PL21304 - Smart Workflow: Adding Business Logic to Your Fusion Lifecycle Workflows with Scripting

Michael Vesperman, Tony Zohrehvandi, Fred Smith
Applications Engineer, Autodesk
Why will this class better than attending Andrew Anagnost’s Closing Keynote Featuring Comedian Rob Corddry?

This certainly won’t be....

As Inspirational
As Visually appealing

Or

As Funny
2 words....

Process Automation

Which leads to....

MAKING MONEY $$$$
Your Instructors

Michael Vesperman
Autodesk
PLM Subject Matter Expert
New York, NY
16 yrs PLM Experience

Tony Zohrehvandi
Autodesk
PLM Subject Matter Expert
Dallas, TX
25+ yrs PLM Experience

Fred Smith
Autodesk
PLM Subject Matter Expert
Houston, TX
25+ yrs PLM Experience
Class summary

- Analyze your As-Is process to identify redundant steps, bottlenecks, missed activities to find opportunities for process automation.

- Design and document a streamlined To-Be process that incorporates decision-making automation of business logic, and enable Fusion Lifecycle software to manage your logic-driven process.

- Technical review of the Fusion Lifecycle application scripting frameworks.

- Workspace modeling and scripting techniques that will enable you to automate and streamline your product lifecycle management workflows.

- See a live example of a workflow with logic based decision making, record validation, process automation.

This session features PLM 360 now Fusion Lifecycle.
Class Agenda

Why would you want to do this?

Understanding the Frameworks

Live demonstration
We will be scripting
1st Lesson - Establish your Team & Define Roles and Responsibilities

Project Manager: Mike Vesperman

Architect: Tony Zohrehvandi

Builder: Fred Smith
Danby Story (Mike Vesperman)
Quality Reverse Logistics Process

- Purchased Fusion Lifecycle for:
  - New Product Introduction (Stage/Gate)
  - Item & BOM Management
  - Change Management (PR, ECR, ECO)
- Problem: Spring ‘16, Corporate decision made to bring outsourced Reverse Logistics program in-house
- Challenges:
  - 3500+ Returns handled per month
  - Need to quickly hire & train quality personnel
  - Process was well documented but they had no system support
  - Need a method to drive business logic into the workflow
  - Integrate with Apprise ERP
Danby Product Live in Action
AS-IS Process: SOP Document (10 Pages)

1.0 Purpose
Outline the inspection and testing criteria requirements for Danby Refrigerators, Wine/Beverage Coolers.

2.0 Scope
This procedure is applicable to the return process involving返退 products used on the Danby Refrigerators, Wine/Beverage Coolers.

3.0 Related References and Documents:

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danby Product - Return Criteria</td>
<td>Standard</td>
</tr>
<tr>
<td></td>
<td>Danby Product - User Guide</td>
<td></td>
</tr>
</tbody>
</table>

4.0 Responsibilities

<table>
<thead>
<tr>
<th>Department/Functional Group</th>
<th>Description of Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Handling - Reverse Logistics</td>
<td>- Check that the product is in the same condition as when received.</td>
</tr>
<tr>
<td></td>
<td>- Check that the product is in the same condition as when received.</td>
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<tr>
<td></td>
<td>- Check that the product is in the same condition as when received.</td>
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</tbody>
</table>

5.0 Definitions

<table>
<thead>
<tr>
<th>Term/Specification</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi-Perfection Testing (aka Hi-Pot)</td>
<td>- Ensure that the product is in the same condition as when received.</td>
</tr>
<tr>
<td>Primary Surface (P)</td>
<td>- Ensure that the product is in the same condition as when received.</td>
</tr>
<tr>
<td>Secondary Surface (S)</td>
<td>- Ensure that the product is in the same condition as when received.</td>
</tr>
<tr>
<td>Score</td>
<td>- Ensure that the product is in the same condition as when received.</td>
</tr>
<tr>
<td>Scratch and Dust Product</td>
<td>- Ensure that the product is in the same condition as when received.</td>
</tr>
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Return Classification:

- **ReMan**
- **Scratch/Dent**
- **More Testing**
- **Scrap**
TO-BE Process

Flowchart diagram showing the process steps for TO-BE returns.

1. **Manual**: Receives Returned Product per Procedure.
   - **Decision**: Model & Serial # (if any)?
     - **Yes**: RL Product Return.
     - **No**: Return.

2. **RL Product Return**:
   - **Scan UPC of Returned Product**.
   - **Type RA Number from "Apprise"**.
   - **Select Consumer Group Name and Return Reason**.
   - **Disposition Return Unit**.
   - **Approve/Modify Disposition**.

3. **Disp. R**
   - **Manual**:
     - **Scrap the Unit**.
     - **Apply red label, record as scrap, harvest usable parts**.

4. **S&D**
   - **Email**:
     - **Notify QA Inspector**.

5. **End**

Additional steps include:
- **Material Handler**: Receives Returned Product per Procedure.
- **Material Handler**: RL Product Return.
- **Material Handler**: Email.
- **Material Handler**: Fix the Unit.
- **Material Handler**: Refurbishing Tech.
- **Material Handler**: Testing.
- **Material Handler**: Packaging.
- **Material Handler**: Notify QA Inspector.
- **Material Handler**: Repairable?
- **Material Handler**: Hi-Pot Testing.
- **Material Handler**: Refurbishing Tech.
- **Material Handler**: Input missing components.
- **Material Handler**: Packaging.
- **Material Handler**: Palletize and Shrink Wrap.
- **Material Handler**: Pass/Fail.
Reverse Logistics Workspace

Without Logic

Which One?
Reverse Logistics Workspace

With Logic
Reverse Logistics Workspace

With Logic
Fusion Lifecycle Scripting Frameworks (Tony Zohrehvandi)
Scripting, Internal vs. External

In Application Scripting
- Workflow Transition
- Workspace Behaviors

External Integration (API)
- Integrations
- Data Migration
Where Scripting is Used, Workflow Transitions

Workflow Transitions

- **Precondition**
  - Script Type: Condition (boolean)
  - Hide or show WF Actions based on the outcome of a condition script

- **Validation**
  - Script Type: Validation (array)
  - Validates requirements before allowing transition to the next state

- **Action**
  - Script Type: Action
  - Performs some action, sends an email
Workspace Behaviors (Action Scripts)

- **On Create**
  - Performs some action, sets the value of a default field

- **On Edit**
  - Performs some action, calculates the total of values
# Fusion Lifecycle Scripting - Script Types and Triggers

<table>
<thead>
<tr>
<th>Script Type</th>
<th>Description</th>
<th>Triggers</th>
<th>Examples</th>
</tr>
</thead>
</table>
| Condition   | Checks for a precondition before showing a workflow transition to the user (return "True" or "False"). | Workflow transition | • Show a workflow transition to the user only if all the required approvals have been made.  
• Hide a workflow transition unless the login user is the item Owner. |
| Validation  | Validates certain requirements before allowing transitioning to the next state in a workflow. If validation fails, provides feedback to the user from an array of messages explaining why. | Workflow transition | • Allow only items with XYZ Co. as the manufacturer to transition to the next step in a workflow. If validation fails, return the message: "The transition can be completed only by workspace items with XYZ Co. as the manufacturer." |
| Action      | Performs an action on a workspace; sends an email message. | Workflow transition  
Workflow escalation  
Workspace behavior | • Spawn a new item in a workspace after successful execution of a workflow transition.  
• Create a set of milestones for an item after the item is created.  
• Perform a transition from an escalated workflow state. |
| Library     | Contains functions that can be used in other scripts. | Import into another script | • Determine if the passed value is an element of the passed array.  
• Create a set of milestones. |
Where Do We Start?

Menu: Administration ➔ Setup ➔ Scripts

Create New
Edit Existing
Delete Existing
Where Used
Fusion Lifecycle Script Editor

Script Management
- Type
- Unique Name
- Description
- Imports
- Code Complete

Code
- Embedded editor

Tools
- Save
- Close
- Testing
- Error Log

```javascript
var varName = false;
var userName = getUserName();
switch(customTransID){
  case 'START':
  case 'CONNECT_ISSUES':
  case 'RETURN_FOR_CLARIFICATION':
  case 'COMPLETE_NO_ISSUES':
  case 'SUBMIT':
  case 'RETURN_FOR_CHANGES':
    varName = item.AUDIT_TEAM.contains(userName);
    break;
  case 'APPROVE':
    varName = item.SUPPLIER_TEAM.contains(userName);
    break;
}
returnValue(varName);
```
Fusion Lifecycle Script Debugging/Errors

Syntactic Errors (design time)
- In editor warnings
- On save messaging

Semantic Errors (run time)
- Testing
- Execution

Debugging
- Errors
- Script Log
- print()
- println()
- Debugger
Condition Script Use Case

- Show a workflow transition to the user only if all the required approvals have been made.

- Hide a workflow transition unless the login user is the item Owner.
Validation Script Use Case

- Allow only items with XYZ Company as the manufacturer to transition to the next step in a workflow

- If validation fails, return the message: "The transition can be completed only by workspace items with XYZ Company as the manufacturer."
Action Script Use Case

- When a change order is released, publish to the ERP system
- When something happens, send a custom email notification
- When time has elapsed on an activity, do this...
  - Set milestones,
  - Set attributes
  - Create other items
  - Set some values based on other values
Basics of Scripting in FLC (Fred Smith)
Methodology

- Kickoff Discovery Interviews
- Goals & Implementation Plan
- Map Overall PLM Solution
- Map Individual Process Workflows
- Identify Fields & Permissions
- Configure Workspace Data
- Define Workflow States & Transitions
- Identify Decision Points & Logic
- Write Code
- Create Users & Permissions
- Test Workspace
- Verify Setup
- Document
- Admin Training
- End User Training
- Repeat
Workflow Example

AUTODESK FUSION LIFECYCLE

Is this an Emergency?

Stay in state and accumulate people, information, and other resources as necessary. Automatic escalation.

Enterprise Down

Do something?

Start Root Cause Analysis

3a

Root Cause Analysis

Go create an 8D Root Cause Analysis request

Demobilize

Complete

Mobilize Resources

Operational Expense

Management Planning

Mobilize Resources

Financial Review

Mobilize Resources

In Process

2a

Where are your Action Plan tasks?

2b

Demobilize

Is the plan done?

Mobilize Resources

Capital Expense

Financial Review

Cancel

Rejected

Cancel

Automatically notify stakeholders when rejected. In process and/or complete.

3b

Is the cost of change less than $100K?

1b

Take appropriate action based on the scope and nature of the issue.

1a

Audit

Describe

New

Analyze Business Impact

Audit to validate accuracy of information.

Audit

Audit

Audit

Audit
Lessons

1. Enable Processes
   a. Explicit routing based on a flag
   b. Implicit routing based on business rules

2. Validate Policies
   a. “Planning must result in a plan.”
   b. “Plans must be followed.”

3. Automate Actions
   a. Integrate with other processes
   b. Notify stakeholders

4. Other Scripting Opportunities
   a. On-creation, on-update, on-demand triggers (aka, behaviors)
   b. Escalation upon time-out
   c. Managing complexity via libraries
Class Handouts

Class Handout – Step by Step Instructions

Lesson Source Code
Business Decisions Demonstration
How did I do?

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- Located outside **Hall C, Level 2**.
- Meet Autodesk developers, testers, & support engineers ready to help with your most challenging technical questions.
- We will be down there between now and 1pm today