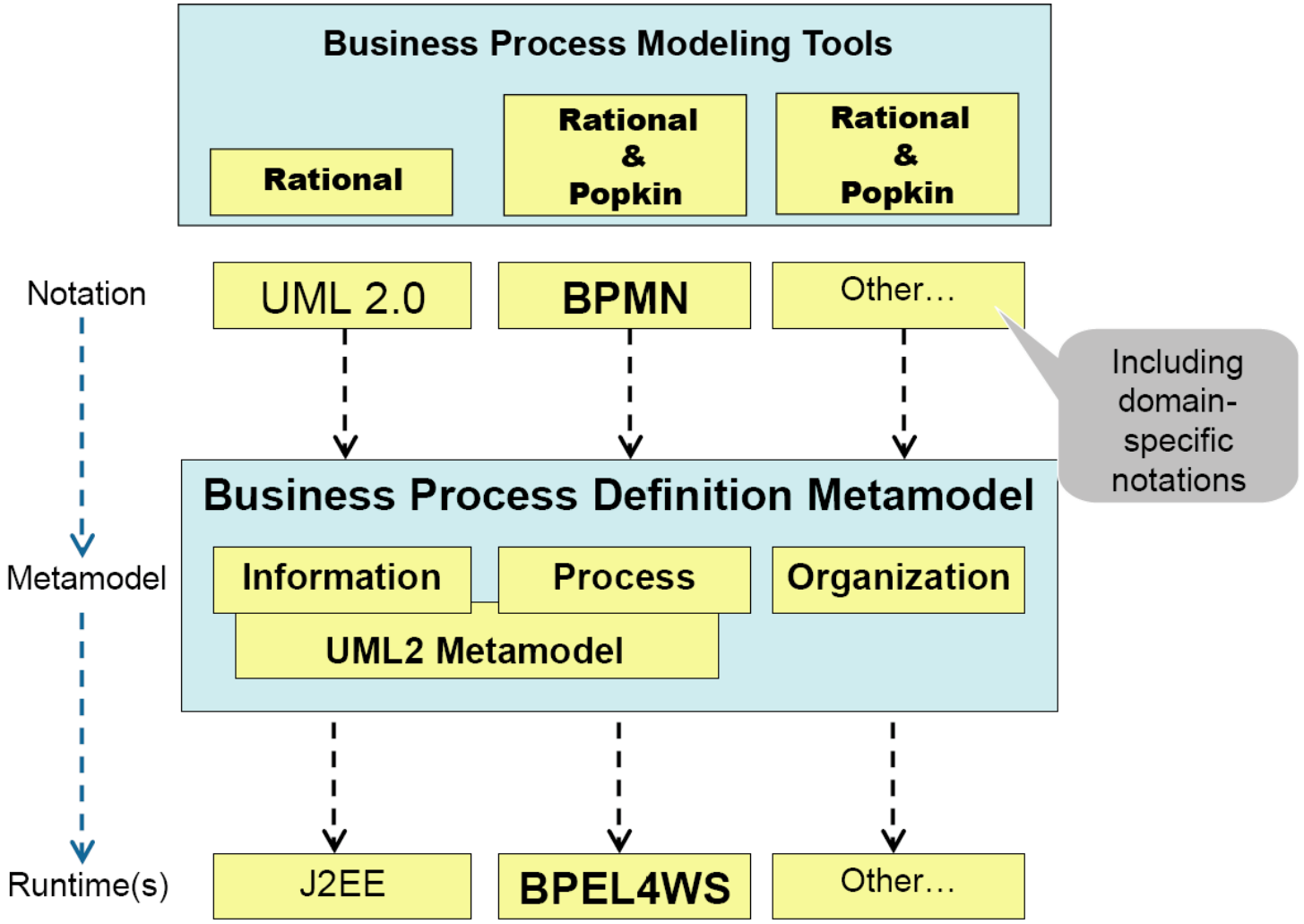
MDA Benefits

- Reduced cost throughout the application life-cycle
- Reduced development time for new applications
- Improved application quality
- Increased return on technology investments
- Rapid inclusion of emerging technology benefits into their existing systems

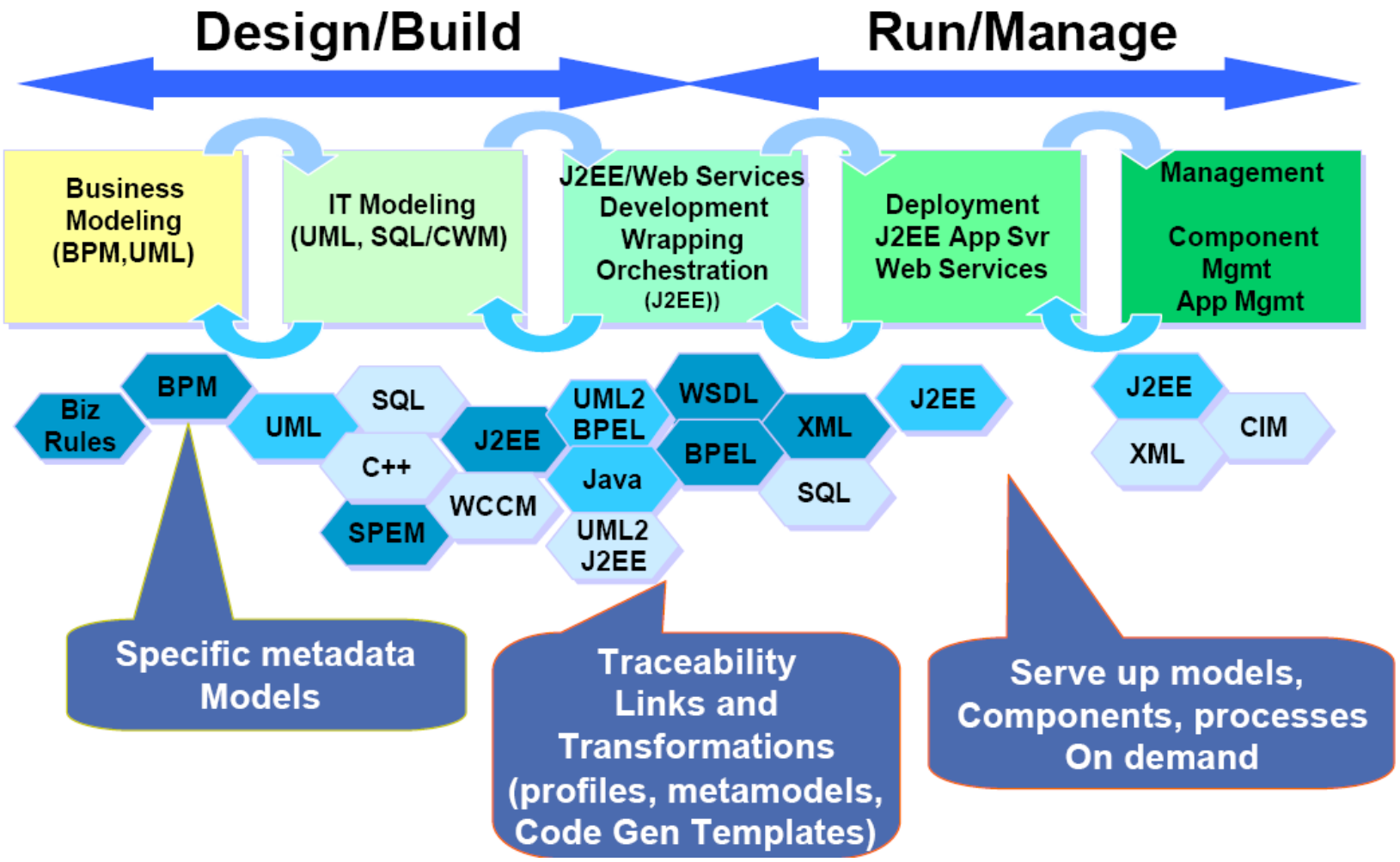
Popkin's modeling capabilities are complementary to IBM's Rational Software Development Solution



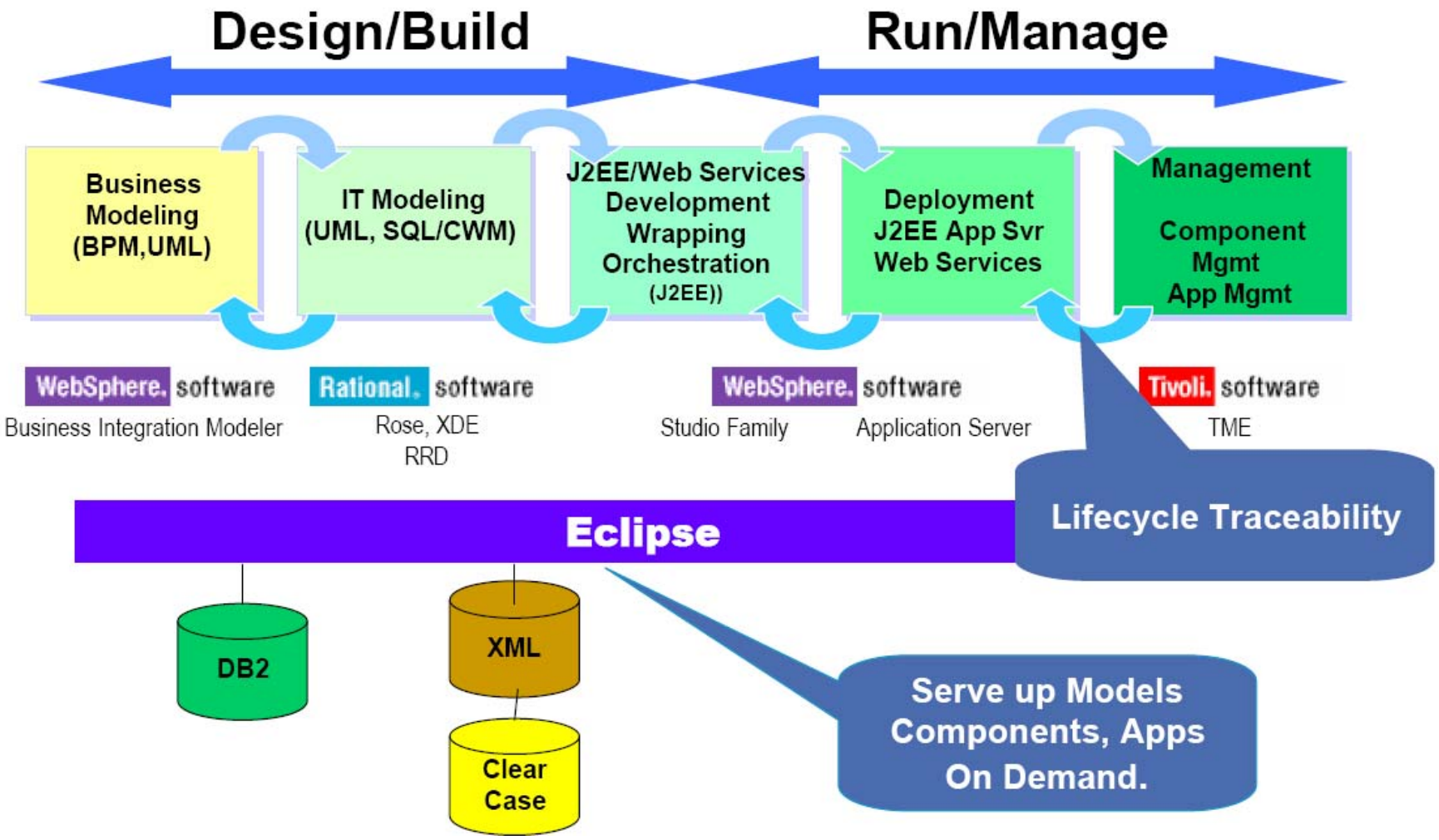
Popkin currently supports BPMN, but does not support UML 2.0 which is needed for full front-end support of MDA



Model Driven Business Integration: Managed Models

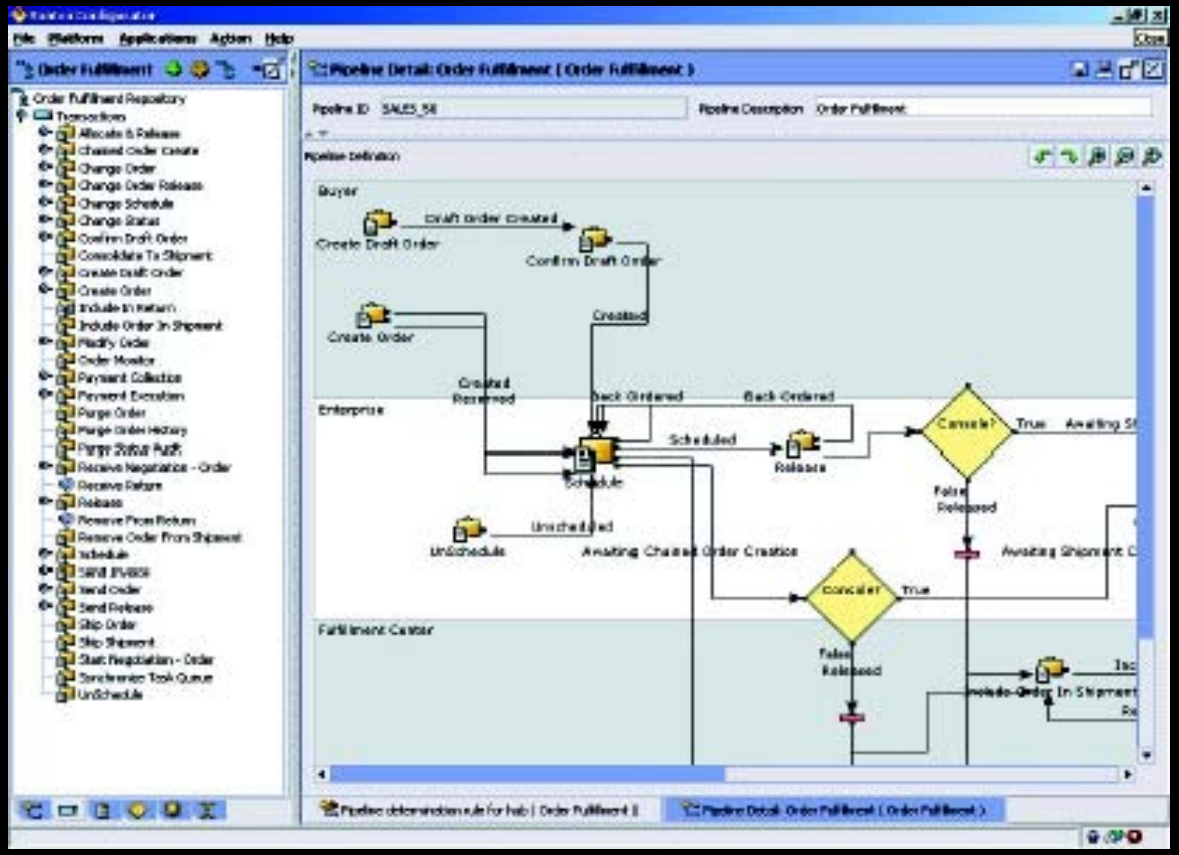


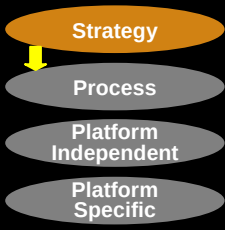
Model Driven Business Integration: Full Lifecycle



Example Application of Model-Based Approach

- Business users graphically configure business processes
- Artifacts are automatically generated and choreographed
- Business processes are easily modified and flexible





Example: Insurance Policy Quote Issuance

Balanced Scorecard captures business objectives

DOI GPRA Strategic Plan

Objective: Protect and manage the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives and affiliated Island Communities.

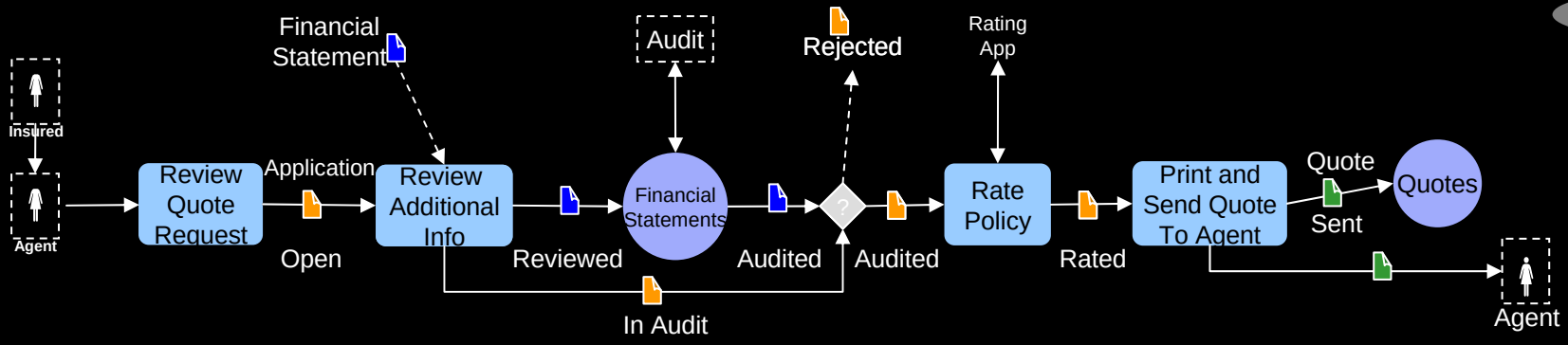
Recreation | Resource Protect | Resource Use | **Management Excel** | Serving Comm

	Targets			
Measures	**Today**	**Q1**	**Q2**	**Q3**
Time to Process Reservation	**15 days**	**12 days**	**10 days**	**10 days**
Time to Process Payment	**19 days**	**16 days**	**13 days**	**12 days**

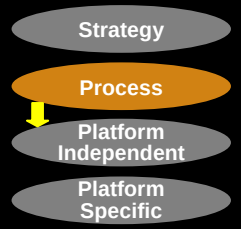
Initiative: Automate the new business acquisition process → **Business process model**

Simplified Process Model -- Quote Issuance

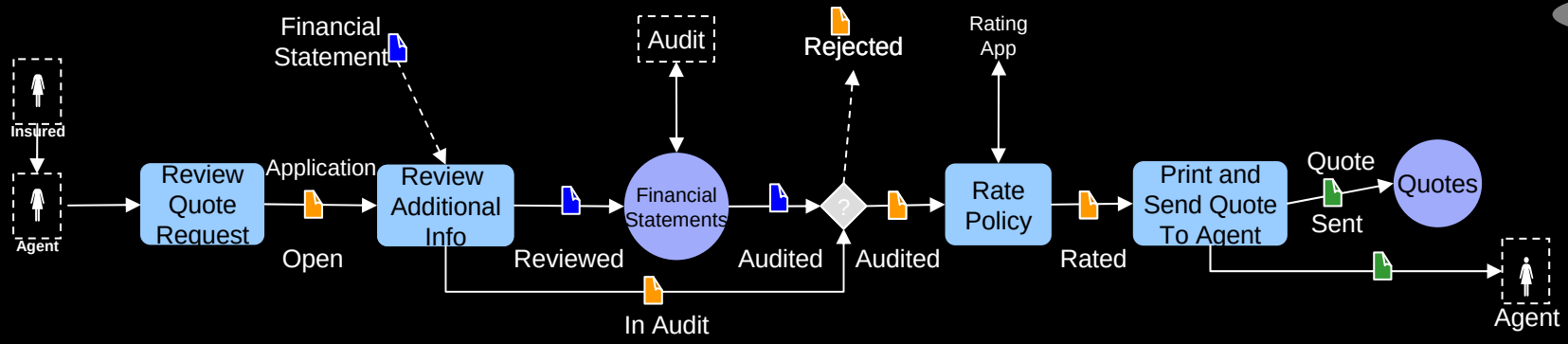
Strategy
Process
Platform Independent
Platform Specific



Transformation to Platform-Independent Model



Structured process model allows transformation to platform-independent model

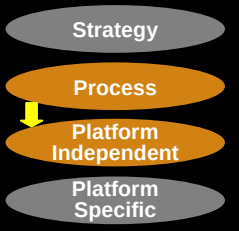


Process Model

Platform-Independent Model

Process Choreography

Transformation to Platform-Independent Model



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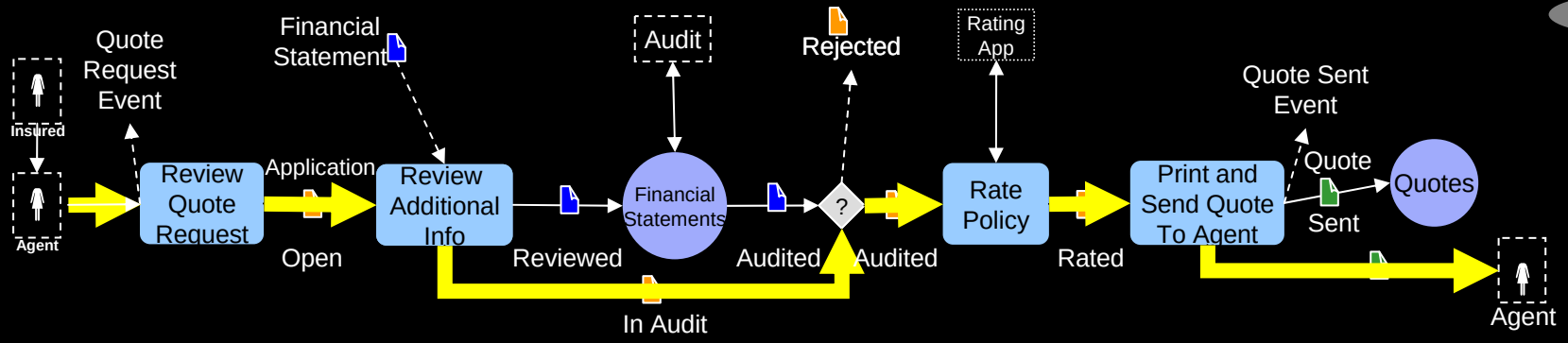
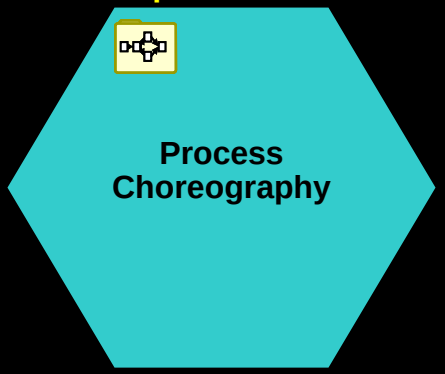


Process Model

Platform-Independent Model

Process Scripts



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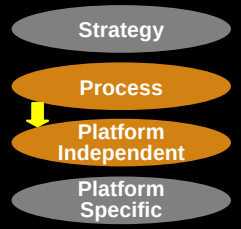
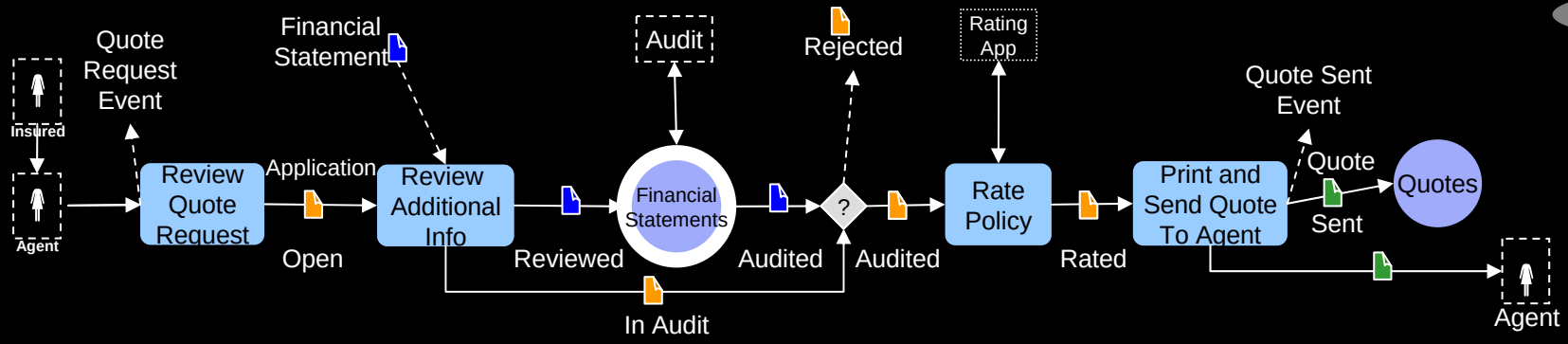


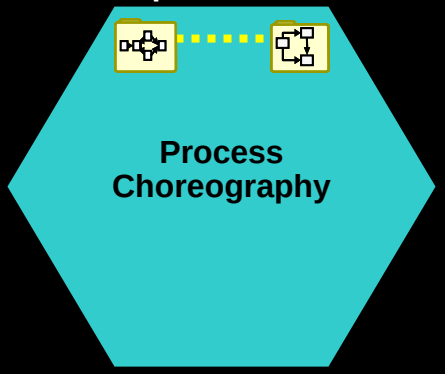
Structured process model allows transformation to platform-independent model



Process Model

Platform-Independent Model

Process **Structured**
Scripts **Documents**



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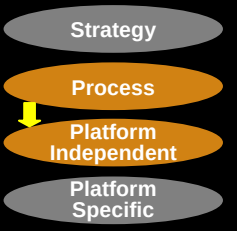
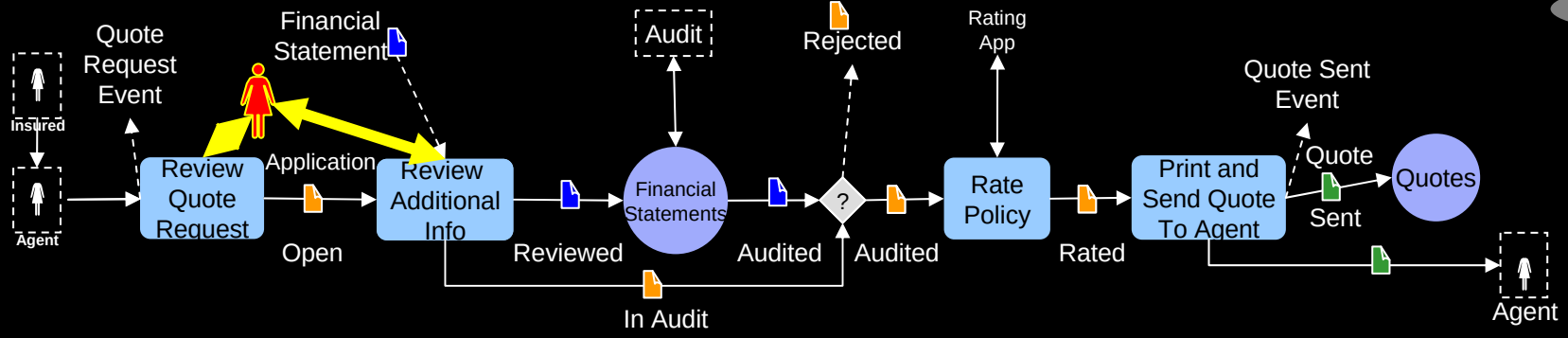
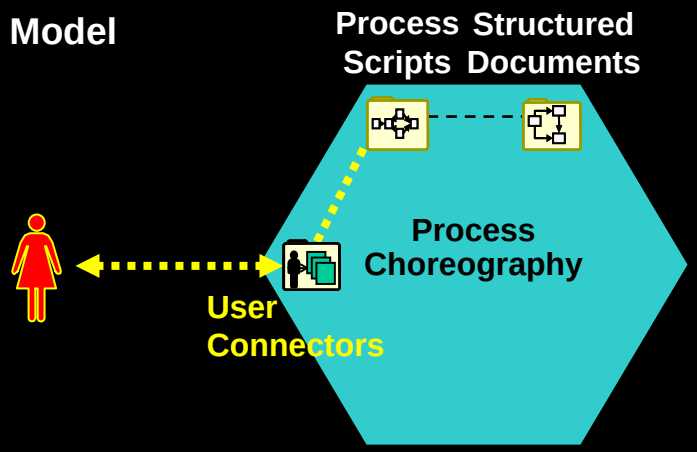


Structured process model allows transformation to platform-independent model



Process Model

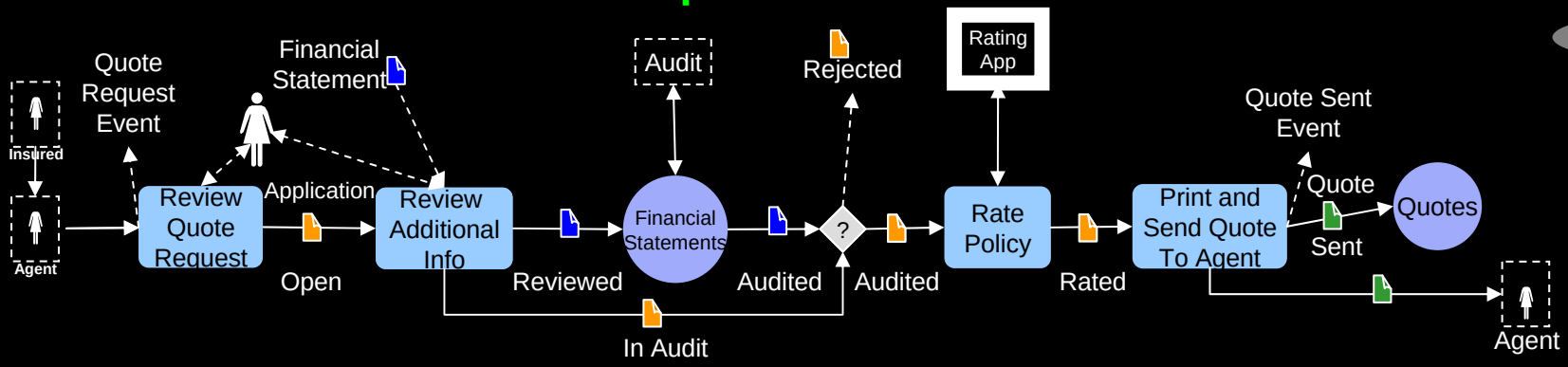
Platform-Independent Model



Transformation to Platform-Independent Model

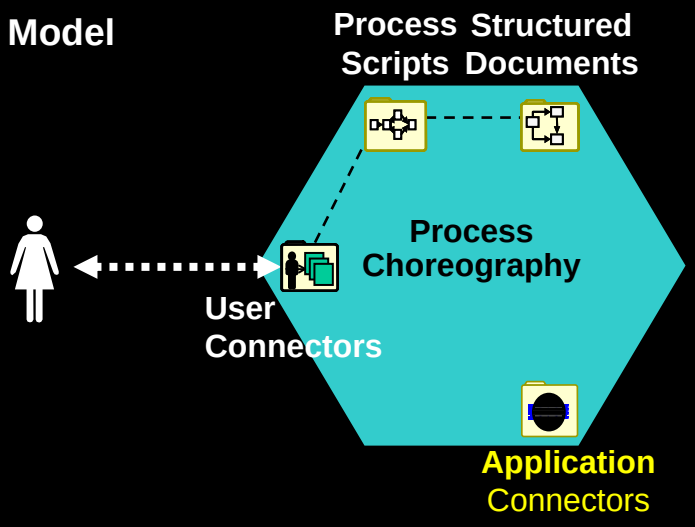
Structured process model allows transformation to platform-independent model

Strategy
Process
Platform Independent
Platform Specific



Process Model

Platform-Independent Model

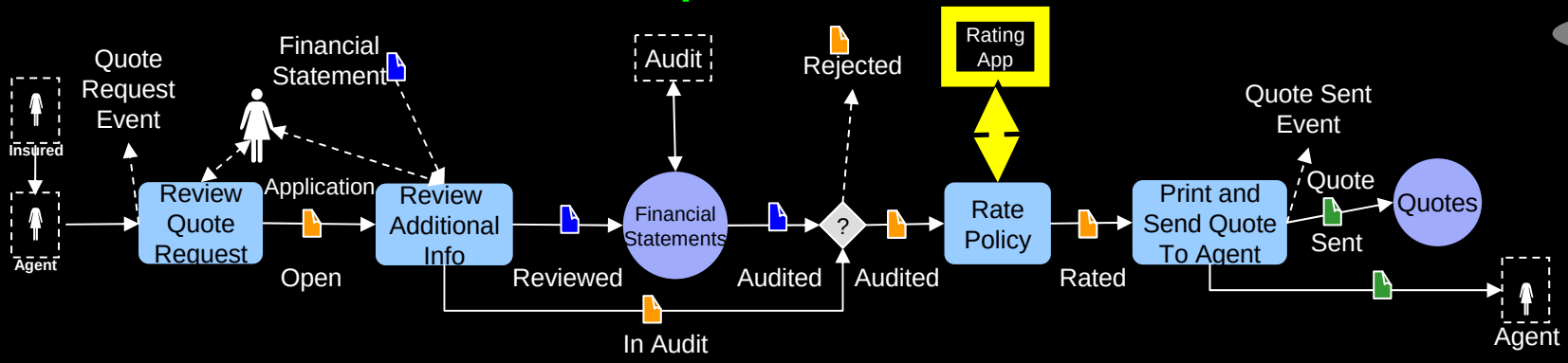


Legacy Rating App

Transformation to Platform-Independent Model

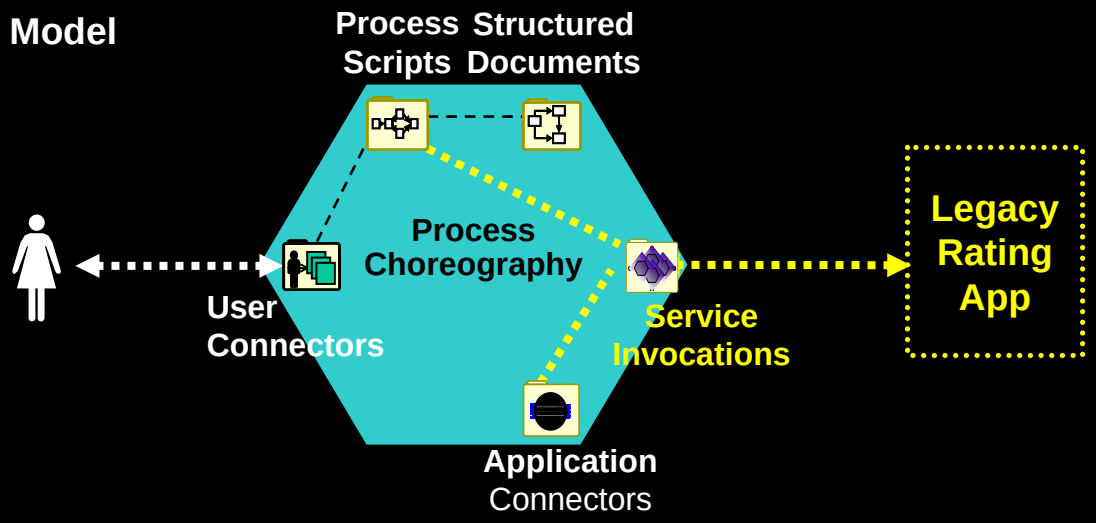
Strategy
Process
Platform Independent
Platform Specific

Structured process model allows transformation to platform-independent model



Process Model

Platform-Independent Model



Transformation to Platform-Independent Model

Structured process model allows transformation to platform-independent model

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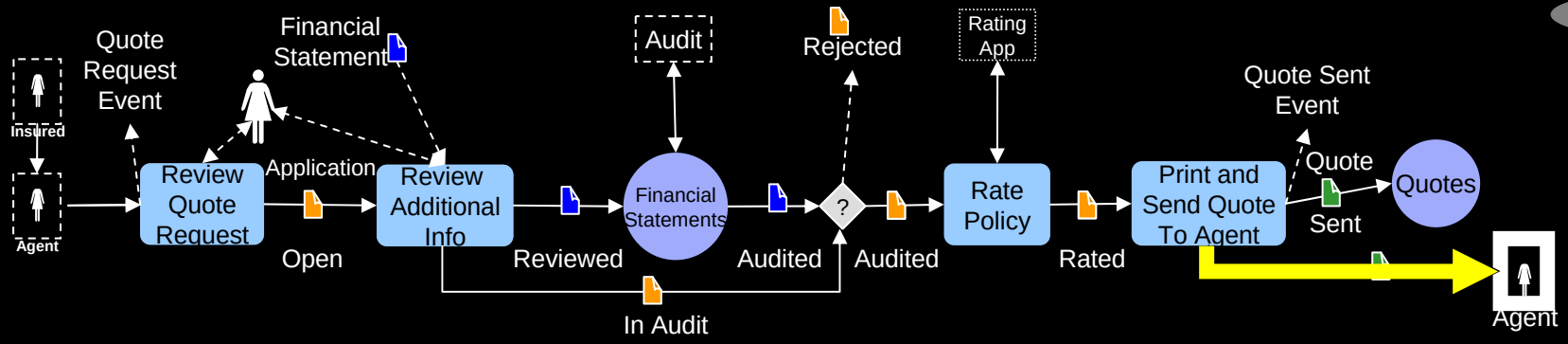

Process Model

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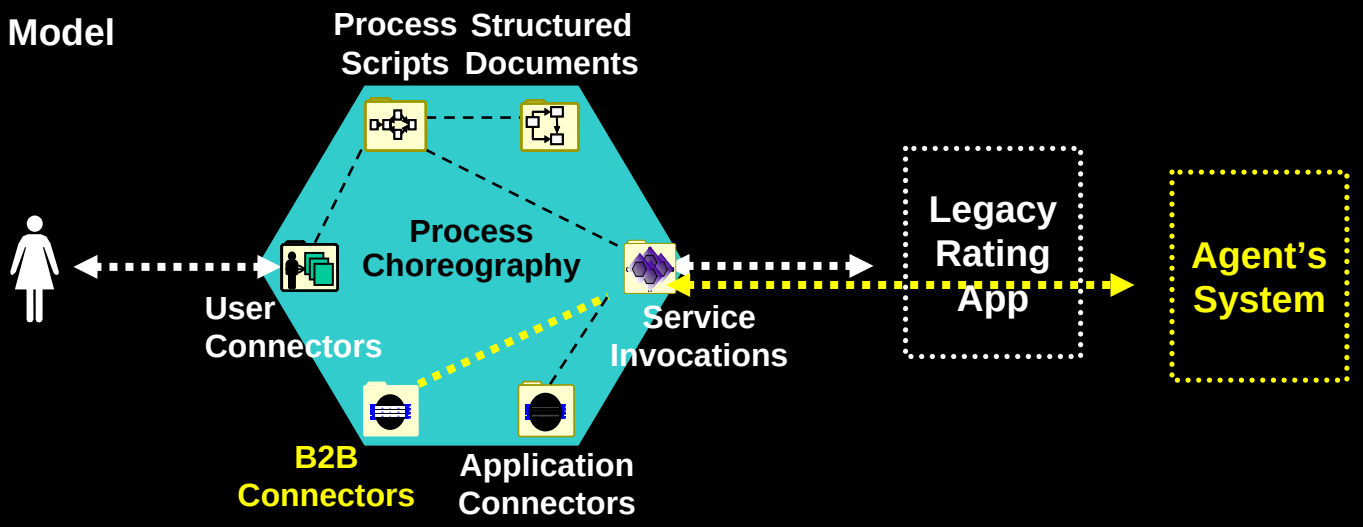
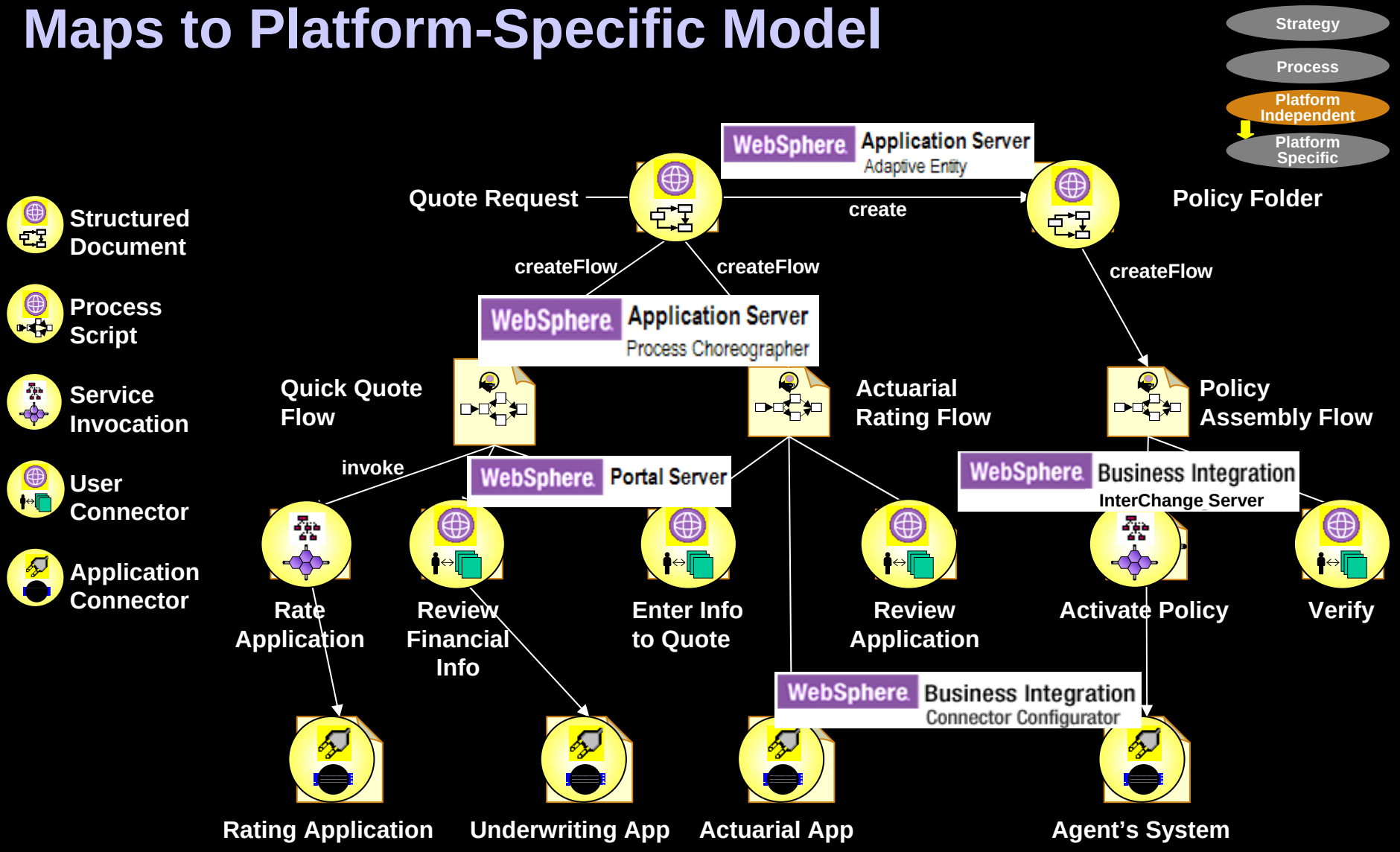
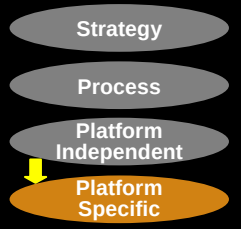


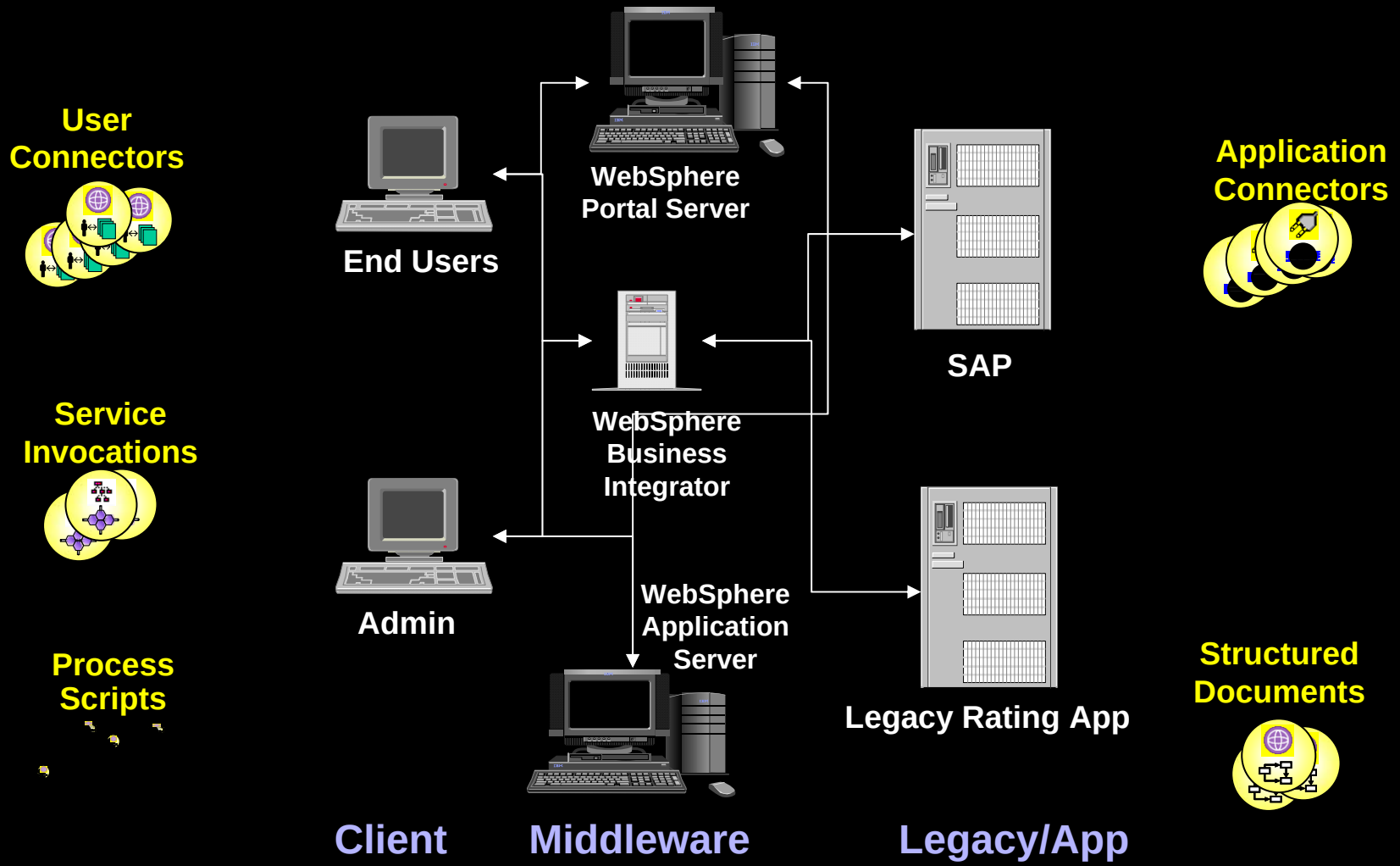
Platform-Independent Model Maps to Platform-Specific Model



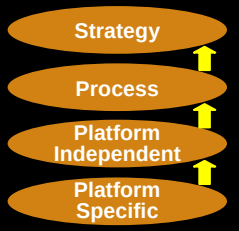
Deploying the Platform-Specific Model

Implementation artifacts can be realized on appropriate IT systems



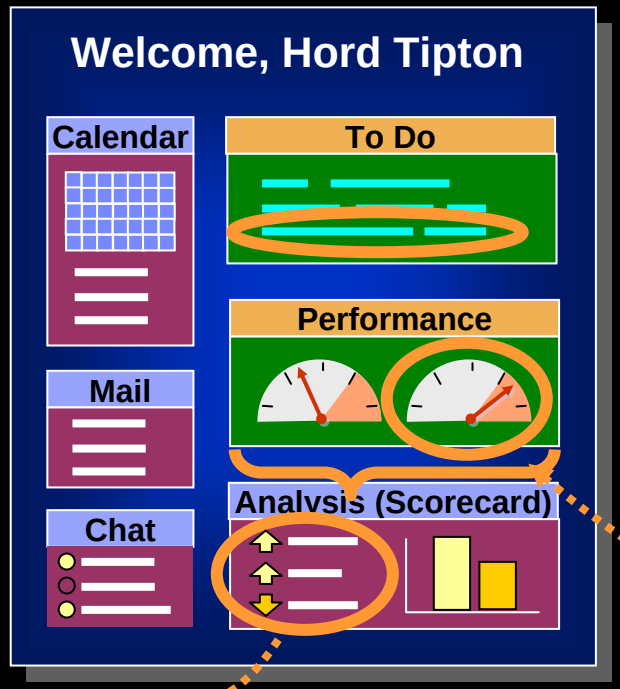


Management Through Monitoring and Models



Monitoring based on models results in rapid, informed management decisions

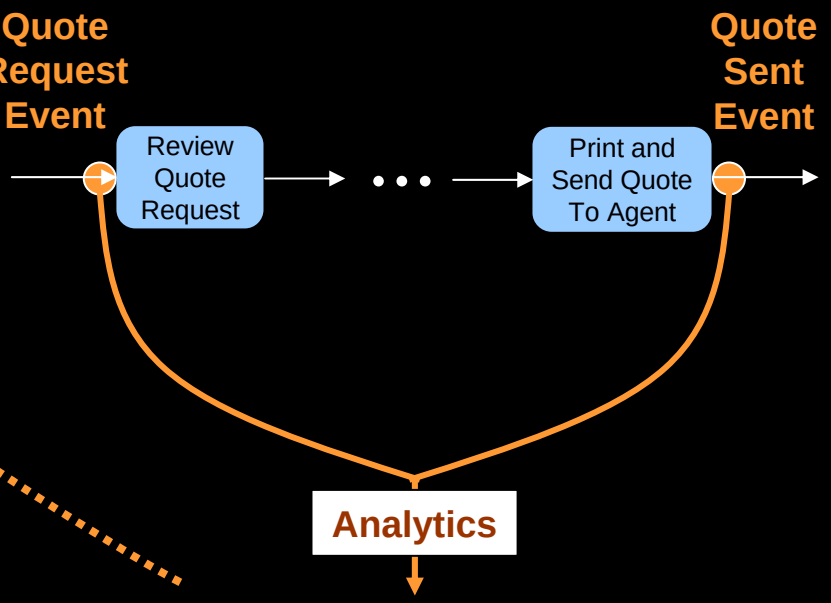
Business Activity Workplace



Manage business

DOI Executive

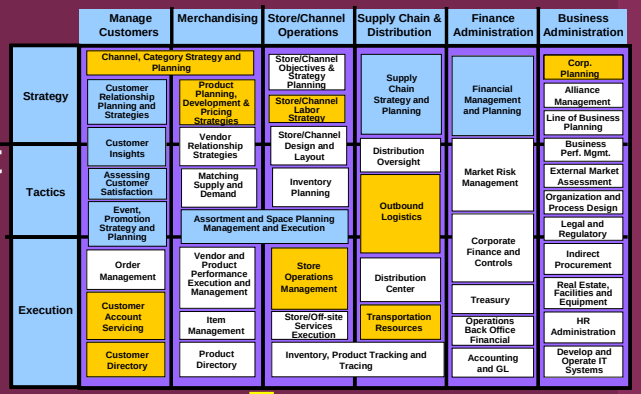
Business Process Model



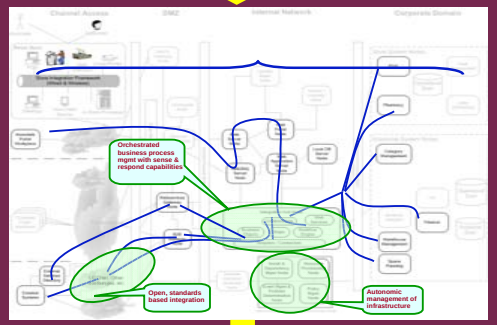
Key Performance Indicator (Sales Processing Index)

Business Transformation Engagements Today

Component Business Model



Informal Process Models



Consultants

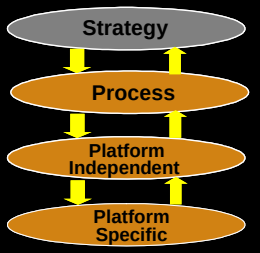
Documents
Presentations
Visual tools

IT Implementers

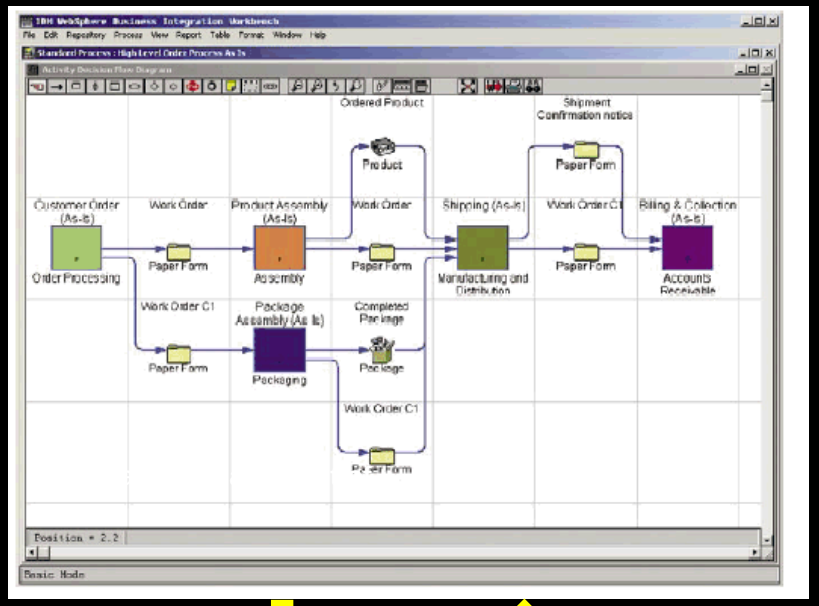
- Utilize informal multi-level models
- The logical model of the business is captured in presentations, documents and visual tools
- "As-Is" and "To-Be" process models are captured in presentations and documents

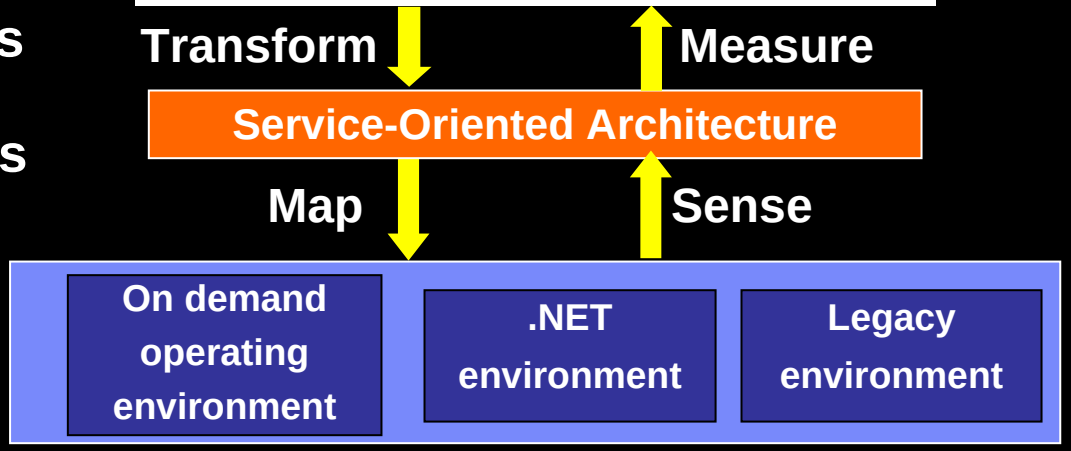
- High potential for loss of business intent
- No simulation capability for "As-Is" and "To-Be" processes
- Completely manual translation to implementation
- Manual collection, analysis and presentation of Key Performance Indicators

Formal Multi-Level Models are Starting to Link Business Processes to IT



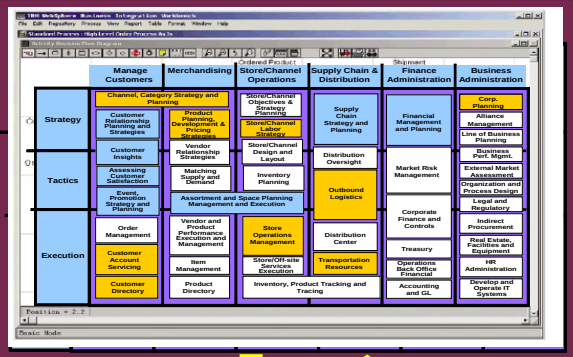
- Support the **creation** and **maintenance** of process models
- Support the **simulation** and **analysis** of business process models
- Increasingly capable of **orchestrating** and **managing** run-time artifacts and providing the means for **monitoring** the performance of business operations





Business Transformation Engagements Will Employ Formal Models and Tools

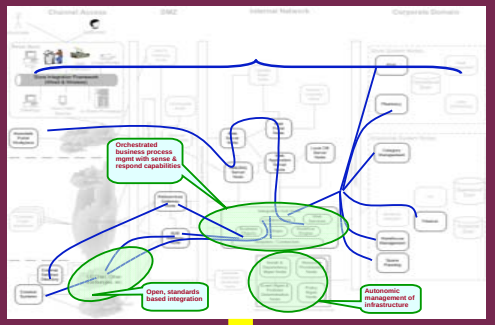
Component Business Model



Link

KPIs

Formal Process Models



Consultants

IT

Documents / Presentations

IT Implementers

- Modeling languages, methodologies and tools will be extended to include integration with such as the use of for
- Mo
- Bu
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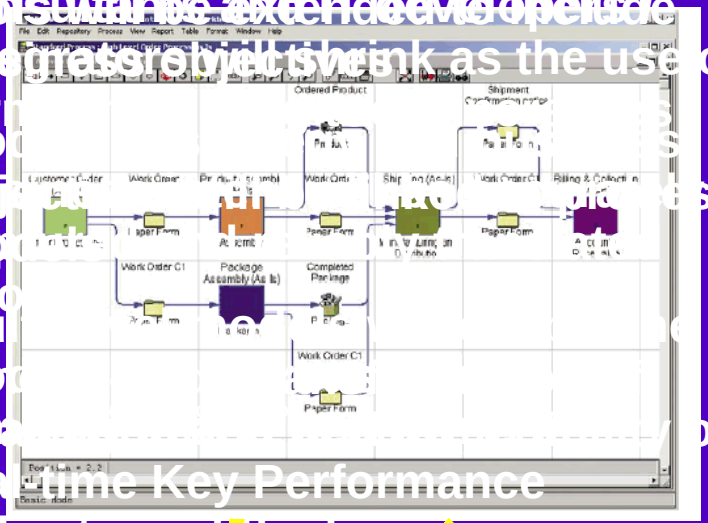
- Mo



real-time Key Performance Indicators of the business

Transform

Measure

Service Oriented Architecture

Man

Sense

Multi-level models will close the Business / IT gap and enable continual optimization of the business

On demand operating environment

.NET environment

Legacy environment

Summary and Recommendations

- DOI should make greater use of formal MDA methods and modeling tools to effectively analyze and transform their enterprise
- Models will become valuable, reusable, competitive assets that
  - Accelerate the deployment of new applications
  - Increase the visibility of enterprise performance
  - Improve the manageability of business operations
  - Increase ROI (reduce cost)
- Business componentization will contribute to the business transformation
- Reusable components should be captured as platform independent artifacts