Exorcising Costs and Time via Reuse

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Presenter Background

Global Product Data Interoperability Summit | 2015

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Associate Tech Fellow

Current Assignment
• Technical Architect, Enterprise Master Data Management (E-MDM)

Education
• BA, Mathematics – Westmont College, Santa Barbara, CA
• MBA – Lake Forest School of Management, Lake Forest, IL

Certification
• MCSE – Microsoft
• SOA Certified Architect, Professional, Consultant – SOA Systems, Inc.
About Boeing

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What We Do Today

- Design, assemble and support commercial jetliners
  - Boeing 7-series family of airplanes leads the industry
  - Commercial Aviation Services offers broad range of services to passenger and freight carriers
- Design, assemble and support defense systems
  - World’s largest designer and manufacturer of military transport, tankers, fighters and rotorcraft
  - Global Services & Support provides services to government customers worldwide
- Design and assemble satellites and launch vehicles
  - World’s largest provider of commercial and military satellites; major service provider to NASA and prime contractor for the International Space Station
- Integrate and support large-scale systems; develop networking technology and network-centric solutions
- Provide financing solutions focused on customer requirements
- Develop advanced systems and technology to meet future customer needs

Connect and protect people globally
Agenda

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• Goal
• Integration Perspectives
  • Historical
  • Current
  • Future
• Enterprise Master Data Management (E-MDM) Example
• Summary
Presentation’s Goal

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Integrations’ Focus Must Change

Application-centric

Information-centric

Time

Focus

Focus
Historical Perspective

• Emphasis on exchange for the purpose of extending applications’ functionality

• Point-to-point solutions so applications can do their job

• Protocols were secondary (file based), although pub-sub had strong supporters
Current Perspective

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• Emphasis on exchange for process improvements

• Service Oriented Architecture (SOA) so composition can fulfill processes – services and APIs dominate but data is secondary

• REST is the preferred protocol
Future Perspective

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• Emphasis on exchange for the purpose of information collaboration

• Cloud services dominate

• APIs rule the protocol landscape
E-MDM – High-Level, Logical Architecture

- Boeing/COTS Applications
- Excel/Flat File/DBs
- Other Master Data Sources
- Integrate/Cleanse/Assemble
- Batch/ETL File
- Standard Format Transaction
- Create/Retrieve/Update
- SOA Layer/ESB
- EMDM Services
- EMDM Updates
  - Customer Master
  - Supplier Master
  - Part Master

Project SOA/Al EMDM
### Options Available to Enterprise MDM

#### Options for Payload of Exchange

<table>
<thead>
<tr>
<th>Option</th>
<th>Pro/Con Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customize each interface uniquely</td>
<td>High cost as shown previously</td>
</tr>
<tr>
<td>Use the MDM vendor’s format</td>
<td>Tie-in to MDM vendor</td>
</tr>
<tr>
<td>Use the predominant application vendor’s format</td>
<td>Tie-in to prime COTS vendor</td>
</tr>
<tr>
<td>Use a standard based format</td>
<td>Abstraction yields long term cost savings and flexibility for changes</td>
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Existing Integration Project

GOLD project had:

- 10 unique instances (sites)
- 117 applications in GOLD
- 7 different integration types
- 134 documented integrations per site

The migration to GOLDesp used OAGIS BOD* formats:

- 7+ times faster integrations
- Multiple removals of common integrations
- Quicker deployment options

*OAGIS is Open Applications Group Integration Specification; BOD is Business Object Document
GOLD’s Tools, Processes and Governance

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Tools

- GEFEG – Standard Tool (Installed, in use)
- XmlSpy – Enterprise Standard Tool
- Excel Spreadsheets – Enterprise Standard Tool
- Eclipse, Visual Studio, JSON, etc…

Processes

- Full lifecycle Boeing OAGIS BOD messaging (Guideline) development vetted
- Close working relationship with the OAGIS Standard Group
- Mutual understanding with the GEFEG vendor
- Full enterprise repository on-line yielding documentation, Java-Docs, Mapping sheets

Governance

- Close working relationship with Ent Arch and Integ
- Define canonical governance processes for projects
- Boeing technical business core infrastructure components
  - OAGIS BOD Guidelines
  - Documentation, XSD’s, XML’s and WSDL’s
  - SOARR
  - MetaData repository
  - Configuration Management (Subversion)
GOLD’s Methodology

Under Configuration Management Control

- Using tools to combine, enable and control the knowledge exchange
- Using process to make things more consistent and repeatable
- Using a standard canonical to achieve a high degree of repeatability
- Using tooling to provide ability to govern and improve
Enterprise Service Context Diagram

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- Meta/Data Standards Management
- UML, SysML Management (e.g. RSA)
- Entity/Relationship Management (e.g. ERStudio)
- Desktop Model Manager
- Report Manager (e.g. Cognos)
- Other Model Manager

- Managed Content Store
- Content Manager (GEFEG, E/R, UML, SysML, etc)

- BOD Message Library
- BOD Governance
- Content Registry (WSDL, etc)
- Applications
- SOA Service
- BOD SVC

- Architecture Development Tools (ARIS)
- BOD Reference

- Metadata Manager & Registry
  - Metadata Information Products
  - Business Glossary/Ontology
  - Metadata Model Assets

- Principal & Master Data Sources
  - Gov. Reference Data
  - Gov. Reference Data

- Finance Sources
  - Account Dept
- HR Sources (BEMSID)
- EA Sources (Application ID)
- IT Sources (Server ID)
- MDM Sources (Cust, Sup, Part)
E-MDM Data Flow and Governance

Enterprise Data Governance Organization and flow of core policies and metrics

- Initial Load
- Synchronization
- Transactions
- Queries

MDM ETL Stack
- Load
- Cleanse
- Analyze
- Etc.

MDM Group

ESB
- OAGIS BOD messages

Enterprise MDM
- Event Management

Application ETL Stack
- Data Services
- Info Steward

ERP, etc.

ESB

Divisional DGO

Enterprise Governance Rules / Policies

Divisional DGO

Project Data Governance Rules / Policies

Data Sources
- Source 1
- Source 2
- Source ...
- Source N

All Master Data

E-MDM Group

Application ETL Stack

Events

DG Workflow

Project’s Master Data

App 1

App 2

App N
For our E-MDM project, the information model of our MDM tool and of OAGIS aligned very closely.

Statistics on timings to do our web services are still being collected and analyzed, but having a starting baseline got us up and running very quickly.

The lack of Service Oriented Architecture (SOA) developers actually caused our biggest delay. At every phase of our project, reuse has proven more valuable than envisioned. For integrations, this has multiple benefits:

- Uniform interfaces
- Common development environment
- Common vocabulary
- Best practices optimized
Summary

The journey and results of this project prove in a small microcosm that application integration work with a strong information focus yields tangible evidence of savings.

This same possibility is applicable to many other projects as well – perhaps even yours.
Questions?

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Recommendations:

• Organize canonical intermediaries around business entities *(such as BODS)*, ensuring that they are able to convey information about all the events associated with that business entity *(i.e., have proper verbs associated with the entities above)*, regardless of the applications in which those events occur *(data centric not application centric)*

* Abstracted excerpt from a Gartner document