OTM Workflow
Best Practices

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Agenda

- Workflow Dependencies & Components
- Workflow Preparation & Design
- Workflow Setup Tips
- Business Scenarios – Best Practices
- Documentation
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Workflow Dependencies

Workflow Setup

Performance Tuning

Integration Design
Workflow – Facts

- Workflow is **NOT** just agents

- What to use is the KEY for “best” workflow design

- One “small” mistake can cause the bigger performance issues

- Lot of new agent actions introduced, before writing traditional way, look for new actions
Major Workflow Components

- Automation Agents
- Schedule Jobs
- (Integration) Saved Queries
- Milestone Monitors
- VPD Profiles
- Action Checks and
- Many more
Integration Design

- Does it impact workflow design? How?

- Integration Components:
  - Interface Design
  - External System Setup
  - Out XML Profiles
  - Error Handling
Performance Tuning

- Again, does it impact workflow design? How?

- Major Performance Tuning Components
  - Tuning Threads
  - Tuning Connection Pools
  - Server Level Tuning (JVM, Memory, etc)
  - Minimizing Logs
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Following chart gives high level time allocation for complex workflow setup.

This may vary depends on the complexity.

**Time Allocation by Phase**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>40%</td>
</tr>
<tr>
<td>Build</td>
<td>30%</td>
</tr>
<tr>
<td>Test</td>
<td>20%</td>
</tr>
</tbody>
</table>

- 0% | 10% | 20% | 30% | 40%
Workflow Preparation

Collect
- Requirement Discussions

Analyze
- Understand & identify affected objects

Prepare
- Document high level workflow setup
Workflow Preparation – Analysis

- Analysis:
  - Document all workflow related tasks before start the build phase
  - Identify all the common components such as saved queries, agent events, schedule jobs, OTM workflow vs Integration layer changes, etc
  - Analyze the proposed approach in terms of timing, performance, data accuracy, etc
Workflow Preparation – Design

- Design:
  - Avoid multiple agents triggering for same agent event
  - Initiate the DB package with frequently used queries & complex business logic
  - Introduce flags at object level for easy workflow & reports separation in multi phased/business process implementations
  - Optimize the server resources by distributing schedule job timings
  - Identification of interfaces & integration process
Process identification is key in workflow design.
Agents:
- Identification of exact triggering conditions
- Identify similar requirements can go together
- Agents high level flow for each business scenario
- Identify key agent actions/lookup/queries

Integrations:
- List of interfaces and data dependency
- Communication Method & List of Ext. Systems
- Out XML Profiles
Error Handling:

- Initiate process for proper technical error handling
- Identify the possible solutions for business exceptions

Team:

- Allocate one dedicated team for workflow preparation to avoid redundancy
- Review the finalized process with different team before build phase starts
Workflow Preparation – Sample

- **Requirement**: Copy the shipment quantities to shipment actuals received via shipment events

- **Analyze**: Identify when to copy actuals, for every shipment event or only Pickup or Delivery? Check any other requirements can marry with this one

- **Prepare**: Document the requirement & write the high level pseudo agent related to this requirement
Prepare:
Sample document for Agents Specification

What might be poor design here?

3. Update Shipment Quantities from Shipment Events

3.1. Purpose
The purpose of this agent is to perform the appropriate updates to shipment actuals when shipment event received through integration.

3.2. Requirements
- Agent that is triggered off the shipment event to copy the received shipment quantities to shipment actuals.

3.3. Agent Details
Agent: SRUJAN SHIPMENT EVENT TRACKER
Event(s):
- SHIPMENT STATUS - TRACKING
Action(s):
- Wherever shipment is set to DELIVERED status
  - Call stored procedure to copy quantities from IE tables to shipment ship unit tables
Error Handler:
- Notify IT SUPPORT contact group about agent failure with agent name in the subject.

3.4. Exit Criteria
This is the list of unit tests to be performed by the developer as acceptance that the workflow build is complete and ready for System Testing.

<table>
<thead>
<tr>
<th>Test Case ID</th>
<th>Test Case Description</th>
<th>Expected Result</th>
<th>Pass or Fail</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Send the delivery event with ship unit quantities</td>
<td>Ship Unit quantities will copy from IE tables to shipment ship unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Send the delivery event without ship unit quantities</td>
<td>Ship Unit quantities should not be overwritten</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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Avoid triggering multiple agents for given agent event. This can cause serious problems if we mis-use.

Avoid using WAIT action

Careful while writing DSU Action:
- Default behavior refreshes entire Business Object Tree (i.e. Shipment, Stop, Ship Unit, etc.)
- Enable ‘Parse SQL’ option to increase performance by only refreshing objects updated by SQL
- Use ‘Do Not Refresh’ when performing multiple updates to the same object within one Agent
Similar actions should not trigger in parallel on same object.

For ex, Recalc on date change & Rerate on locations change. There are chances we can expect these two changes at once.

Every agent must pass through the test cases.

Split the agents by business process.

Enforce the version controlling in the agents.
Avoid writing all actions into one big agent

Error Handler section should minimum notify users

Before going to production, NO AGENT TECHNICAL FAILURES for any reason.

The acceptable failures will be business exceptions but not technical exceptions
Workflow Setup – Saved Queries

- Every SQL query must be optimized by running an explain plan.
- When a query is expected for heavy usage, validate the query with a DBA for better performance.
- Move the commonly used queries into a DB package.
- Avoid using OTM shipped views more than once in the same query.
- When a query is running for a longer time, negotiate with the business team to compromise the requirements.
Workflow Setup – Ext. Systems

- Ext. systems configuration is simple and key
- Identify the BEST communication method to use, for ex, HTTP, Web Service, FTP, etc by analyzing the current environment
- MUST have an habit to use “Out XML Profile” with template option to reduce the xml size in ext. systems
- Try to create a separate ext. system for each interface even though they are referring to same URL
- Avoid using GLOG_* out xml profiles in notifications
Workflow Setup – Schedule Jobs

- Query must be tuned to the greater extend
- Timing must be adjusted properly
- Avoid running different long running jobs at the same time
Workflow Setup – Tuning

- Threads:
  - A backlog of queued events and/or a long average wait time may indicate a need to increase threads.
  - Moving longer processing events to a dedicated thread group will increase throughput and reduce backlogs.
  - Workflow processing is monitored with the Event Diagnostics screen.

- Increase the connection pool sizes to desired level based on the load test results.
Logs

- Too much logging will impact on performance

- Avoid using “Ad-Hoc” logs (which are written for all users)

- Do not turn on too many logs for “User” logs as well, still impacts performance
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Best Design Approaches

- Restrict the user access to see the orders & shipments related to their work location

- Create separate screen sets, manager layouts & menus?

- Create separate VPD profile and User Role?

- Create one VPD profile with different User Roles link via VPD context variables?
Best Design Approaches

- Send planned shipment to legacy when shipment tendered or accepted
  - Send planned shipment when tendered & accepted
  - Revise the requirement and try to send planned shipment at tender accepted time and introduce out xml profile to reduce the size of XML as low as possible

- With this approach, half of the transmissions for sending the planned shipments will be decreased
Best Design Approaches

- Recalc Shipment when shipment dates are changed, Rerate shipment when locations are changed

- Write one agent for Recalc when dates changed and another agent for Rerate when locations are changed

- One agent with conditional check for dates vs location changes. Introduce Rerate status to identify rating failures

- This will the avoid duplicate planning process when both dates and locations are changed at the same time
Best Design Approaches

- Send vouchers to payment system

- OTM will send voucher to middleware, business validation checks perform in the middleware before sending to payment system

- Perform as max as possible business validations before approving the invoice and then send to middleware for further processing

- Provides the better exception handling mechanism
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Documentation

- List of workflow requirements (agents or etc) spreadsheet
- Agents Specification Document
- End to End technical document for complex processes
- Saved Queries details & usage
Documentation

Schedule Jobs Flow Diagram

11.0 Schedule Jobs

- VOUCHER
  Scheduled Time: Every Day at 03.00 AM
  Saved Query: GET ALL VOUCHERS WHICH ARE NOT ISSUED_ISSUED
  Find all vouchers which are not in ISSUED_ISSUED status and send the voucher transaction to BPEL by raising SEND VOUCHER TO BPEL custom event.

- Buy Side Shipments
  Scheduled Time: Every Day at 03.00 AM
  Condition: ORDERS READY FOR BULKPLN BUY - USFRL RCVD
  This job will build the buy shipments for all orders received USFRL status in the day before. Uses SOA_DEFAULT parameter set to build the shipments.

- LOCATION
  Scheduled Time: Every Day at 02.30 AM
  Condition: RUN-ASN-INTERFACE
  Find the location RUN-ASN-INTERFACE using above query and send the RUN-ASN-INTERFACE location to BPEL to run the ASN from BPEL.

- LOCATION
  Scheduled Time: Every Day at 03.00 PM
  Condition: RUN-OVERLAY-INTERFACE
  Find the location RUN-OVERLAY-INTERFACE using above query and send the RUN-OVERLAY-INTERFACE location to BPEL to run the OVERLAY from BPEL.

- SHIPMENT
  Scheduled Time: Every Day at 06.00 AM
  Condition: GET ALL RAIL SHIPMENTS READY TO GENERATE INVOICE
  Find all buy shipments satisfying below conditions.
  - Invoice must not created already.
  - Perspective is B
  - Transport mode is RAIL.
  - Payment method code is not COL

- SEND VOUCHER TO BPEL
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- BPEL
  Send Location xml to BPEL

- GENERATE INVOICE FOR RAIL BUY SHIPMENT
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