Process Remittance Advice and Beyond

Strategic Roadmap to OAGIS 10.x

Scott Nieman
Enterprise Integration Architect
Agenda

- Introduction to Land O’Lakes
- Business Application and Oracle Fusion Middleware Landscape
- Lockbox Overview and Roadmap
- ProcessRemittanceAdvice Challenges and Recommendations
- E2open Third-Party Logistics (3PL) Overview
- Enterprise Lab Information Management Integration
- OAGIS PurchaseOrder Noun Subsets for API Gateway
- AgGateway Efforts
Land O’Lakes, Inc. today

- ~10,000 employees
- 3,200 direct producer-members and 1,000 member-cooperatives
- Serve +300,000 agricultural producers
- 300+ facilities in the U.S.

- 3 diversified businesses
- Annual revenue +$14 billion
- Goal to double revenues and increase international growth in the next 10 years
An operating company with three diversified businesses
To become an Operating Company...change is required

“I put a dollar in a change machine. Nothing changed!”
— George Carlin

"It is not necessary to change. Survival is not mandatory."
- W. Edwards Deming
Land O’Lakes On-Premise Application Landscape

- Oracle JDEdwards Xe (Purina)
- Oracle JDEdwards 8.12 (Dairy)
- Oracle JDEdwards 9.0.2 (WinField)
- Oracle Transportation Management (OTM) - Shared Logistics Services
- Oracle Fusion Procurement - Shared Indirect Procurement Service
- Oracle Data Relationship Management (DRM) - Shared Hierarchy Service
- Oracle WebCenter Content – Shared Content / Retention Management
- LabVantage Lab Information Management System (LIMS) - Shared Test Results Service; Dairy upgrade in-flight, roll-out to SureTech subsidiary
- Oracle Hyperion Financials (in-flight) – Shared Corporate Financial Services roll up
- Hundreds of peripheral applications, web sites, cloud solutions, and data warehouses / marts
Integration Tool Landscape and Roadmap

Autosys (jobs/boxes) /Shell Scripts/ ftp/ watch files/ plsql/ JDE UBEs

Mercator (Purina/WinField)

Informatica PowerCenter Extract Transfer Load (ETL)

Websphere ESB/ ffp /JDE 8.12 WSG (Dairy)

SOA Suite10g/AIA
globalscape Enterprise File Transfer (EFT)

SOA Suite 11g/AIA

FMW 11g PS5/6

EOY 2013

Cisco Tidal WS API / Scripts/ UBEs

EOY 2014

FMW 12c/OAGIS
Fusion Middleware 11g Production Environment

- AIA (Oracle SOA Suite 11.1.1.6 w/AIA Foundation Pack) (6 node cluster)
- B2B (Oracle SOA Suite 11.1.1.7) (4 node cluster)
- Direct (Oracle SOA Suite 11.1.1.6) (6 node cluster)
- Messaging (Oracle Service Bus 11.1.1.7) (6 node cluster)
- Managed File Transfer (Oracle Service Bus)(6 node cluster) w/ globalscape
- Oracle Data Integrator 12c (one agent per JDE environment)
- Oracle Business Process Management 11.1.1.6 (6 node cluster)
- Oracle Business Activity Monitoring 11.1.1.7 (2 node cluster)
- Oracle Business Transaction Management 11.1.1.7
- Oracle Enterprise Repository 11.1.1.7
- Oracle Enterprise Management Cloud Control 12c
Deployed on Oracle Hardware

- Exadata – Oracle Databases; FMW dehydration store, JDE, OTM
- Exalogic – Oracle Fusion Middleware 12c
- Exalytics - OBIEE
Lockbox / Remittance Advice
Integration Process using OAGIS
ProcessRemittanceAdvice as Canonical Pattern/
Enterprise Business Service (EBS)
Business Goals

- Harmonize three different approaches of integrating lockbox information into one
- Address a need to work with our bank to update transport methods
- Define an iteration plan that provides an Enterprise-wide method for cash receipt application to invoice for all lines of business, including the eventual removal of JDEdwards customizations
- Enable a transition to a shared services business model
Lockbox/Remittance Advice Use Cases

- Process Remittance Advice
- Include Account Info and Total Amount Paid
- Match Invoice Number and Amount Paid Against Invoice
- Hold for Cash Receipt
- Process Lockbox for Cash Receipts
- Check Number, Routing, and Amount
- Credit Card, Routing, and Amount
- ACH
- Match Invoice Number
- No Check Detail
- Process Disputes
- Process Discounts
Customers want credit release within JDE so they can buy more product; they may be on ‘credit hold’

High SLA is good for business relations and our bottom-line

Payments may not exactly match referenced invoices; many customer treat their JDE credit similar to personal credit cards

Payment amount > SUM (referenced invoice amounts); applied as customer credit in ERP for anticipated demand or budgeting reasons

Difficulty in addressing disputes (e.g., uncredited returns), deductions, or discounts not reflect on original invoice, at invoice line level
Banks that act as SME Service Provider

- Many Small-, Medium-sized Enterprises (SMEs) do not have resources to send Remittance Advise
- Banks provide data entry services to add detail to payment
- Data entry processes lead to data entry errors (Humans make mistakes)
- Level of detail varies based on SMEs are willing to pay
- Banks support numerous formats, seldom deprecate or advise against older formats (‘whatever the customer wants’)
Financial Services File Formats and Document Standards

- Bank Administration Institute (BAI) Reporting Standard v1 (COBOL Copybook)
- NACHA (ACH; Business to Business)
- ANSI ASC X9.121-2012 Balance Transaction Reporting Standard (BRTS/ BAI2)
- EDIFACT REMADV
- ANSI ASC X12 820 – Remittance Advice (how check is applied to invoices)
- ANSI ASC X12 823 – Lockbox (cash receipts)
- SWIFT MT family
- ISO 20022
- OAGIS ProcessRemittanceAdvice
BAI formats lacked invoice detail

- Invoice detail missing in BAI formats, added in BTRS by ANSI ASC X9
- In BAI, ‘Override’ or ‘Continuation’ record types provide ‘custom’ data, often name/value pairs a single record
Source: BAI v1 Format

- **TransmissionHeader_Type1**
  - RecordType : Integer
  - PriorityCode : Integer
  - Destination : String
  - Origin : String
  - FileCreateDateTime : Date
  - Fill : String

- **ServiceRecord_Type2**
  - RecordType : Integer
  - Destination : String
  - Origin : String
  - ReferenceCode : String
  - ServiceType : String
  - RecordSize : String
  - BlockSize : String
  - FormatCode : Integer
  - Fill : String

- **BatchHeader_Type5**
  - RecordType : Integer
  - BatchNumber : String
  - Fill : String
  - LockboxNumber : String
  - DateOfCredit : Date
  - Destination : String
  - Origin : String
  - Fill : String

- **DetailRecord_Type6**
  - RecordType : Integer
  - BatchNumber : String
  - ItemNumber : String
  - DollarAmount : String
  - TransitRoutingNumber : String
  - AccountNumber : String
  - CheckNumber : String
  - RemittanceData : String
  - Fill : String

- **OverflowRecord_Type4**
  - RecordType : Integer
  - BatchNumber : String
  - ItemNumber : String
  - OverallRecordType : Integer
  - SequenceNumber : String
  - LastOverflowIndicator : Integer
  - Invoice1Number : String
  - Invoice1PaidAmount : String
  - Invoice2Number : String
  - Invoice2PaidAmount : String
  - Invoice3Number : String
  - Invoice3PaidAmount : String

- **LockboxTotalRecord_Type8**
  - RecordType : Integer
  - BatchNumber : String
  - LockboxNumber : String
  - DateOfCredit : Date
  - TotalItems : String
  - TotalDollarAmount : String
  - Fill : String

- **BatchTotalRecord_Type7**
  - RecordType : Integer
  - BatchNumber : String
  - LockboxNumber : String
  - DateOfCredit : Date
  - TotalItems : String
  - TotalDollarAmount : String
  - Fill : String

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Target: JDEdwards OOTR EDI Interface Tables

Which lockbox

Which check/payment

Which invoice ‘Z4DOCO’

UML attributes only show table keys
Process Remittance Advice Data Mapping efforts

- Transform BAI to OAGIS
- Route OAGIS to Correct JDE Environment
- Transform OAGIS to JDE Interface Tables
High Level View
Bank Data Transfer View

- Real-time processing of sftp PUT (SSH) operation via REST invocation of Oracle Service Bus
- Integration Registry DB holds configuration of file specific proxy processing logic
- WebCenter Content for file archive and retention management
OSB Xquery Transforms to OAGIS ProcessRemittanceAdvice
JMS Store and Forward to SOA Suite for RemittanceAdviceEBS routing
BPEL processing into respective JDE environments
Detailed JDEwards View – Match to Invoice

- Lockbox PL/SQL: duplicate checking and matching to invoices
- In JDEdwards, the invoice is a ‘status’ on the order line
• Errors routed to BPM with metadata and error detail
• Support reviews error details, determines course of action including potential edit of source BAI file
• File versioned, resubmitted to JMS queue and reprocessed
OAGIS RemittanceAdvice Mapping Challenge

- RemittanceAdvice noun xsd only two supports levels; i.e., header / detail
- Requires that the transaction, lockbox/batch and check levels be ‘flattened’ to header
- Need to map invoice detail at the line level, but invoice number is not explicitly defined
# BAI v1 to OAGIS ProcessRemittanceAdvice v10.0 Data Mapping - ApplicationArea

<table>
<thead>
<tr>
<th>BAI v1</th>
<th>Record Type</th>
<th>ProcessRemittanceAdvice Element Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headers / File Header / FileCreationDate</td>
<td></td>
<td>1 ApplicationArea / CreationDateTime</td>
</tr>
<tr>
<td>Headers / File Header / FileCreationTime</td>
<td></td>
<td>1 ApplicationArea / CreationDateTime</td>
</tr>
<tr>
<td>Headers / LockBox Header / LockboxNumber</td>
<td></td>
<td>5 ApplicationArea / Extension/ ID</td>
</tr>
<tr>
<td>Headers / LockBox Header / LedgerDateOfCredit</td>
<td></td>
<td>5 ApplicationArea / Extension/ DateTime</td>
</tr>
<tr>
<td>Headers / File Header / Origin</td>
<td></td>
<td>1 ApplicationArea / Sender / LogicalID</td>
</tr>
<tr>
<td>Headers / File Header / Destination</td>
<td></td>
<td>1 ApplicationArea / Receiver / LogicalID</td>
</tr>
<tr>
<td>{Source_App_Partner_Name from Control table}</td>
<td></td>
<td>ApplicationArea / Sender / ComponentID</td>
</tr>
<tr>
<td>{Target_App_Partner_Name from Control table}</td>
<td></td>
<td>ApplicationArea / Receiver / ComponentID</td>
</tr>
<tr>
<td>{GlobalScapeAccount Name from the Header}</td>
<td></td>
<td>ApplicationArea / Sender / ReferenceID</td>
</tr>
</tbody>
</table>
## BAlv1 to OAGIS Data Mapping – Check Level

<table>
<thead>
<tr>
<th>BAl v1</th>
<th>Record Type</th>
<th>ProcessRemittanceAdvice Element Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeaderService/ ServiceType</td>
<td>2</td>
<td>RemittanceAdvice@typeCode</td>
</tr>
<tr>
<td>Transaction/TransactionDetail/ItemNumber</td>
<td>5</td>
<td>RemittanceAdvice / RemittanceAdviceHeader / TransactionID</td>
</tr>
<tr>
<td>Transaction/BatchTrailer/ TotalItems</td>
<td></td>
<td>RemittanceAdvice / RemittanceAdviceHeader / Status</td>
</tr>
<tr>
<td>Transaction/BatchTrailer /TotalAmount</td>
<td></td>
<td>Extension/Quantity</td>
</tr>
<tr>
<td>Transaction/BatchHeader/ LedgerDateOfCredit</td>
<td>5</td>
<td>RemittanceAdvice / RemittanceAdviceHeader / DocumentDateTime</td>
</tr>
<tr>
<td>Transaction/TransactionDetail/DollarAmount</td>
<td>6</td>
<td>RemittanceAdvice / RemittanceAdviceHeader / TotalAmount</td>
</tr>
<tr>
<td>Transaction/BatchHeader / BatchNumber</td>
<td>6</td>
<td>Extension/ID@typeCode=&quot;BatchNumber&quot; -- batch level</td>
</tr>
<tr>
<td>Transaction/TransactionDetail/CheckNumber</td>
<td></td>
<td>RemittanceAdvice / RemittanceAdviceHeader /</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CheckInstruction/CheckNumberID</td>
</tr>
<tr>
<td>Transaction/TransactionDetail/AccountNumber</td>
<td>6</td>
<td>RemittanceAdvice / RemittanceAdviceHeader / Status/ IDSet /ID</td>
</tr>
<tr>
<td>Integration_Attribute row</td>
<td></td>
<td>RemittanceAdvice / RemittanceAdviceHeader / Status/ IDSet /ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6@typeCode=&quot;AccountNumber'</td>
</tr>
<tr>
<td>Transaction/TransactionDetail/TransitRoutingNumber</td>
<td>6</td>
<td>RemittanceAdvice / RemittanceAdviceHeader / Status/ IDSet /ID</td>
</tr>
<tr>
<td>Integration_Attribute row</td>
<td></td>
<td>RemittanceAdvice / RemittanceAdviceHeader / Status/ IDSet /ID</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6@typeCode=&quot;TransitRoutingNumber'</td>
</tr>
</tbody>
</table>
# BAIv1 to OAGIS ProcessRemittanceAdvice v10.0 Data Mapping – Invoice Level

<table>
<thead>
<tr>
<th>BAI v1</th>
<th>Record Type</th>
<th>ProcessRemittanceAdvice Element Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceNumber1</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/LineNumberID</td>
</tr>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceAmount1</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/Extension/Amount</td>
</tr>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceNumber2</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/LineNumberID</td>
</tr>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceAmount2</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/Extension/Amount</td>
</tr>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceNumber3</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/LineNumberID</td>
</tr>
<tr>
<td>Transaction/InvoiceDetail[BatchNumber= Transaction/BatchHeader / BatchNumber And ItemNumber= Transaction/TransactionDetail/ItemNumber]/InvoiceAmount3</td>
<td></td>
<td>RemittanceAdvice / 4RemittanceAdviceLine/DocumentReference/Extension/Amount</td>
</tr>
</tbody>
</table>
Mapping Summary/ Enhancements

- Consider a Lockbox level – currently we have to map from a *four level document hierarchy* to a *two level hierarchy*, then back to a four level set of interface tables

- Related to payment options
  - Check: Routing Number missing, could be explicit
  - Credit Card: Sibling to Check Number
  - ACH: ditto to Check

- Call out disputes and discounts (with reason) as deductions to invoice payment at the *invoice line level*

- Consider including invoice type(s) from Invoice.xsd
RemittanceAdviceEBS composite exposing WSDL

Land O’Lakes’ feedback to OAGi: WSDL approach provides ‘ideal’ level of granularity
RemittanceAdvice.wsdl in JDeveloper
Exposing ProcessRemittanceAdvice services via API Gateway
Next Generation BPM-based Cash Application

- Add Validation Service
- Check if cash is received
- Check for remittance issues
Remittance Advice/Lockbox Roadmap

- Purina ‘go-live’ was this past weekend (11/9)
- WinField and Dairy go-live 11/23
- Consolidation of other Integrations to Canonical
- Upgrade Cloud-based Customer Payment services
- Provide API Gateway capability for Mobile /web services
- Upgrade Customer 820 during Dairy ERP upgrade; include Oracle BPM to resolve errors
Third Party Logistics

Using OAGIS BODs to replace Traditional ANSI ASC X12 / WINS EDI transaction sets
Long term Business Goals

- Provide Enterprise Shared Services for Third Party Logistics
  - Currently unique by line of business (primarily Purina and Dairy)
  - Labeling requirements often pose business process ‘challenges’
- Achieve common business processes across all lines of business that utilize 3PL vendors
- Gain metrics regarding 3PL performance
- Ultimately improve 3PL visibility for shipping status (pick, pack, stage, load) to allow change orders as late as possible in the process
- Improve visibility of actual inventory, especially related to damaged goods (not 100% implemented today)
## Business Object Documents – Planned for Use

<table>
<thead>
<tr>
<th>Context</th>
<th>X12</th>
<th>OAGIS BOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse Shipping Order</td>
<td>940</td>
<td>ProcessWarehouseShippingOrder.xsd</td>
</tr>
<tr>
<td>Warehouse Shipping Advice</td>
<td>945</td>
<td>ProcessWarehouseShippingAdvice.xsd</td>
</tr>
<tr>
<td>Warehouse Stock Transfer Shipment Advice</td>
<td>943</td>
<td>NotifyMoveProduct.xsd</td>
</tr>
<tr>
<td>Warehouse Stock Transfer Receipt Advice</td>
<td>944</td>
<td>NotifyReceiveDelivery.xsd</td>
</tr>
<tr>
<td>Warehouse Inventory Adjustment Advice (damaged</td>
<td>947</td>
<td>NotifyInventoryConsumption.xsd</td>
</tr>
<tr>
<td>goods, etc)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ship Notice</td>
<td>856</td>
<td>NotifyShipment.xsd (currently F47*)</td>
</tr>
<tr>
<td>Inventory Inquiry/Advice (EOD system balances)</td>
<td>846</td>
<td>NotifyInventoryBalance.xsd</td>
</tr>
</tbody>
</table>
Current State Logistics EDI

Land O’Lakes, Inc.

204 (Tender Offer)  →  We have a load to ship
990 (Tender Response)  ←  We accept / decline this load
214 (Shipment Status)  →  We’ve delivered the orders / load

940 (Ship Orders)  ←  Please ship this order
945 (Ship Confirm)  →  We shipped this order
856 (Ship Notice)  ←  We shipped this order
856 (Ship Notice)  →  Order is on its way (Formatted for customer)

**Transfers**

940 (Ship Orders)  ←  Please transfer some product
945 (Ship Confirm)  →  We transferred the product
943 (Transfer Advice)  ←  Transferred product is on its way
944 (Transfer Confirm)  →  Transferred product was received
Land O’Lakes, Inc.

947 (Inventory Adjustment)

Fork lift damaged 4 bags

846 (EOD Inventory)

Here what we have on hand

DC/ 3PL
Common Logistics EDI Errors

Transportation Errors
- LOL changes load & neglects to send change to carrier
- Carrier does not update changes to load & sends outdated response to LOL
- Carrier sends a transaction missing LOL EDI requirements

3PL Warehouse – 940 & 943 Errors
- Location not setup in E1 for EDI transactions
- Item Master / Branch Plant not set up for 3PL
- Wrong Order status (Line & header dates)

3PL Warehouse – 944 Errors
- Received item(s) not on the order
- Duplication
- E1 order out of status
- E1 Costing not setup at location.
- Receipt line items are out of sync
- Product weight variance
- Unit of measure

3PL Warehouse – 945 Errors
- Line items are out of sync (Do not match the 940)
- Shipped item(s) not on the order
- Duplication
- E1 order out of status
- Product weight variance
- Unit of measure

Advanced Warehouses / Plants
Do not use EDI.
3PL Shipping Order Sequence Diagram
Stock Transfer Sequence Diagram

- **Land O'Lakes**
  - Process Warehouse Shipping Order()
  - Acknowledge Warehouse Shipping Order() <-- 997
  - Process Warehouse Shipping Advice() <-- 945() 997
  - Notify Move Product()
  - Confirm BOD

- **E2Open**
  - 940()

- **3PL**
  - Pick, Pack, Stage, Load, Ship

- **Distribution Center**
  - Receive Product
Product Data Quality

Incorporating newly submitted Infor BODs for Enterprise Lab Information Management System integration
Long Term Business Goals

- Create **Enterprise Lab Information Management Systems (LIMS)**
- Upgrade existing **Dairy R&D**
- Retire custom LIMS at Spencer, WI and Tulare, CA Dairy plants
- Tightly integrate with **Product Lifecycle Management system**
- Tightly integrate with **JDEdwards** environments (Workorders, Certificate of Analysis)
  - Phase One: Finished goods
  - Phase Two: incoming ingredients, PO Receipt
- Use **OAGIS standards for data exchange** with outside testing labs
Iterative rollout to lines of business

- Dairy Research and Development (plant trials, unique test equipment)
- Dairy Operations (various process capabilities at each plant)
- WinField/ Omnium Crop Protection (Chemical)
- SureTech Labs (wholly owned subsidiary; provides testing services to other companies)
- Purina (various process capabilities at each plant; Near Infrared Testing and Formulation Systems)
Example Outside Agency Maintained Test Methods – Military Electronics Industry

<table>
<thead>
<tr>
<th>METHOD NO.</th>
<th>ENVIRONMENTAL TESTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Barometric pressure, reduced (altitude operation)</td>
</tr>
<tr>
<td>1002</td>
<td>Immersion</td>
</tr>
<tr>
<td>1003</td>
<td>Insulation resistance</td>
</tr>
<tr>
<td>1004.7</td>
<td>Moisture resistance</td>
</tr>
<tr>
<td>1005.9</td>
<td>Steady state life</td>
</tr>
<tr>
<td>1006</td>
<td>Intermittent life</td>
</tr>
<tr>
<td>1007.1</td>
<td>Agree life</td>
</tr>
<tr>
<td>1008.2</td>
<td>Stabilization bake</td>
</tr>
<tr>
<td>1009.8</td>
<td>Salt atmosphere (corrosion)</td>
</tr>
<tr>
<td>1010.8</td>
<td>Temperature cycling</td>
</tr>
<tr>
<td>1011.9</td>
<td>Thermal shock</td>
</tr>
<tr>
<td>1012.1</td>
<td>Thermal characteristics</td>
</tr>
<tr>
<td>1013</td>
<td>Dew point</td>
</tr>
<tr>
<td>1014.14</td>
<td>Seal</td>
</tr>
<tr>
<td>1015.10</td>
<td>Burn-in test</td>
</tr>
<tr>
<td>1016.2</td>
<td>Life/reliability characterization tests</td>
</tr>
<tr>
<td>1017.3</td>
<td>Neutron irradiation</td>
</tr>
<tr>
<td>1018.7</td>
<td>Internal gas analysis</td>
</tr>
<tr>
<td>1019.9</td>
<td>Ionizing radiation (total dose) test procedure</td>
</tr>
<tr>
<td>1020.1</td>
<td>Dose rate induced latchup test procedure</td>
</tr>
<tr>
<td>1021.3</td>
<td>Dose rate upset testing of digital microcircuits</td>
</tr>
<tr>
<td>1022</td>
<td>Mosfet threshold voltage</td>
</tr>
<tr>
<td>1023.3</td>
<td>Dose rate response of linear microcircuits</td>
</tr>
<tr>
<td>1030.2</td>
<td>Presel burn-in</td>
</tr>
<tr>
<td>1031</td>
<td>Thin film corrosion test</td>
</tr>
<tr>
<td>1032.1</td>
<td>Package induced soft error test procedure (due to alpha particles)</td>
</tr>
<tr>
<td>1033</td>
<td>Endurance life test</td>
</tr>
<tr>
<td>1034.1</td>
<td>Die penetrant test (for plastic devices)</td>
</tr>
</tbody>
</table>
# Business Object Documents – Planned for Use

<table>
<thead>
<tr>
<th>Context</th>
<th>X12</th>
<th>Submitted BOD/noun to OAGIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defines Test method / procedure to perform on sample</td>
<td>841</td>
<td>QualityTestMaster.xsd</td>
</tr>
<tr>
<td>Specification of Item or Product, including references to Test Method</td>
<td>841</td>
<td>QualitySpecification.xsd</td>
</tr>
<tr>
<td>and allowable Tolerances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order to perform Tests on provided Samples</td>
<td></td>
<td>InspectionOrder.xsd</td>
</tr>
<tr>
<td>Statistical Data from performed Tested</td>
<td>863</td>
<td>QualityTestResult.xsd</td>
</tr>
<tr>
<td>Report of Nonconforming Item or Finished Good</td>
<td>842</td>
<td>DefectiveMaterialNotice.xsd / NonconformanceReport.xsd</td>
</tr>
<tr>
<td>Response to Nonconformance Report</td>
<td></td>
<td>CorrectiveActionPlan.xsd</td>
</tr>
</tbody>
</table>
Quality Specification Sequence Diagram
Inspection Order Class Diagram
Nonconformance /Corrective Action Plan

Diagram:

- LIMS
  - ProcessNonconformanceReport()
  - ConfirmBOD
  - AcknowledgeNonconformanceReport()
  - ConfirmBOD
  - ProcessCorrectiveActionPlan()
  - ConfirmBOD
  - ReviewCorrectiveActionPlan()
  - AcknowledgeCorrectiveActionPlan()
  - ConfirmBOD

- ManufacturingPlant
  - DetermineCorrectiveActionPlan()
Mobile Order Management:
Using PurchaseOrder.xsd (noun-only) subsets for Backend-as-a-Service implementation
Business Goals

- Attempt to provide mobile capabilities for our co-op customers and members to be able to scan UPC codes on the shelf to create an order
- Provide real-time integration to our ERP
- Leverage our Enterprise API Gateway
Purina Backend-as-a-Service ‘Proof-of-Value’

Internet

DMZ

Service Security Policies

API Gateway

Ping Integration

Oracle Service Bus

Create Order

Add Line

Edit Line

Change Order

Customer Lookup

Location Lookup

Product Lookup

Inventory Check

JDEdwards Application Adapter (JCA Adapter)

JDEdwards Xe

DB Queries

Business Functions

Sales Order

Data Cache

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PoV Scope

- Use OAGIS PurchaseOrder.xsd subsets to emulate the typical “Shopping Cart” experience from the context of a Land O’Lakes Member Co-op
- Prove sales order (created from PO information) can be cached in JDE, properly referenced, and successfully ‘committed’ from Internet via API

<table>
<thead>
<tr>
<th>API Capability</th>
<th>JDE Master Business Function- ‘C’</th>
</tr>
</thead>
<tbody>
<tr>
<td>Party Info</td>
<td>Address Book BSFN</td>
</tr>
<tr>
<td>Create Order</td>
<td>F4211FSBeginDoc</td>
</tr>
<tr>
<td>Add Line</td>
<td>F4211FSEditLine</td>
</tr>
<tr>
<td>Edit Line</td>
<td>F4211FSEditLine</td>
</tr>
<tr>
<td>Submit Order</td>
<td>F4211FSEndDoc</td>
</tr>
</tbody>
</table>

Exposing BSFN, Generating WSDL, Creating OAGIS JSON Subsets, Building/Test OSB Services, Exposing/Test via API Gateway
Mobile – Authentication Sequence Diagram
PurchaseOrder.json Resources/ Subsets

- HTTP GET: /PurchaseOrder/PurchaseOrderHeader/CustomerParty
- HTTP GET: /PurchaseOrder/PurchaseOrderHeader/BuyerParty
- HTTP GET: /PurchaseOrder/PurchaseOrderHeader/BillToParty
- HTTP PUT: /PurchaseOrder/PurchaseOrderHeader/
- HTTP PUT: /PurchaseOrder/PurchaseOrderLine/
- HTTP POST: /PurchaseOrder

JSONify this subset:

- DropShipmentAllowedIndicator
- PartialShipmentAllowedIndicator
- EarlyShipmentAllowedIndicator
- Item
- LineNumberID
- Status
- UnitPrice
- Quantity
- Tax
- TotalAmount
- FreightClassification
REST / JSON recommendations

- Focus on the Nouns
- Keep existing UpperCamelCase
- Convert XPATH to URI /resources
- Finalize mapping of OAGIS Verbs to HTTP Verbs
- Review OASIS recent OData capabilities (Microsoft-driven)
- Allow us to create subsets once Semantic Refinement effort is complete, similar to Georgia Tech GJXDM subset generator
Final Note on AgGateway Efforts
Agribusiness Standards Initiatives
AgGateway Activities

- Promoting OAGIS as next generation
- Seed Connectivity II Project, reviewed GetPartyMaster vs. making changes to Chem e-Standard for grower license lookup
- Adding OAGIS education track
- Plan to review Quality BODs for Agribusiness Food Safety regulations
  - AgXML has quality documents
  - Address traceability requirements for Animal Feed, Grain and Consumer Products (Milk)
- Adding OAGIS Update in Architecture Committee
- ADAPT; farm equipment integration – REST APIs
THANK YOU!!