IBM SOA Architect Summit

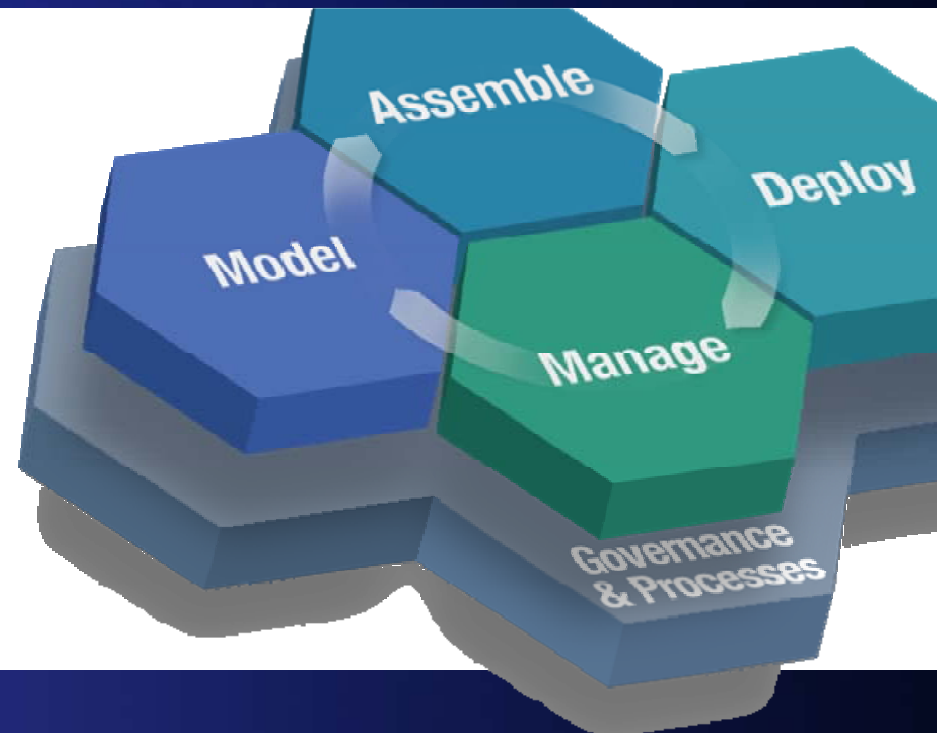Assemble

Deploy

Model

Manage

Governance
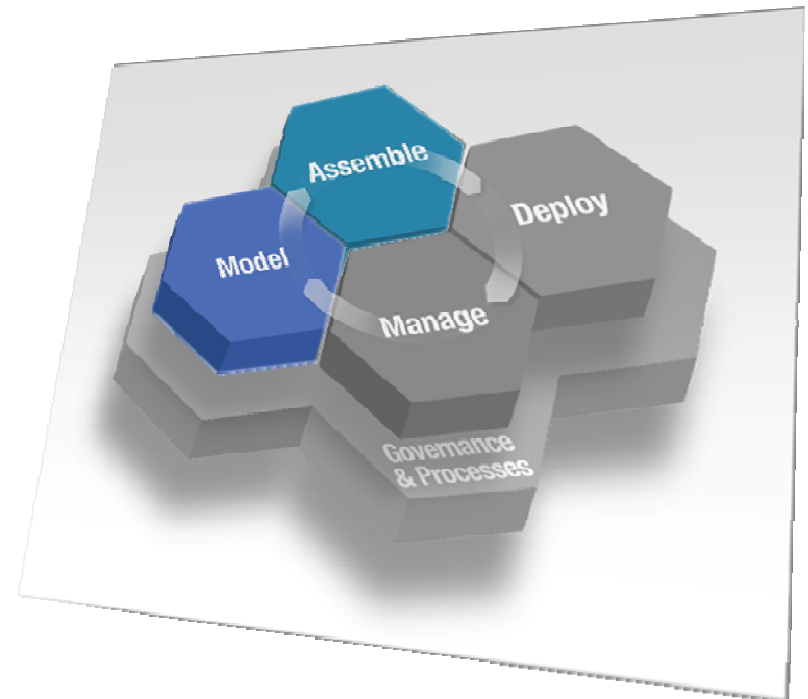& Processes

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Model and Assemble: Business Driven Development
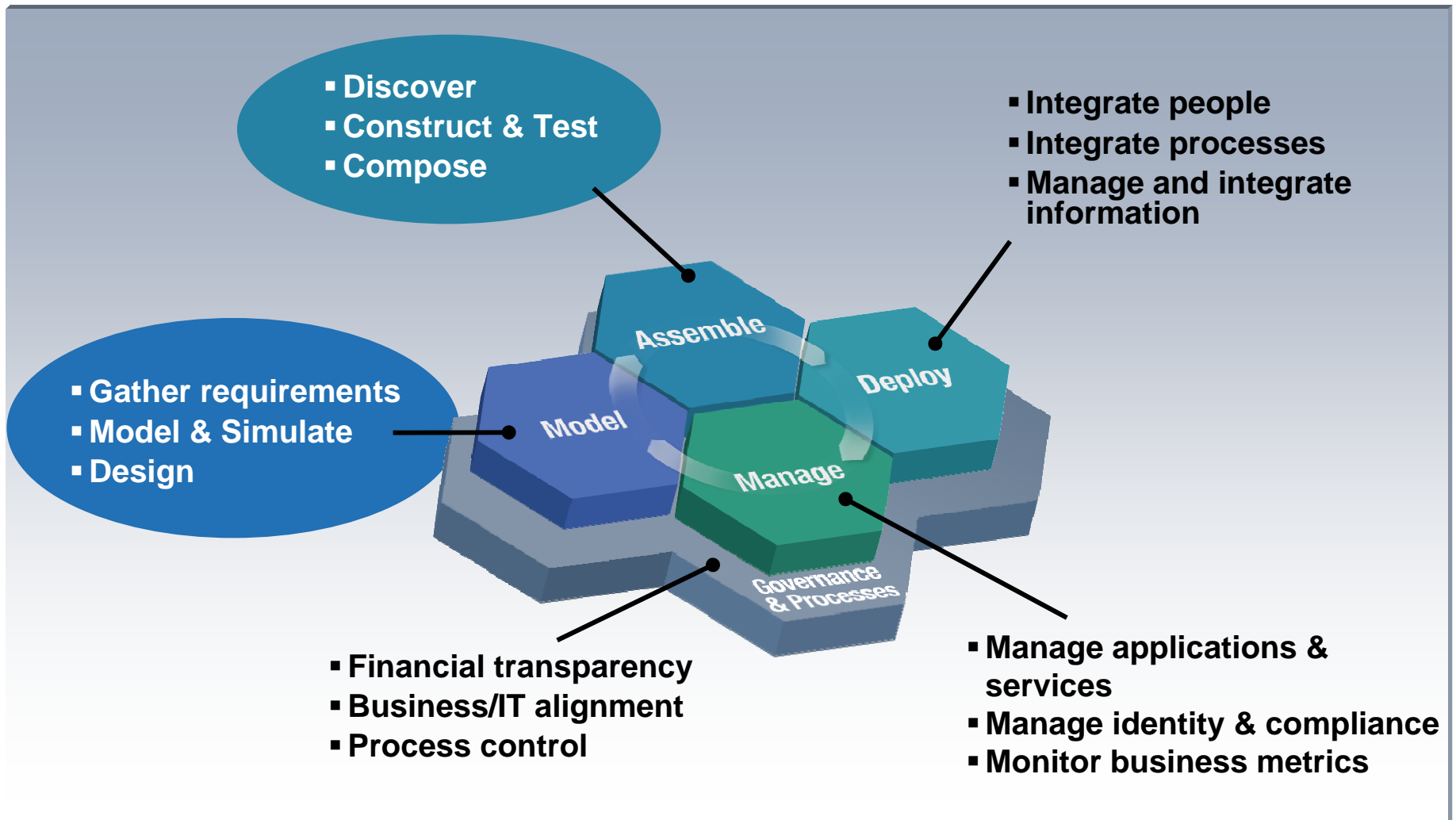
- A Presentation for the Enterprise Architect

Agenda

- **Business Driven Development for SOA**

- **Software Development Platform for Business Driven Development and SOA**

- **Summary**

SOA Operating Environment for Composite Applications

- **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**

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Complexity is Forcing Change
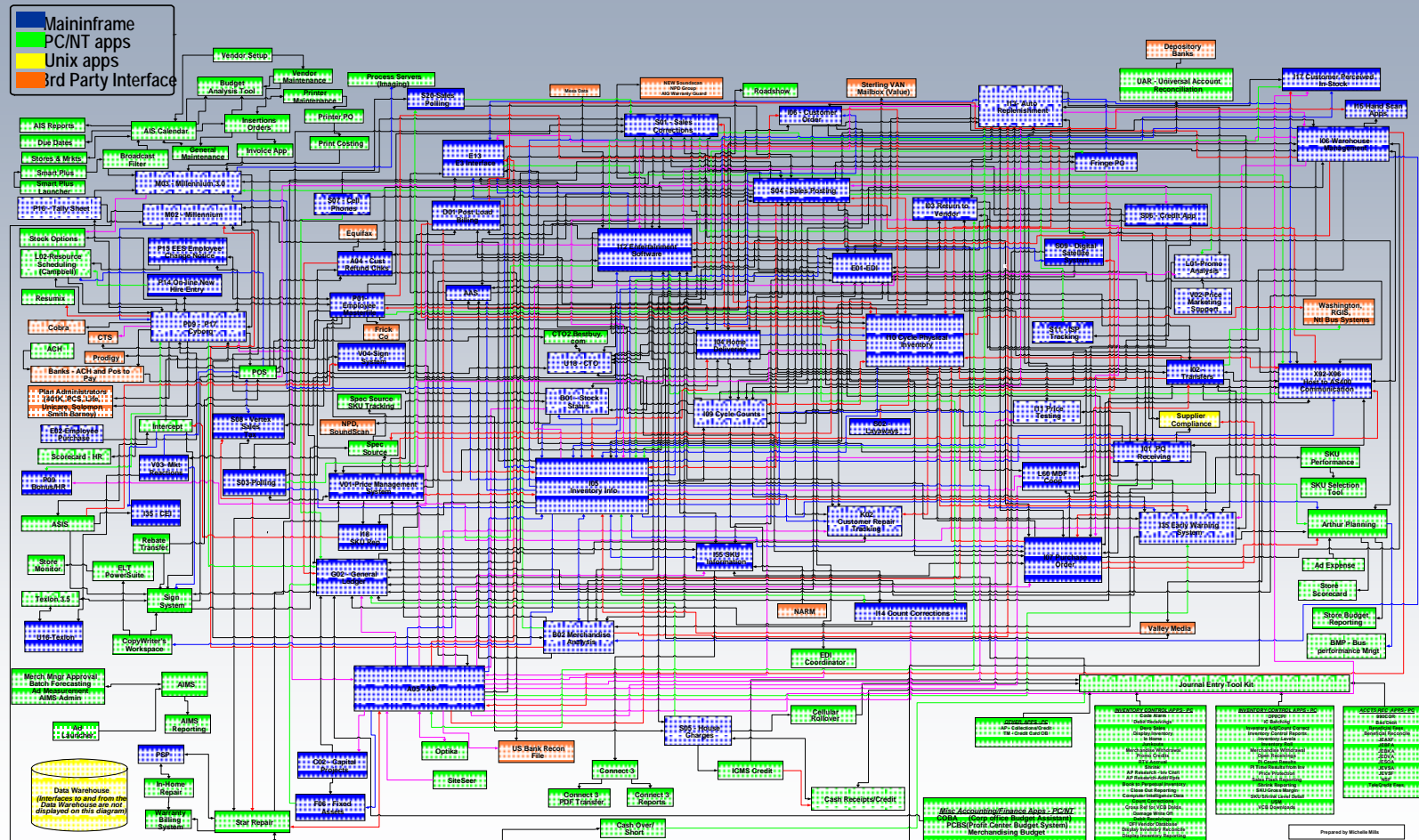
Actual Application Architecture for Consumer Electronics Company

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But … Tools & Technology Applied Correctly
Can Pave the Way for Successful Business Innovation

- Standards (including open source) for interoperability

- Self-defined, loosely coupled interfaces

- Tools to visualize and integrate existing assets

- Model Driven Architecture (MDA)

- Declarative specifications and languages

- **Architecture is the key to successful business innovation**

Case Study: Procure to Pay Process

Customer

Division

Shared Service

Supplier

Outsourced

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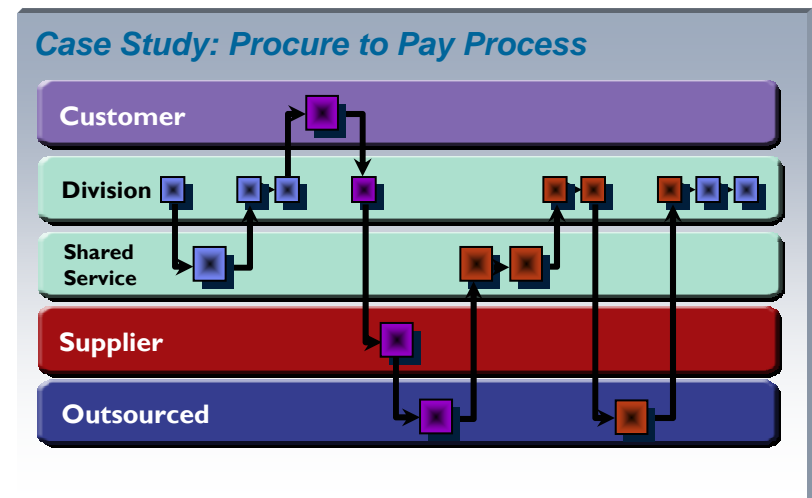
Three Key Concepts
To Adapt for Business Driven Development

Service Oriented Architecture

-- Focus on Flexibility and Reuse

- *An approach for designing and implementing distributed systems that allows a tight correlation between the business model and the IT implementation*

Model Driven Architecture

-- Focus on Efficiency and Quality

- *A style of enterprise application development and integration based on using automated tools to build system independent models and transform them into efficient implementations.*

Business Innovation and Optimization

-- Focus on Responsiveness and Optimization

- *A monitoring and management approach that leverages integrated resources to achieve aligned, accountable, and action-oriented business operations*

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Patterns Accelerate Business Driven Development

Systematic:
top-down approach to building systems

Opportunistic: start at any point

Business
business processes and models
for business problems

- Business Model/Process Patterns
- Cross-Industry Business Patterns

Operational Architecture
solution architecture and runtime
views mapped to business processes

- Patterns for e-Business (P4eb)
- Process integration patterns (P4eb)
- Data integration patterns (P4eb)
- SOA & Web Services patterns
- Enterprise integration patterns
- System management patterns (P4eb)
- Information integration patterns (P4eb)

Application Architecture
application architecture,
design and development solutions

- Cross-industry business application patterns (P4eb)
- LWP templates
- SOA design patterns
- Design patterns (ISSW, ODSD)
- Data model & Grid patterns
- Legacy transformation patterns

Deployment
component and service mapping
to servers and nodes

- PRiSM patterns
- Rainforest patterns
- Data management patterns
- Application & infrastructure deployment patterns
- Testing patterns

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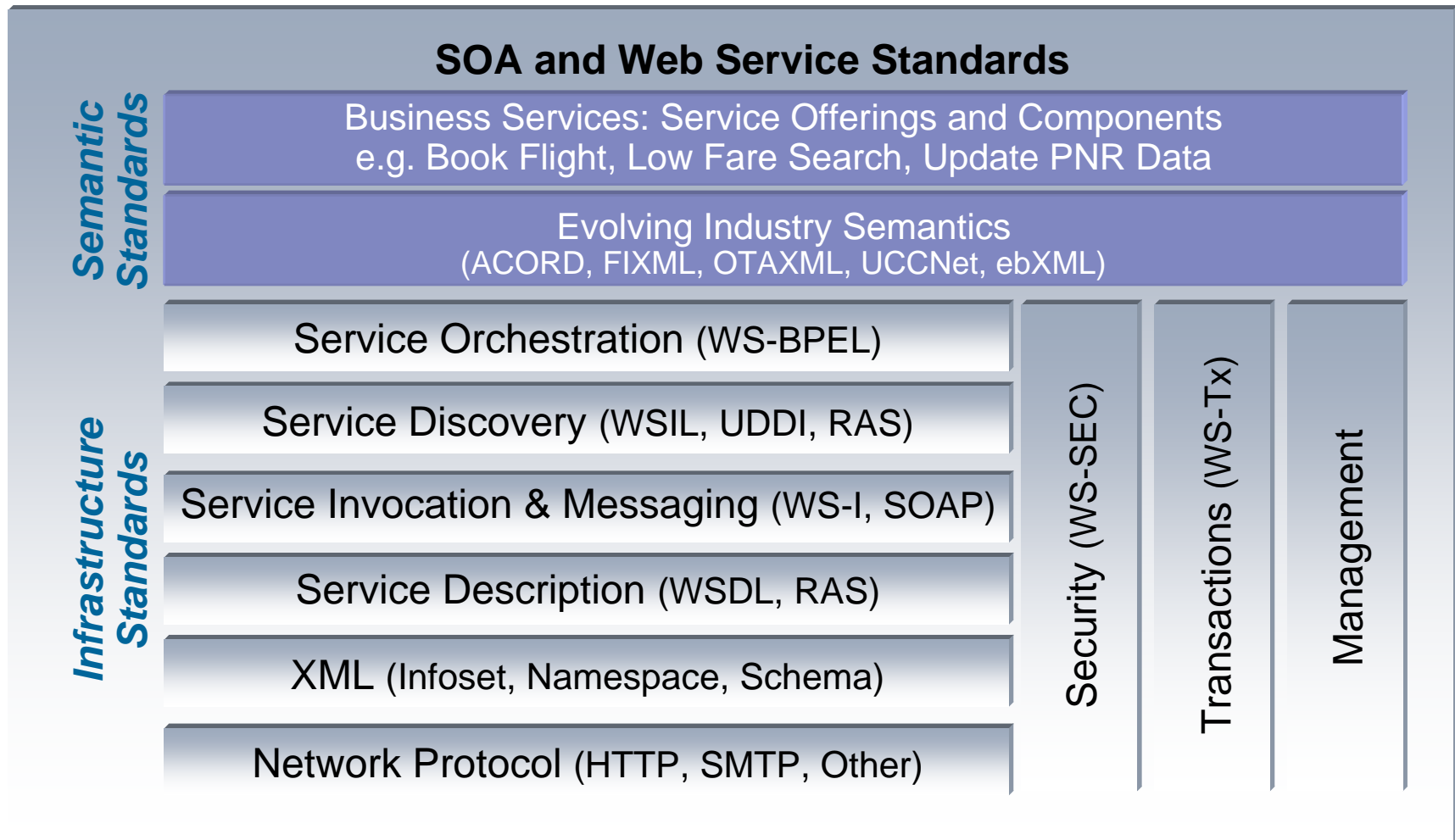
IBM Pattern Solutions

- IBM Pattern Solution Assets currently available:

  - Enterprise Patterns

    - J2EE Patterns

      - Session Façade, Business Delegate, Message Façade, etc.

  - WebSphere Platform Messaging Patterns

- New patterns are being developed:

  - Security Patterns
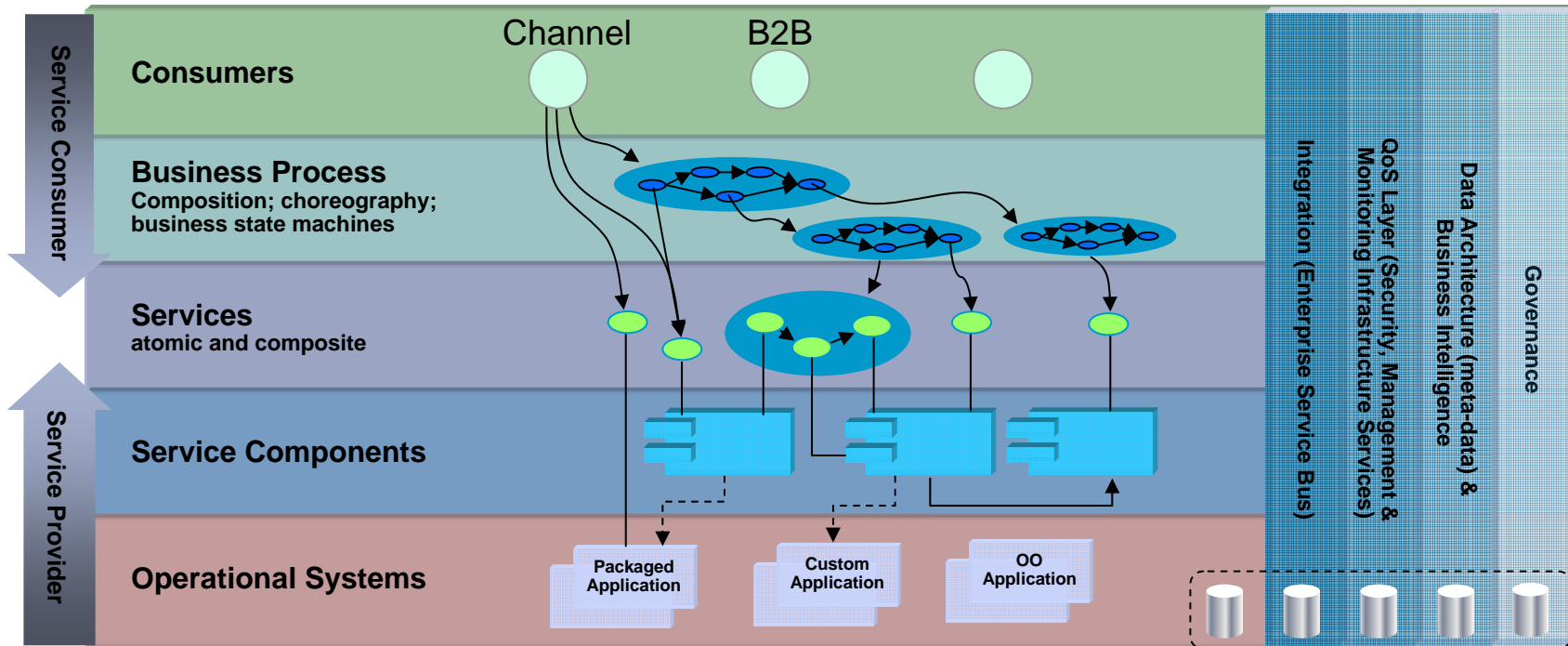
  - Portlet Patterns

  - ESB Patterns

  - More …

  ***ibm**.com/developerworks/rational/products/patternsolutions/*

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Key Standards and Technologies
Used in Business Driven Development

SOA and Web Service Standards

Semantic Standards

Business Services: Service Offerings and Components
e.g. Book Flight, Low Fare Search, Update PNR Data

Evolving Industry Semantics
(ACORD, FIXML, OTAXML, UCCNet, ebXML)

Infrastructure Standards

Service Orchestration (WS-BPEL)

Service Discovery (WSIL, UDDI, RAS)

Service Invocation & Messaging (WS-I, SOAP)

Service Description (WSDL, RAS)

XML (Infoset, Namespace, Schema)

Network Protocol (HTTP, SMTP, Other)

Security (WS-SEC)

Transactions (WS-Tx)

Management

Moving to Services-Oriented Solutions

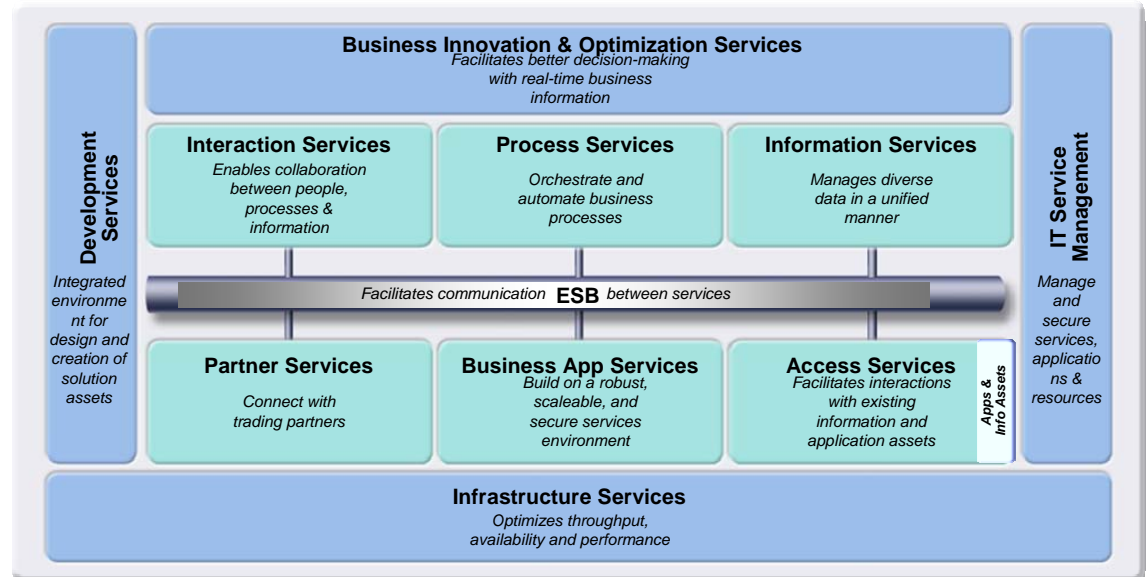*SOA on your terms and our expertise*

Key Development Phases in Business Driven Development

- **Model**
  - Business Level Modeling
  - Service Oriented Modeling and Design

- **Assemble**
  - Construction of Services (User, Service, Information)
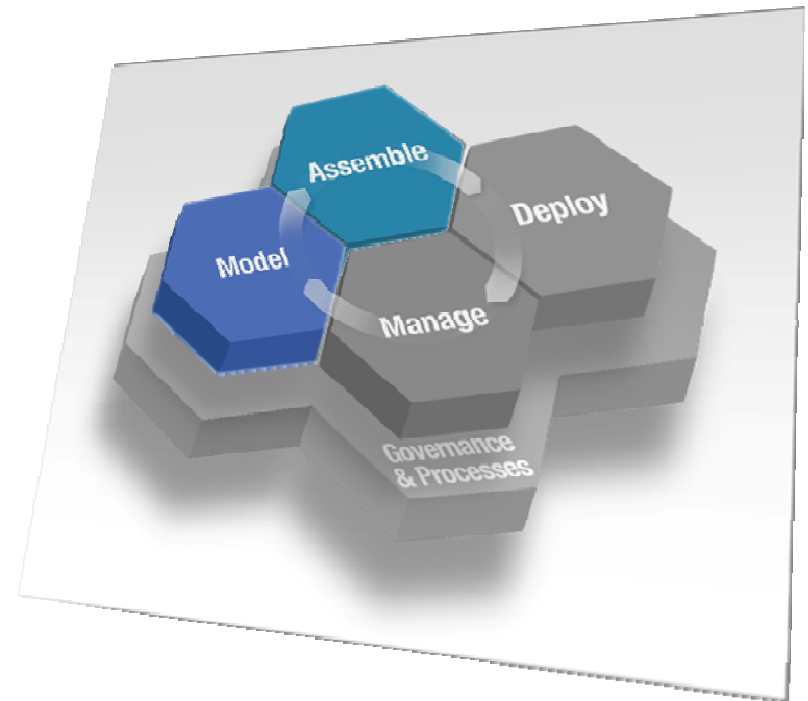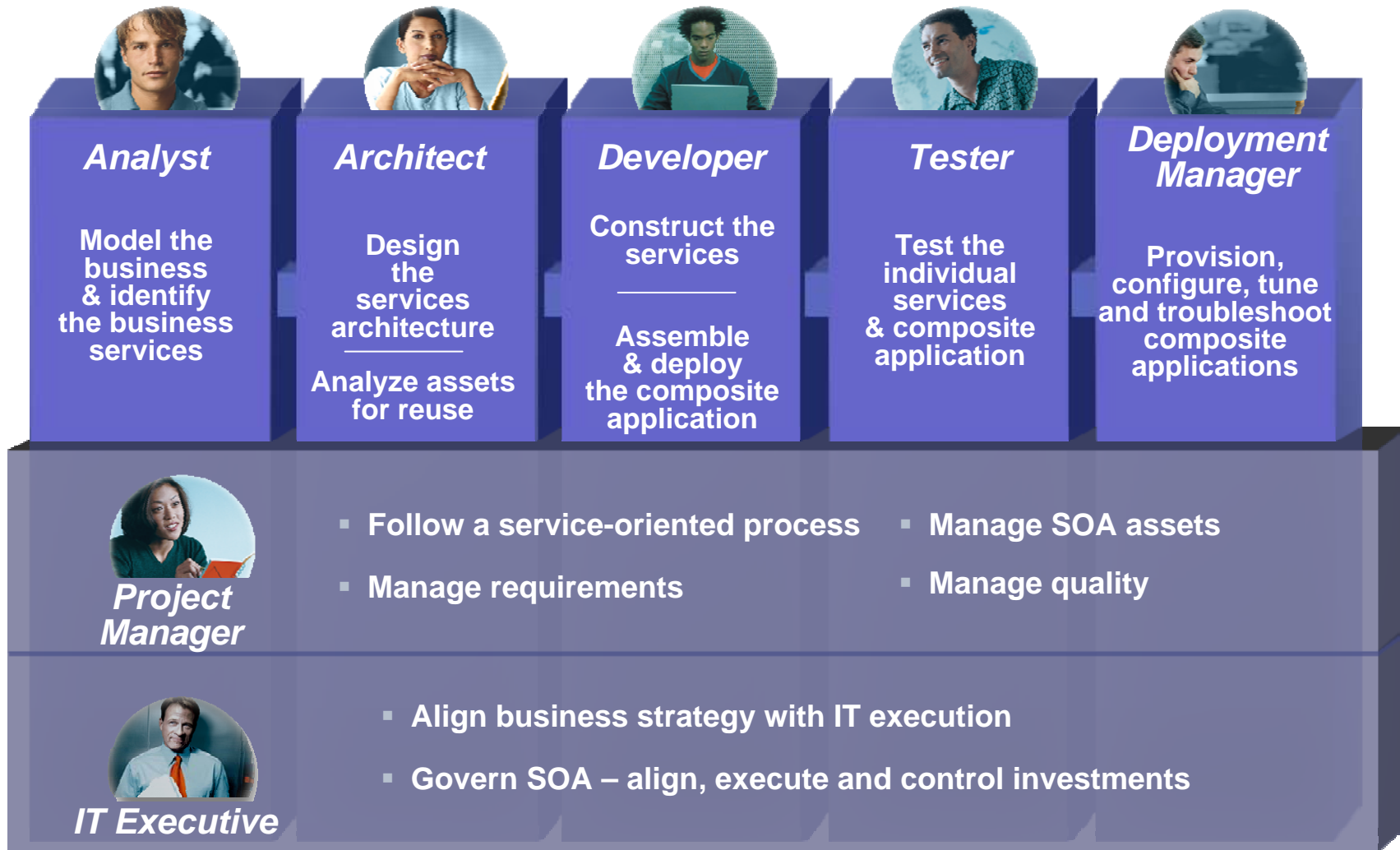 - Assembly of services (new and existing)
  - Choreography of Services

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

Development Services
Integrated environment for design and creation of solution assets

Interaction Services
Enables collaboration between people, processes & information

Process Services
Orchestrate and automate business processes

Information Services
Manages diverse data 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

Apps & Info Assets

IT Service Management
Manage and secure services, applications & resources

Infrastructure Services
Optimizes throughput, availability and performance

- **End result:**
  - A deployed business process and associated services
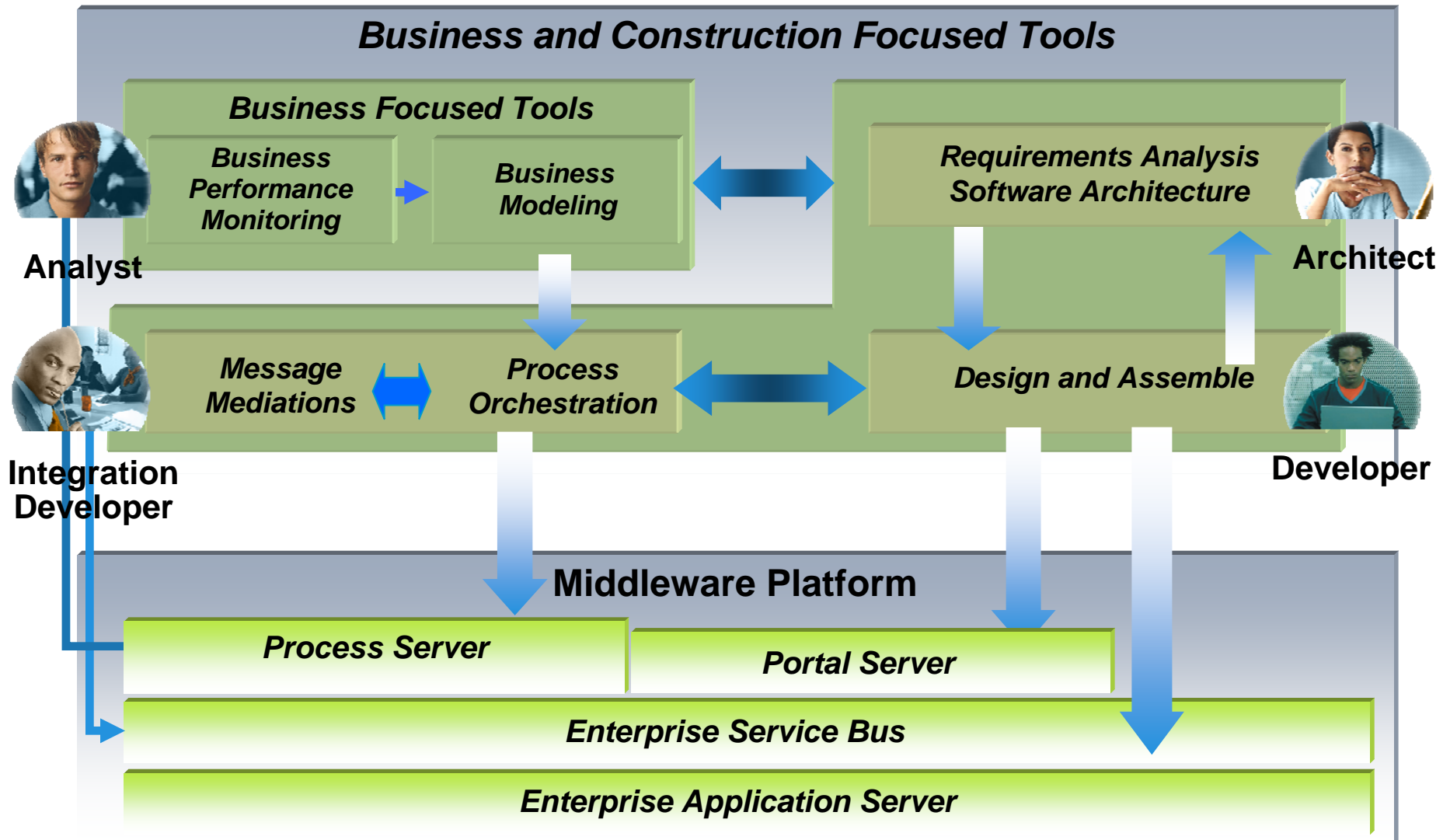
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Agenda

- Business Driven Development for SOA

- Software Development Platform for Business Driven Development and SOA

- Summary

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The IBM Rational Software Development Platform

Analyst	**Architect**	**Developer**	**Tester**	**Deployment Manager**
Model the business & identify the business services	Design the services architecture ───── Analyze assets for reuse	Construct the services ───── Assemble & deploy the composite application	Test the individual services & composite application	Provision, configure, tune and troubleshoot composite applications

Project Manager

- Follow a service-oriented process
- Manage requirements
- Manage SOA assets
- Manage quality

IT Executive

- Align business strategy with IT execution
- Govern SOA – align, execute and control investments

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Business Driven Development Scenario

Business and Construction Focused Tools

Business Focused Tools

Business Performance Monitoring → Business Modeling ↔ Requirements Analysis Software Architecture

Analyst

Architect

Message Mediations ↔ Process Orchestration ↔ Design and Assemble

Integration Developer

Developer

Middleware Platform

Process Server

Portal Server

Enterprise Service Bus

Enterprise Application Server

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Business Process Modeling and Analysis

Analyst

- Business analyst analyzes, designs, tests, and simulates business process
- Model from a Business perspective
  - As is and to be modeling
  - Business service identification
  - Specification of business KPI's
    - e.g. Average time to open an account should be <18 hours
    - 80% or more of the total account opening requests should be approved
- Business-level simulation
  - Used to optimize business process by understanding Process Duration, Costing, ROI, etc.
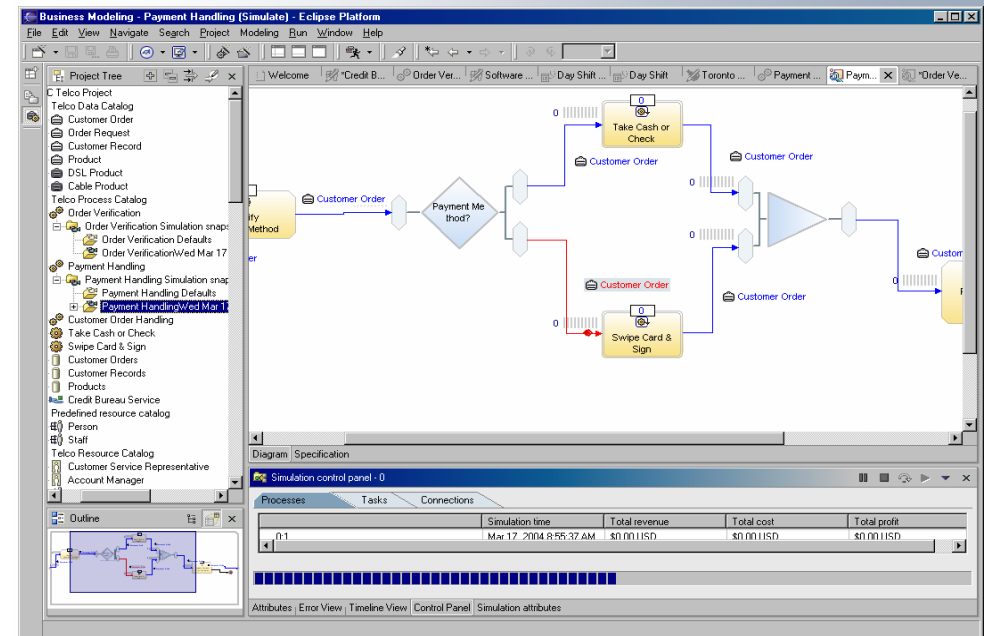
Customer Benefit:

  - Business-level tools for modeling and simulation
  - Describe business-level services in context of business improvement

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# Service Oriented Analysis, Modeling, and Design

Architect

- Business Process Model can be transformed and visualized as a UML model
  - Create the design model from the business process model
  - Understand the business intent

- IT service identification:
  - Create design model for new services (top-down)
  - Identify existing components for reuse (bottom-up)
  - Meet in the middle (most common)
  - UML Profile for Software Services aids in designing software services

- Artifacts in Design Models can be transformed into efficient service implementations
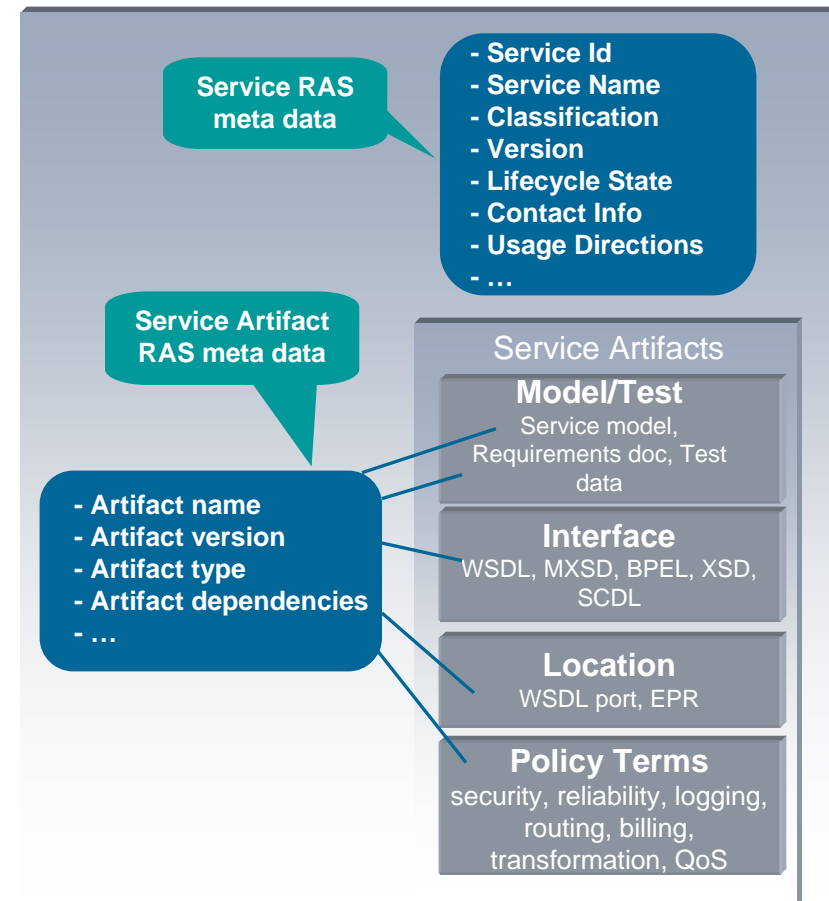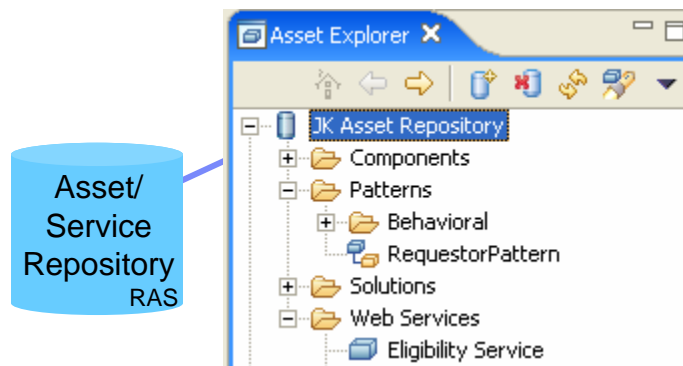
Customer Benefit:
  - Architecture and design for service implementations
  - Automate application of design patterns
 - Build transformations from analysis and design to implementation

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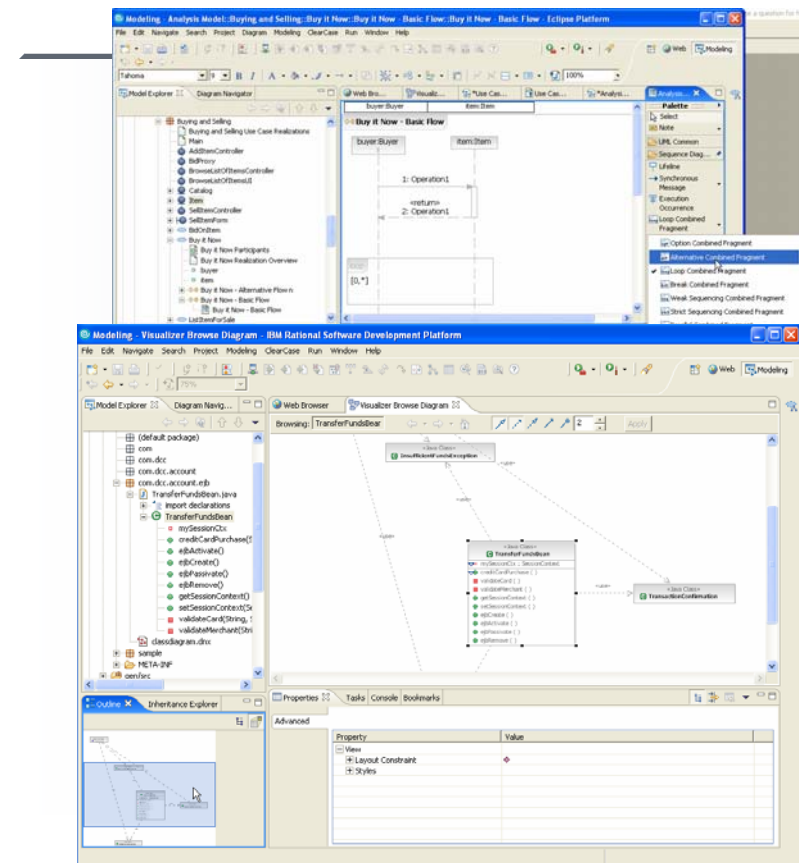
Reusable Asset Specification (RAS)

- **Reusable Asset Specification (RAS)**
  - A standard way to package services & other assets
  - Services are Assets
  - Assets can contain other elements:
    - Design Models, Test Cases, Documentation, etc
- **Three dimensions to consider for Asset Specification**
  1. Variability
  2. Granularity
  3. Articulation (The degree of completeness of the artifacts providing the solution)

Service RAS meta data
- Service Id
- Service Name
- Classification
- Version
- Lifecycle State
- Contact Info
- Usage Directions
- …

Service Artifact RAS meta data
- Artifact name
- Artifact version
- Artifact type
- Artifact dependencies
- …

Service Artifacts

Model/Test
Service model, Requirements doc, Test data

Interface
WSDL, MXSD, BPEL, XSD, SCDL

Location
WSDL port, EPR

Policy Terms
security, reliability, logging, routing, billing, transformation, QoS

Asset/ Service Repository
RAS

Asset Explorer ✕

JK Asset Repository
- Components
- Patterns
  - Behavioral
  - RequestorPattern
- Solutions
- Web Services
  - Eligibility Service

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Development-time Service Lifecycle

- At development time services are:
 - Identified, Produced, Consumed, and Managed
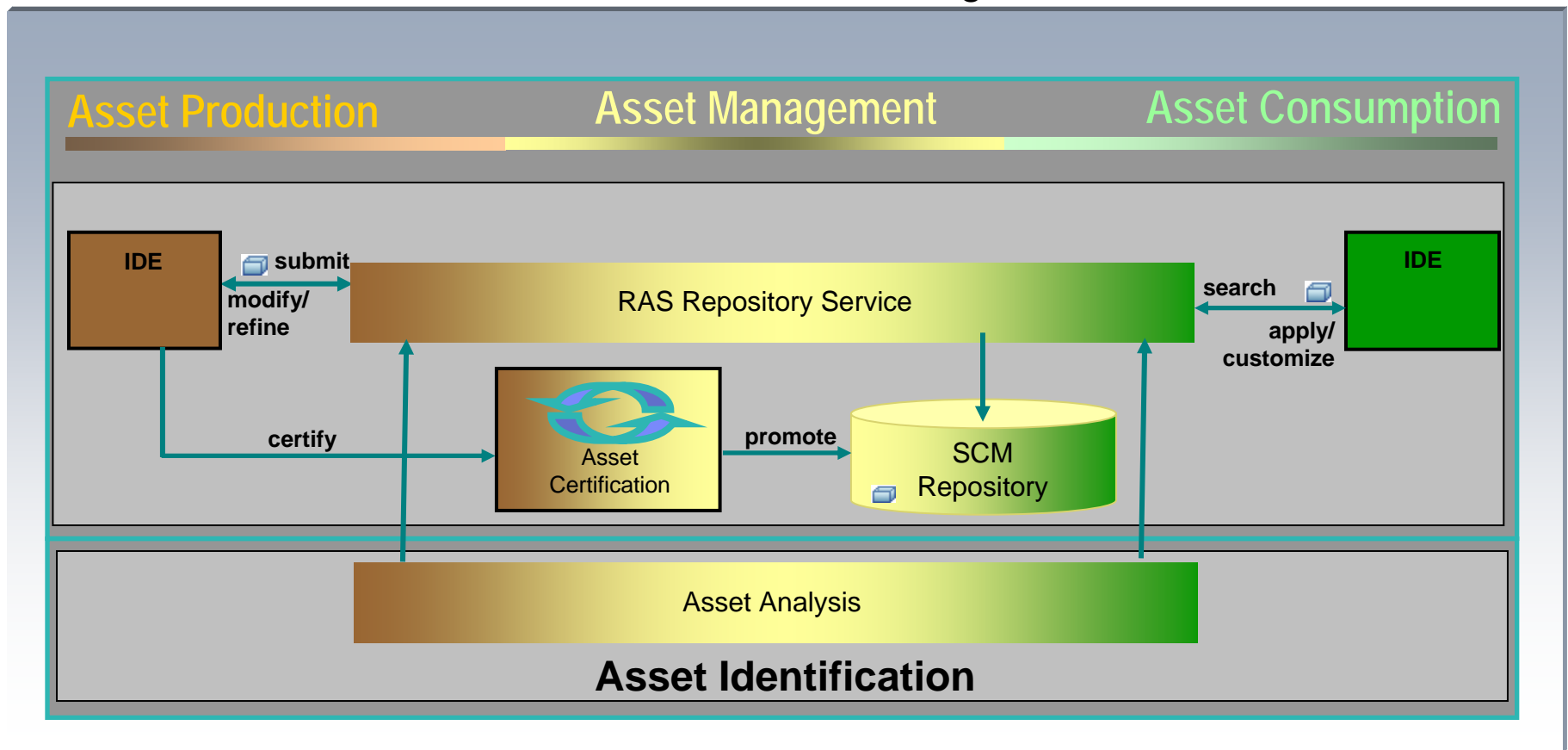
Business Process Choreography

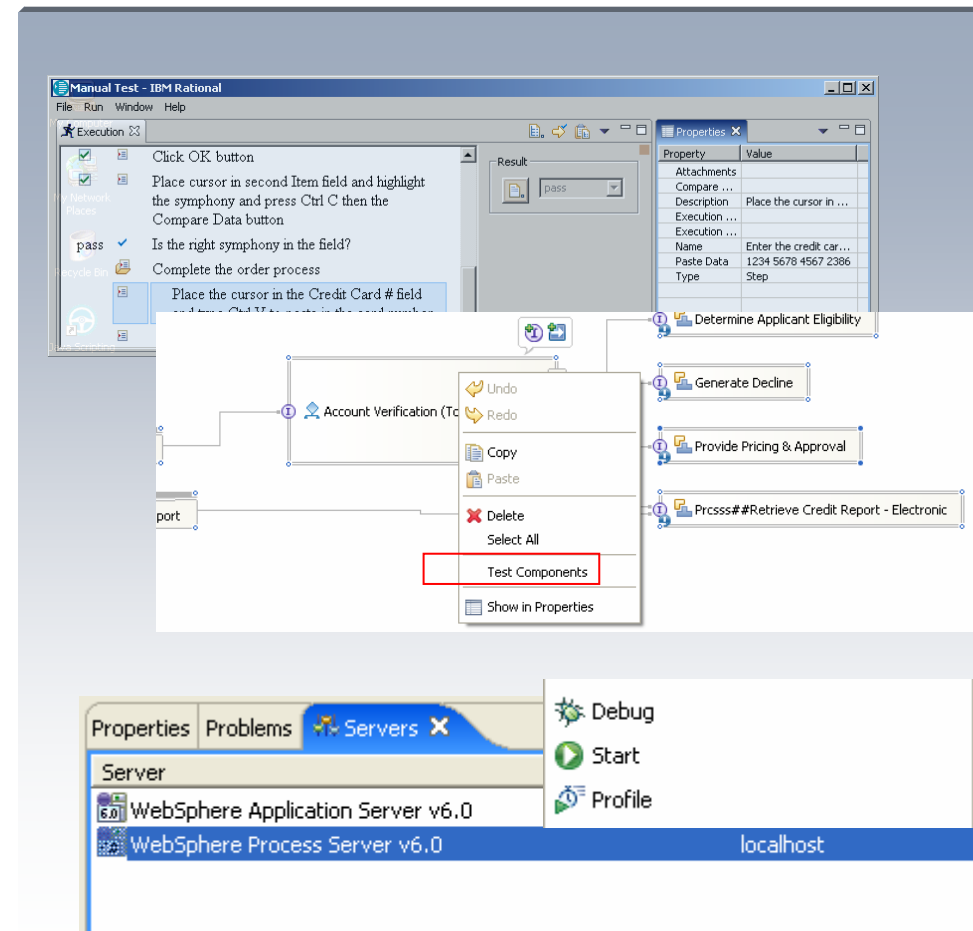**Integration Developer**

- Business Process Choreography is linking services together to form *deployable* business processes:

  - Deployable process model (WS-BPEL) derived from business process model designed by a Business Analyst

  - Both Flow and Event based Business Process can be modeled

  - Choreography includes automated and human based services

  - Specify IT KPI's

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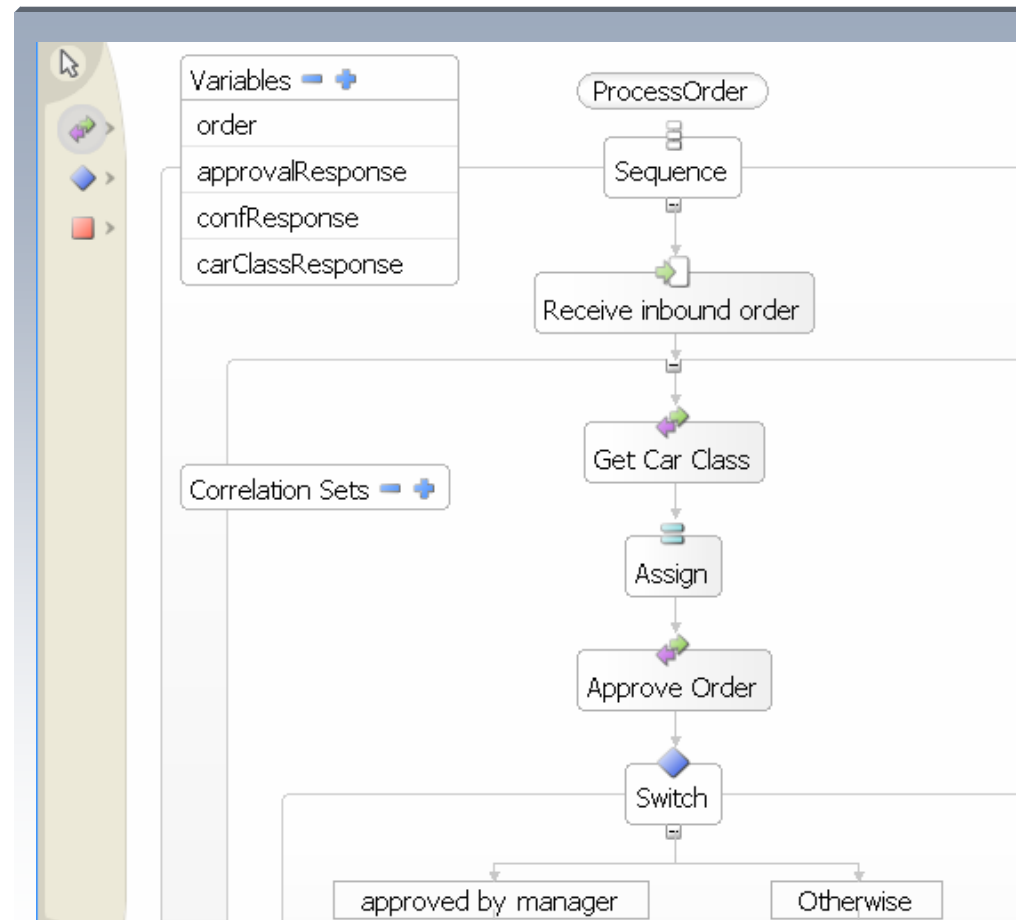
Test Early, Test Often

- Testing needs to occur across Business Driven Development:
  - Component
  - Service
  - Business Process
  - Composite Application
  - Functional
  - User Interface
  - Performance
  - Regression
  - System

- Integrated set of test tools and an integrated test environment (for the runtime) simplifies testing

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Key Products - Business Driven Development

WebSphere Business Modeler

Rational Software Architect

Rational Application Developer

WebSphere Integration Developer

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

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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

Apps & Info Assets

IT Service Management

Manage and secure services, applications & resources

Infrastructure Services

Optimizes throughput, availability and performance

Business Driven Development in the Larger Context

Run-time Statistics

Observation Model

CIO

Understand Risk, Project Costs, and ROI

Project Manager

Identify and Manage Projects and Resources

Business Analyst

Create, Simulate & Analyze As-Is Business Model

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

Create Financial Reports & ROI Estimates

Create Observation Model with KPIs & export to Monitor

BPEL WSDL

Choreograph services using BPEL, WSDL, etc.

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

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

Integration Developer

WSDL

UML

WSDL EAR

Data Architect

Model Relational Database Schemas

RDB Mapping

Create & Manage System Requirements

Trace Requirements & Create System Use Case Realizations

Model & Implement Services, & expose as Web Services

Test

Tester

Develop Portlets (App UI and Monitor)

WSDL EAR

Runtime

Deploy/Run

Monitor

Business Operations Analyst

Architect

Java Developer

Portal Developer

DBA

**Team Unifying Platform
Process Guidance
Governance**

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धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

شكراً
Arabic

Thank You

Obrigado
Brazilian Portuguese

Danke
German

Grazie
Italian

多谢
Simplified Chinese

Merci
French

நன்றி
Tamil

감사합니다
Korean

ありがとうございました
Japanese

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More Information

- **IBM's WebSphere Platform**
  - ✓ www.watchit.com/websphere

- **Business Integration**
  - ✓ http://www.ibm.com/software/info/topic/perform/busintegration.html

- **Information on IBM WebSphere Software**
  - ✓ www.ibm.com/software/websphere

- **Information on IBM Rational Software**
  - ✓ www.ibm.com/software/rational/sw-bycategory/index.html

- **IBM, Web Services and SOA**
  - ✓ http://www.ibm.com/developerworks/webservices/newto/

- **IBM and Model-Driven Architecture (MDA)**
  - ✓ http://www.ibm.com/software/rational/mda/

- **Business Innovation and Optimization**
  - ✓ http://www.ibm.com/software/info/topic/perform/

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