SOA Case Studies: Lessons Learned

*Business-Driven SOA*

**USJFCOM Meeting, July 2007**

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BearingPoint, Inc.
Agenda

Introduction
Where We’ve Been
Case Studies
- Consumer Packaging Client: Schawk
- Insurance Client: Fireman’s Fund
Conclusions
Q & A
Integration: Where We’ve Been
**Past Impediments to Integration**

<table>
<thead>
<tr>
<th>Impediment</th>
<th>SOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>O/S Platform</td>
<td>Web Services are platform neutral</td>
</tr>
<tr>
<td>Networks/Protocols</td>
<td>Web Services on IP port 80 or 443 traverse firewalls easily</td>
</tr>
<tr>
<td>Coding</td>
<td>SOA tools require little or no coding</td>
</tr>
<tr>
<td>Data Models</td>
<td>Data transformations by point and click</td>
</tr>
<tr>
<td>Interfaces</td>
<td>XML standards enable loose coupling</td>
</tr>
<tr>
<td>Program/Project Management and Migration</td>
<td>Service producers can exist before service consumers</td>
</tr>
<tr>
<td></td>
<td>Changes to interfaces do not necessarily require tight coordination of migration</td>
</tr>
</tbody>
</table>

**Q: With all these impediments eliminated, how can we fail?**

**A: By failing to focus on the business or mission!**

*Technology is not enough!*
Consumer Packaging and Labeling Case Study

Schawk, Inc.
Media Platform Exchange - mpX
Process of Package Creation

Creative
- Planning
- Conceptual
- Design
- Artwork
- Photography
- Copy

Assembly
- Digital Asset Management
- Retouching
- Color Correction
- Proofing

Prepress
- Color Management
- RIP
- Proofing
- Plates
- Films

Printing/Delivery
- Printing
- Delivery

Process Flow
Schawk is a medium sized business (~$540M annual revenue)
Schawk has grown in recent years to a multinational company
   ■ 51 offices in 13 countries
Schawk needs to be able to seamlessly move jobs from one office to another to:
   ■ Load balance across offices
   ■ Take advantage of lower-cost offshore labor
   ■ Remain competitive and meet deadlines

Improve/Cement Relationship with Clients
   ■ Reduce errors which cause expensive rework
   ■ Appear innovative to customers
   ■ Sell agility, leadership, higher value
Technical Challenges

- **Legacy systems:**
  - Standalone job management systems at each office
  - Centralized financials/billing/data warehouse
    - Unusual technology choices
    - Financial systems undergoing consolidation

- **Information exchange with clients in the form of documents**
  - Requires copy and paste into Schawk systems

- **Systems are currently “hardwired” together (mainly through batch data transfers) with little or no structural or architectural continuity**

- **No real-time business view across enterprise**

- **Operations and customers are changing faster than IT can respond**
Schawk needed a consistent technology vision that could be communicated and adhered to over a multi-year period.

- **Initial integration focused on:**
  - B2B reliability and agility for job-related data
  - Real-time data synchronization across distributed systems
- **View to build reusable services and internal components that:**
  - Bring value now
  - Will still bring value when future architectural improvements occur
    - Seamless job movement
    - Single view of customers, vendors, etc.
    - Real-time enterprise job management visibility
Approach and Lessons Learned
Key Success Factors and Lessons

- Executive Support – Establish and Maintain
- Rapid Protoyping – Quick Wins
- Purposely Build for Reuse
  - Canonical XML Data Forms
  - Modular Construction
  - Built-in Flexibility
- Productionizing the Solution
  - Where point-and-click configuration meets command-line deployment
With the help of various Schawk business and IT stakeholders, a set of candidate business use cases were developed. A team collaboration site was setup so that people could contribute ideas and/or comment on other’s ideas.

The Schawk Executive Management Team worked with the team to verify the relevance of the use cases and to prioritize them in terms of value to the company.

From there, the mpX team selected three to be included in scope of the prototyping effort.
Rapid Prototyping

The team prototyped the three highest value use cases.

These use cases included the following concepts:

- Accessing an internal web service
- Accessing an external web service
- Database synchronization between IBM UniVerse database and Microsoft SQL Server database.
- Transforming multiple data sources into a canonical job data format
- End user access to the data via browser or email response.
- System access to the data via a web service
The team’s efforts were accelerated by the modular nature of the solution:

- Initially the team had the data formats of the internal and external web services and built transforms into a common canonical form for job data.
- The transforms were built and unit tested with sample data before process flows were complete.
- The transforms were integrated into process flows to perform the integration.
  - Initially, access to the internal and external web services were built as separate process flows.
  - Later, each of the process flows were integrated into a parent process flow.
- The team configured multiple listener types to enable provide access to the parent process flow:
  - HTTP GET
  - Email
A key component of our approach was to define a canonical Schawk XML format for Job data.

Canonical format drivers:

- Job data comes to Schawk in different forms from each client
- Job data includes standard attributes as well as attributes that are customized to the client
- For those clients that could send data in XML format, Schawk’s developers had to code custom XSLT for each client to translate their specific XML format into a format that Schawk’s system could store internally

To replace the need to code custom XSLT, the solution uses a point-and-click transformation tool, to simplify mapping into the canonical form

- Drag-drop, point-click configuration replaces hand coding
- Greater agility in reacting to changes
- The transformation is essentially self-documenting

Canonical formats promote reusability and the need for reusability drives the need for canonical formats.
The configurations of the listeners, process flows and other items often require specification of environment variables:

- Web Service Endpoints
- Email addresses
- URLs
- User ids and passwords
- DB Connection strings

These change as you migrate the solution from development to testing to production.

After initially developing the solution, the team went back and changed all environment variables to replaceable parameters.

We then created a scripted process to replace these in the configuration files as part of the migration process.
Maintain Support for SOA

Communicate the value
Keep end users informed
Keep management interested
Advertise – keep SOA visible
Schawk is in production with automated access to job data from one of its largest clients.

Before mpX, access to one client’s data was taking hours for Customer Service Reps and Print Production Managers to retrieve data manually.

This was because they were forced to use a slow-responding, complex-to-navigate user interface for the client’s job management system.

The mpX solution has reduced the time to access this information to a matter of seconds.

One production technology specialist in Schawk’s Newcastle-upon-Tyne, UK office declared it “brilliant.”
Schawk’s developers are integrating this capability to auto-populate this data into its internal job management application. Now the integration is based on the standardized canonical form instead of separate formats per client.

The speed of development and the ease of integration has changed the game within Schawk and opened up new possibilities as well as new challenges.

- Legacy data design and architectural issues are more apparent.
- Islands of technology are islands no more.
- New skill sets and new ways of thinking about systems integration are in demand for taking advantage of this platform (especially from management).

Schawk is spearheading the Intelligent Packaging Consortium based on success in SOA technology.
# Code of Federal Regulations: US FDA Mandated Food Labeling Data

<table>
<thead>
<tr>
<th>Required Information</th>
<th>CFR Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement of Identity</td>
<td>21 CFR 101.3</td>
</tr>
<tr>
<td>Net Quantity Statement</td>
<td>21 CFR 101.105(a)</td>
</tr>
<tr>
<td>Name and Place of Business of Manufacturer, Packer or Distributor</td>
<td>21 CFR 101.5</td>
</tr>
<tr>
<td>Serving Size (English and Metric)</td>
<td>21 CFR 101.9(b)</td>
</tr>
<tr>
<td>Servings per Container</td>
<td>21 CFR 101.9(b)(8)</td>
</tr>
<tr>
<td>Identifying Heading: Nutrition Facts</td>
<td>21 CFR 101.9(d)(2)</td>
</tr>
<tr>
<td>- Calories</td>
<td>21 CFR 101.9(c)(1)</td>
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<tr>
<td>- Calories from Fat</td>
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<tr>
<td>- Calories from Saturated Fat (voluntary)</td>
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<tr>
<td>- Total Fat</td>
<td>21 CFR 101.9(c)(2)</td>
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<tr>
<td>- Saturated Fat</td>
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<tr>
<td>- Polyunsaturated Fat (voluntary)</td>
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<tr>
<td>- Monounsaturated Fat (voluntary)</td>
<td></td>
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<tr>
<td>- Trans Fat (Mandatory as of January 1, 2006)</td>
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<tr>
<td>- Cholesterol</td>
<td>21 CFR 101.9(c)(3)</td>
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<tr>
<td>- Sodium</td>
<td>21 CFR 101.9(c)(4)</td>
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<td>- Potassium (voluntary)</td>
<td>21 CFR 101.9(c)(5)</td>
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<tr>
<td>- Total Carbohydrate</td>
<td>21 CFR 101.9(c)(6)</td>
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<tr>
<td>- Dietary Fiber</td>
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<td>- Soluble Fiber (voluntary)</td>
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<tr>
<td>- Insoluble Fiber (voluntary)</td>
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<td>- Sugars</td>
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<td>- Sugar Alcohol (voluntary)</td>
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<td>- Other Carbohydrate (voluntary)</td>
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<tr>
<td>- Protein</td>
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<td>- Vitamins and Minerals</td>
<td>21 CFR 101.9(c)(8)</td>
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<tr>
<td>- Mandatory</td>
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<tr>
<td>- Vitamin A</td>
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<td>- Vitamin C</td>
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<td>- Calcium</td>
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<td>- Iron</td>
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<td>- Vitamin K</td>
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<td>- Riboflavin</td>
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<td>- Niacin</td>
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<tr>
<td>- Vitamin B6</td>
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<td>- Folate (Folic acid)</td>
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<td>- Vitamin B12</td>
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<td>- Biotin</td>
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<td>- Pantothenic acid</td>
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<td>- Phosphorus</td>
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<tr>
<td>- Iodine</td>
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<td>- Magnesium</td>
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<td>- Zinc</td>
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<td>- Selenium</td>
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<td>- Copper</td>
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<td>- Chromium</td>
<td></td>
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<tr>
<td>- Chromium</td>
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<tr>
<td>- Molybdenum</td>
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<tr>
<td>- Chloride</td>
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<tr>
<td>- Percent Daily Values Footnote (Percent Daily Values are based on a ...)</td>
<td>21 CFR 101.9(d)(9)</td>
</tr>
<tr>
<td>- Caloric Conversion Information (Calories per gram: fat 9, carbohydrate 4, protein 4)</td>
<td>21 CFR 101.9(d)(10)</td>
</tr>
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### Nutrition Facts

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
<th>% Daily Value</th>
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</thead>
<tbody>
<tr>
<td>Calories</td>
<td>100 cal</td>
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</tr>
<tr>
<td>Total Fat</td>
<td>11 g</td>
<td>17%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0 mg</td>
<td>0%</td>
</tr>
<tr>
<td>Sodium</td>
<td>120 mg</td>
<td>7%</td>
</tr>
<tr>
<td>Total Carbohydrates</td>
<td>14 g</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Protein**

<table>
<thead>
<tr>
<th>Protein</th>
<th>1 g</th>
</tr>
</thead>
</table>

**Vitamins / Minerals**

**Claims (requires substantiation in Ingredient List)**

**Ingredient List – English**

**Allergic Content Warning - English**

**Ingredient List – Spanish**

**Allergic Content Warning - Spanish**

**Name and Place of Business of Manufacturer, Packer or Distributor**

**Claims (requires substantiation in Ingredient List)**
Insurance Case Study

Fireman’s Fund
Business Drivers for SOA

- Improve business agility and top line growth
- Improve time to market with new services
- Enable game changing business models
- Avoid rip and replace of legacy IT systems
First Project

Adoption Stage

- Focus: Business Function
- Automation of billing inquiry service
- Service with multiple modes of inquiry
- Virtualized 9 different legacy billing systems
- Exposed legacy systems as web services
- Webify Fabric for assembly & delivery
- Delivered in 3 months
Expansion of SOA

- Focus: Business Function → Business Process
- Automation of quote process for agents
- Services with multiple modes of access
- Add mainframe rating system
- Exposed additional systems as web services
- Webify Fabric for assembly and delivery
- Delivered 5 states in 6 months
- 52% reuse of services from last project
Third Project

Enterprise wide SOA Adoption

- Focus: Enterprise SOA Transformation
- Automation of additional processes
- Spans multiple lines of businesses
- Addressing core business processes
- New business, policy admin, claims
- Expects over $200m savings over 5 years
Lessons Learned
Taxonomy of Services

- Business Function Services
- Business Process Choreography Services
- Information Services
- Integration Services
- Presentation Services
- ESB Services
  - Transformation
  - Routing
  - Security
Results to date

- Deployed to 8,000+ agents
- Delivered 52% service reuse
- Reduced time to market by >50%
- Reduced call center volume by >30%
- FFIC expects to reduce apps by 70%
- Scaled to 18m transactions/day

“This is the best example I’ve seen of being able to describe the business process in a way that allows us to build flexible technology. It is a huge opportunity to transform both the business and, frankly, what IT does for a living."

Fred Matteson, CIO Fireman’s Fund
Conclusions
## Remaining Challenges in a SOA World

<table>
<thead>
<tr>
<th>Challenge</th>
<th>SOA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Management</td>
<td>There is still a need to coordinate multiple teams to a common view of the solution</td>
</tr>
<tr>
<td>Funding Models</td>
<td>Funding common, reusable services still confounds many IT funding models</td>
</tr>
</tbody>
</table>
| Reuse                     | Reuse does not occur by accident. It requires enterprise requirements analysis to define:  
  - Truly reusable services 
  - Services with the proper granularity 
  - Use of canonical data forms 
  - Registries and rules for assessing services |
| “Not Invented Here” Syndrome | Reuse versus build new |
| Governance                | Build time governance – selection, reuse, version control  
  Run time governance – availability, performance, SLAs, volume, monitoring, visibility |
Some Final Thoughts

- SOA Maturity
  - Incremental approaches work best
  - Expect to get smarter along the way

- Business Process Management and SOA
  - BPM is the ultimate enabler of return on SOA investment
  - BPM is to SOA what a conductor is to an orchestra
  - Business processes are built from high-level composite services
  - Invoke business processes as services

- Knock down remaining impediments
- Maintain Leadership Support
Thank You