Websphere SOA foundation

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What is .....?

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

… service orientation?
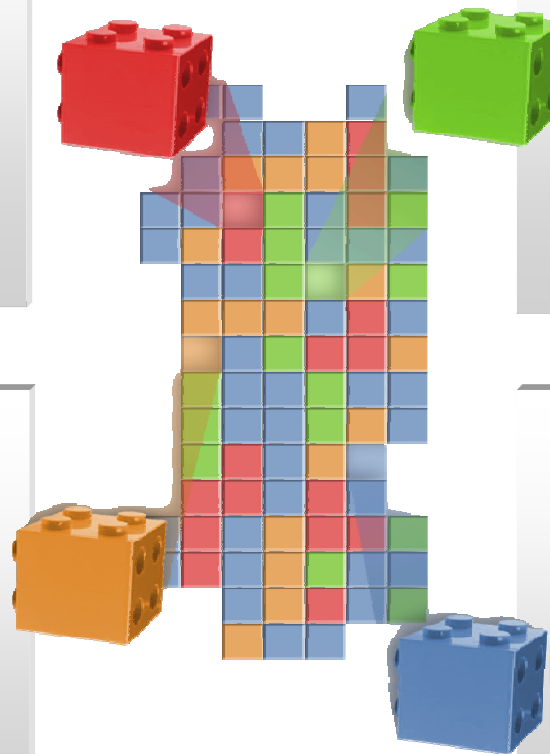
A way of integrating your **business as linked services** and the outcomes that they bring

… service oriented architecture (SOA)?

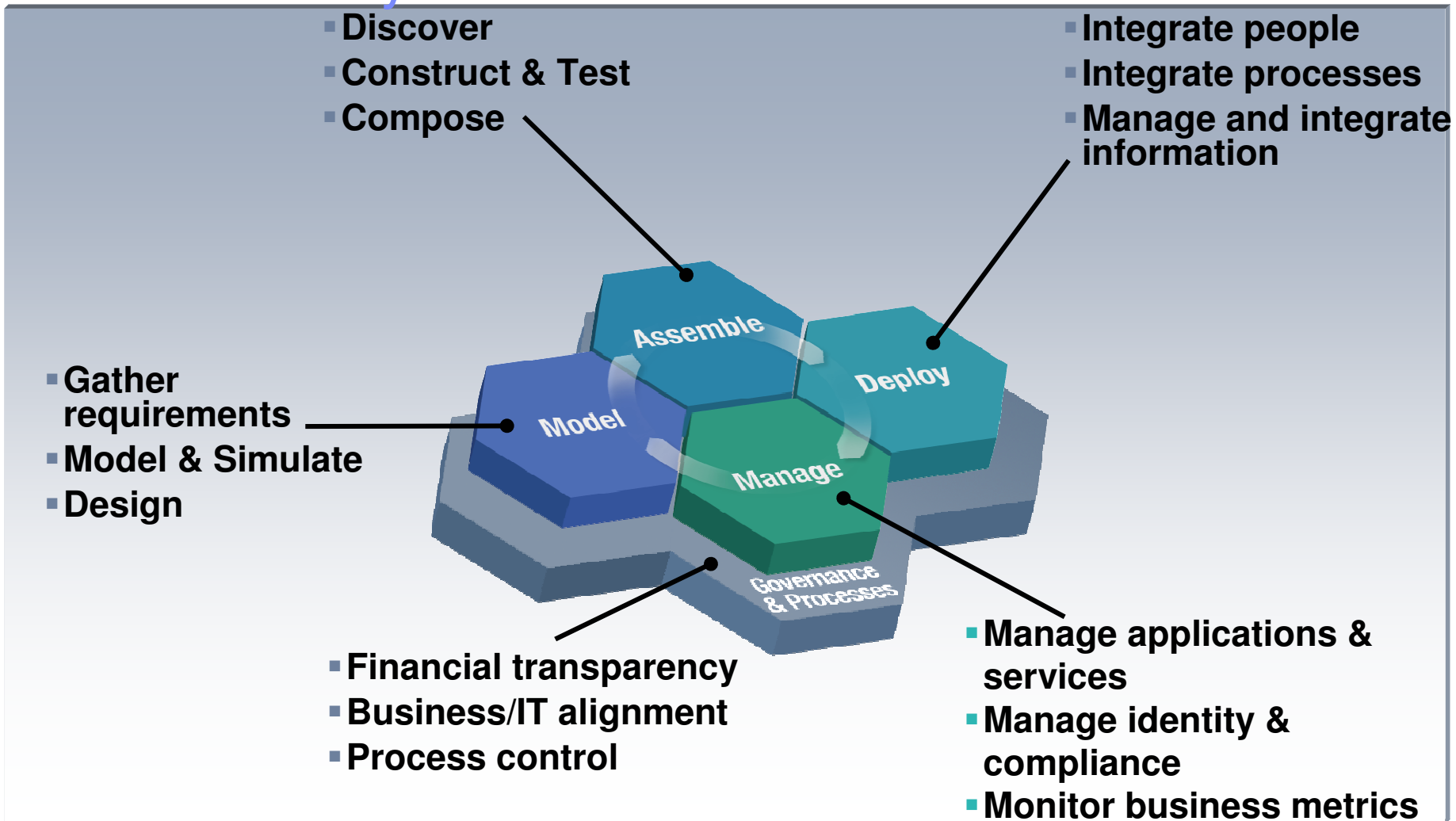An IT **architectural style** that supports service orientation

… a composite application?

A set of **related & integrated** services that support a business process built on an SOA

The SOA Lifecycle

- Discover
- Construct & Test
- Compose

- Integrate people
- Integrate processes
- Manage and integrate information

- Gather requirements
- Model & Simulate
- Design

Assemble

Deploy

Model

Manage

Governance & Processes

- Financial transparency
- Business/IT alignment
- Process control

- Manage applications & services
- Manage identity & compliance
- Monitor business metrics

SOA: Different from the Past

Standards

- Broadly adopted Web services ensure well-defined interfaces.
- Before, proprietary standards limited interoperability

Connections

- SOA services are linked dynamically and flexibly
- Before, service interactions were hard-coded and dependent on the application

Level of Reuse

- SOA services can be extensively re-used to leverage existing IT assets
- Before, any reuse was within silo'ed applications

Degree of Focus

- SOA services focus on business-level activities & interactions
- Before, focus was on narrow, technical sub-tasks

Organizational Commitment

- SOA unites Business and IT (66% of projects today are driven by line of business)
- Before, IT alone defined the design

SOA Reference Architecture -
Providing the technical underpinnings for the IBM SOA Foundation

Development Services

Integrated environment for design and creation of solution assets

Business Innovation & Optimization Services
Facilitates better decision-making with real-time business information

Interaction Services
Enables collaboration between people, processes & information

Process Services
Orchestrate and automate business processes

Information Services
Manages diverse data and content in a unified manner

Facilitates communication **ESB** between services

Partner Services
Connect with trading partners

Business App Services
Build on a robust, scaleable, and secure services environment

Access Services
Facilitates interactions with existing information and application assets

IT Service Management

Manage and secure services, applications & resources

Infrastructure Services
Optimizes throughput, availability and performance

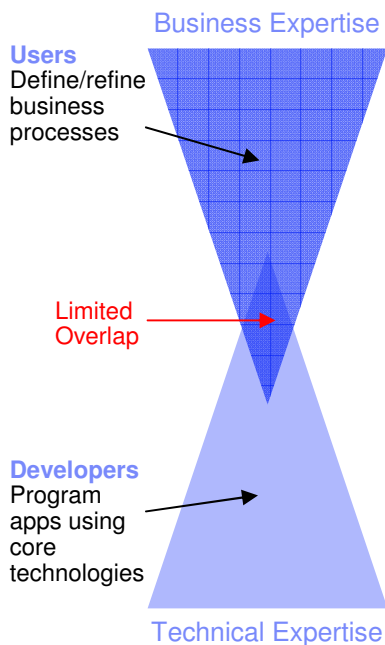# A new Programming Model for SOA

- **The IBM SWG Programming Model derives its SOA technical strategy and vision from the basic concept of a *service*:**
  - "A service is merely an abstraction that encapsulates a software function."
  - "*Developers* build services, use services and develop solutions that aggregate services."

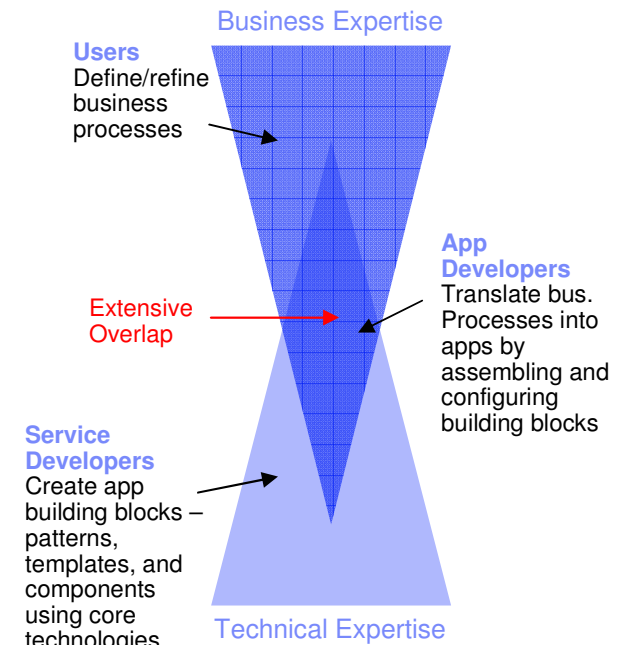- **Key to the IBM SOA is the expanding definition of the *developer* role**

  SWG SOA: Programming Model and Architectural Overview

  - The developer role embraces a number of roles and skills that are responsible for translating the definition of business processes into artifacts that codify the automation of those processes
    - Includes assembly and configuration of service component building blocks
    - Includes deriving patterns and templates
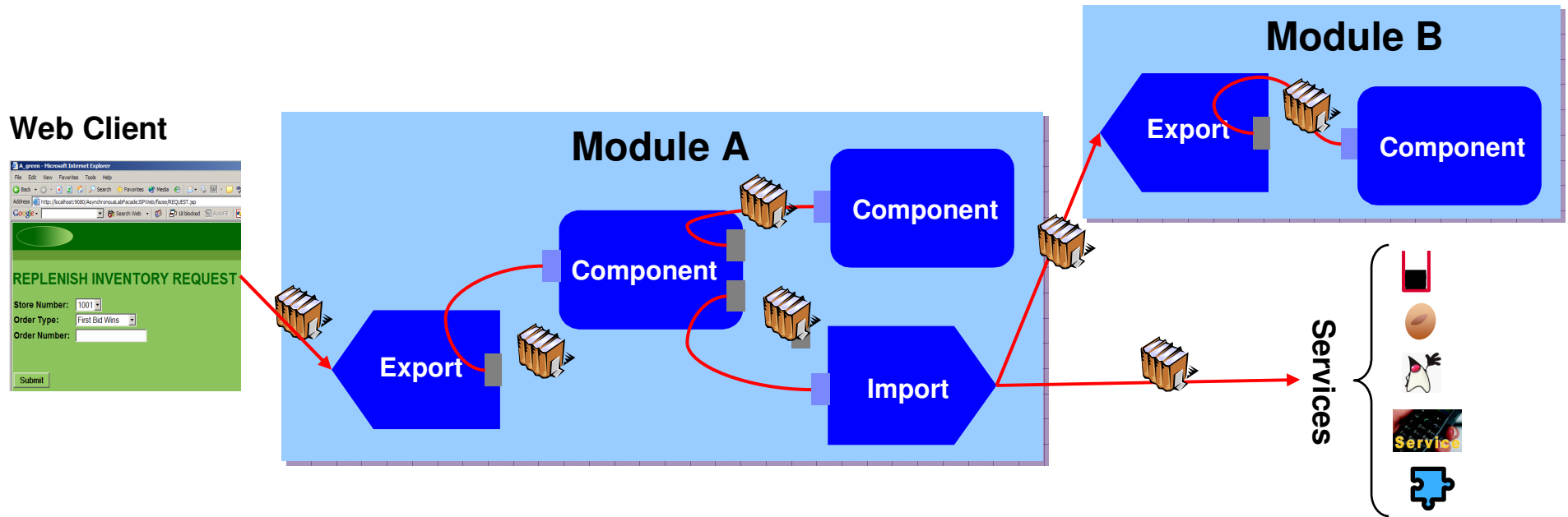   - Includes deep and specialized service component development

Business Expertise

Users
Define/refine business processes

Limited Overlap

Developers
Program apps using core technologies

Technical Expertise

Traditional Software Develoment

Business Expertise

Users
Define/refine business processes

App Developers
Translate bus. Processes into apps by assembling and configuring building blocks

Extensive Overlap

Service Developers
Create app building blocks – patterns, templates, and components using core technologies

Technical Expertise
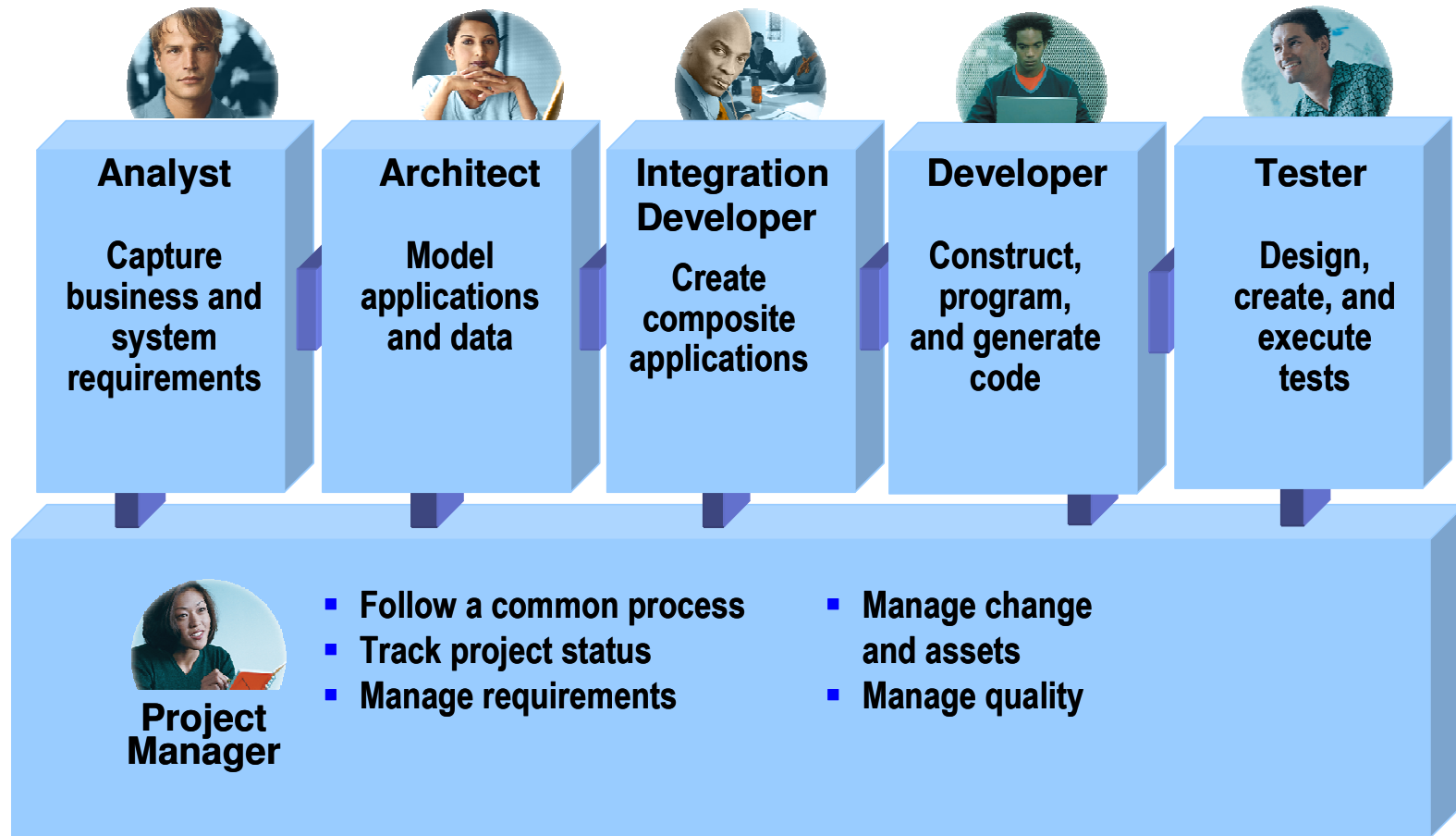
Service-Oriented Develoment

WebSphere Integration Server Programming Model ...

- **Modules contain "wired" Service Components**

- **Service Components use Business Objects for data**
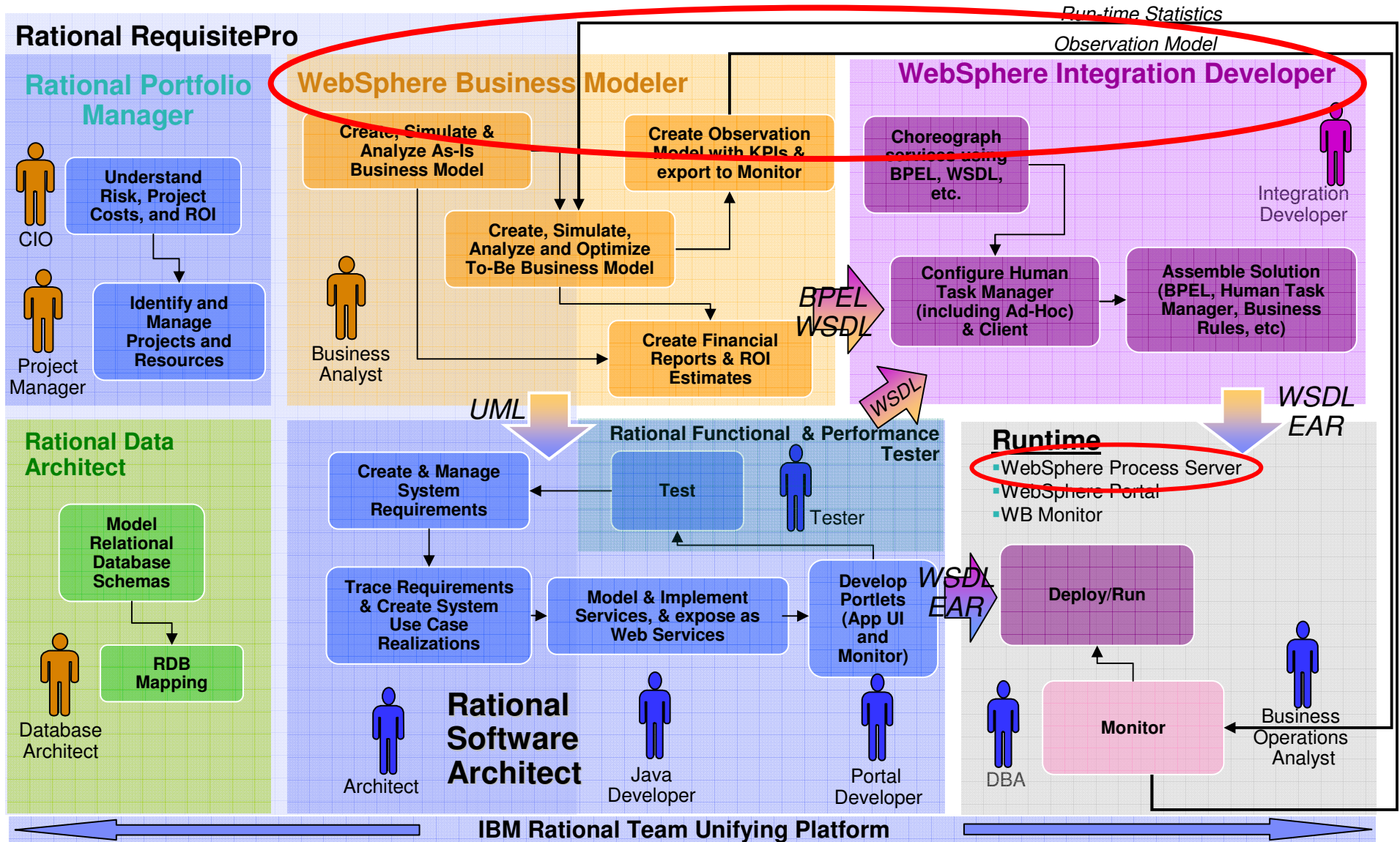
- **Solutions are a collections of Modules**

Wires | **Interfaces** | **References** | **BO**

Key Development Roles for SOA

Analyst	**Architect**	**Integration Developer**	**Developer**	**Tester**
Capture business and system requirements	Model applications and data	Create composite applications	Construct, program, and generate code	Design, create, and execute tests

Project Manager

- Follow a common process
- Track project status
- Manage requirements

- Manage change and assets
- Manage quality

The Big Picture of SOA Development Cycle

Rational RequisitePro

Rational Portfolio Manager

CIO

Understand Risk, Project Costs, and ROI

Project Manager

Identify and Manage Projects and Resources

WebSphere Business Modeler

Create, Simulate & Analyze As-Is Business Model

Create Observation Model with KPIs & export to Monitor

Business Analyst

Create, Simulate, Analyze and Optimize To-Be Business Model

Create Financial Reports & ROI Estimates

Run-time Statistics

Observation Model

WebSphere Integration Developer

Integration Developer

Choreograph services using BPEL, WSDL, etc.

Configure Human Task Manager (including Ad-Hoc) & Client

Assemble Solution (BPEL, Human Task Manager, Business Rules, etc)

BPEL WSDL

WSDL

Rational Data Architect

Model Relational Database Schemas

Database Architect

RDB Mapping

UML

Rational Functional & Performance Tester

Create & Manage System Requirements

Test

Tester

Trace Requirements & Create System Use Case Realizations

Model & Implement Services, & expose as Web Services

Develop Portlets (App UI and Monitor)

WSDL EAR

Rational Software Architect

Architect

Java Developer

Portal Developer

WSDL EAR

Runtime
- WebSphere Process Server
- WebSphere Portal
- WB Monitor

Deploy/Run

DBA

Monitor

Business Operations Analyst

IBM Rational Team Unifying Platform

IBM Products Supporting SOA Lifecycle

WebSphere Integration Developer*
Rational Application Developer
Workplace designer*

Process:
   WebSphere Process Server*
   WebSphere ESB*
   WebSphere Message Broker
   WebSphere Extended Deployment
People:
   WebSphere Everyplace Deployment*
   Workplace Collaboration Services
   Workplace Managed Client
Information:
   IBM Information Services

Assemble

Deploy

Model

Manage

Governance & Processes

WebSphere Business Modeler
Rational Software Architect

WebSphere Business Monitor
Tivoli Composite Application Manager*

* New products

WebSphere Business Modeler v6
Modeling business processes for SOA roll-out

Expanded user experience and analytical capabilities

- **More granular and precise modeling of activities**

- **Business analyst can now manage end-to-end processes across the organization**

- Collaborative modeling to enable team work

- **Ability to publish, share and comment on models through the web**

- **Versioning control for capturing most recent changes**
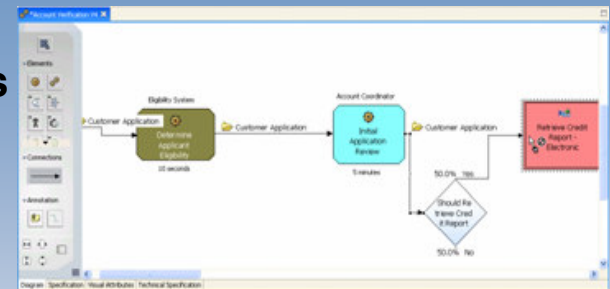
Business performance modeling

- **Fine tune operations to increase growth and market share**

- **Continuous process optimization and improvement**

WebSphere Integration Developer

Graphical Tools for Assembling Composite Applications

Streamlining process design hand-off between business and IT

- **Import and work with business process models directly from the business analyst (WebSphere Modeler)**
- **Single architecture that supports multiple roles**

Simplifying and speeding development

- **Easy to use tools where everything can be done through the GUI**
- **Can be the starting point for developing business processes through IT**
- **Single way to define all types of processes (human, automated, rules, etc.)**

Maximizing re-use

- **Ability to leverage existing services and develop for future reuse**
- **Leverages existing skills through technology built on Eclipse**
- **Migration tools allow you to use what you have today through WebSphere applications**
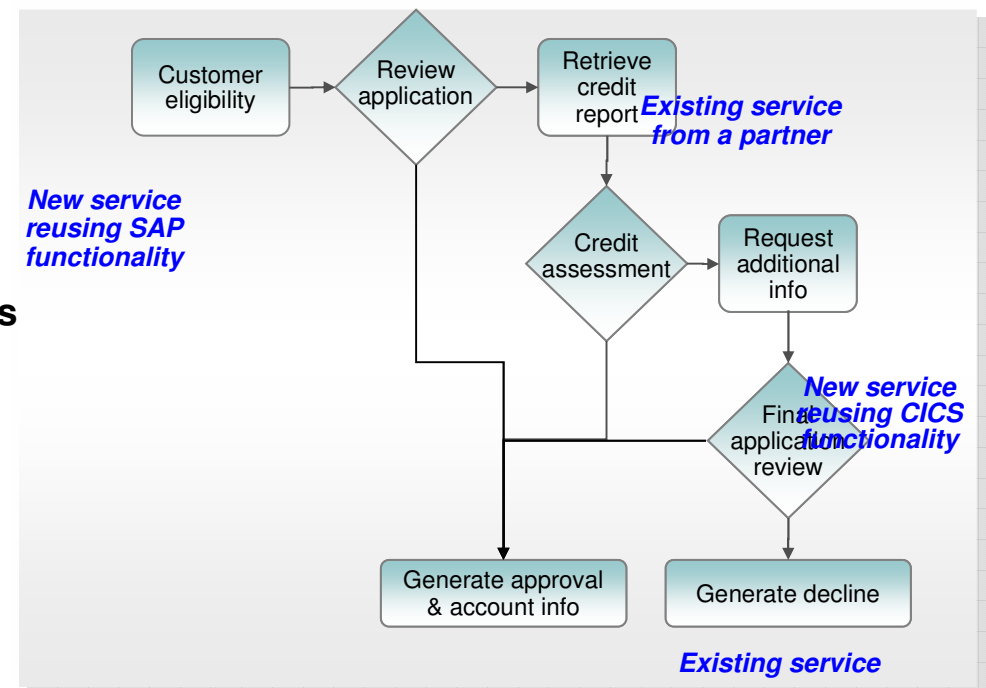
WebSphere Process Server

Comprehensive Business Flexibility

Businesses want to understand and change their operational processes quickly
…But their processes are: misunderstood, inconsistent, hard-wired, or inflexible

- **Support all aspects of process integration**
  - ✓ process flows
  - ✓ business rules
  - ✓ human steps
  - ✓ events
  - ✓ services
  - ✓ active state management

- **Rapidly change process behavior to keep pace with business requirements**
  - ✓ build process flows without knowing where the information is coming from (late binding of services)
  - ✓ business rules control the execution sequence of the process and can change dynamically

- **Based on an WebSphere ESB for Integration**
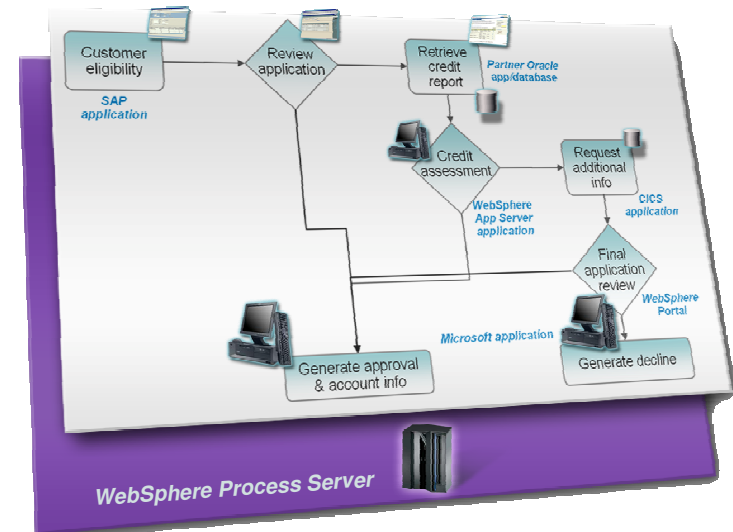
What is an Enterprise Service Bus (ESB)

Flexible connectivity infrastructure for integrating applications and services to power your SOA

▶ ROUTING **messages between services**

▶ CONVERTING **transport protocols between requestor and service**

▶ TRANSFORMING **message format between requestor and service**

▶ HANDLING **business events from disparate sources**

Color = Data type

Shape = Protocol
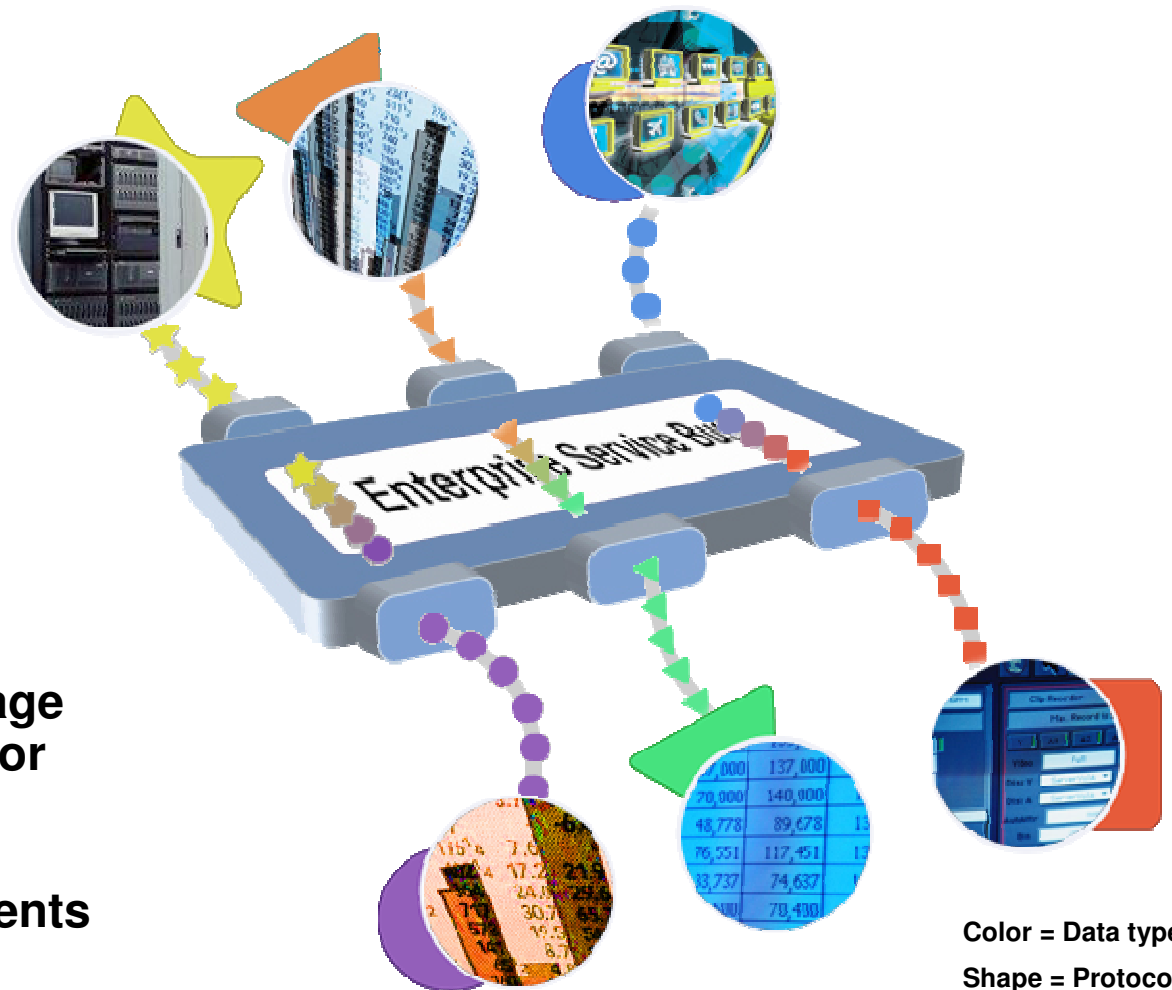
WebSphere ESB

Provides Web Services connectivity, JMS messaging and service oriented integration
- **Improve flexibility through the adoption of service oriented interfaces**
- **Minimize disruption by using an ESB to handle integration logic**

Ease of use
- **Integrated, interactive, and visual development experience requires minimal programming skills**
- **Simple to development, build, test, deploy and manag**

Improve time to value
- **Cost effective solution for services integration**
- **Support for over hundreds of ISV solutions**
- **Save time and development costs by utilizing pre-built mediations**
- **Dynamically re-configure to meet changing business needs**

Seamless integration with the WebSphere platform
- **Leverages WebSphere qualities of service: clustering, fail-over, systems management, security**
- **Easily extends to leverage WebSphere Process Server as needs dictate**
- **Integrates tightly with IBM Tivoli security and systems management offerings**

WebSphere Message Broker

Provides universal connectivity

- **Provides Web Services connectivity and non standard interface connectivity**
- **Unmatched ability in integrating many systems, platforms, devices, and APIs**
- **Facilitates service oriented integration**

Provides universal data transformation

- **Advanced message transformation, enrichment, and routing**
- **Option to use WebSphere DataStage TX**
- **Support for industry standard data formats (AL3, HL7, SWIFT, HIPAA, EDI, etc.)**

- **Leverage existing skills with rich Java and XML support**
- **Implement complex event processing with no programming**
- **Offers simple and easy to use tools with advanced capabilities**

Leverage the performance

- **Offers performance of traditional transactional processing environments**

Integrate standards-based as well as existing non-service enabled applications into an SOA
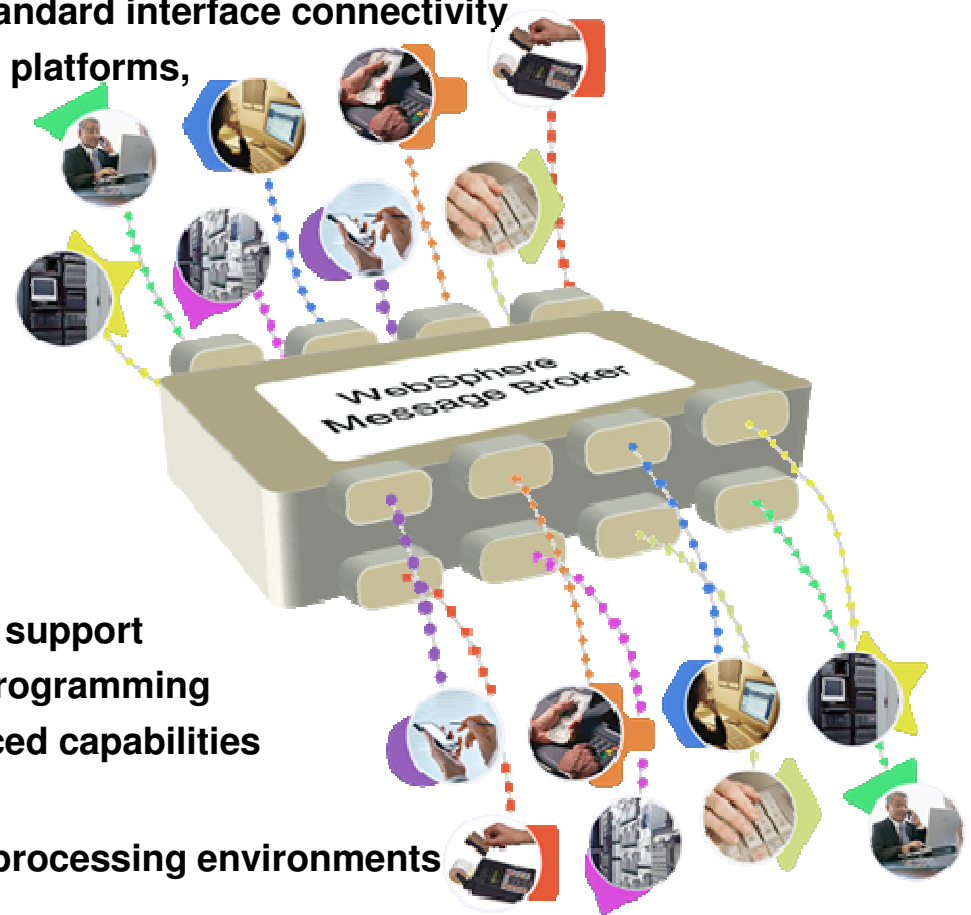
Selecting an ESB Depends Upon Your Requirements

	Full J2EE, JMS, and Web Services focus	Integration of Services with non-Services Applications
	WebSphere ESB	**WebSphere Message Broker**
Web Services Support	●	●
Message Transport & Protocol Switching	●	●
Intelligent Routing & Message Logging	●	●
Event Driven Processing	●	●
Transformation of XML Data Formats	●	●
Transformation of non-XML Data Formats		●
Complex Event Processing		●
Sensor & Device Integration		●
Native Integration with CICS & VSAM		●
Third party JMS integration		●

Enterprise Service Bus

Summary ...

- Key Themes

  - Simplicity and skill acceleration
    - Provide a simpler programming model

  - Reduced time to deployment
    - Solution building blocks based on integration-level concepts and patterns rather than J2EE artifacts

- The Programming Model

  - Invocation - Components (Service Component Architecture)

  - Data - Business Objects

  - Composition - SCA Components + SCA wires = SCA modules

- Role Based Development Environment

  - WebSphere Integration Developer V6.0
    - Integration Developer assembles composite applications
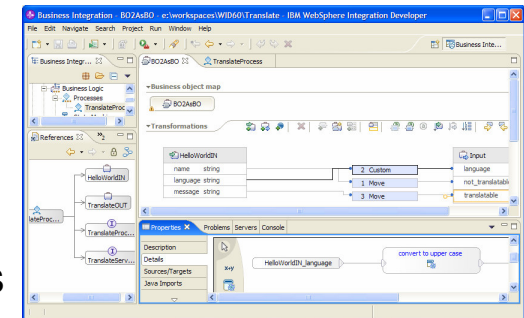
Resources

BPEL

- BPEL Specification
  http://www-106.ibm.com/developerworks/webservices/library/ws-bpel/

- OASIS Technical Committee
  http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsbpel

WBI Server Foundation

- WBI Server Foundation
  http://www-306.ibm.com/software/integration/wbisf/

- WebSphere Studio Application Developer Integration Edition
  http://www-306.ibm.com/software/awdtools/studiointegration/

- Various Redbooks: http://www.redbooks.ibm.com/

CEI

- Common Base Event Specification at
  http://www-106.ibm.com/developerworks/webservices/library/ws-cbe/

- Further information can be found in the Infocenter at
  http://publib.boulder.ibm.com/infocenter/ws51help/index.jsp

धन्यवाद
Hindi

多謝
English

Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Merc i
French

شكراً
Arabic

Obrigado
Brazilian Portuguese

Grazie
Italian

多谢
Simplified Chinese

Danke
German

நன்றி
Tamil

ありがとうございました
Japanese

감사합니다