21st Century Tax Systems: COTS or Service Oriented Architectures

August 3, 2009
Agenda

- SOA and COTS Defined
- Integrated Tax Systems
- Other Tools that support SOA
- Pros and Cons
- Additional Considerations
A service ...

- Is a unit of work done by a service provider to achieve results for the service consumer
- Is a software component that is capable of providing access to functions and data
- Is exposed to other components via a service description
- Appears as a “black box” to the service consumer
- Is interacted via message exchanges
- Encompasses a business perspective
- Decouples its interface from its implementation
- Is built to last
- Needs to ensure stability and robustness
SOA - Definition

Service Orientation

- Use of “open” interoperability protocols that facilitate application assembly based solely on service descriptions that supports the dynamic discovery of appropriate services at run time

Service Oriented Architecture

- A process of putting together components to achieve some overall goal
- A blueprint that comprises the components organized by layers, their visible properties, their relationships, interactions, and constraints
- A discipline that addresses cross-cutting concerns to manage complexity and encourage holistic thinking
Commercial off the Shelf Solution (COTS) – Definition

- Used for application software that performs one or more functions
- Can be a large end-user application performing robust functions
  - Integrated Tax System that performs registration, accounting, correspondence, workflow and case management
  - Collection system that performance case management, correspondence and workflow
- Can be business applications that perform a few functions
  - Image capture application that reads text and provides workflow around that function
  - Customer relationship application that has workflow and case management capabilities
- Can be specific applications that perform targeted functions
  - Address Normalization
  - Skip Tracing/Locate Services
  - External Security Authentication
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The Evolution of Integrated Tax Systems

- COTS
- Transfer
- Custom
- SOA COTS
- SOA Framework
Custom Solutions

Pros
- Complete control
- Custom fit
- In-House skilled staff

Cons
- Long and complex development
- High cost to develop and maintain
- High risk
- Staff attrition with institutional knowledge
## Transfer Solutions

### Pros
- Somewhat proven solution
- Known features and functionality
- Expectation to implement quickly
- Reduce risk

### Cons
- Can result in more development than reuse
- Must adapt to imbedded business rules – changes can lead to significantly higher costs
- Solution initially designed for specific customer
  - Did not design original systems for reuse
  - Difficult to generalize requirements for different jurisdictions and taxes
  - Not component based
First Generation COTS Solutions

**Pros**
- Proven solution
- Quick implementation
- Low risk
- Low cost
- On-going product support
- Less pressure on agency technical staff

**Cons**
- Bolt-ons selected by the vendor
- Modifications may not be possible without vendor support/permission
- Interfaces could be limited by the vendor due to their proprietary software
- UI Changes could be limited without vendor support/permission
- Permanent vendor staff on-site or mandatory remote support
- Upgrades may be very costly
## Pros

- Proven solution
- Quick implementation
- Low cost/risk
- On-going product support and upgrades
- Supports integration with outside products
- States can become much more self-sufficient
- States can add more services
- Configurable to adapt business changes
- Business rules more clearly defined for service-enabled components

## Cons

- Flexibility requires State to know their business rules and requirements
- Requires agency technical staff to learn new tools
SOA Framework Approach

Pros

- Provides most long-term flexibility
- States can add more services
- Configurable to adapt business changes
- Business rules clearly defined
- Industry direction
- Best of breed services, with product support and upgrades
- May be supported by SOA COTS ITS
- States become more self-sufficient
- Lower cost of ownership over time

Cons

- Requires State to know their business rules and requirements
- Requires agency technical staff to learn new tools
- Longer to implement initially
- More expensive for initial implementation
- Not yet proven model for tax agencies
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SOA Tools and Processes

Tools
- Business Process Management Systems
- Business Rules Engine
- Enterprise Service Bus
- Business Rule Modeling and Design
- Real time Simulation

Processes
- Governance
- Business Rules – User Designed
- Real Time Testing/Simulation/Implementation of new system functionality (Business Rules)
Business Rules Engine

- Can be used to develop, manage, inventory, and invoke application logic and trigger actions
- A number of COTS have specialized business functions (e.g., document imaging) for their applications, may or may not support integration as another service call from the ESB

Key Goal: Flexibility to do work where it makes most sense
SOA Enterprise Noticing

- Leverages interfaces using more standard technologies
- Can be integrated with all applications
- Single repository of notice templates
- Single repository of all sent notices

Goals:
- Easy integration with current and future applications
- Enterprise noticing services for all channels (paper, email, fax, etc.)
SOA Case Management

Many different types of cases at a tax agency:
- Registration
- Return Validation
- Collections
- Audit
- Appeals

Goals:
- Integrated case management solution defined by specific business rules
- Flexibility to support a wide variety of case types
- Can support multiple SOA enabled applications (desk and field)
- Business rules governed, designed, managed by business users
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Comparison Areas

- Implementation
- Flexibility/Agility
- Maintenance
- Long-term cost of ownership
- Proven solutions
- Risk
## SOA – COTS

<table>
<thead>
<tr>
<th>Comparison Area</th>
<th>COTS with SOA Plug-ins or SOA Framework</th>
<th>COTS without SOA</th>
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</table>
| **Implementation** | ▪ Higher costs currently due to add’l integration and licensing  
▪ Many vendors and solutions  
▪ Complex – testing may need to be more comprehensive | ▪ Lower initial costs  
▪ Only one major software component to select  
▪ Limited plug-ins offered |
| **Flexibility/Agility** | ▪ Significant flexibility of solutions and technologies  
▪ Expanded ability to add new capabilities and technologies | ▪ Potentially significant expansion limitations  
▪ Can be dependant on the COTS vendor |
| **Maintenance** | ▪ Complex – multiple services to maintain – mitigated by having an integrator responsible  
▪ Streamlined – enterprise services used by multiple systems | ▪ Simplified with fewer siloed systems  
▪ Complex as similar services may be implemented across multiple packages |
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<td>Long-term cost of ownership</td>
<td>Not yet proven within tax…but SOA should have lower maintenance costs over time. Significant maintenance flexibility (and cost competition) as multiple vendors can provide services.</td>
<td></td>
</tr>
<tr>
<td>Proven solutions</td>
<td>Individual components are well proven and SOA is well proven, however SOA’s for tax agencies are still in its infancy</td>
<td>Well proven solutions are in place</td>
</tr>
<tr>
<td>Risk</td>
<td>Higher in the short-term, lower in the long-term</td>
<td>Lower in the short-term, higher in the long-term</td>
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Additional Considerations

Is the COTS ITS you are considering really an SOA?
- Platform independent
- Plug-and-play middleware
- How open is their software
- Ask for guarantees if not proven at other clients

Ask what “SOA-enabled” means
- Is it built in a SOA Framework?
- Has it been implemented with various SOA tools?
- Has been implemented in production in a SOA environment?

Investment by the software provider
- Investment is the key to long-term enhancements and viability
Additional Considerations

Do you need the flexibility of an SOA?

- All indications are this is where the market is going
- Implementations are beginning to be designed and implemented at tax agencies today
- New systems need to last for 10-20 years
- However…SOA is likely more complex to maintain and operate

A hybrid approach is possible

- If the COTS software truly integrates with the tools and processes that supports an SOA Framework and architecture
- The evolution of SOA into Tax Administration has begun
ISO 9001 Certified

Ted London
Vice President
Tax and Revenue Solutions
(916) 284-7277
Ted.London@cgi.com

About the Presenter

- 16 Years with CGI exclusively working with State, Federal and Local tax agencies
- Leader of CGI’s Global Tax and Revenue Practice
- Experience with more than 20 different tax agencies
- Experience with enhancing collections, audit and tax accounting systems and business processes
- Oversees estimation and measurement for CGI’s benefits funded tax projects