Building Business Flexibility with SOA on System i

Al Grega
WebSphere Product Manager for System i
alggrega@us.ibm.com
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

**Sources**: CBDi
Traditional Business Process

Case Study: Order to Cash Process

• 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

Customers

Order entry

Division
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 WDSc

![ARRT Web Service](image)

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

Call Center

Process to optimize

Case Study: Customer Order & Fulfillment

Call Center

CRM Service

ERP System

Supplier

Outsourced Shipping, Credit Check

Creating IT flexibility
And SOA lifecycle is the key to successful projects

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

- Discover
- Construct & Test
- Compose
- Gather requirements
- Model & Simulate
- Design
- Share & reuse services
- Establish decision rights
- Policies, measurement and control for SOA oversight

- Integrate people
- Integrate processes
- Integrate information
- Manage IT resources
- Manage services
- Monitor business metrics

Deliver trusted information to provide business insight to enable innovation

Enable human and process interaction with consistent levels of service

Achieve greater efficiency and effectiveness with business model innovation

Enable human and process interaction with consistent levels of service

Achieve greater efficiency and effectiveness with business model innovation

Deliver trusted information to provide business insight to enable innovation

Enable human and process interaction with consistent levels of service

Achieve greater efficiency and effectiveness with business model innovation

Deliver trusted information to provide business insight to enable innovation

Enable human and process interaction with consistent levels of service

Achieve greater efficiency and effectiveness with business model innovation
Don’t Panic… You Can Start Simple
SOA helps you solve top business challenges
Creating or improving IT solutions by leveraging IBM SOA Foundation
Where do you see your System i with SOA?

**IT Focused**
- **Reuse**
- **Service Creation**
- **Connectivity**
- **Service Connectivity**

**Line of Business Focused**
- **People**
- **Interaction and Collaboration**
- **Process**
- **Business Process Management**
- **Information**
- **Information as a Service**

**System i as an SOA End Point**

**System i as the SOA Focal Point**
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

WDSc: 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.
* "D" specs are used to define variables.

```
FARMSTF1   UF   E       K     Disk    Rename(ARMST:RARMST)
D pCusNo S              6p 0
D pName S             30aD 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)
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 WDSc 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

Portal

- Zero footprint
- View through your favorite browser

Web

Integration at the glass
Click-to-Action support
Requires WDSc AE
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

Sales
Visual Basic PGM
WebSphere MQ Client
Message

A/R
RPG PGM
WebSphere MQ Client
Message

Shipping
C++ PGM
WebSphere MQ Client

Finance
Java PGM
WebSphere MQ Client

WebSphere MQ
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.
Web Services are a good start…

Turn this …

…into this (web services).

- Rich business abstractions describe the application interface
- Decouples the interfaces from the business applications
- The number and complexity of the interfaces is reduced
- Business applications and their interfaces become reusable

But separate connection points still leaving bloated interfaces ….
The Enterprise Service Bus shrinks those interfaces further

**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

Enterprise Service Bus

Commerce S/W
ESB Capabilities: Transformation

Shipping System

TRANSFORMS message formats between requestor and service

<table>
<thead>
<tr>
<th>Shipping Master</th>
<th>Customer Master</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lname (Char 15)</td>
<td>Lastname (Char 20)</td>
</tr>
<tr>
<td>Fname (Char 15)</td>
<td>Firstname (Char 20)</td>
</tr>
<tr>
<td>Zipcode (Char 5)</td>
<td>Address1 (Char 25)</td>
</tr>
<tr>
<td>Addr1 (Char 30)</td>
<td>City (Char 20)</td>
</tr>
<tr>
<td>City (Char 20)</td>
<td>State (Char 20)</td>
</tr>
<tr>
<td>State (Char 2)</td>
<td>Zipcode (Char 5)</td>
</tr>
<tr>
<td>etc</td>
<td>etc</td>
</tr>
</tbody>
</table>
ESB Capabilities: Conversion

CONVERTS transport protocols between requestor and service

Customer Master

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
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
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
- Process Designer
- Business Object Designer
- Map Designer

Deploy
- Process Integration
- Objects
- Adapters

Model

Manage
- Probes
- Web based dashboard

Everything you need to implement the lifecycle approach for SOA

*Available on i5/OS Today!
Business Process Management Enabled with SOA

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

WebSphere Integration Developer
http://www.ibm.com/software/integration/wid/
Easy-to-use integration to simplify and speed the assembly of composite applications

WebSphere Process Server*
http://www.ibm.com/software/integration/wps/
Flexible deployment of business processes, making plug-and-play of components a reality

WebSphere ESB*
Connectivity infrastructure for integrating applications and services to power your SOA

WebSphere Business Modeler
http://www.ibm.com/software/integration/wbimodeler/
Simple to use process modeling for the business analyst to help maximize process and business resource re-use

WebSphere Business Monitor
Real-time visibility into process performance enabling process intervention and continuous improvement

*SOD on iSeries, GA 2007
Business Process Management Enabled with SOA Demo
How the IBM SOA Foundation Portfolio works together

WebSphere Business Modeler

WebSphere Integration Developer

WebSphere Business Monitor

WebSphere Process Server, WESB*

*BPEL on i5/OS, 2007
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

If Approved then
Send letter offering gold

If NOT Approved
Send letter offering Credit counseling service
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
- WDSw 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

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/27/2007</td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>3/1/2007</td>
<td>Waltham, MA</td>
</tr>
<tr>
<td>3/8/2007</td>
<td>Southbury, CT</td>
</tr>
<tr>
<td>3/13/2007</td>
<td>Tampa, FL</td>
</tr>
<tr>
<td>3/15/2007</td>
<td>Richmond, VA</td>
</tr>
<tr>
<td>3/20/2007</td>
<td>Atlanta, GA</td>
</tr>
<tr>
<td>3/27/2007</td>
<td>Mexico City (TBD)</td>
</tr>
<tr>
<td>3/28/2007</td>
<td>Mexico City (TBD)</td>
</tr>
</tbody>
</table>
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

Registration at:

- Early registration through March 15

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
Get started now!

**SOA Maturity Model, Assessment Tool and Workshops to select projects**

Receive actionable recommendations customized to your level of SOA maturity

**SOA Assessment Tool**

For more information visit…

- **SOA Videos:**
  - *What is SOA:* [http://www.youtube.com/profile?user=richneckyogi](http://www.youtube.com/profile?user=richneckyogi)
  - *SOA Launch Video:* [http://www.soalaunch.com](http://www.soalaunch.com)

- **IBM SOA Landing Page:**

- **SOA Readiness Assessment:**

- **Business Process Management Demo:**
  - [http://www.soaflexibility.com/BPM1/](http://www.soaflexibility.com/BPM1/)

- **Business Process Management Enabled with SOA:**
  - *Product Information, Trials and Demonstrations*

- **ZapThink (Great 3rd Party Site):**
  - [http://zapthink.com](http://zapthink.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 efficiency to 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

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 an application 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

“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.

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

**Deployed** with WebSphere Business Integration Server Express.

**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*

Web Service enabled legacy ERP system to increase productivity and flexibility

**Created** a three-tier Java-based application and **assembled** business logic and user interface software

**Deployed** through WebSphere Application Server to improve small volume quote for wholesalers

**Modeled** a proprietary ERP system versus Web Service enabling existing ERP system for Call Center operators

**Managed** using Web Browser based console

SOA Adoption

*Annual savings of AUS$550,000 with 100% payback within 3 years.*