



Building Business Flexibility with SOA on System i

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for System i
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ON DEMAND BUSINESS™

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Agenda

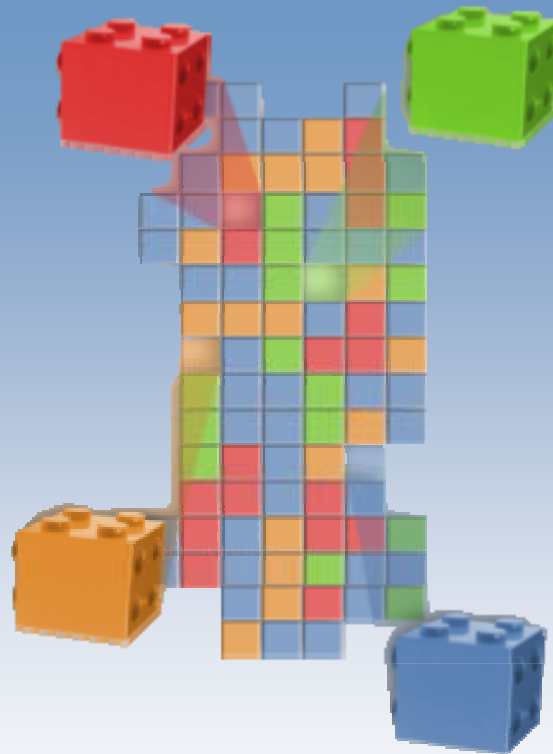
- **What is Service Oriented Architecture and how can it improve your business?**
- **What value is there in SOA based solutions?**
- **What are the Entry Points for getting started?**

73% of Mid-market companies already using Web Services

What is?

... a service?

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

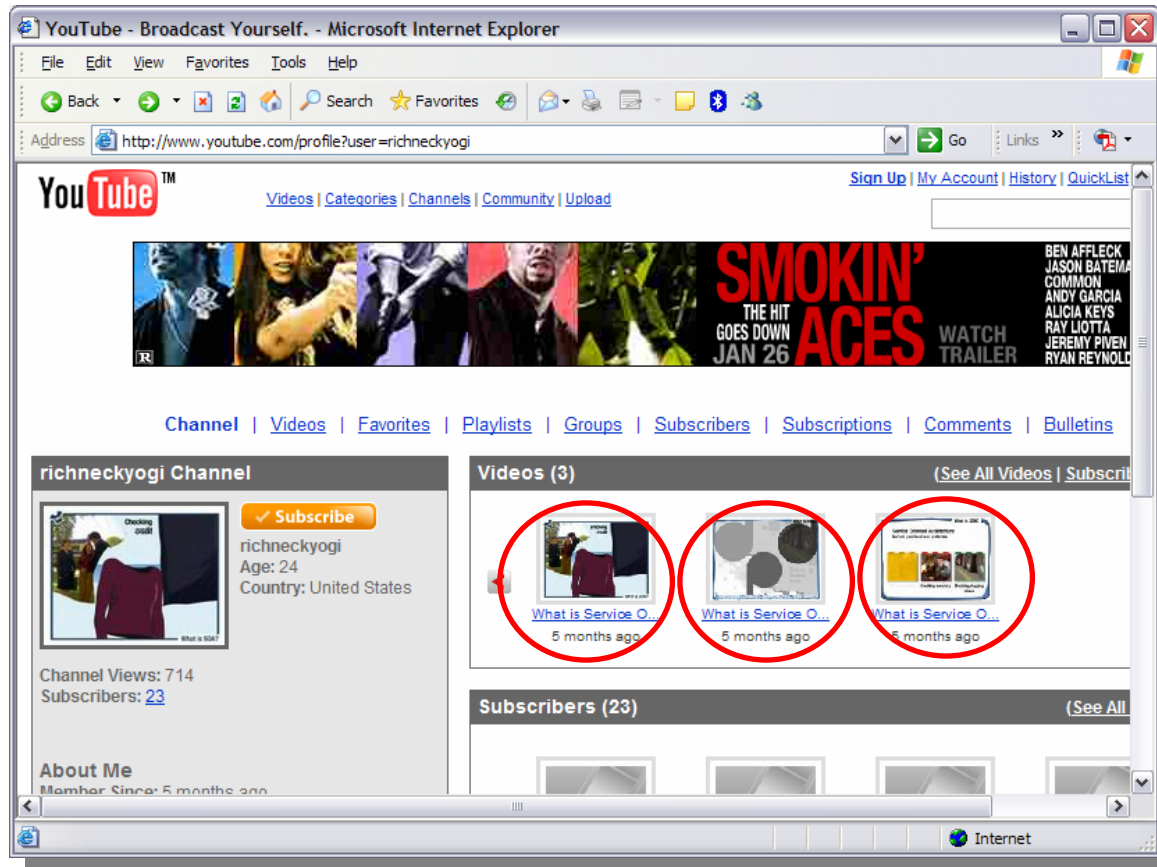


... service oriented architecture (SOA)?

An IT **architectural style** that supports
integrating your business as linked services

"SOA impacts every aspect of IT and business."

“What is SOA?” Videos on YouTube™



<http://www.youtube.com/profile?user=richneckyogi>

Entry points and best practices can address challenges

Top Business Challenges

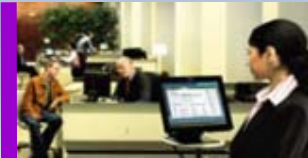
Operational efficiency

Cost Reduction

Customer retention

Productivity

Access information



SOA Entry Points

Reuse

Connectivity

Integrate People

Integrate Processes

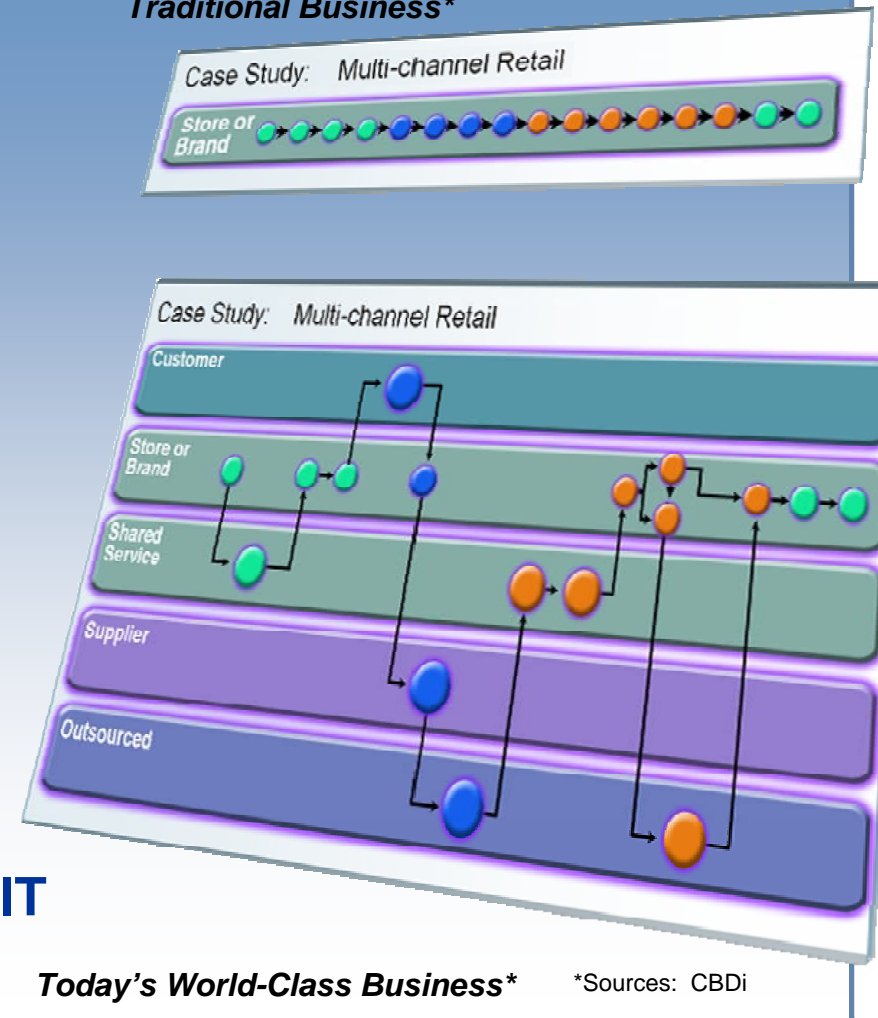
Integrate Information

Why is business flexibility important?

- **Economics:** global competition demands greater flexibility
- **Business processes:** changing more rapidly
- **Growth:** CEOs are saying that business flexibility is key to growth
- **Cost savings:** reusable assets can cut costs up to 20%
- **Outsourcing:** effective outsourcing of non-core functions demands flexible IT

Flexible business requires flexible IT

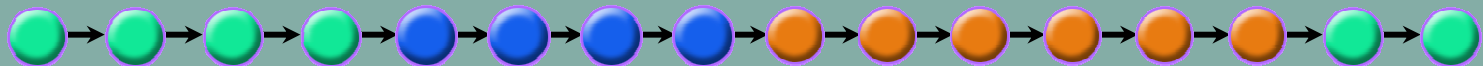
Traditional Business*



Traditional Business Process

Case Study: Order to Cash Process

Division



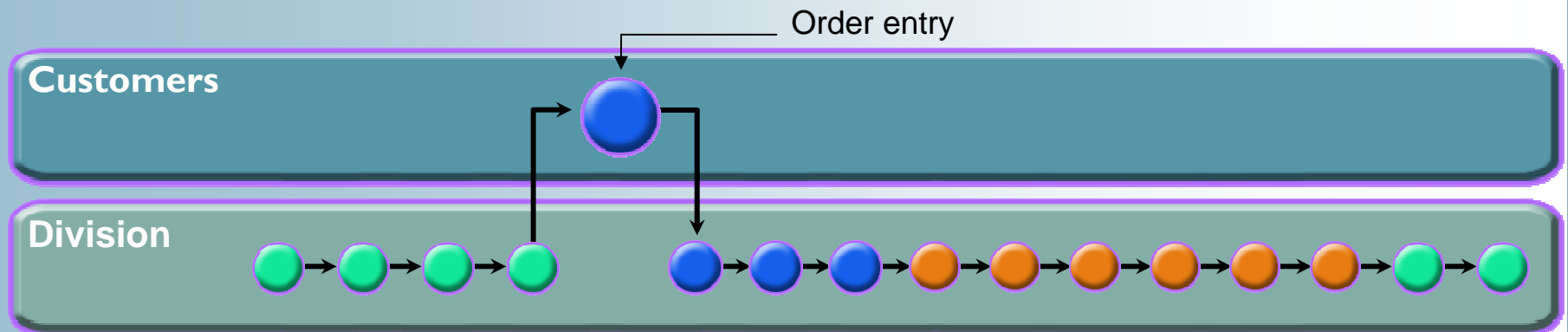
- Business process is embedded in three separate applications
- Business functions are tightly coupled within applications
- Business functions have unique and proprietary interfaces, restricting re-use
- Manual steps introduce functional gaps in the process
- Process cannot be easily measured and managed
- Changes to the process are difficult to implement
- New processes which are designed this way require long development cycles

Result: Business cannot operate on demand

On Demand Flexibility: Customer Self Service

Case Study: Order to Cash Process

Change: Allow customers and partners to order and manage accounts on-line



American Registry of Radiology Technologies

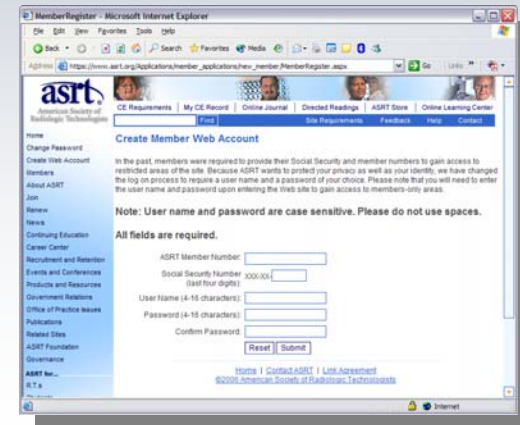
- World's largest credentialing organization that seeks to ensure high quality patient care in radiologic technology (257,000 Registrants)
- Needed inexpensive way to exchange certification information with other Radiology Organizations (American Society of Radiologic Technologists)
- Used web services wizard in WDS*c*



ARRT
Web Service

SS#, Birth Date, ARRT ID#

Registration Info

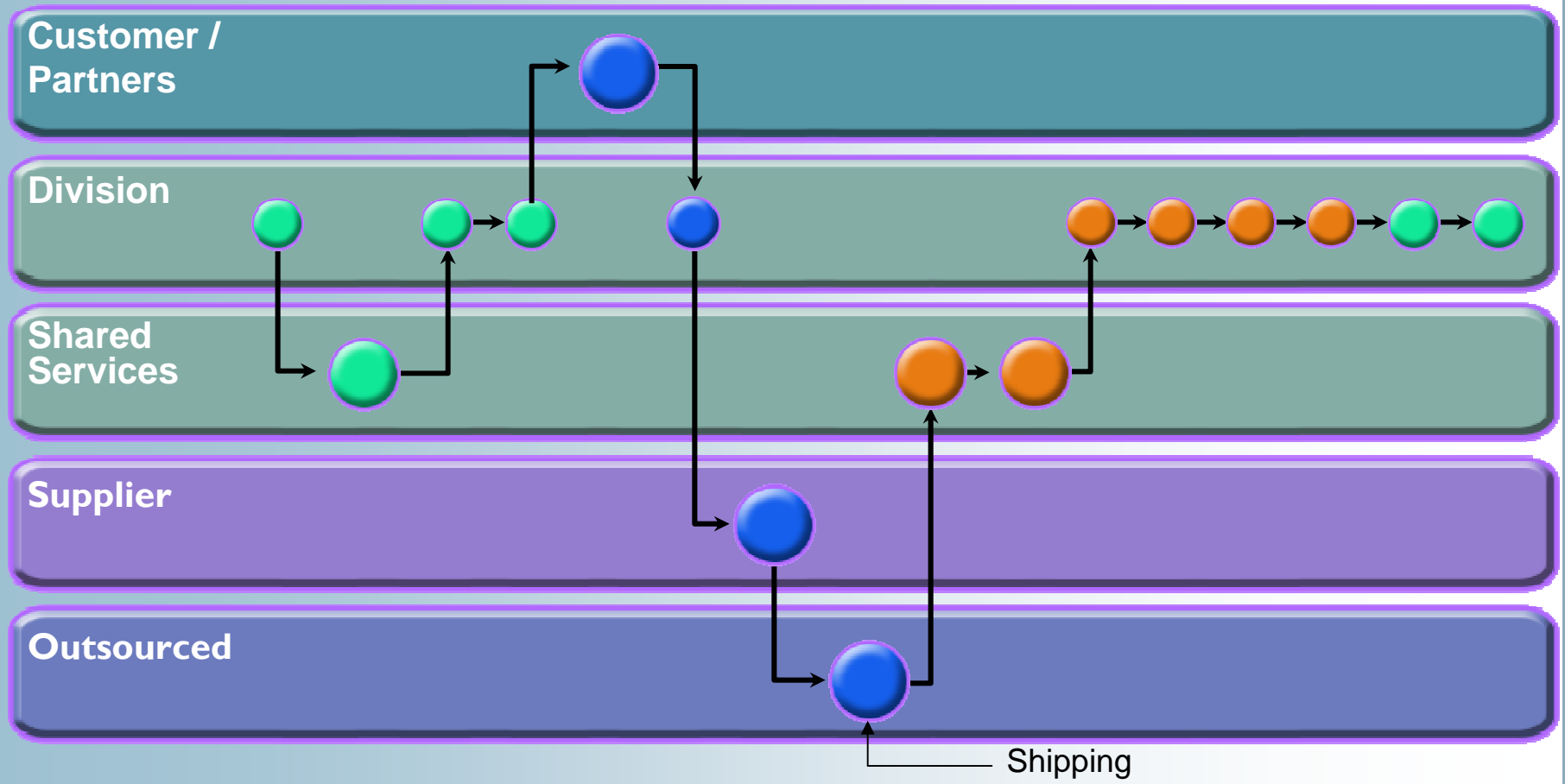


WWW.ASRT.ORG

On Demand Flexibility: Outsource

Case Study: Order to Cash Process

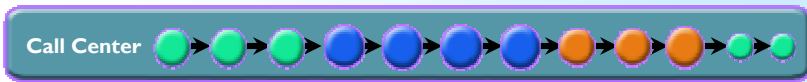
Change: Reduce shipping infrastructure and overhead costs



Flexible business requires flexible IT

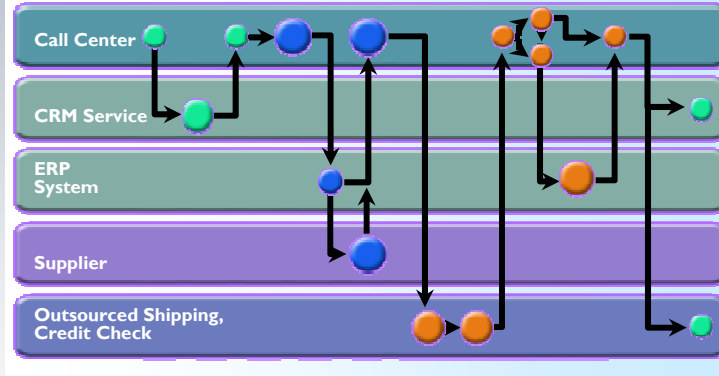
Traditional Business

Case Study: Customer Order & Fulfillment



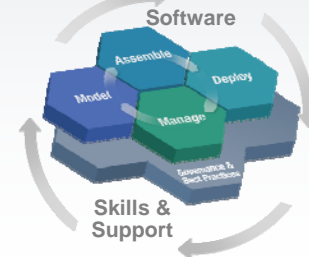
Process to optimize

Case Study: Customer Order & Fulfillment



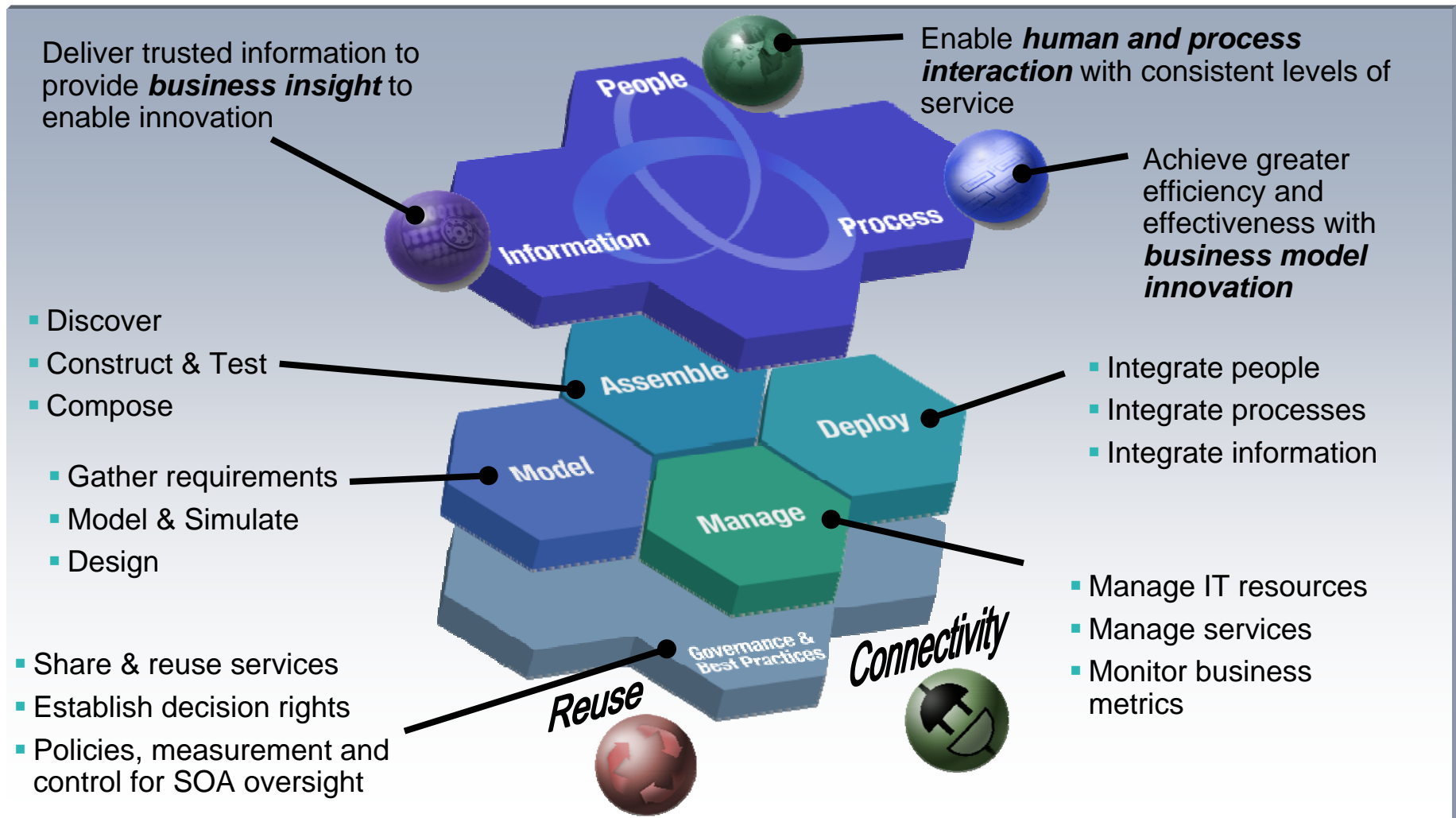
Creating IT flexibility

IBM SOA Foundation



And SOA lifecycle is the key to successful projects

Entry points: Reuse, Connectivity, People, Process, Information



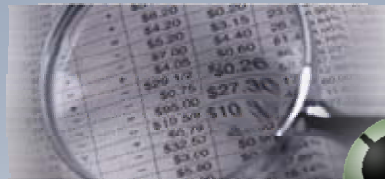
Don't Panic... You Can Start Simple



SOA helps you solve top business challenges

Creating or improving IT solutions by leveraging IBM SOA Foundation

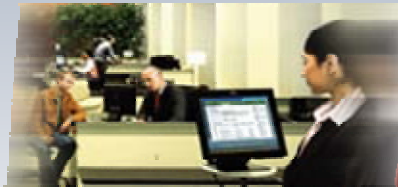
Cost reduction



Connectivity



Operational efficiency



Reuse



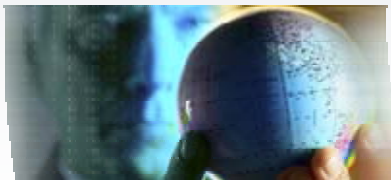
Customer retention



People



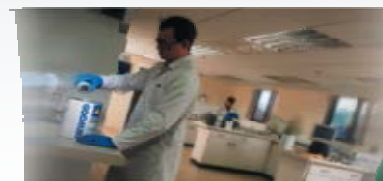
Access information



Information



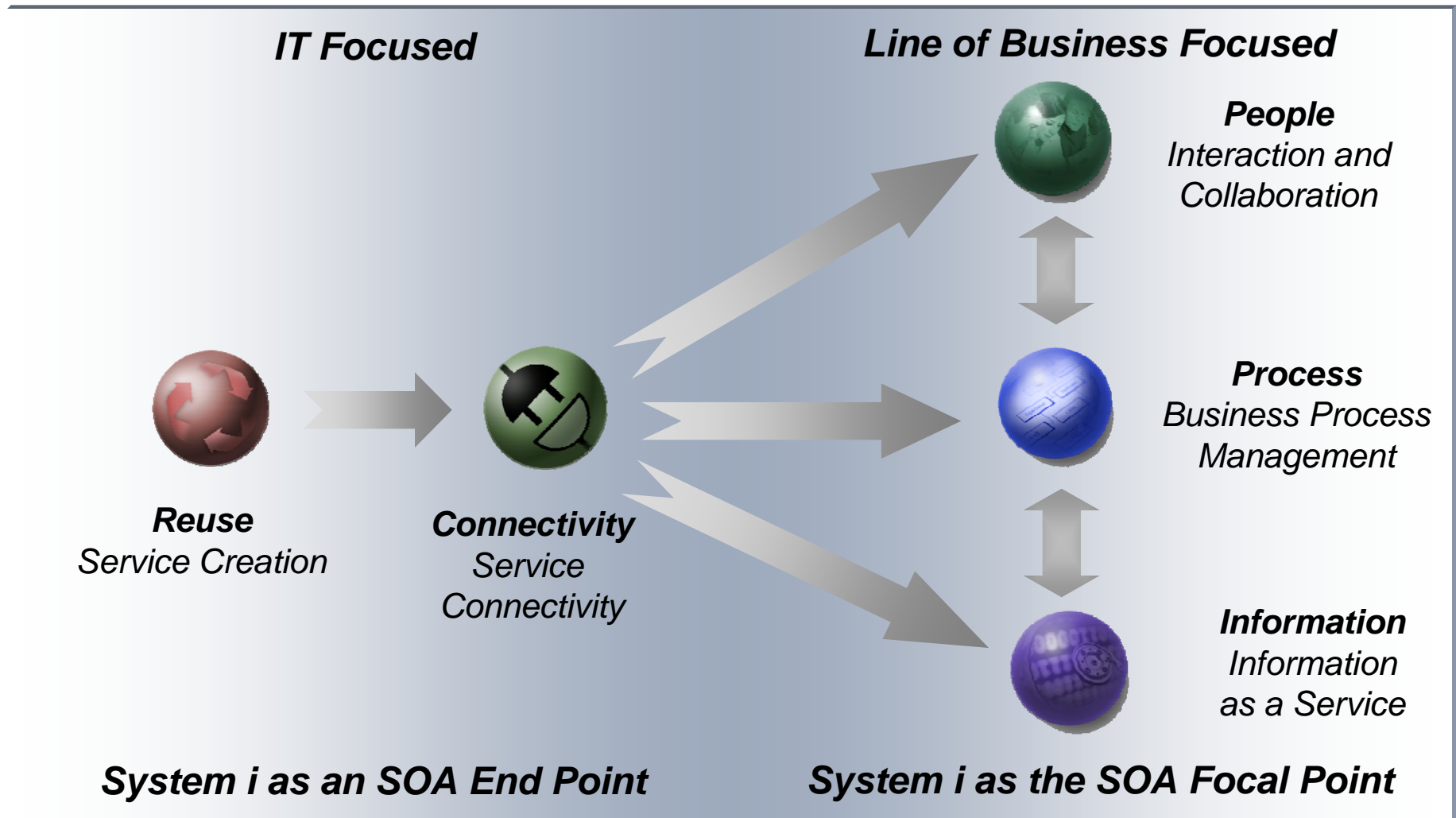
Productivity



Process



Where do you see your System i with SOA?



Improve operational efficiency

Taking advantage of information and business tasks provided by others

SOA Entry Point: Reuse

- Reduce errors, cost and time associated with manual processes
- Improve satisfaction by interacting real-time with customers and partners
- Increase customer loyalty by providing value-add services



IBM SOA Foundation

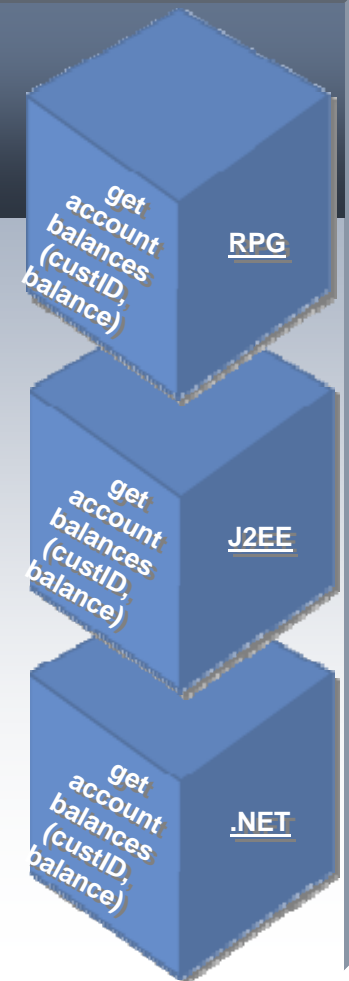
Assemble: WebSphere Development Studio Client

Deploy and Manage: WebSphere Application Server – Express, IBM Webfacing Deployment Tool with HATS Technology

What is a Web Service?

Web Services are based on mature industry standards

- Web Services provide business function (get stock quote, check order status, check credit rating, etc.) that can be described, published, located, invoked over a network
 - Built on established, ubiquitous Internet standards (SOAP/HTTP)
 - Supports other protocols providing higher QoS (SOAP/JMS, etc.)
 - Platform and implementation neutral providing true interoperability
 - Service Consumers need to know the Interfaces to web services but not the implementation details of services
- Web Services allow businesses to:
 - Describe application functionality (services) without regard to implementation details
 - Publish those services
 - Discover other services they wish to use
 - Connect and invoke those services



Reuse: Using tools you may be entitled to

Modernize RPG and COBOL Batch Applications



WDS*c*: Web Services Wizard

RPG Application

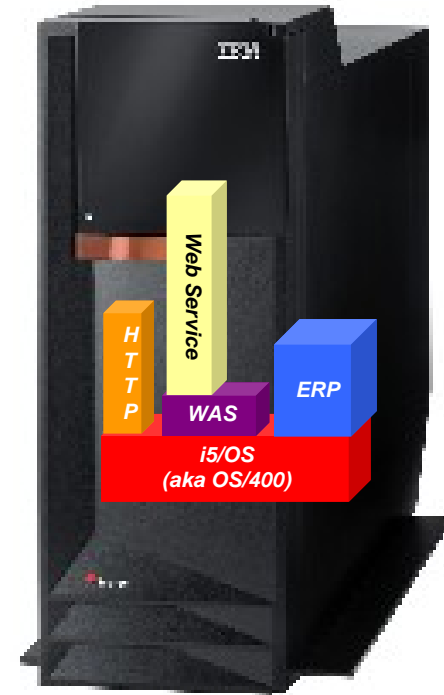
```

*Historically RPG is columnar in nature, though free-formatting
* is allowed under particular circumstances.
* The purpose of various lines code are determined by a
* letter code in column 6.
* An asterisk (*) in column 7 denotes a comment line

* "F" (file) specs define files and other i/o devices
FARMstF1  UF      K      Disk      Rename(ARMST:RARMST)

* "D" specifies data structures
D pCusNo      S          6P 0
D pName       S          30a
D pAddr1      S          30a
D pAddr2      S          30a
D pCity       S          25a
D pState      S           2a
D pZip        S          10a
    
```

Web Service



Service Provider: WDSC

- Use Remote System Explorer
- Locate RPG source
- Start wizard to create the service (new in WDSC v6.0.1)

Test Client

- Generated by wizard
- Used to test the service
- JSP based
- Uses Java proxy
- Runs in WDSC

Methods

- [useJNDI\(boolean\)](#)
- [getEndpoint\(\)](#)
- [setEndpoint\(java.lang.String\)](#)
- [getGETFLIGHTINFOService\(\)](#)
- [findflights_XML](#) (series.wsbeans.getflightinfo)
- [getflightinfo](#) (series.wsbeans.getflightinfo)
- [findflightsdow](#) (series.wsbeans.getflightinfo)
- [findflightsdow_XML](#) (series.wsbeans.getflightinfo)
- [findflights](#) (series.wsbeans.getflightinfo)
- [getflightinfo_XML](#) (series.wsbeans.getflightinfo)

Inputs

inputData:

tOCITY:

fLIGHTDATE:

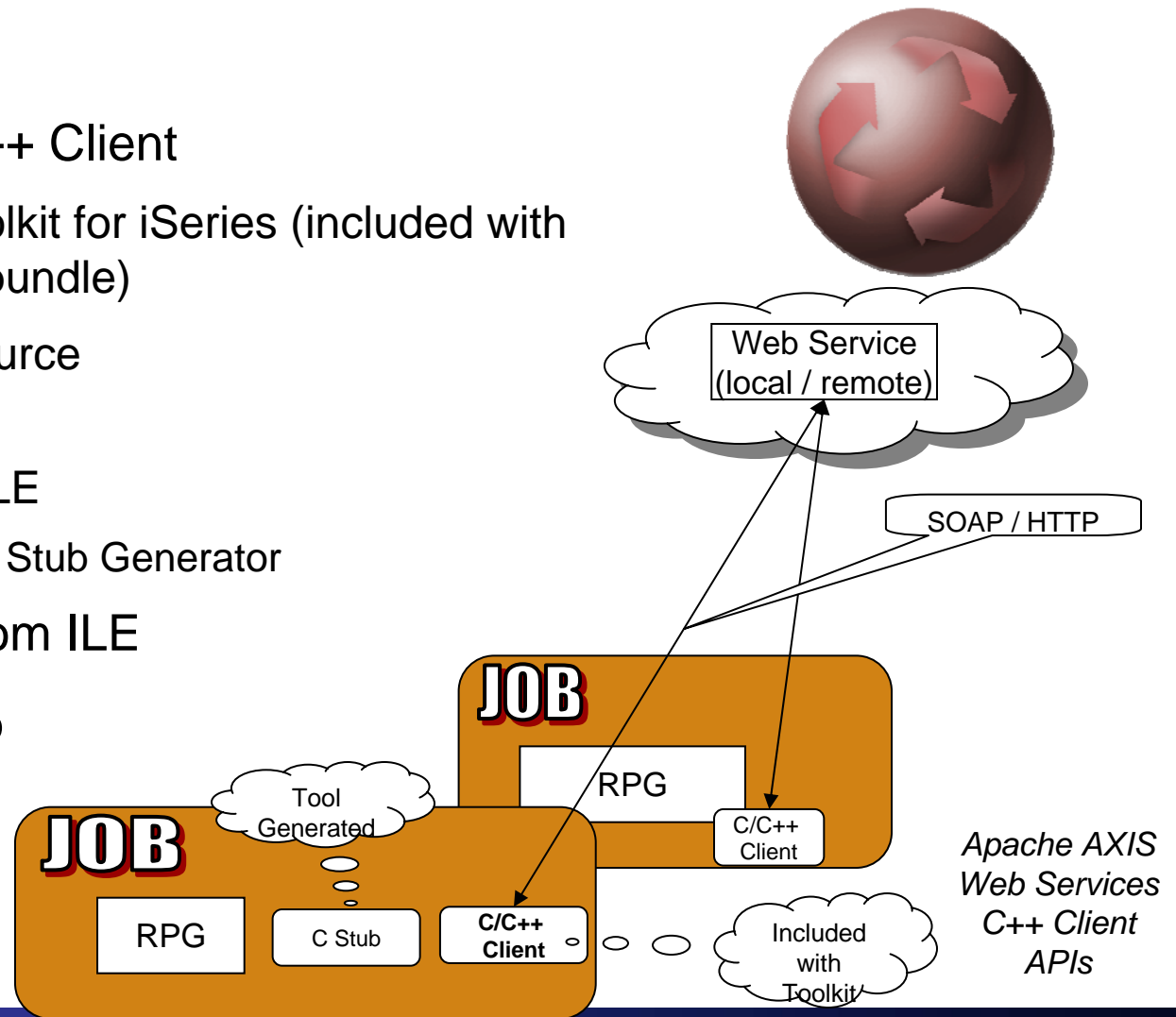
rROMCITY:

Result

```
<?xml version="1.0" encoding="UTF-8"?> <FINDFLIGHTS> <FLIGHTCOUNT>9</FLIGHTCOUNT> <FLIGHTS>
<AIRLINE>AMA</AIRLINE> <FLIGHT>5100163</FLIGHT> <DOW>Fr</DOW>
<DEPARTCITY>ABY</DEPARTCITY> <ARRIVECITY>ATL</ARRIVECITY> <DEPARTTIME>07:05
AM</DEPARTTIME> <ARRIVETIME>09:05 AM</ARRIVETIME> <PRICE>169</PRICE> </FLIGHTS>
<FLIGHTS> <AIRLINE>AMA</AIRLINE> <FLIGHT>5200164</FLIGHT> <DOW>Fr</DOW>
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<DEPARTCITY>ABY</DEPARTCITY> <ARRIVECITY>ATL</ARRIVECITY> <DEPARTTIME>09:10
AM</DEPARTTIME> <ARRIVETIME>11:10 AM</ARRIVETIME> <PRICE>199</PRICE> </FLIGHTS>
<FLIGHTS> <AIRLINE>AMA</AIRLINE> <FLIGHT>5400166</FLIGHT> <DOW>Fr</DOW>
```

Web Services Client for Non-Java Programs

- Web Services C/C++ Client
 - 5733-XT1 XML Toolkit for iSeries (included with Enterprise Edition bundle)
 - Based on Open Source
 - Apache.org AXIS
 - Ported to OS/400 ILE
 - WSDL -> C++ or C Stub Generator
- Direct invocation from ILE
- Runs in the ILE Job



5250 Applications Deployed as a Web Service ...Created with the HATS Toolkit and Deployed with WDHT

Uses the HATS Toolkit in WDS Sc V7.0



- Integration at the desktop with other Eclipse applications
- Client side processing
- Rich set of user interface widgets
- Built on the standard, open Eclipse foundation
- 3270e print directly to end user's printer

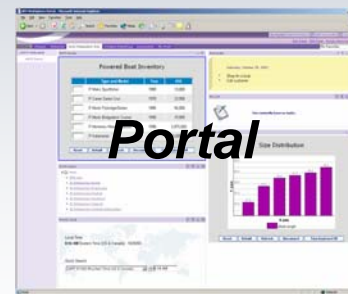


5250 Data stream

Web Service



- Build self-service transactions



- Integration at the glass
- Click-to-Action support
- Requires WDS Sc AE



- Zero footprint
- View through your favorite browser

Reduce administrative costs

Reduce cycle time, increase throughput and enhance partner interactions

SOA Entry Point: Connectivity

- Integrate nearly anything with consistent interfaces across 80+ operating systems
- Eliminate errors introduced by re-keying information
- Enable IT to be more responsive and flexible to changing business demands
- Reuse existing assets and applications
- Easily add, remove, and change applications as required



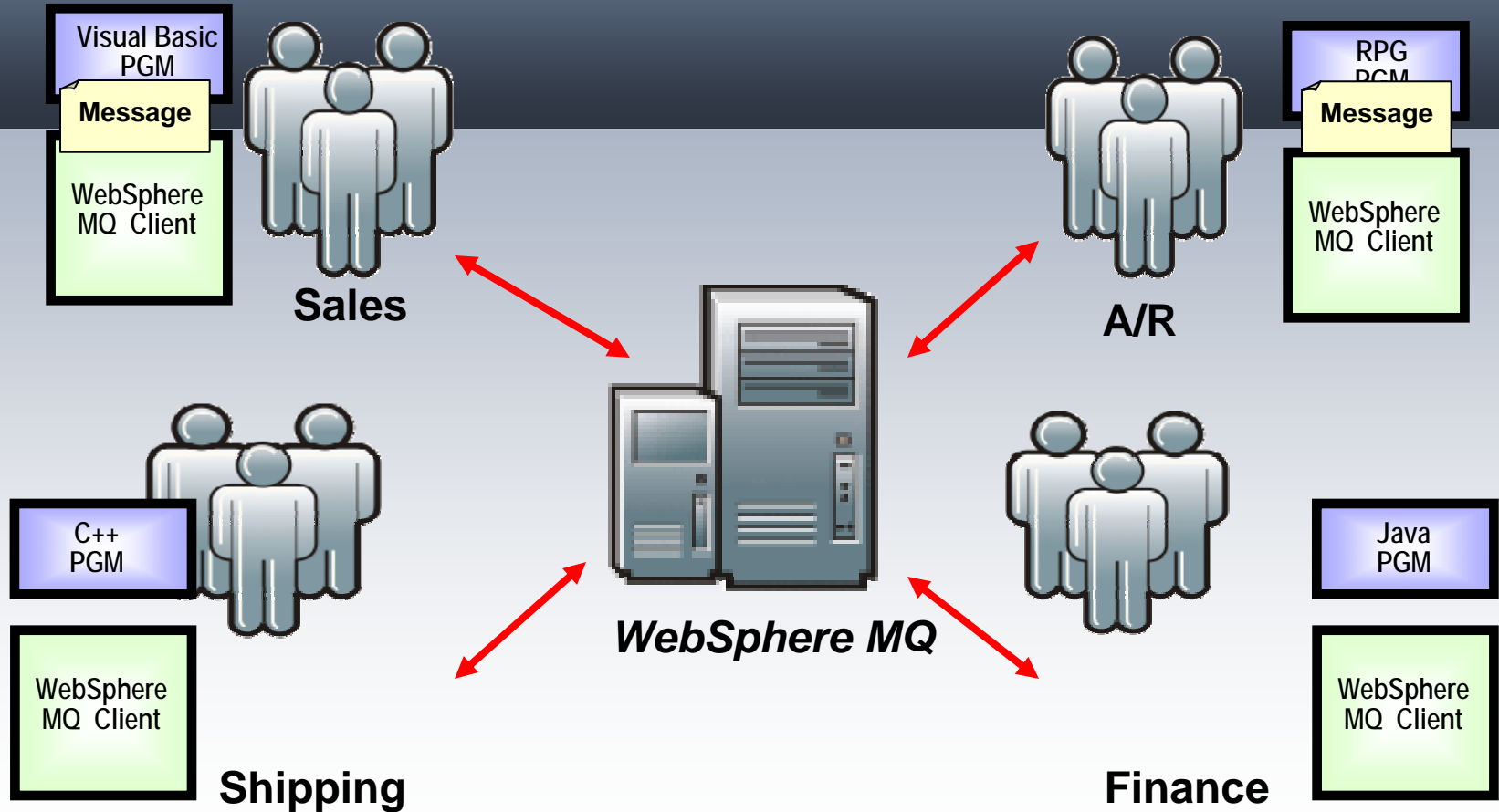
IBM SOA Foundation

Assemble: WebSphere Integration Developer

Deploy and Manage: WebSphere MQ, WebSphere ESB, WebSphere DataPower

You can start with Message Queuing

SOA Entry Point: Connectivity



Connectivity: Leveraging Existing Skills

Connecting Applications



WebSphere MQ

- WebSphere MQ is the second highest deployed WebSphere product on System i after WebSphere Application Server
- Natural upgrade path for native i5/OS Data Queues which do not provide build in audit capabilities or security
- Provides connections for over 80 Platform Configurations besides i5/OS
- Leverages in-house skills with Application Program Interfaces for RPG and COBOL

Connectivity: What if you already have MQ?

Web Services Appliance



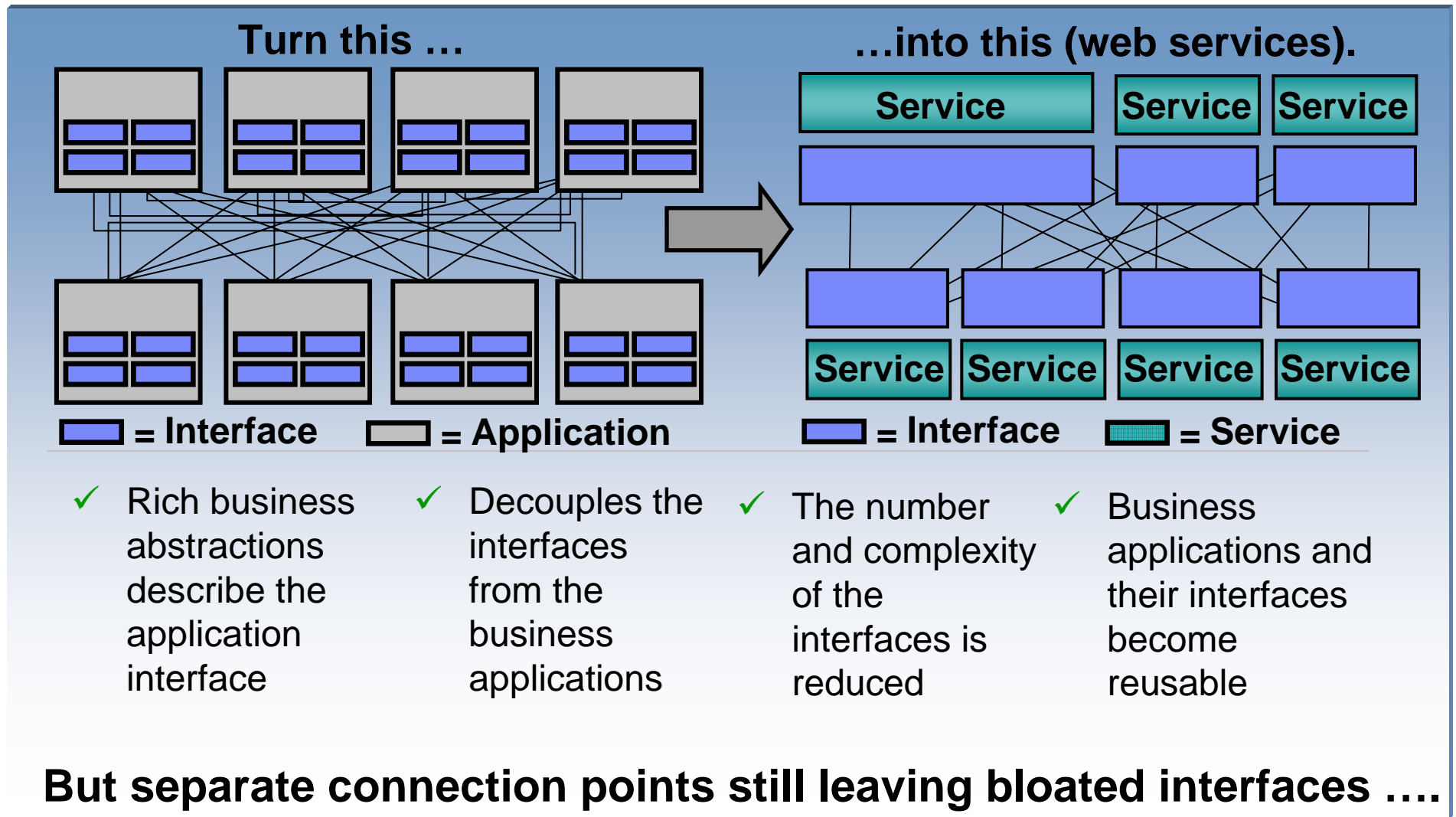
WebSphere Datapower XI50

- WebSphere Datapower is a SOA Hardware Appliance designed to provide high speed web services routing, web services security and legacy application modernization
- It acts like an WebSphere MQ Client
- It can deploy RPG and COBOL applications as web services using WebSphere MQ to communicate with backend applications

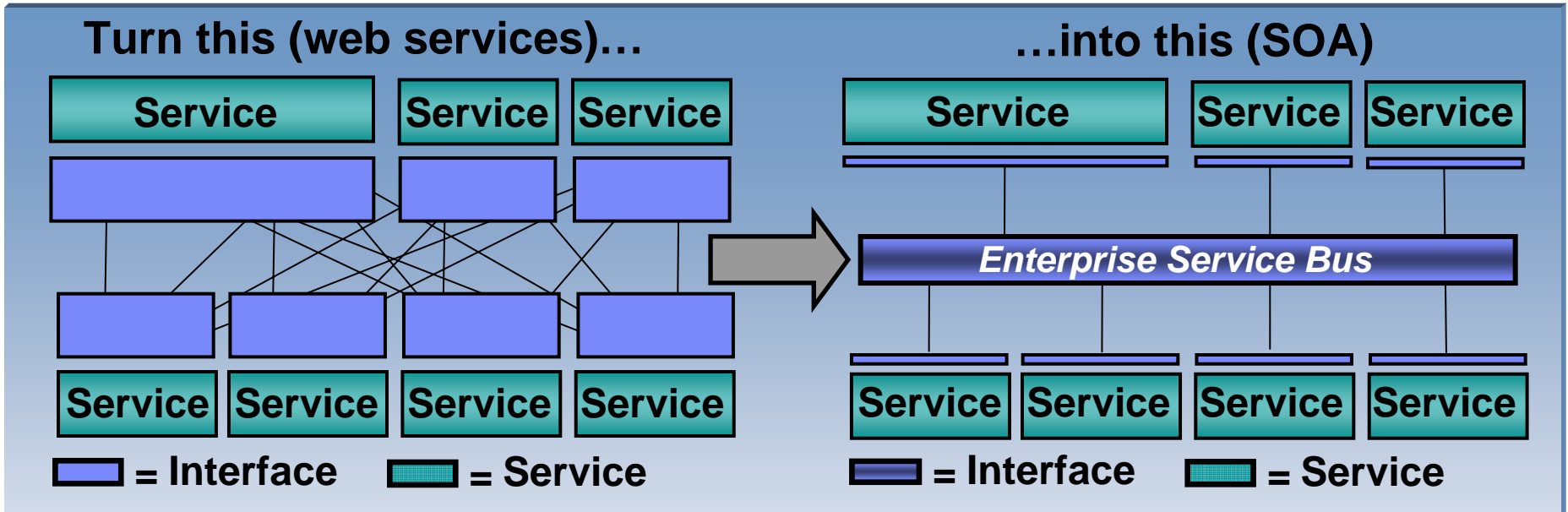


Client Apps

Web Services are a good start...



The Enterprise Service Bus shrinks those interfaces further



✓ Decouples the point-to-point connections from the interfaces

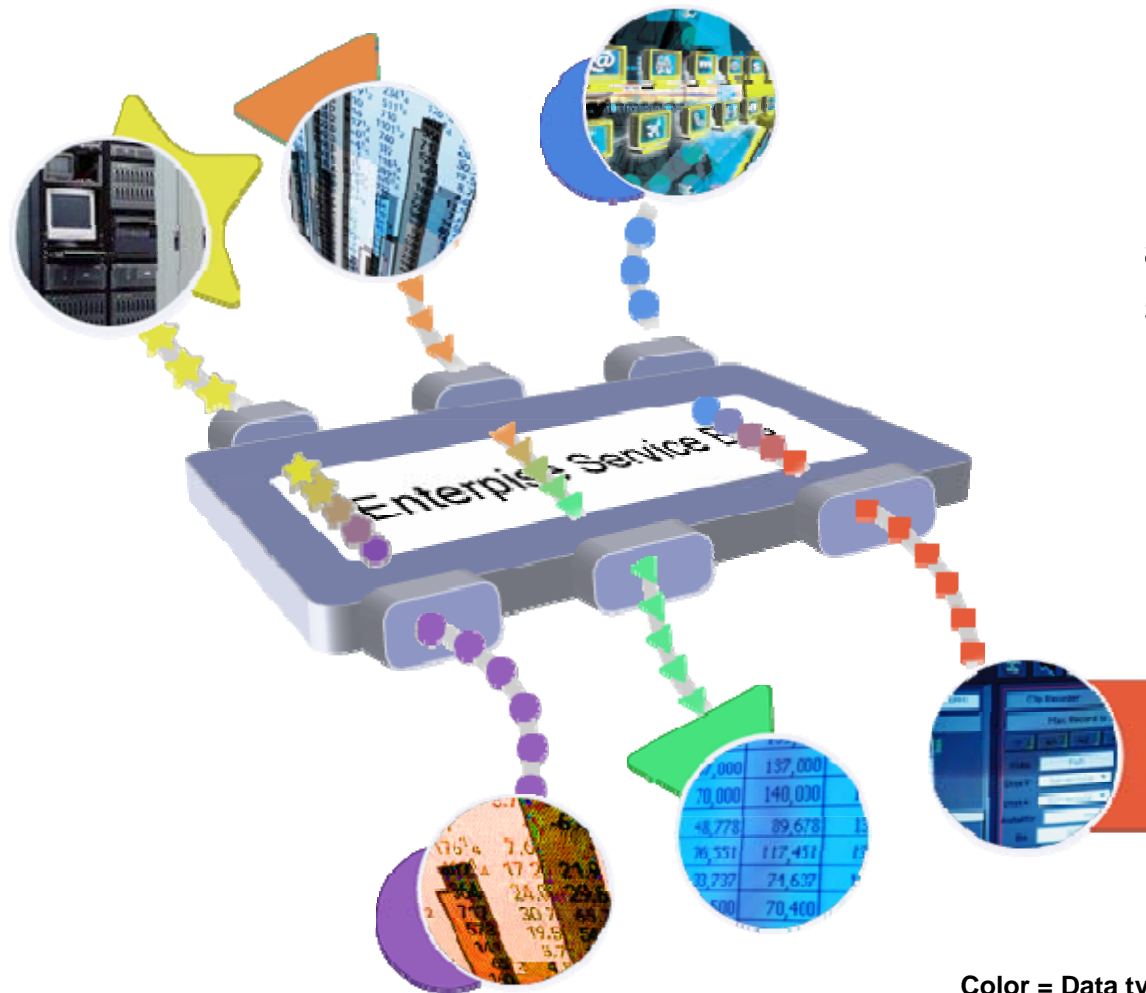
✓ Allows for dynamic selection, substitution, and matching

✓ Enables more flexible coupling and decoupling of the applications

✓ Enables you to find both the applications and the interfaces for re-use

RESULT → Greater Business Responsiveness

Enterprise Service Bus capabilities



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

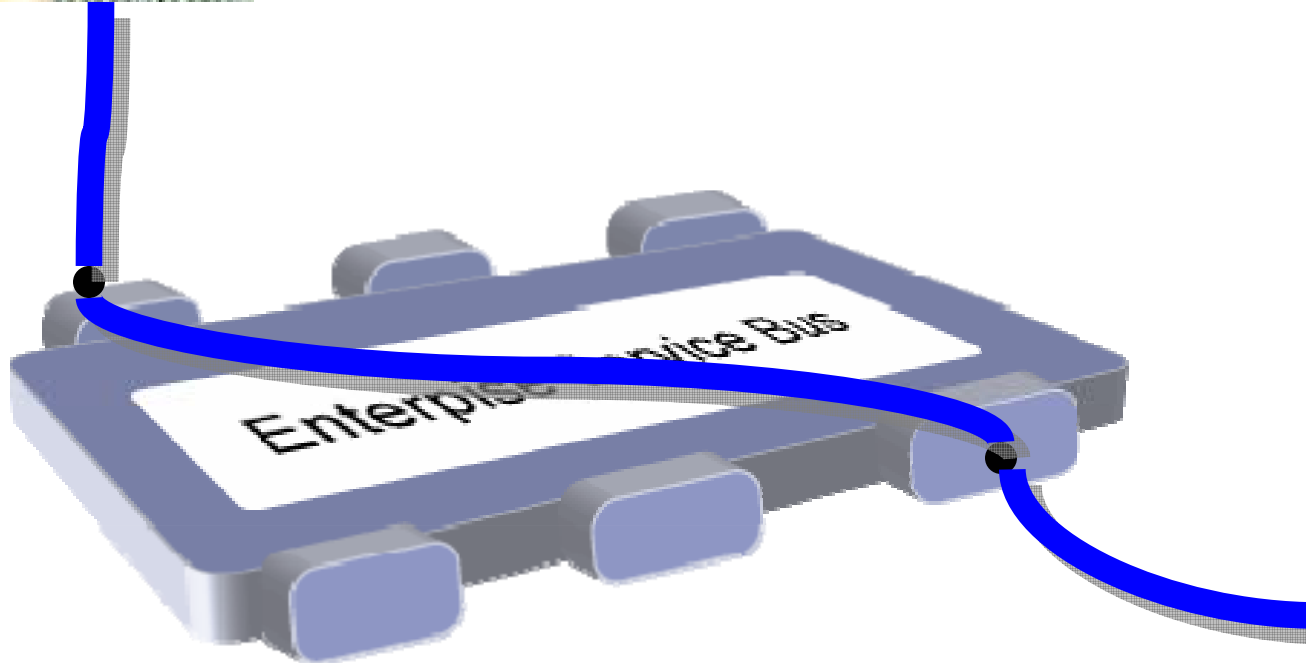
Color = Data type
Shape = Protocol

ESB Capabilities: Routing

Shipping System



► **ROUTES** messages between services



Commerce S/W

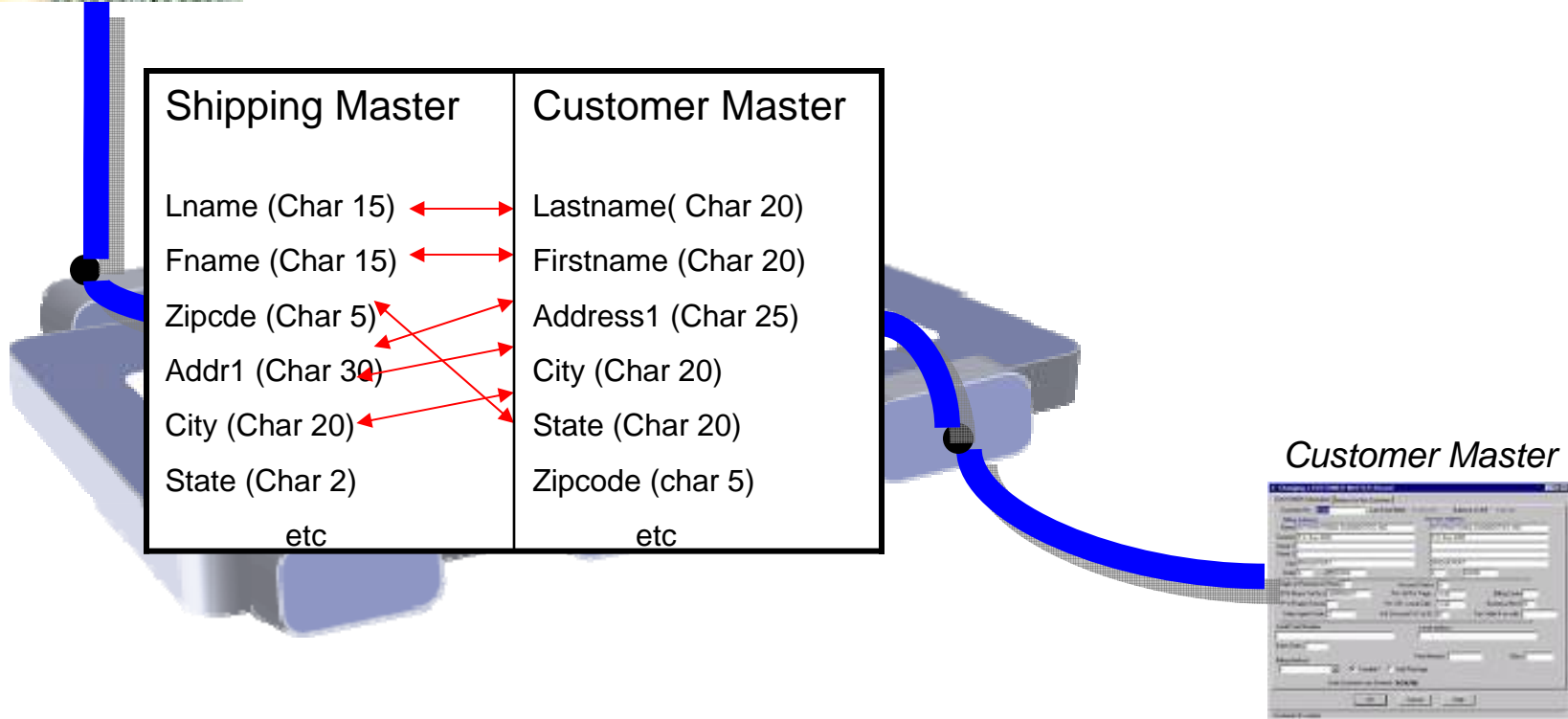


ESB Capabilities: Transformation

Shipping System



► **TRANSFORMS**
message formats
between requestor and
service

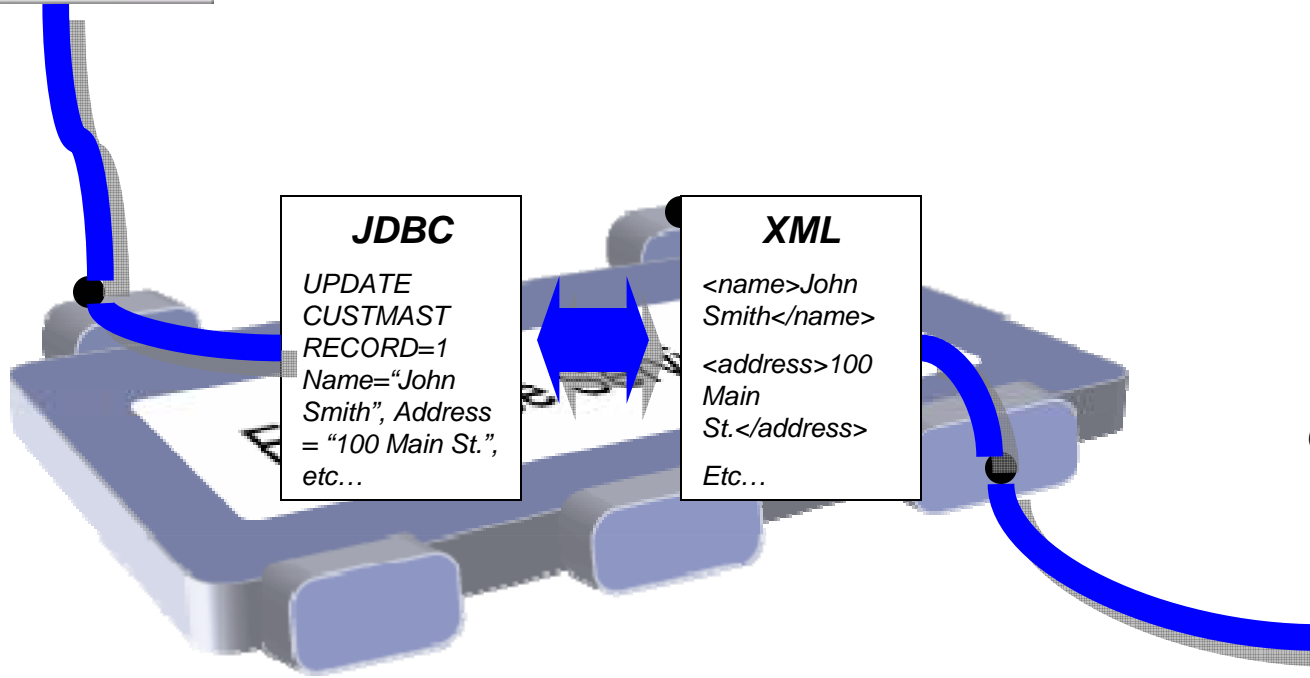


ESB Capabilities: Conversion

Customer Master



CONVERTS transport protocols between requestor and service



JDBC

```
UPDATE
CUSTMAST
RECORD=1
Name="John
Smith", Address
= "100 Main St.",
etc...
```

XML

```
<name>John
Smith</name>
<address>100
Main
St.</address>
Etc...
```

Customer Address Change



ESB Capabilities: Publication/Subscription

Customer Master



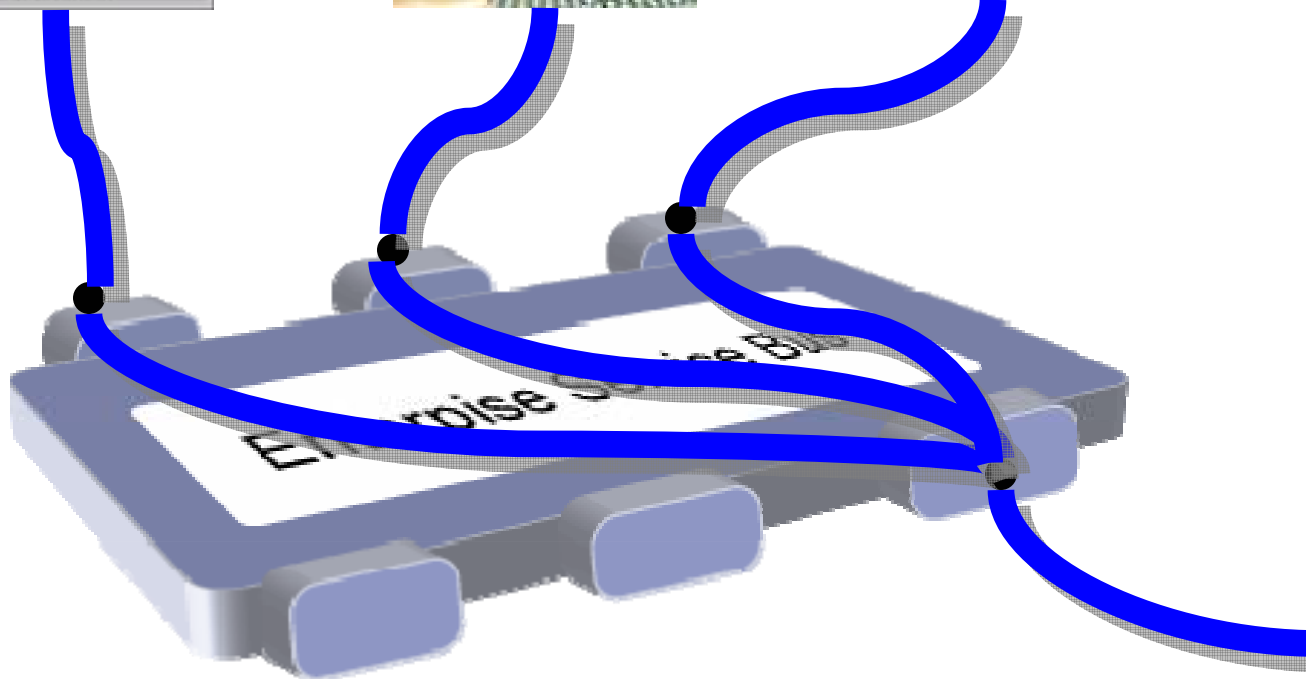
Shipping System



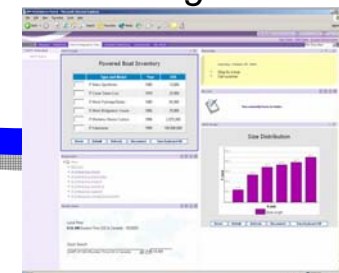
Warranty System



HANDLES business events between disparate sources



Customer Address Change



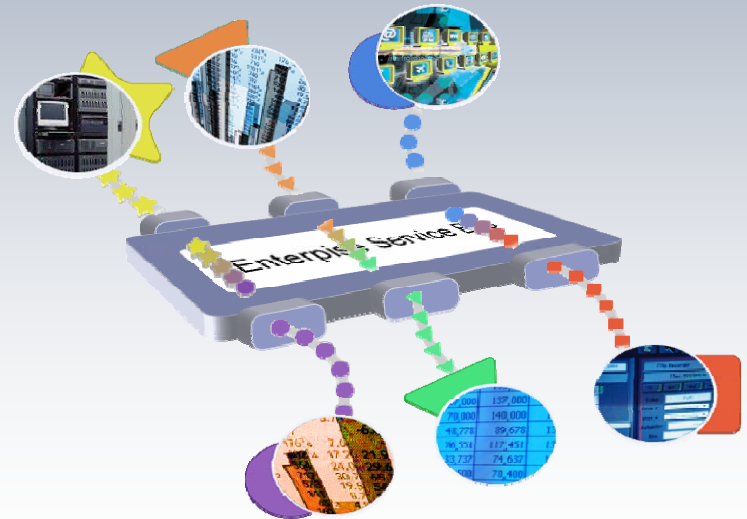
Connectivity: Enterprise Service Bus

Connecting Services



WebSphere Enterprise Service Bus

- Flexible connectivity infrastructure for integrating applications, data, and services to power your SOA
- Statement of direction for i5/OS in 2007
- Can be deployed on System i today in an LPAR running POWER Linux



<http://www.ibm.com/software/integration/wsesb>

Improve customer retention

Provide role-based information access for employees, partners & customers

SOA Entry Point: People

- Enhance customer satisfaction through self-service
- Improve access to applications and content
- Providing customer choice and flexibility
- Deliver consistent customer service



IBM SOA Foundation

Assemble: WebSphere Development Studio Client Advanced Edition, WebSphere Portlet Factory

Deploy and Manage: IBM Workplace Services Express, IBM Webfacing Deployment Tool with HATS Technology

People: Leveraging IBM Workplace on System i

Deploying a Portal



Workplace Services Express and WDHT

- Generate portlets for traditional RPG and COBOL applications using the HATS Toolkit in WebSphere Development Studio Client Advanced Edition
- Many System i clients with new Enterprise Edition systems are entitled to 20 to 80 User Licenses for Workplace Services Express
- Portlets are deployed using Workplace Services Express licenses and the IBM Webfacing Deployment Tool with HATS technology

Improve employee productivity

Automate work and make it easier to make improvements

SOA Entry Point: Process

- Integration implemented with flexibility that is easy to adapt as business changes
- Leverage existing business critical legacy systems and custom business applications
- Improved Productivity and Responsiveness



IBM SOA Foundation

Model: WebSphere Business Server Tools (WBI-SE+), WebSphere Business Modeler

Assemble: WebSphere Business Server Tools (WBI-SE+), WebSphere Integration Developer

Deploy and Manage: WebSphere Business Integration Server Express Plus, WebSphere Process Server

Process: Automating Business Processes

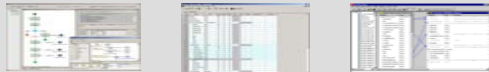
Increase Operational Efficiency



WebSphere Business Integration Server Express Plus*

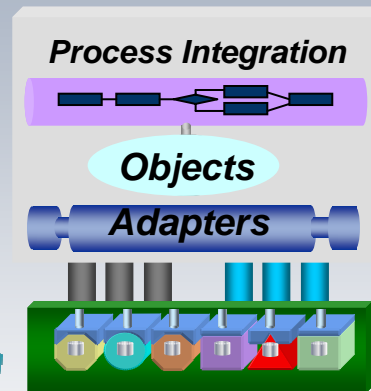
Assemble

Templates



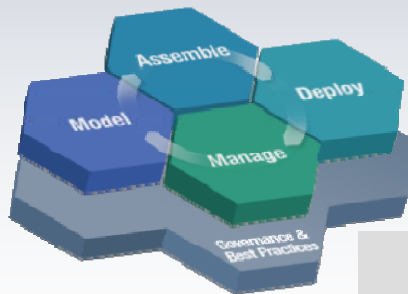
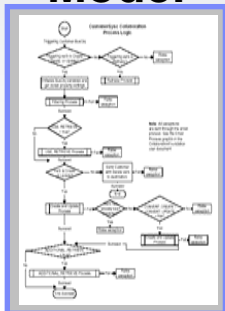
- **Process Designer**
- **Business Object Designer**
- **Map Designer**

Deploy



*Everything you need
to implement the
lifecycle approach
for SOA*

Model



Manage

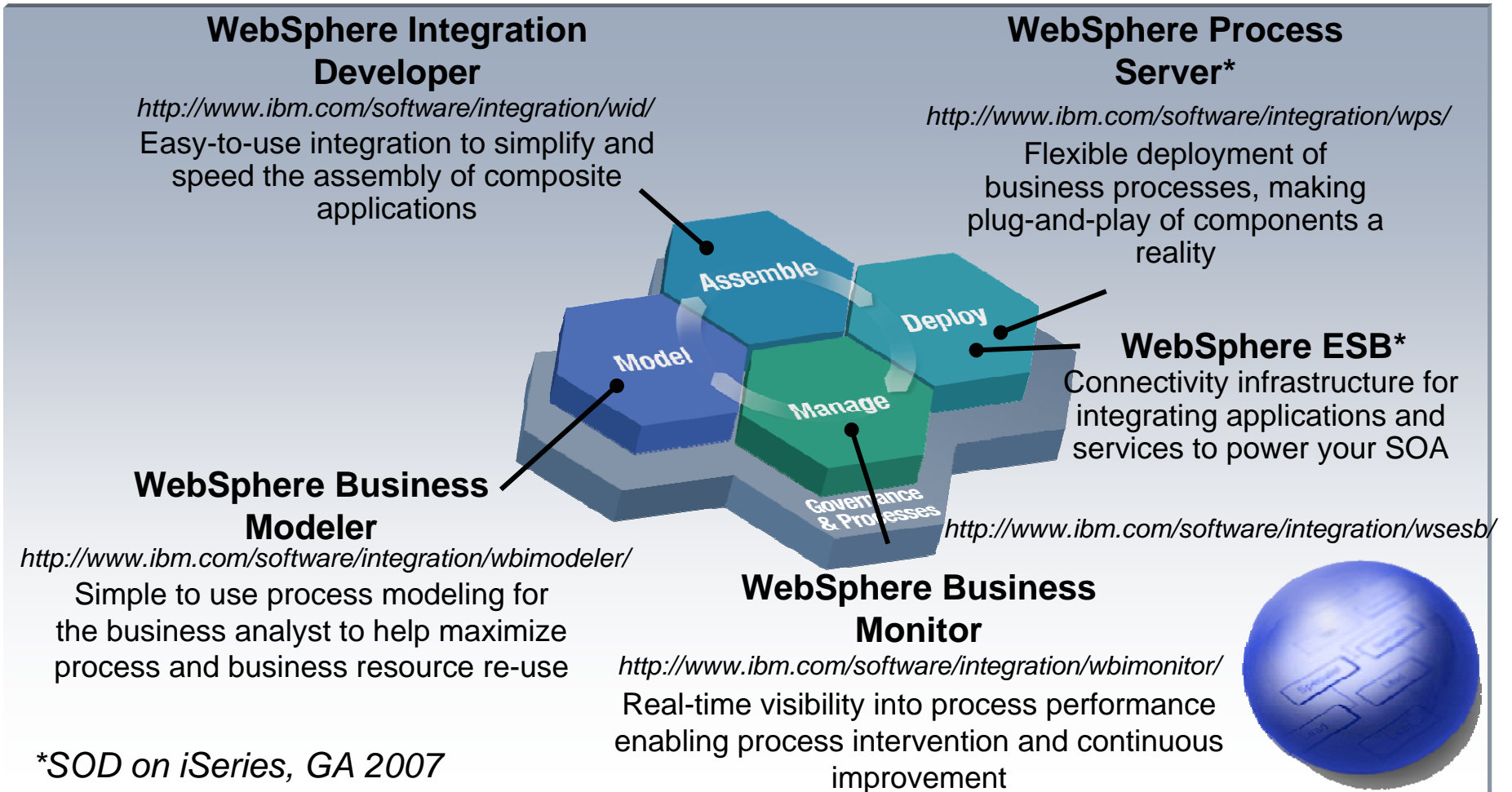


- **Probes**
- **Web based dashboard**

*Available on i5/OS Today!

Business Process Management Enabled with SOA

IBM SOA Foundation: <http://www.ibm.com/soa>



*SOD on iSeries, GA 2007

Business Process Management Enabled with SOA Demo

The image shows a man in a white shirt and tie sitting at a desk with a computer monitor. The monitor displays a Macromedia Flash Player 8 window showing a Business Monitor dashboard. The dashboard includes a bar chart, a line graph, a table, and two pie charts. The man is looking at the monitor.

Macromedia Flash Player 8
File View Control Help

Business Monitor

Client Performance

Client Percent Errors

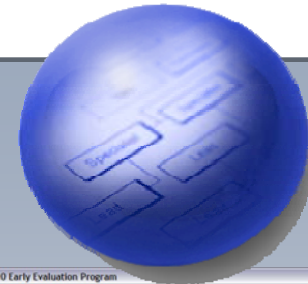
Client Status

IBM Business Process Management Service Oriented Architecture

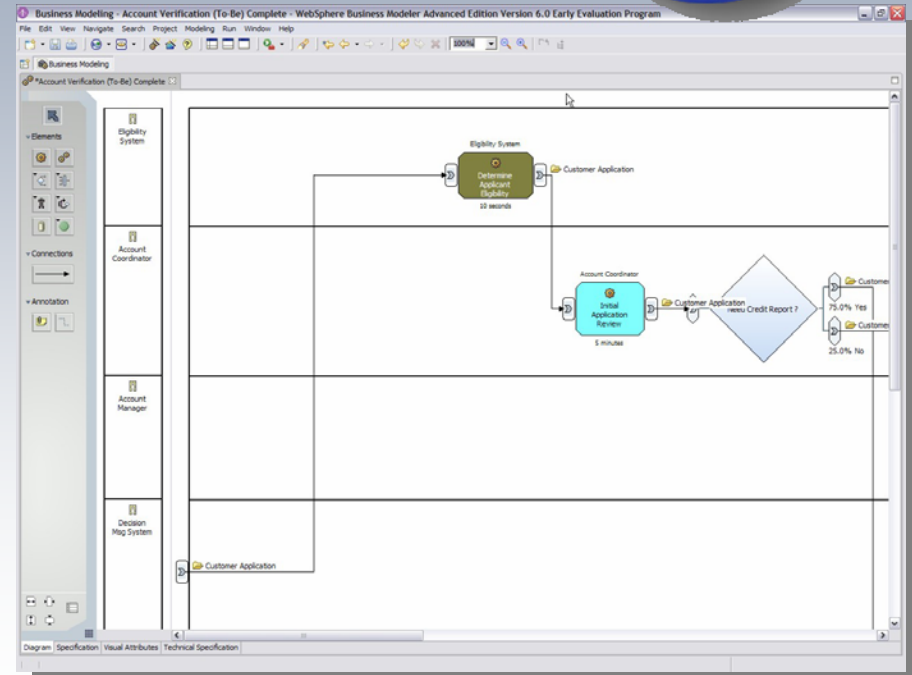
1 2 3 4 5 6 7 8 9 10
Select A Chapter

WebSphere Business Modeler

A Business Tool for Business Users



- Graphically Model Processes
 - Simple but Comprehensive Modeling
- Simulate And Analyze
 - Simulated execution of the business process with detailed statistical analysis tools
- Collaborate and Web Publish
 - Tools to allow multiple people to work as a team on business process work
 - Tools to publish business process work across the business
- Hand Off To IT
 - Export business and data models for use in IT deployment
- Visio import
 - Import existing process pictures done in Visio as a starting point for true business modeling

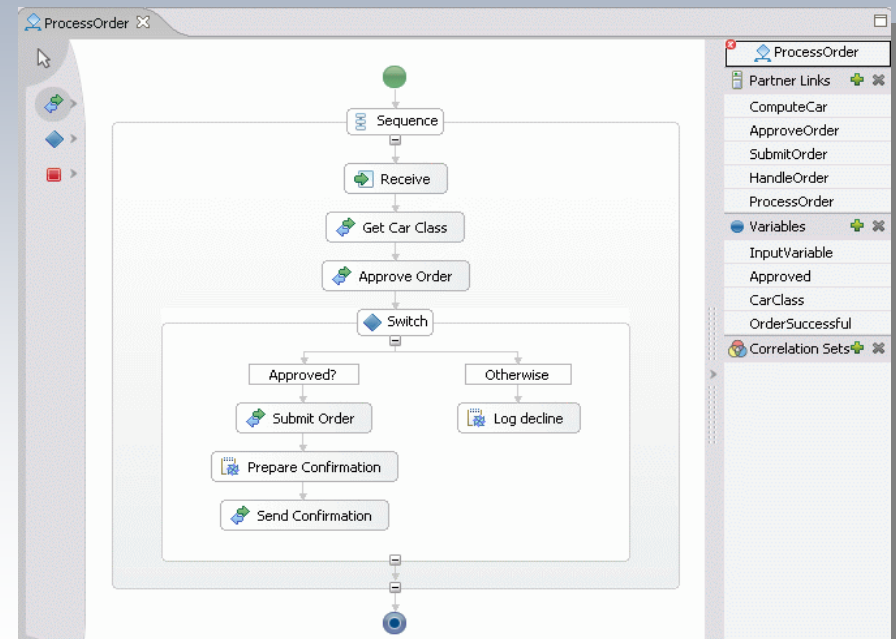


<http://www.ibm.com/software/integration/wbimodeler/>

WebSphere Integration Developer

BPEL without Coding – Standards-Based Process Support

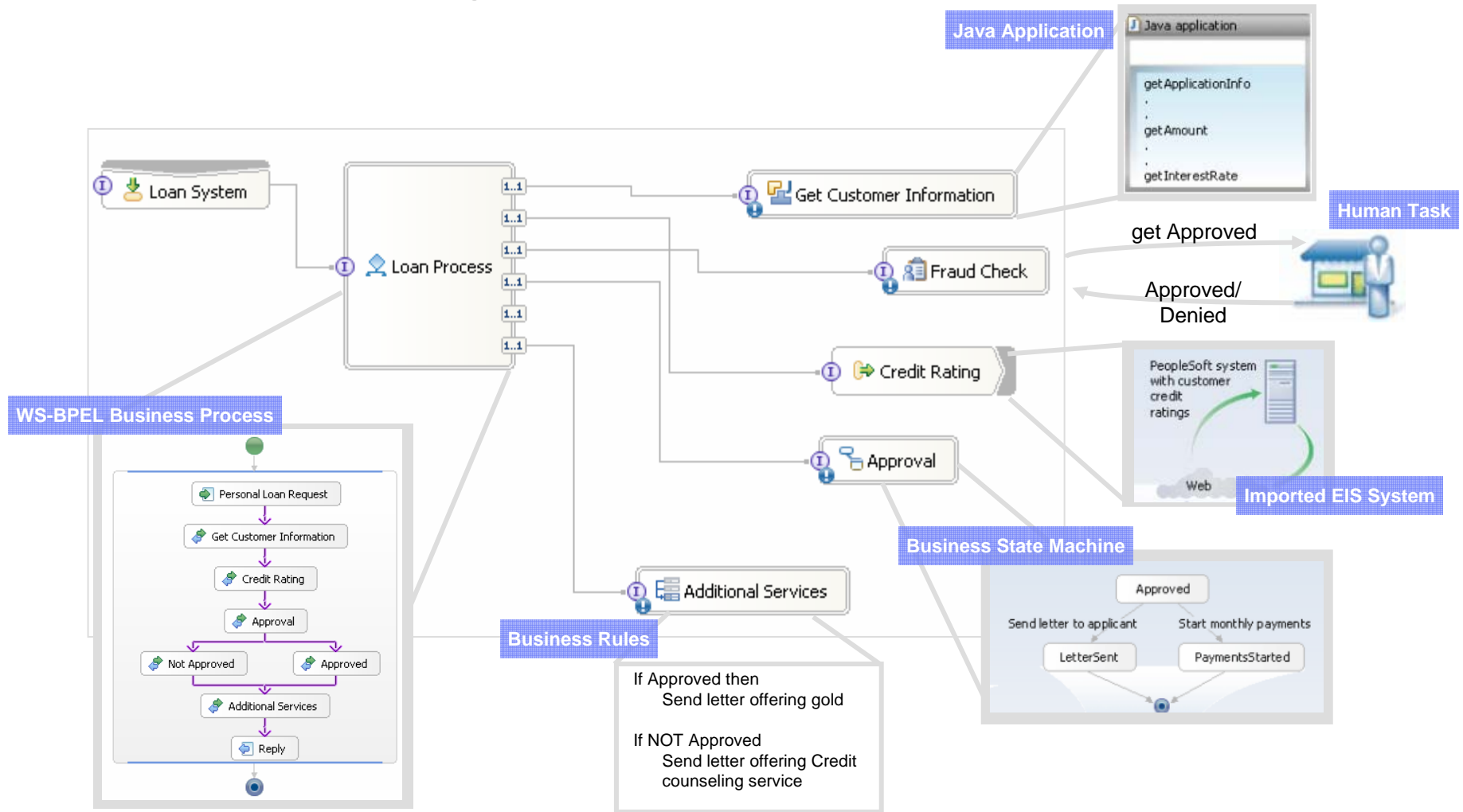
- Develop executable process
 - WS-BPEL-based business processes
 - WS-BPEL with or without IBM extensions
- Intuitive drag-and-drop tools
 - Visually define the sequence and flow of business processes
- A visual business process debugger
 - Step through and debug business processes
- Integrated fault and event handling
 - Provide an easy and integrated means of handling in-flow exception handling and external events
- Compensation support
 - Provide a logical “undo” capability



<http://www.ibm.com/software/integration/wid/>

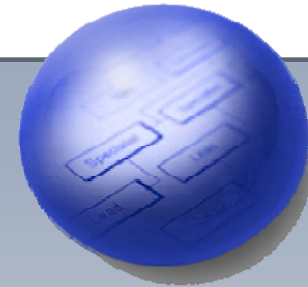
Assembling The Components into a BPM solution

A set of related and integrated services that support a business process

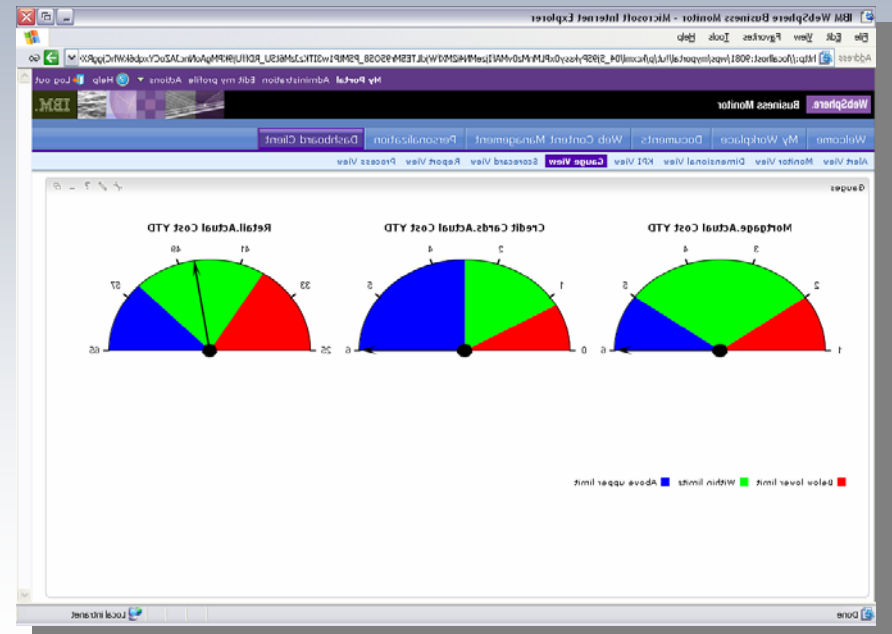


WebSphere Business Monitor

Graphical Tooling that Tracks your Business Processes



- Business Dashboards
 - Scorecards of Key Performance Indicators
 - Track cost, time and resources
 - Identify bottlenecks, balance workloads, reduce latencies
- Process Intervention
 - Business event triggers and notifications
 - Dynamic response to alerts
- Continuous Process improvement
 - Real data in WebSphere Business Modeler to understand your business performance and design the next release of your business process



<http://www.ibm.com/software/integration/wbimonitor>

Process: Process Framework for the Future

Industry Compliant Process Automation



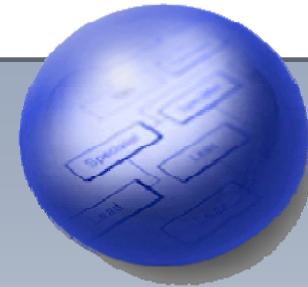
WebSphere Process Server

- Deploys your Business Processes
 - Support for Automated Processes including Human Workflow
 - Supports Industry Standard Business Process Execution Language
 - Includes WebSphere ESB
- Can be deployed in a System i Logical Partition running POWER Linux today
- Statement of Direction for i5/OS in 2007

Business Partners

WebSphere ESB and Process Server Enablement

The WebSphere and System i Team Needs You...



**Contact Al Grega
algrega@us.ibm.com**



***To Learn about SOA and Implement this
For your Customers!***

Improve employee access to information

Address new markets by expanding access to existing applications

SOA Entry Point: Information

- Lower costs by supporting a single version of a business function
- New business opportunities by making existing business functions available to new users or channels
- Extend value of existing assets through reuse to deliver new business value



IBM SOA Foundation

Assemble: WebSphere Development Studio Client (Included with WDS), IBM Workplace Designer, DB2 XML Extender

Deploy and Manage: WebSphere Application Server – Express, IBM Workplace Services Express

Information: Leverage your Existing Data

Web service DB2 UDB resources on i5/OS

WebSphere Development Studio Client and WebSphere Application Server - Express



- DB2 for i5/OS includes Web services provider and requestor infrastructure
- WDS Sc wizards can build Web Services runtime wrappers over SQL statements and Stored Procedures
- WebSphere Application Server - Express [bundled with i5/OS] provides the Server runtime environment

Take Action Now

Encourage innovation with a focused SOA project

1. Understand the value of SOA (ibm.com/soa)
 - It's not just Web Services
 - It's not just technology, but joining technology with business insight and thought leadership
2. Select your top business challenge and your entry point (Reuse, Connectivity, People, Process, Information)
3. Attend and SOA Proof of Technology Workshop in your Area
4. Attend IMPACT 2007



“While deploying technology is certainly key to a successful SOA integration, it is the maximizing of the people, process and information elements that are truly core to the SOA process.”

Judith Hurwitz
President, Hurwitz & Assoc.

Discovering the value of IBM SOA on System i5 – Current Events

Date	Location
2/27/2007	Seattle, WA
3/1/2007	Waltham, MA
3/6/2007	590, Madison Ave. New York
3/8/2007	Southbury, CT
3/13/2007	Tampa, FL
3/15/2007	Richmond, VA
3/20/2007	Atlanta, GA
3/27/2007	Mexico City (TBD)
3/28/2007	Mexico City (TBD)

Immerse Yourself in the Latest in SOA

Join IBM Impact 2007 Event for information, education and networking

You'll experience:

- Role-based tracks tailored for business & technical professionals
- A separate executive track
- 400+ sessions to choose from
- Collaboration with 4000+ attendees
- Over 100 companies telling their SOA success stories
- The latest news about SOA offerings
- Unparalleled access to IBM executives and thought leaders



Featured speakers:

- Mark Burnett, producer of Survivor, The Apprentice, and The Contender
- Steve Mills, Senior VP & Group Executive SWG, IBM
- Robert LeBlanc, GM, Global Consulting Services and SOA, IBM
- Carol Baroudi, Best-selling author & Industry Analyst, Aberdeen Group
- Tom Rosamilia, GM, Application & Integration Middleware, IBM
- Sandy Carter, VP SOA & WebSphere Strategy, Channels and Marketing, IBM

Registration at:

- www.ibm.com/events/impact2007
- Early registration through March 15

Get started now!

SOA Maturity Model, Assessment Tool and Workshops to select projects

Free!

Receive actionable recommendations customized to your level of SOA maturity

	Ad-Hoc	Systematic	Composite	Dynamic
Business Domain				
IT Environment				

SOA Project → How Do I Get Here?

SOA Assessment Tool

<http://www-306.ibm.com/software/solutions/soa/soassessment/index.html>

For more information visit...

- **SOA Videos:**
 - *What is SOA:* <http://www.youtube.com/profile?user=richneckyogi>
 - *SOA Launch Video:* <http://www.soalaunch.com>

- **IBM SOA Landing Page:**
 - <http://ibm.com/soa>

- **SOA Readiness Assessment:**
 - <http://www-306.ibm.com/software/solutions/soa/soassessment/index.html>

- **Business Process Management Demo:**
 - <http://www.soaflexibility.com/BPM1/>

- **Business Process Management Enabled with SOA:**
 - **Product Information, Trials and Demonstrations**
 - <http://www-306.ibm.com/software/solutions/soa/demos/BPM1.html?ca=demo>

- **ZapThink (Great 3rd Party Site):**
 - <http://zaphink.com>

THANK
YOU



AAA Carolinas: SOA drives call center improvements

"IBM WebSphere software lets us reuse existing services" Harry Johns, IT Manager

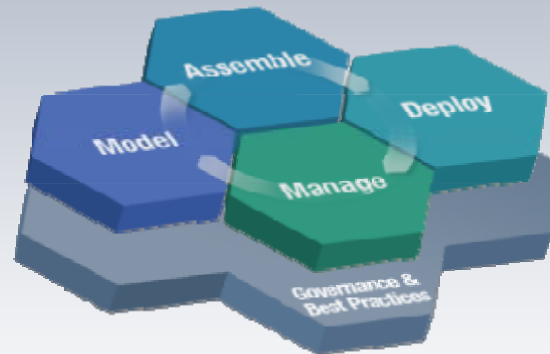


Needed to boost revenue and maintain profitability

Installed WebDocs-iSeries Edition from RJS Software Systems (RJS), an IBM Business Partner

Deployed through WebSphere Application Server to access all customer service functions from one screen

Modeled solutions to automate their insurance application processes



Managed using Web Browser based console

SOA Adoption

23% reduction in resolution time for customer calls; applications processed in days, not weeks; \$20,000 annual storage cost savings; ROI in less than two months

Great Lakes Higher Education: Reduced loan creation costs

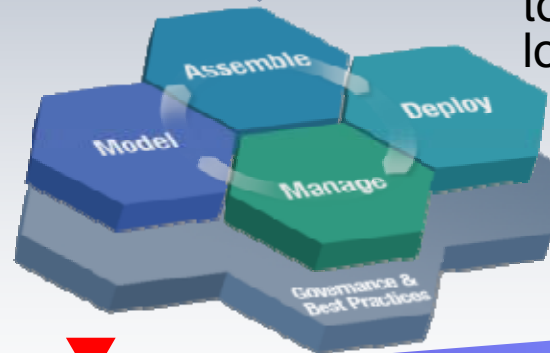
Delivered Web Services based reporting capabilities to students, schools and lenders



The time it takes to submit a [redacted] has gone from days to hours.

Assembled messages to optimize workflow to deliver real-time information

Modeled loan application, guaranty and servicing processes



Deployed through WebSphere Application Server and WebSphere MQ to automate submission of loan applications

Managed using Web Browser based console

SOA Adoption

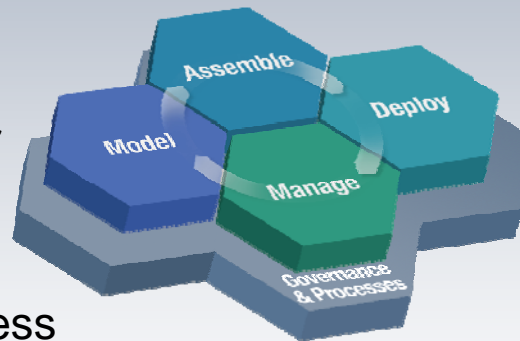
“Providing better services faster than our competition is what gives us our competitive advantage.” Mike Walker, CIO, Great Lakes Higher Education

SOA lifecycle in action at Actavis

Increase Productivity: Operational Efficiency - Business service reuse



Created an integrated workflow where users are unaware they are moving from one system to another



Deployed with WebSphere Business Integration Server Express

Modeled an automated business process integrating their JDE One World System with their warehouse management system and dispensing system

Manages the new business processes with in house personnel

Business Focus: Ensure Federal Drug Administration (FDA) Compliance

IT Action: Improve Business Process Integration

Olex Cables: Improves information access for call center

Handled a 50% increase in Call Center volume with reduced staff

