IBM SOA Architect Summit

SOA on your terms and our expertise
SOA Case Study:
A Practical Guide to SOA

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Dean, IBM School of Software Architecture
JK Enterprises (JKE) Case Study

JKE Enterprise Architecture

- Service Integration Maturity Model
- Defining and Enforcing SOA Governance
- Project Prioritization and Planning

JKE Business Architecture

- Business Component Analysis
- Service-Oriented Modeling and Architecture
- Identifying Areas for Improvement

JKE Application Architecture

- Exposing Services using Indirect & Direct Patterns
- Developing Service Flows

JKE Information Architecture

- Developing Data Federation
- Exposing Information Services

JKE Infrastructure Architecture

- Security Architecture
- Composite Application Management
JK Enterprises

Corporate Overview
- JK Enterprises is a premier supplier to retail channel, small business channel, and corporate customers
- Founded in 1935, now a well liked brand image
- High-touch approach to our customers
- Customers of all types can interact with us in a way that suits their individual needs
- Best service at the lowest cost
- Now with customer centers around the world
- Acquired Jensen Incorporated in 2000, which strengthened our corporate customer base
- Corporate customers are true business partners

Corporate Attributes
- 900 Offices, 6 Countries
  - Corporate Headquarters (2)
  - 350 Customer Centers
  - 500 Remote Sales Offices
  - 6 Call Centers
  - 8 Data Centers
- 11,000 employees
  - 1500 Corporate
  - 1000 Sales and Sales Support
  - ~15 per Customer Center
  - 150 per Call Center
  - 2000 in IT

Line of Business Organization

CEO

Commercial
  - Sales
  - Service
  - Credit

Retail
  - Sales
  - Service
  - Credit

e-business
  - Sales
  - Service
  - Credit
JK Enterprises

**Envisioned Future State**
- The most profitable high-touch company in the industry
- Aggressive growth with minimal risk
- Optimized responsive corporate organization
- A company that leverages its strategic investments
  - Best Web Site in the industry
  - Expert Sales force
  - Global CRM
  - Sales Focused Call Centers

**Key Initiatives**
- Grow organically and leverage our size
  - 100,000 new customers this year
  - Increase cross-sell ratio to over 2.0 in 24 months
- Multi channel integration
  - Access any service from any channel with consistent experience
  - Then move customers toward lower cost channels
- Business transformation and optimization
  - Optimize then grow - organization and processes
  - Remove redundancies - centralized shared services
  - Shift our focus to strategic functions - outsource high cost tactical business functions, invest in the rest
- Control access to information to ensure appropriate security

**Future Organization**
- CEO
  - LOBs
  - CIO
    - VP Development
      - Development
      - Release Engineering
      - Process Improvement
    - VP IT Operations
      - Service Support
      - Service Delivery
      - Solution Deployment
      - Infrastructure
  - CTO
    - Project Management
    - Risk, Security, Compliance
Agenda

- Enterprise Architecture
- SOA Business Architecture
- SOA IT Architecture
  - Application Architecture
  - Information Architecture
  - Infrastructure Architecture
- Getting Started
SOA and Enterprise Architecture: Best Practices

**Enterprise Architecture:**
- Assess SOA Readiness and Maturity
- SOA Governance
- Business Component Design

**Transition Planning**

**Governance**

**Enterprise Architecture Models**

**JK Enterprise Projects**

**SOA Design:**
- Service Identification
- Service Specification
- Service Realization
- Service Implementation

**SOA Development/Deployment:**
- Developing/creating Services
- Developing Information Services
- Developing User Interaction and Collaboration Services
- Developing Business Process Services

**SOA Management:**
- Service Infrastructure Considerations (Performance, Security, Virtualization)
## Service Integration Maturity Model (SIMM) – Next Steps

<table>
<thead>
<tr>
<th>Business</th>
<th>Organization</th>
<th>Methods</th>
<th>Applications</th>
<th>Architecture</th>
<th>Information</th>
<th>Infrastructure</th>
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<tr>
<td>Silo: Isolated Business Line Driven</td>
<td>Application Specific Skills</td>
<td>Structured Analysis &amp; Design</td>
<td>Modules</td>
<td>Monolithic Architecture</td>
<td>Application Specific</td>
<td>LOB Platform Specific</td>
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<td>Integrated: Business Process Integration</td>
<td>IT Transformation</td>
<td>Object Oriented Modeling</td>
<td>Objects</td>
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<td>Deploy Common Information Services</td>
<td>SOA Infrastructure Standard</td>
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<tr>
<td>Componentized: Business Service Decomposition</td>
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<td>Move to SOA-based Design Methodology</td>
<td>Components</td>
<td>Component Architecture</td>
<td>Information As a Service</td>
<td>Common SOA Environment</td>
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<td>Services: Componentized Business offers Services</td>
<td>Define &amp; Enforce SOA Governance</td>
<td>Service Oriented Modeling</td>
<td>Process Choreography Assembly</td>
<td>Focus on SOA Foundation</td>
<td>Enterprise Data Dictionary and Repository</td>
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<td>SOA and IT Governance Alignment</td>
<td>Service Oriented Modeling</td>
<td>Process Integration via Services</td>
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<td>SOA and IT Infrastructure Governance Alignment</td>
<td>Business Grammar Oriented Modeling</td>
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<td>Grid Enabled SOA</td>
<td>Virtualized SOA Environment</td>
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<td>Governance through Policy</td>
<td>Business Grammar Oriented Modeling</td>
<td>Process Integration via Services</td>
<td>Dynamically Reconfigurable Architecture</td>
<td>Dynamic Sense &amp; Respond</td>
<td>Level 4</td>
</tr>
</tbody>
</table>

- **Level 1**: SOA Foundation
- **Level 2**: LOB or Enterprise Specific
- **Level 3**: Virtualized Data Services
- **Level 4**: Semantic Data Vocabularies
- **Level 5**: Dynamic Sense & Respond
- **Level 6**: Level 6
- **Level 7**: Level 7
SOA Governance

*Defining SOA Governance at JK Enterprises*

**Execute the “JKE SOA Governance Project”**

1. **Identify SOA Business and IT Principles**
2. **Determine Existing Governance Structure**
3. **Define CoE Structure**
4. **Create the SOA Governance Framework**
   - **Roles**
   - **Processes**
   - **Policies**
   - **Metrics**
   - **Quality Gates**
5. **Tailor SGMM**
6. **Create Project Proposal**
7. **Implement Tools and Infrastructure**
   - WebSphere
   - Lotus
   - Tivoli
   - Information Management
   - Rational
8. **Refine Operational Environment**
SOA Governance

Enforcing Governance at JK Enterprises

Service Design and Development

Implement Policies

Service Reuse → Architectural Compliance → Access Method

Governance Policy and Best Practices

WebSphere Service Registry and Repository

WebSphere Integration Developer

Enforce Policies

Service Reuse → Architectural Compliance → Service Management

WebSphere Service Registry and Repository

SOA Design Review

Tivoli Composite Application Manager for SOA

Tivoli Change and Configuration Mgmt DB

Define Governance Policy

Review Service Lifecycle

Business Requirements Traceability

Rational Method Composer

WebSphere Business Modeler

Rational Requisite Pro
Agenda

- Enterprise Architecture
- **SOA Business Architecture**
  - SOA IT Architecture
    - Application Architecture
    - Information Architecture
    - Infrastructure Architecture
- Getting Started
## Business Analysis

### Identifying Business Components

**Target Competency:**
- Base
- Competitive
- Differentiated

**Investment Review**
- Contribution
- Cost (H, M, or L)

#### ‘Hot’ Component

<table>
<thead>
<tr>
<th>Business Administration</th>
<th>New Business Development</th>
<th>Relationship Management</th>
<th>Servicing &amp; Sales</th>
<th>Product Fulfillment</th>
<th>Financial Control and Accounting</th>
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<tr>
<td><strong>Directing</strong></td>
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<td>L Business Unit Tracking</td>
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<td>M Sector Management</td>
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<td>M Credit Assessment</td>
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<td><strong>Controlling</strong></td>
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<tr>
<td>L Account Administration</td>
<td>H Product Administration</td>
<td>L Product Directory</td>
<td>M Credit Administration</td>
<td>M Product Fulfillment</td>
<td>M General Ledger</td>
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<tr>
<td>H Purchasing</td>
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<td>L Branch/Store Operations</td>
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Business Analysis

Identifying Business Components

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### Directing
- Business Administration: M - Business Planning, L - Staff Appraisals

### Controlling
- Business Unit Tracking: M - Management, L - Staff Appraisals

### Executing
- Account Administration: L - H, M - M
- Product Administration: M - M
- Purchasing: H - M, L - M
- Branch/Store Operations: L - M
- Product Directory: L - M
- Marketing Campaigns: L - M
- Credit Administration: M - M
- Sales: M - H
- Customer Service: M - H
- Collections: M - L
- Document Management: M - M

- Cost control opportunity
- Revenue / Profit improvement opportunity
- Cost control opportunity
Business Analysis
Identifying Improvement Areas at JK Enterprises

- Negotiate volume discounts based on combined volume of all departments
  - Decrease negotiated cost of automated credit report by 20%
  - Automate 75% of credit report retrievals
- Implement consistent business rules to improve risk management
  - Decrease number of credit report retrievals by 10%
- Automate manual tasks for creating and administering accounts
  - Decrease cost of account activation by 50%
  - Decrease time to open account by 50%
- Develop optimized cross-channel account application process
  - Increase cross-sell ratio to 2.0
  - Add 500 new corporate customers
  - Improve STP of applications by 35%
  - Reduce call center calls from sales force and offices by 30%
- Decrease paper processes by automation of manual tasks
  - Increase electronic applications by 25%
Defining Solution Scope

Business Context Diagram

- Customer
- CSR (Store)
- Account Manager (HQ)
- Portal
- Forms
- Account History
- Credit Scoring Partner
- Account Owner (HQ)

Account Open Request
New Account Request
Real-time Collaboration re: Account History

Account On-Boarding

Account Requests
eForms
Decision
**Service Design via SOMA**

**Service Identification**

**Domain Decomposition**
- Techniques:
  - Process Modeling Tools
  - Design of KPIs/Metrics
- Services Identified
  - Open Account
  - Account Activation
  - Account Verification

**Goal Service Modeling**
- Techniques
  - Requirements Planning Tools
  - Design of KPIs/Metrics
- Services Identified
  - Determine Applicant Eligibility
  - Address Verification

**Existing Asset Analysis**
- Techniques
  - Asset Analysis Tools
  - Interviews/Documentation
- Services Identified
  - Account Inquiry (CICS 2.2)
  - AR Setup (CICS 2.2)
  - Account Setup (CICS 3.1)
  - Create Account (SAP)
Service Specification

Applying The Service Litmus Test

- **Candidate Service Name**: AR Setup

- **Business Alignment**:
  - Is the service business relevant? **YES**
  - Is funding available for service development and management? **YES (Governance Board)**
  - Is the service sharable? **YES**

- **Composability**
  - Is the service consistent with NFRs at the composite level? **YES - As per current requirements**
  - Is service stateless? **YES**
  - Is the service self-contained? (Are there dependencies?) **YES – No Dependencies**
  - Is the service technology neutral? **Implementation is CICS 2.x - technology neutral**

- **Externalized Service Description**
  - Is there an externalized service description e.g. WSDL? **NO - done as part of service creation**
  - Can the service be discovered and bound via the service description? **Following service creation**
  - Does the description contain meta-data about itself? **Following service creation**

- **Redundancy Elimination**
  - Can the service be applied to all processes where its function is required? **YES**
SOMA Service Specification
Defining the “Account Receivable (AR) Setup” Service

Building the Service Message Model
Designing the Service Components
Service Specification

Service Model for “Account Activation”
SOMA Service Realization

Designing the implementation for the “AR Setup” Service

- Architectural Considerations
  - Implementation is CICS 2.2
  - WebSphere MQ on mainframe
  - Security requirements (RACF)
  - Alternatives
    - ESB Integration
    - Custom EJB Development
    - J2C Adapter
    - Application-level messaging

- Architectural Decisions
  - ESB Integration
    - Security requirements
    - Availability requirements
    - Message augmentation/transformation
  - Support for both synchronous and asynchronous interactions
  - Compensatory service need to be designed and deployed
Agenda

- Enterprise Architecture
- SOA Business Architecture
- **SOA IT Architecture**
  - Application Architecture
  - Information Architecture
  - Infrastructure Architecture
- Getting Started
The End-to-end Account Opening Solution

**People**

- Account Opening Service
- Credit Policy
- Create Account
- Confirm Account
- Receive Request
- Check Application
- Internet/Intranet Portal

**Information**

- Account History Service
- Account Info Service
- Account Status
- Customer Orders
- Customer Application
- Customer Account

**Process**

- The End-to-end Account Opening Solution
- Internet/Intranet Portal
- Customer Application
- Customer Account

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Developing the Process Model

Completing the “Account Open” Process Model

Design and Simulation of the “Account Open” Business Process Model

Collaborative Development of the “Account Open” Business Process Model

WebSphere Business Modeler

WebSphere Business Modeler
Publishing Business Server
Application Architecture

“Account Setup” Service (Billing System)

Direct Exposure
CICS 3.1
Application Architecture
“Account Inquiry” Service (Customer Management)

Indirect Exposure
J2C Adapter to CICS

Adapter Development

WebSphere Integration Developer
Application Architecture
“Create Account” Service (SAP)

Indirect Exposure to SAP

Developing The SAP Adapter Instance

Setting SAP Adapter Properties

Selecting BAPIs For Adapter Operations

WebSphere Adapter for SAP Software
Service Reuse

Integration with the Service Registry

Browsing for Services and Publishing Services with the Web Interface

Browsing for Services with the Eclipse Interface

WebSphere Service Registry and Repository
Application Architecture

*Developing Basic and Composite Service Flows*

Develop Service Flows for “Determine Eligibility” and “Account Activation” Services

*WebSphere Integration Developer*
Information Architecture
Data Federation, XML Retrieval and Data Cleansing Services

Operational DB ACCOUNT
Table: INFORMIX ACCOUNT
id: Informix
DW: ibmpassword

INFORMIX

DB2 Database CUSTACCOUNT
Table: JKE CUACCOUNT
Instance: DB2
id: administrator
pw: ibmpassword
INFORMIX Server Name: ol_plstew

DB2 Federation Server

Building Federation Services
Building Native XML Retrieval Services
Building Account Application Data Cleansing Service

WebSphere Federation Server
DB2 v9 Viper
WebSphere Quality Stage
Information Architecture

Exposing Information Services

Registering Information Services

IBM Information Server
Process Design and Deployment
Assembly and Deploy

WS-BPEL Process Implementation

“Account Open” WS-BPEL Implementation

Wiring the Components for the “Account Open” Process

WebSphere Integration Developer
Process Monitoring and Management

Building BPM Monitoring Components and Dashboards

Monitoring Credit Risk

<table>
<thead>
<tr>
<th>Customer Location</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<td>Canada</td>
<td>1</td>
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<td>USA</td>
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Account Verification Instances

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<tr>
<th>KPI Name</th>
<th>Status</th>
<th>Value</th>
<th>Target</th>
<th>Value in Range</th>
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<tr>
<td>Account Opening Duration Indicator</td>
<td>1 m, 9 d</td>
<td>14 h, 0 m, 6 s</td>
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<tr>
<td>Manual Approval Indicator</td>
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<td>New Accounts Opened Indicator</td>
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<td>50</td>
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WebSphere Business Monitor

WebSphere Dashboard Framework

SOA on your terms and our expertise
Building User Interaction Services

Developing and Deploying the “New Account” Application

Lotus Forms

WebSphere Dashboard Framework

WebSphere Portal

Building Role-Specific Portlets and Dashboards
Deploying the Solution Architecture

Implementation Topology for JK Enterprises
JK Enterprises Security Architecture
Infrastructure Architecture
Composite Application Management

Configuring Service Management Agents
Monitoring Account Opening Performance and Availability

Tivoli Composite Application Manager for SOA
Tivoli Enterprise Portal
Agenda

- Enterprise Architecture
- SOA Business Architecture
- SOA IT Architecture
  - Application Architecture
  - Information Architecture
  - Infrastructure Architecture
- Getting Started
SOA Adoption: Tactical and Strategic Action Combined

**SOA Goal**

- Market return through transformation: quicker time to production, lower costs, competitive differentiation

Two Primary Roadmap Perspectives

- **Strategic Vision**
  Business and IT statement of direction which can be used as a guideline for decision making, organizational buy-in, standards adoption

- **Project Plans**
  Implementation projects to meet immediate needs of the current business drivers
Why IBM?

Trusted, experienced guidance based on 5700 customers*

- Simplicity & robustness for consumability and confidence
- Investment protection through open standards
- Basic to advanced to grow as your needs evolve
- Pioneering metrics for SOA and agility
- Only vendor across people, process, and information
- End-to-end processes based on industry best practices

*# of Customers using our SOA offerings
Why IBM for SOA?

IBM understands service orientation and your business

Expertise in aligning business and IT processes
- 7500+ certified SOA consultants, architects, IT specialists
- Dozens of SOA-enabled business solutions

Thriving ecosystem of partners (ISVs, SIs, Resellers)
- 2500+ partners in SOA community
- 3500+ assets in SOA Business Catalog

Extensive Industry experience and best practices
- Over 4000 customers worldwide
- SOA Entry Points, SOA Reference Architecture, SIMM

Unmatched breadth and depth of products
- Over $1B/yr invested in SOA
- Leadership in open standards & 300+ SOA-related patents

Leadership in Governance & Service Lifecycle Management
- IBM SOA Governance & Management Method that spans the services lifecycle
Let's Go!
*Build on SOA Successes for Greater Business Value*

1. Continue to discover the value of SOA
   - Not just doing the same thing a different way
   - SOA is not just about technology, but technology’s integration with business insight

2. Get Assessed! SOA Self Assessment
   On-line at ibm.com/soa/assessment

3. Evaluate and select a SOA project

4. Arrange for a SOA Workshop to begin your SOA journey

"...IBM is the leader in the development of SOA intellectual property.... with firm-wide SOA investment of $1 billion, IBM will leverage cutting-edge R&D, leading to quicker SOA value and reusable SOA assets for clients."

The Forrester Wave™
North American SOA Integration, Q3 2006, September 2006
Thank You
IBM SOA Architect Summit

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