Codagen

Transform your software architecture into a reusable asset

OMG's Second Workshop on Web Services

Orchestrating Web Services from a UML Development Platform

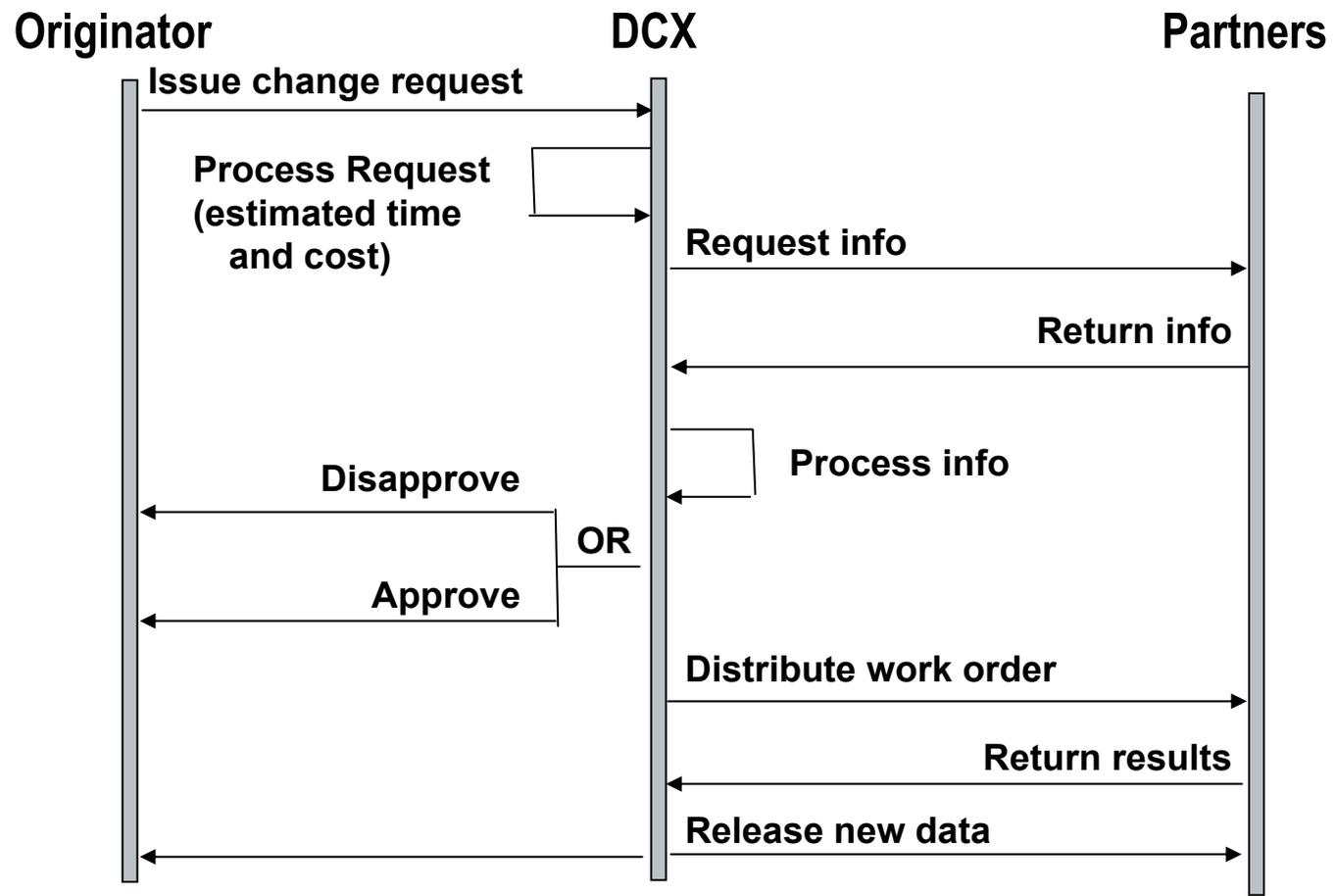**Michel Brassard**
Founder & CTO
mbrassard@codagen.com

DCXnet
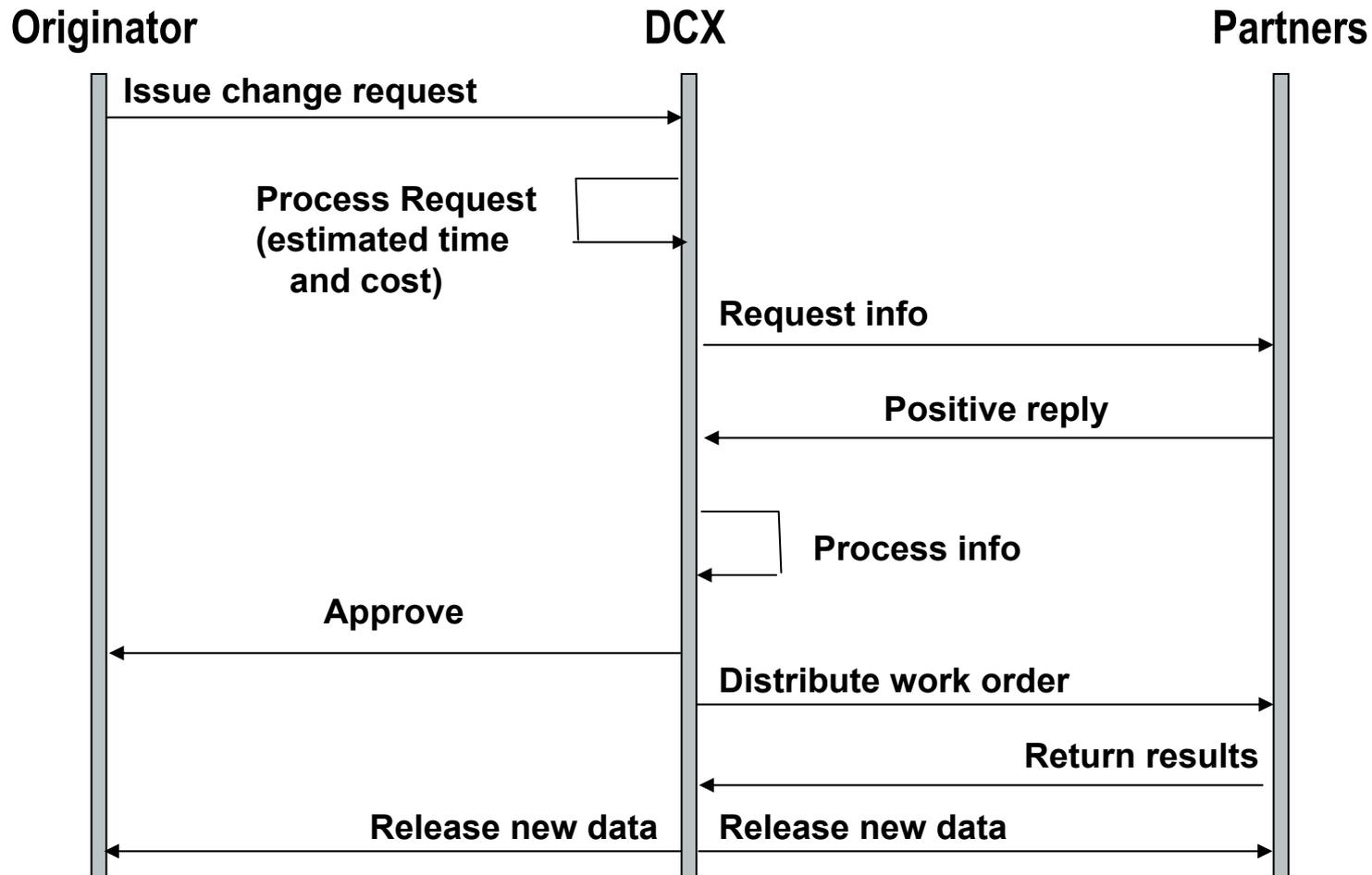*ebusiness by DaimlerChrysler*

Agenda

- Modeling Business Scenarios and Business Processes with UML

- Reusing Business Scenarios, Business Documents and Web Services across Business Processes

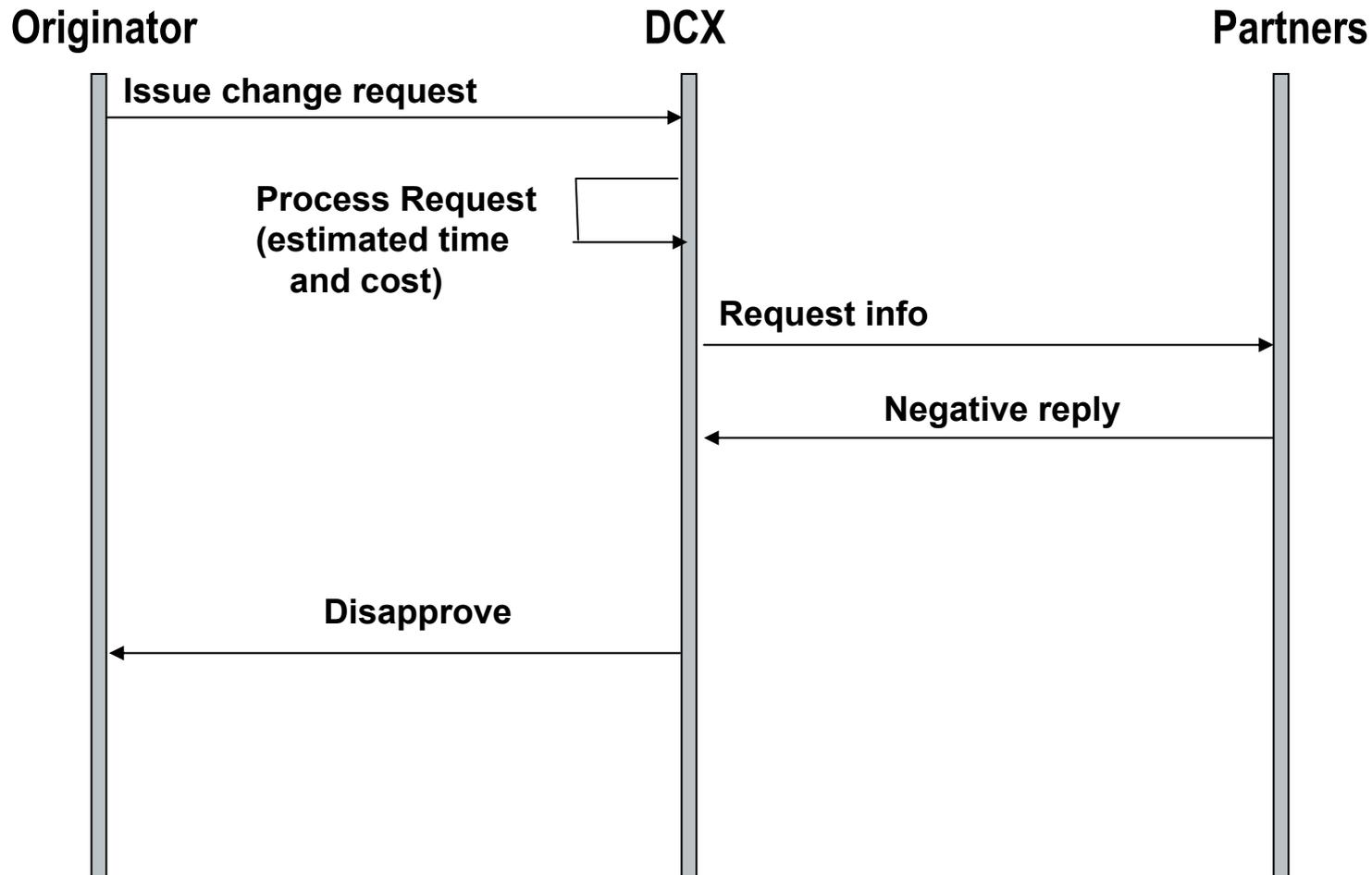- Implementing a Business Process using Web Services from a MDA platform
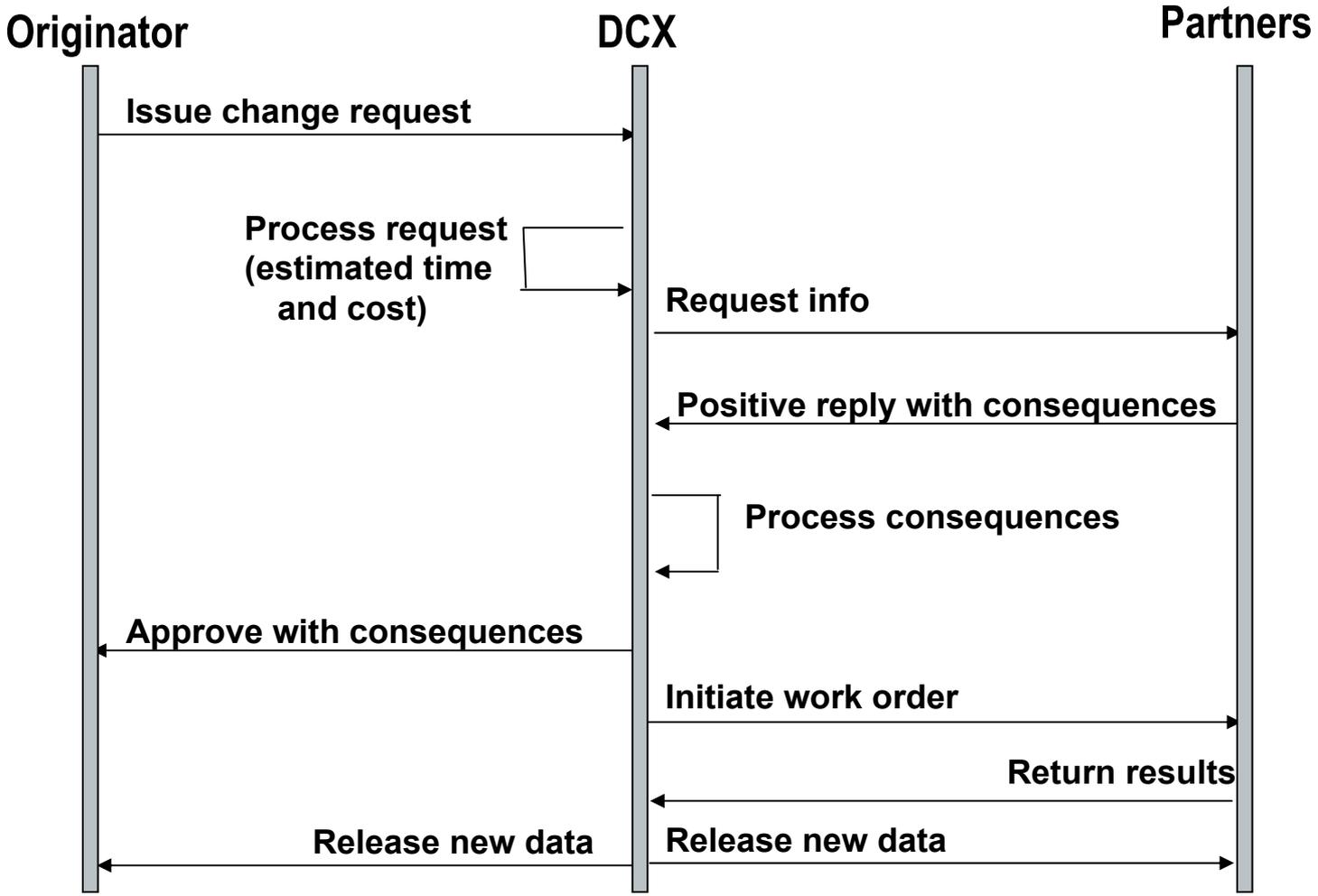
DCX Business Process: Engineering Change Management

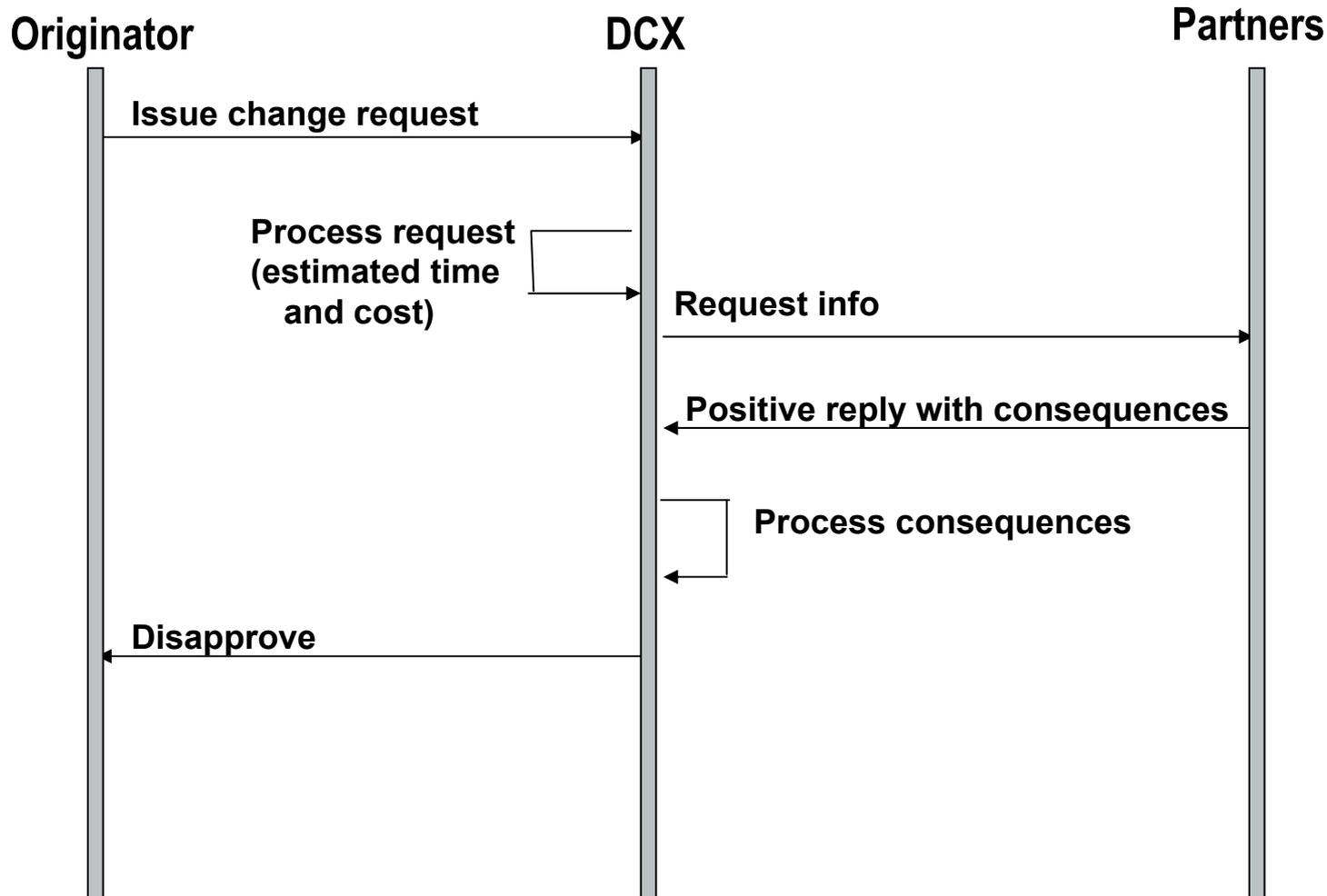## DCX Business Scenario #1a: Engineering Change Request Without Consequences

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DCX Business Scenario #1b: Engineering Change Request Without Consequences

DCX Business Scenario #2a: Engineering Change Request with Consequences

Originator **DCX** **Partners**
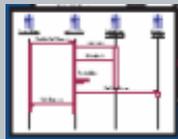
Issue change request

Process request (estimated time and cost)

Request info

Positive reply with consequences

Process consequences

Approve with consequences

Initiate work order

Return results

Release new data   Release new data

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DCX Business Scenario #2b: Engineering Change Request with Consequences

Originator   **DCX**   **Partners**

Issue change request →

Process request
(estimated time
and cost)

Request info →

← Positive reply with consequences

Process consequences

← Disapprove

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Business Scenarios allow an incremental approach to business process modeling
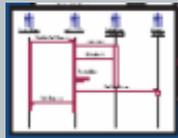

Business scenarios

Sequence diagram — #1

Sequence diagram — #2

Activity diagram — #3

Sequence diagram — #4

Synthesis

Business process

Activity diagram

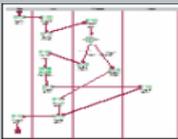## Behaviors found in Business Scenarios are Mapped with Web Services
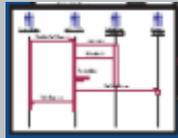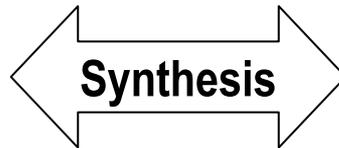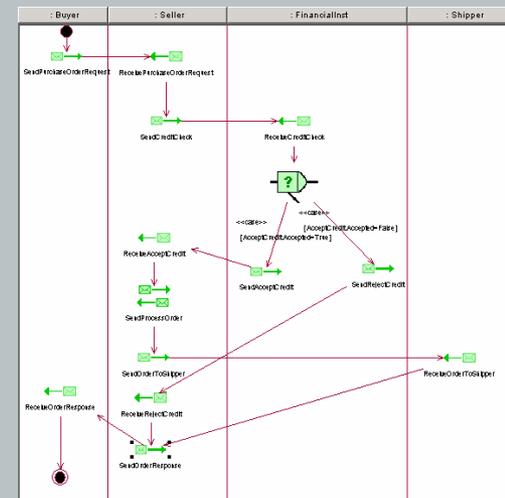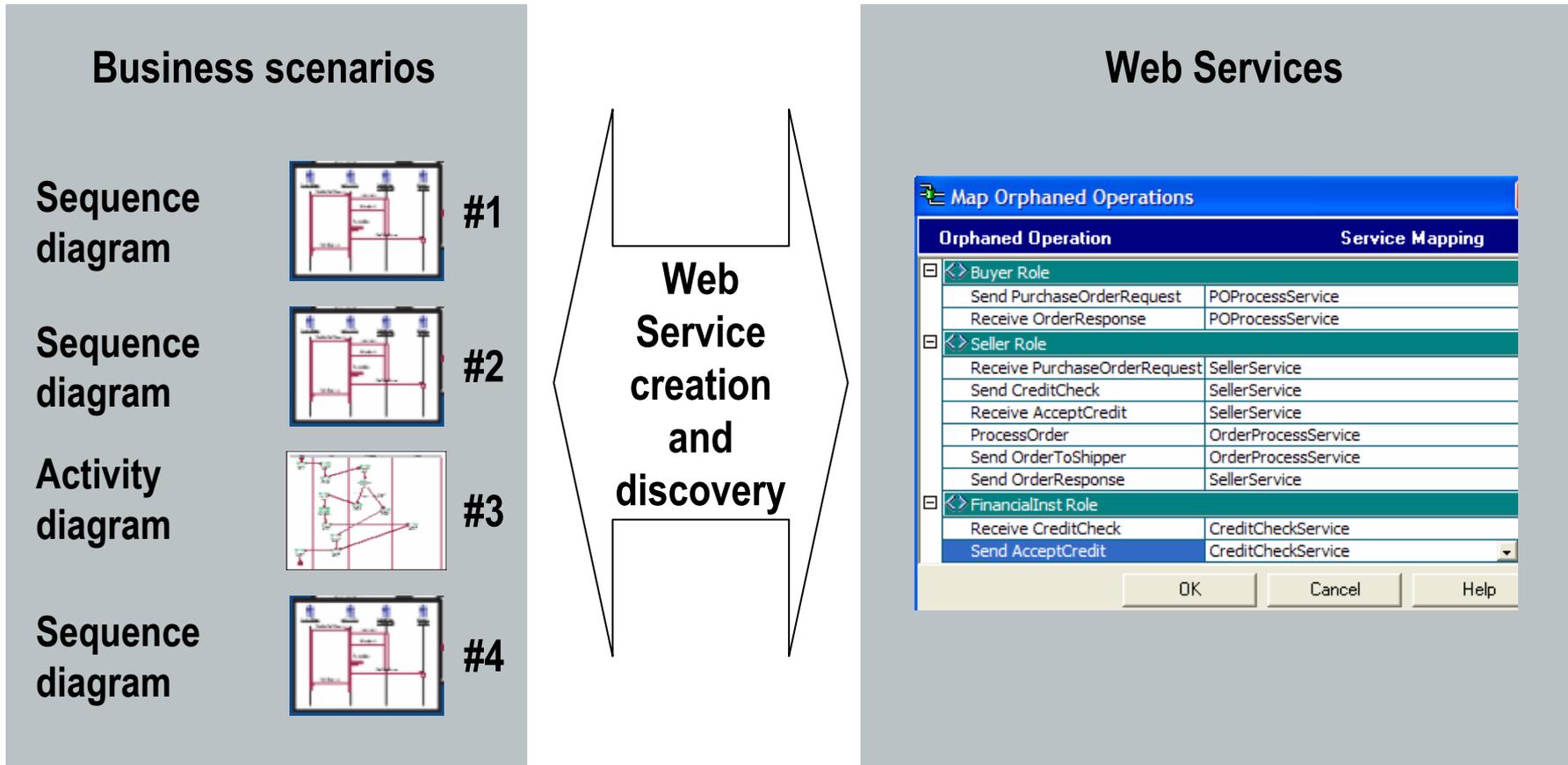

Business scenarios

Sequence diagram #1

Sequence diagram #2

Activity diagram #3

Sequence diagram #4

Web Service creation and discovery

Web Services

Map Orphaned Operations

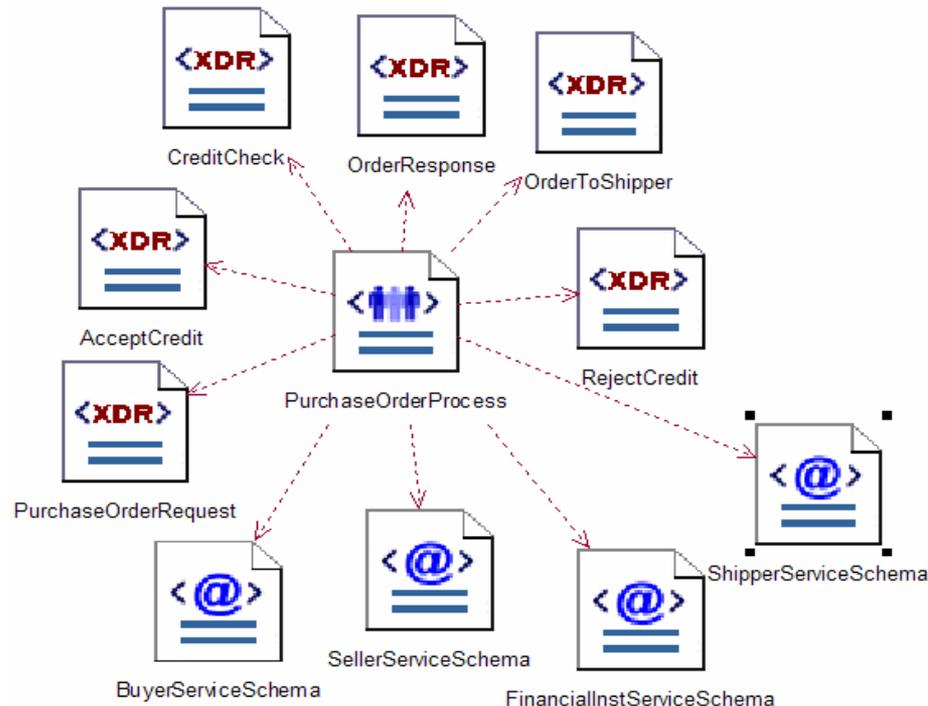| Orphaned Operation	Service Mapping
Buyer Role	
Send PurchaseOrderRequest	POProcessService
Receive OrderResponse	POProcessService
Seller Role	
Receive PurchaseOrderRequest	SellerService
Send CreditCheck	SellerService
Receive AcceptCredit	SellerService
ProcessOrder	OrderProcessService
Send OrderToShipper	OrderProcessService
Send OrderResponse	SellerService
FinancialInst Role	
Receive CreditCheck	CreditCheckService
Send AcceptCredit	CreditCheckService

OK   Cancel   Help

Web Services can be reused across business processes

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- **Business Scenario integration:**
  - Automatic Synthesis of the global view of the business process:
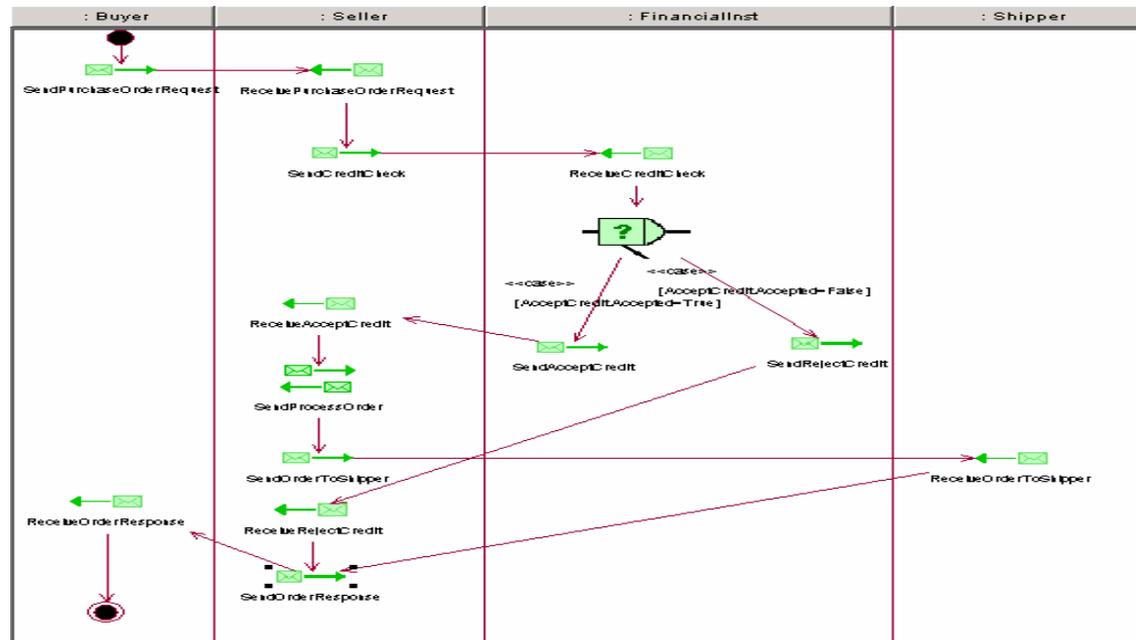   - Generates the structure of the global view of the business process

A business process is a multiparty collaboration between a set of Web Services and XML documents
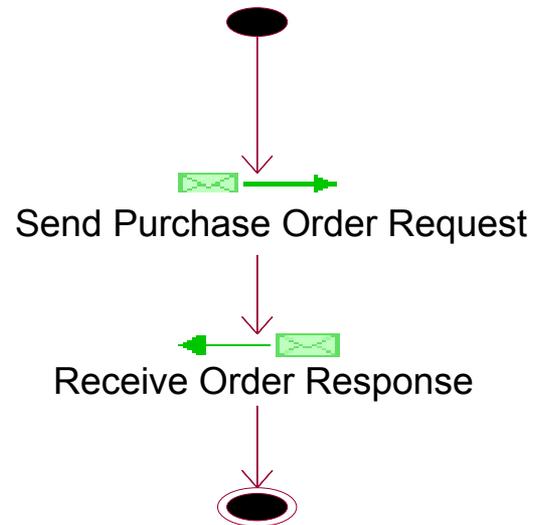

Each Web Service is provided by a trading partner involved in the collaboration

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- **Business Scenario integration (continued):**
  - Automatic Synthesis of the global view of the business process (continued):
    - Generates the behavior of the global view of the business process

Enforces a consistent view of the contract among trading partners
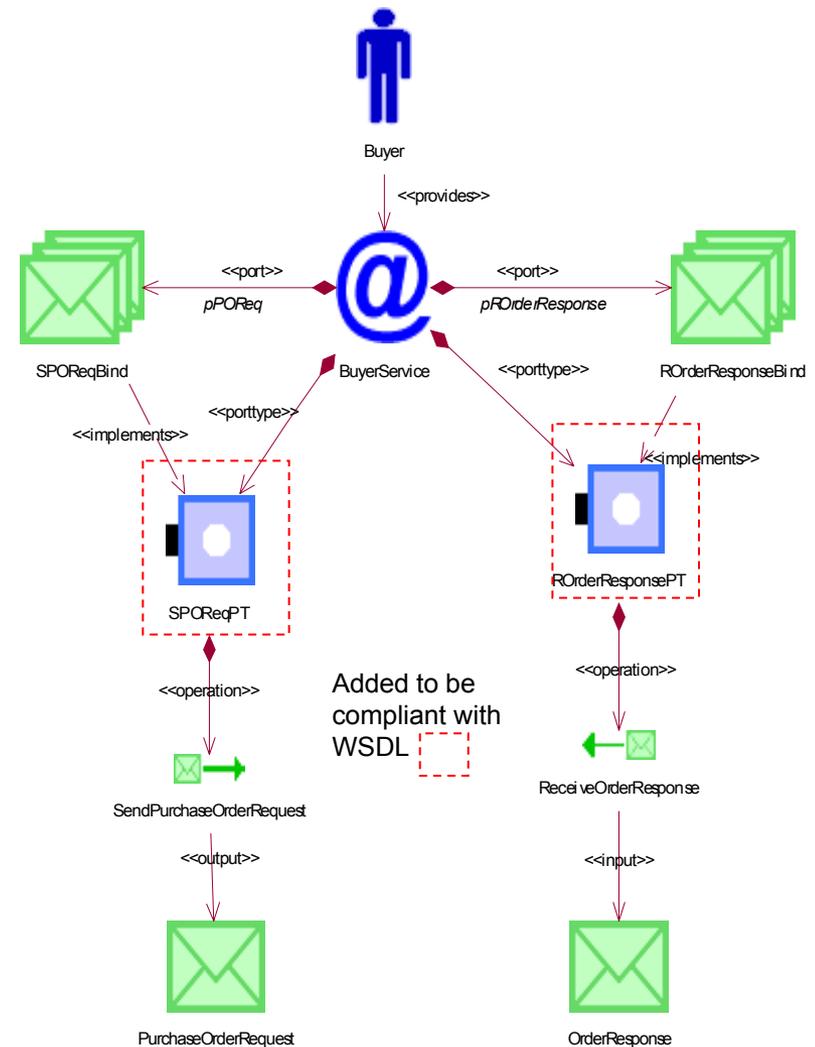

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- **Business Scenario integration (continued):**
  - Automatic Synthesis of the local views (Web Services) of the business process:
    - Generates the behavior of the local view of a trading partner that plays a role in the business process
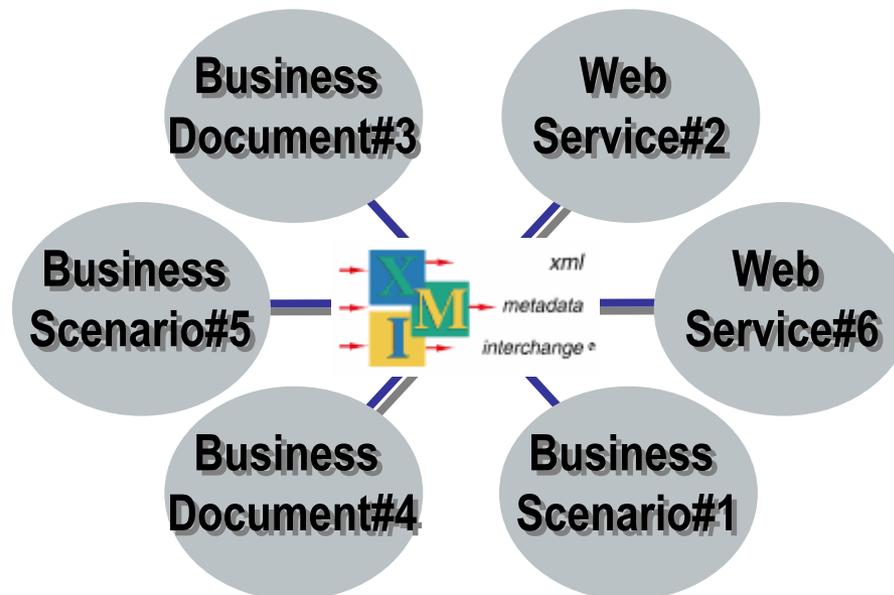
Send Purchase Order Request

Receive Order Response

- **Business Scenario Integration (continued):**
  - **Automatic Synthesis of the local views (Web Services) of the business process (continued):**
    - **Generates the structure of the local view of a trading partner that plays a role in the business process**
      - Binds operations of a business process with messages
      - Binds operations with a port implementation (manual step)
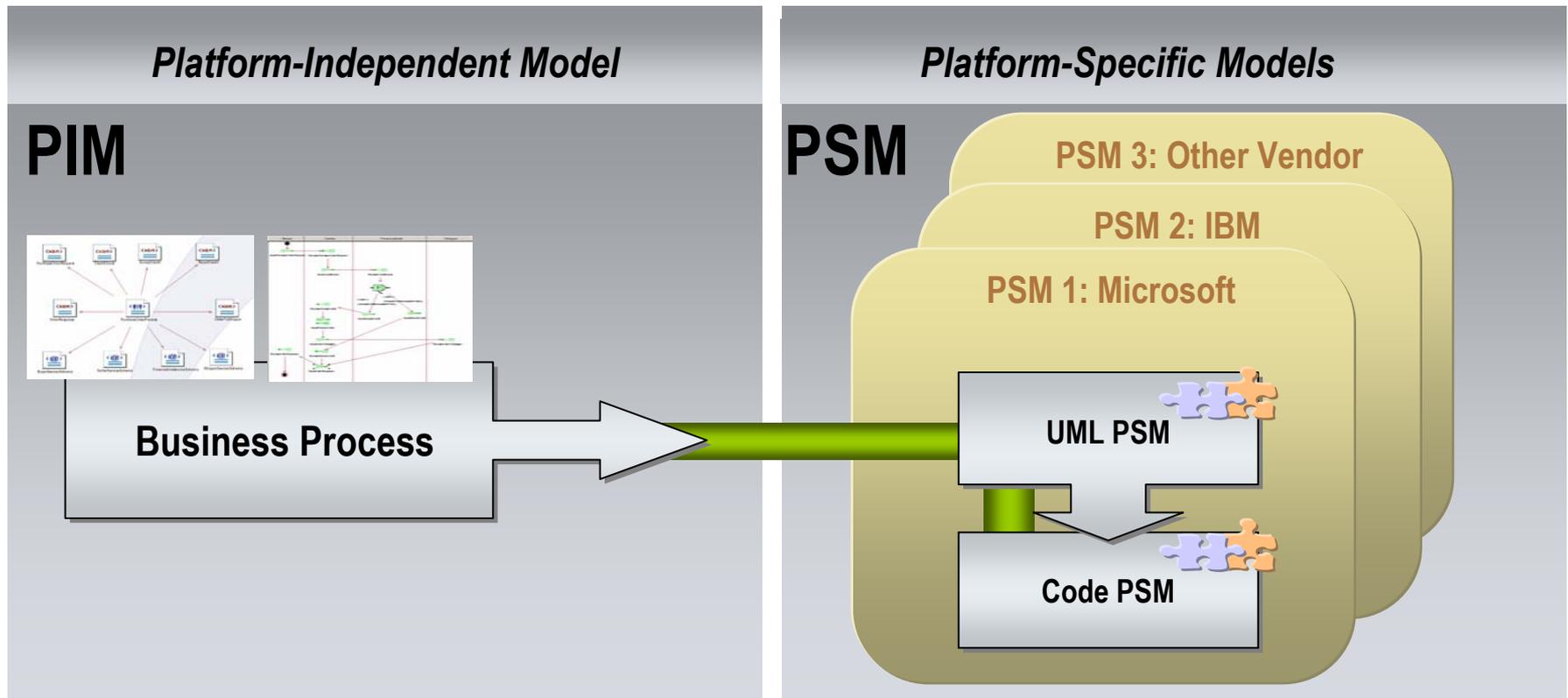
Reusing Business Scenarios, Business Documents and Web Services across Business Processes

- **Import/export using:**
  - Proprietary utilities among same UML modeling tool vendors
  - XMI 2.0 among different UML modeling tool vendors
- **Facilitates collaborative development**

- **Loosely-coupled implementation for a single business process**

Platform-Independent Model

PIM

Business Process

Platform-Specific Models

PSM

PSM 3: Other Vendor

PSM 2: IBM

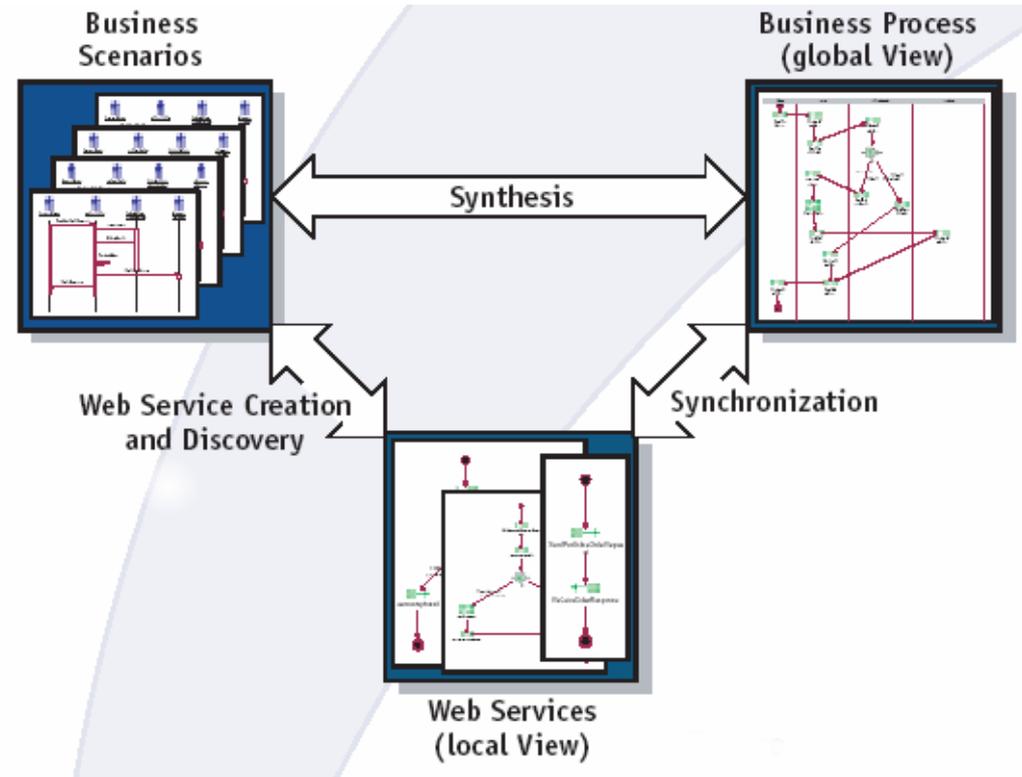PSM 1: Microsoft

UML PSM

Code PSM

Trading partners build Web Services using a .NET or Java platform and different vendors for their workflow engine

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Demonstration

- **Provides a UML platform for modeling:**

  - **Business scenarios**
  - **Business processes**
  - **Business documents**
  - **Web Services**

Business Scenarios — Synthesis — Business Process (global View)

Web Service Creation and Discovery — Synchronization

Web Services (local View)

Summary

- **Business scenarios can:**
  - Facilitate a collaborative and incremental approach for designing a business process
  - Reduce the risk and cost of creating and maintaining a business process

- **Synthesis of business scenarios generates the static and dynamic view of:**
  - The global business process
  - The local view for each trading partner, which is consistent with the contract describing the interaction among them

Summary

- **UML profile, MDA and XMI can:**
  - Maximize UML investments without requiring a working knowledge of the standard
  - Enforce a business process over a heterogeneous implementation

- **Web Services for EAI or B2B can be implemented as:**
  - Activities orchestrated by a workflow engine for each trading partner involved
  - Composite Web Services using a programming language like Java, C#, or VB