Strategies for Process Documentation
- Part 2

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This Presentation…

This briefing is Part 2 of a two part presentation on lessons learned from our experiences working with the SIAP (Single Integrated Air Picture) Joint Program Office

Part 1 addressed the subject topic broadly, providing tips and suggestions for an audience of process improvement professionals

This briefing provides a "deep dive" on the topic of documenting processes, with actual examples from our experience

The SIAP JPO…

The SIAP JPO existed in various forms from 1999 – 2009

Their deliverables were a system engineering specification, and a software instantiation of that specification

They existed in an acquisition context

Their development context was incremental:

- Two-year major increments "Capability Drops"
- 12-week minor increments "Timeboxes"

The process scope encompassed all of the "Divisions" of the JPO

- Requirements
- Acquisition
- Test
- Development
- Engineering

- Technology
- Contracts
- Quality
- Configuration Mgmt
- Security

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Your Authors…

Fred Schenker is a Senior Member of the Technical Staff working in the SEI's Acquisition Support Program. He participates in activities to improve software acquisition and product development practices throughout the armed services, and other government agencies.

Mr. Schenker has worked at the SEI for 8 years. He is a certified Intro to CMMI instructor, and a certified SCAMPI A Lead Appraiser. Before joining the SEI, Mr. Schenker spent over twenty years in industry as an active contributor in all phases of product development activities.

Mr. Schenker is also an inventor, and has obtained patents for a pressure switch (used in automotive airbag applications), and for a manufacturing process to seal gas inside a vessel.

Kursten Szabos graduated from Virginia Tech with a B.S. in Industrial and Systems Engineering and a M.S. in Systems Engineering.

Ms. Szabos worked for the SIAP JPO for 10 years as a contractor. During that time, she helped to: charter the organization, set the architecture framework in place, defined, implemented and executed Test Team processes and eventually took on the responsibility of chairing the Engineering Process Group. In this role she helped develop the Process Architecture, documentation standards and guidelines and supported the review of all process submissions. She is currently employed as a Research Associate in the field of Child Development and Human Relations.

Rolf W. Reitzig is the President and a Principal Consultant with cognence, inc. cognence helps companies integrate best practices, automation tools, and training to create a repeatable and scalable engineering system. The firm's methodology employs proven transformation techniques, creating the organizational buy-in essential for lasting change.

Mr. Reitzig has 20 years practical experience in software engineering and has helped dozens of Fortune 500 companies improve quality, productivity and project results. Mr. Reitzig is an SEI Resident Affiliate assisting in communicating the return on investment of CMMI efforts to the software development community. Mr. Reitzig holds a Bachelor's degree in Computer Science and an MBA in Finance from the University of Colorado.

Documenting Processes

Process documentation is not easy.

In the end, the documented process may serve many purposes:

- Communicates "process intent" and expectations to users
- Provides a baseline for analysis which could be used to:
  - Avoid scrap and rework (defects)
  - Improve the process efficiency (throughput, productivity, etc.)
- Provides opportunity to break down functional silos, and improve organizational cohesion
- Provides training materials
- Provides a means for objective evaluation of process performance

The process artifacts may need to be used by process appraisers for evaluation purposes.

The process description should reflect the business of the organization; it should be a roadmap that shows how work is done.

Process Documentation Strategy 6 "Deep Dive"

Whatever strategies you employ to document your processes the goals are to deliver "value" to the user, and improved productivity to management.

1. Establish and Maintain Management Support
2. Build the Process Documentation Team Infrastructure and Competency
3. Establish the Process Architecture
4. Focus on Process Outputs (Artifacts or Deliverables)
5. Connect the Dots
6. **Plan Your "User" Strategy**
7. When you are finished, read CMMI
8. Don't Forget to Have Fun!
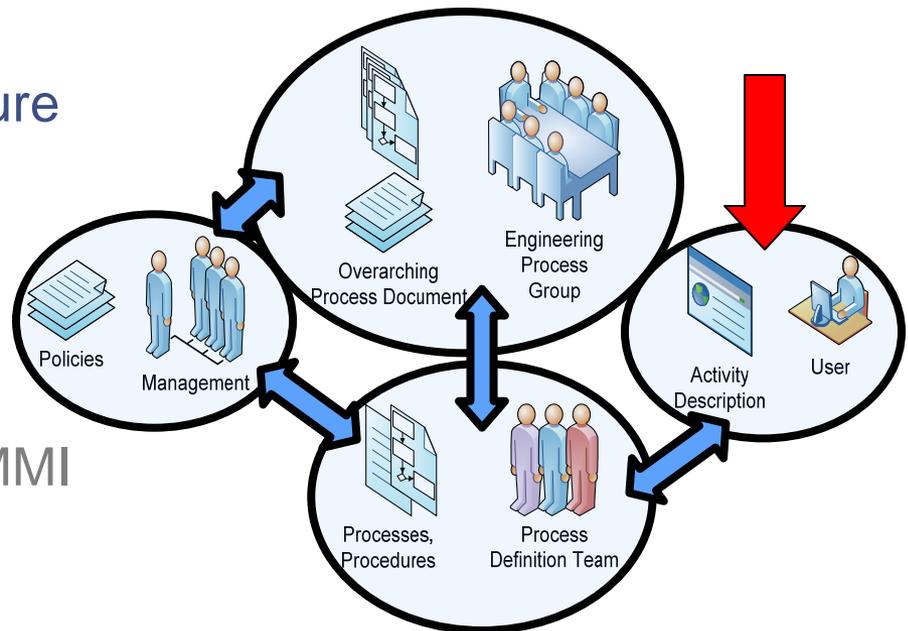
Strategies 2 (b), 3, 4, 5, and 6 were covered in Part 1 of this presentation
Strategy 6 is the primary focus of this presentation

Strategy #6 – Plan Your "User" Strategy

How do you want to deliver the process descriptions to the user? We have all experienced "shelf-ware" process descriptions. Ideally the latest process description would be delivered to the user when the task assignment is delivered.

- Process descriptions can take many forms (e.g. templates, guidance, flowcharts, procedures).
- Figure out how you want to train your users, and how to update the training when the process artifacts change.
- Determine the level of detail that you intend to provide to your users.

The tools that you use to document your process may impact the way your process description is delivered. Examples of documentation tools include:

- Microsoft Office (Visio, MS Word)
- COTS (either freeware, such as Eclipse Process Framework; or commercial, such as Processmax or Rational Method Composer)

All of the process descriptions you produce are stored in your Process Asset Library (PAL)

What is a Process Asset Library (PAL)?

A collection of process asset holdings that can be used by an organization or project.

Examples of items to be stored in the organization's PAL include:

- Policies
- Process descriptions
- Procedures
- Process aids (e.g. checklists, guidelines, templates, examples)
- Training materials
- Project plans
- QA plans
- Lessons learned

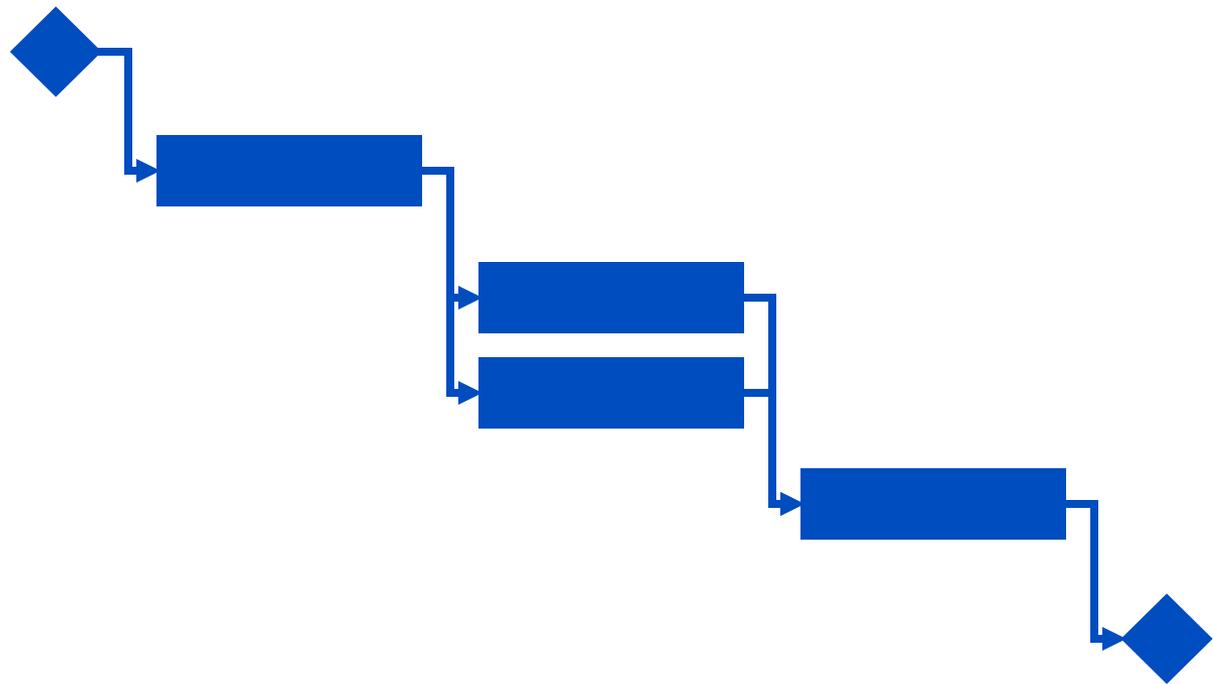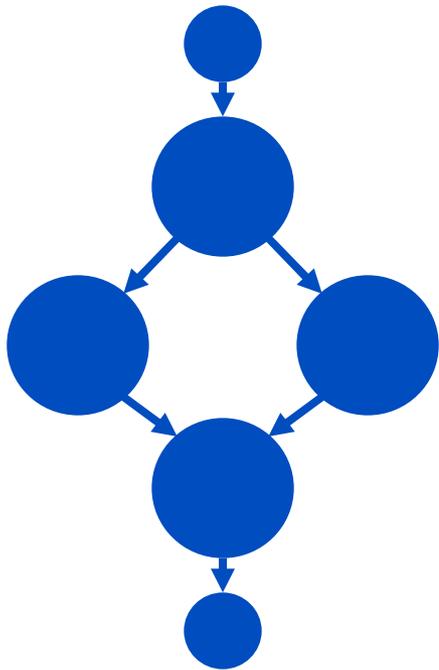An organization's PAL does not need to be unified (all artifacts in a single repository).

Process Assets in Action
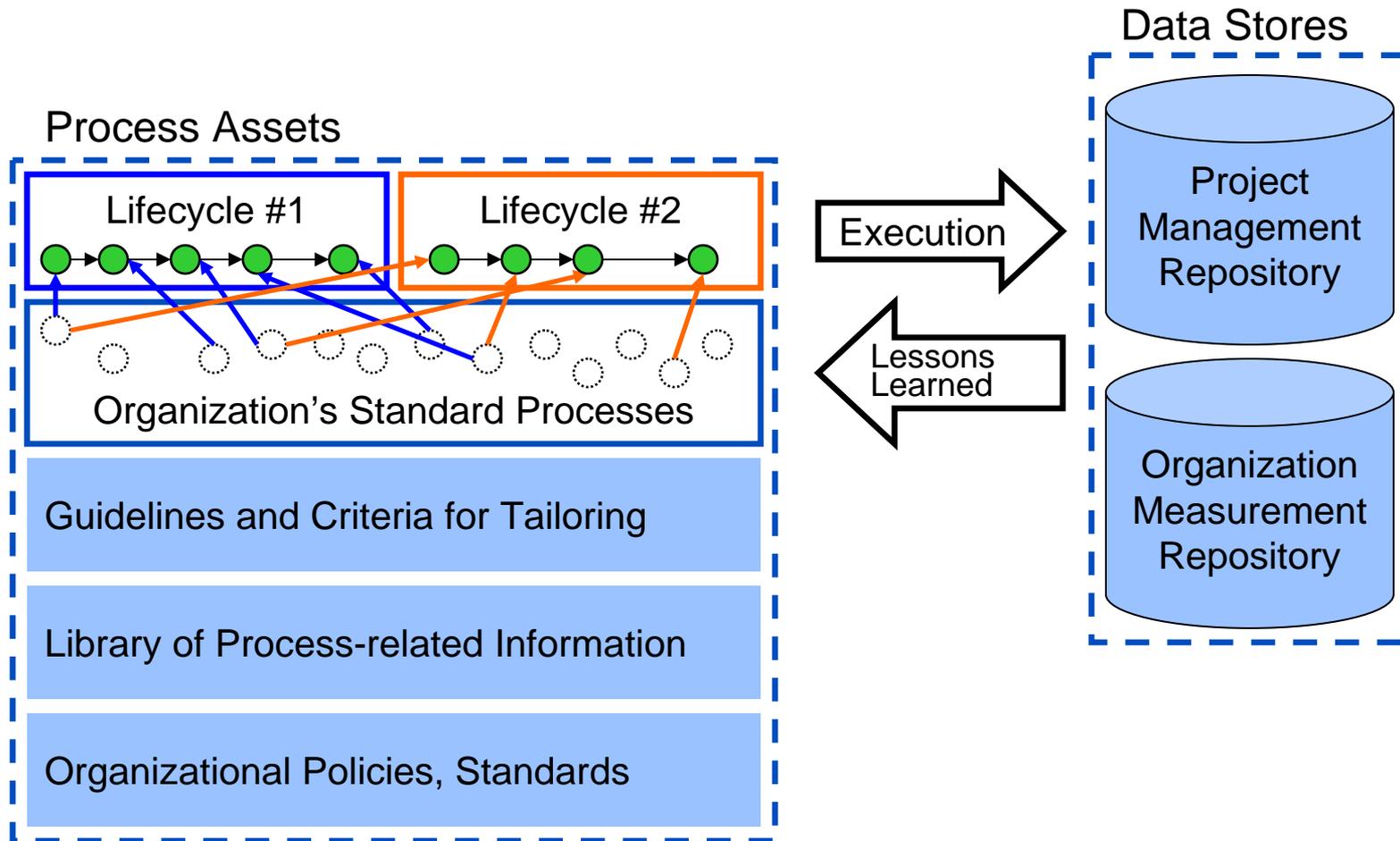
Is Your Process Mapped to Reality?

Look at schedules

Ask people if their planned efforts show up on a schedule and whether they track time against them

Do schedules map to processes?

You Have Choices!

There are alternatives…

- Typewriters (then word processors) and binders
- MS Word/Visio (or equivalent) and shared drives
- MS Word/Visio (or equivalent) published to HTML
- Native HTML
- Database-driven tools

Which one is the right one for your organization?

Some Potential Selection Criteria…

- Budget
- Project Size
- Organization Size
- User Skill Level

- Training
- Technology
- Complexity
- Consistency

- Timeline
- Process Stability
- Level of Detail
- Security

SIAP JPO – Process Definition Tool Choices

Microsoft Office

Pros:

- Visio is a decent graphics tool
- MS Office tools available on network
- Process authors are generally fluent with MS tools

Cons:

- Unconnected process assets
- Dependencies very hard to manage
- Delivery of process to user is manual

Eclipse Process Framework

Pros:

- Web publishing
- Industry standard process architecture based on SPEM (OMG)
- Import and export capability
- Rich process content
- Separation of method content from process promotes reusability
- Database-driven tool manages dependencies well

Cons:

- Graphics need work
- Deploying software on a Government network requires certification
- Learning curve/training time

Process Documentation Example 1:
Microsoft Office (Visio, MS Word)

Processes are represented graphically by "swimlane" diagrams in Visio.

- Process activities (or tasks) are shown on the diagram, and dependencies are shown with arrows.
- Decision points are shown on the diagram.
- Artifacts/deliverables are shown on the diagram.
- Tasks (with procedures) are shown on the diagram.
- Color codes can be used to indicate different task environments.

Process descriptions in Word.

- Standard template employed for all of the process descriptions
- Good format for the Government approval process

Activity descriptions in Word.

- Standard template employed for all of the activity descriptions
- Activity descriptions were typical… Inputs, Outputs, Entry and Exit Criteria, Roles, Guidance (reference), Purpose, Steps, Process Metrics

Process Swimlane Example 1:
Microsoft Office (Visio. MS Word)
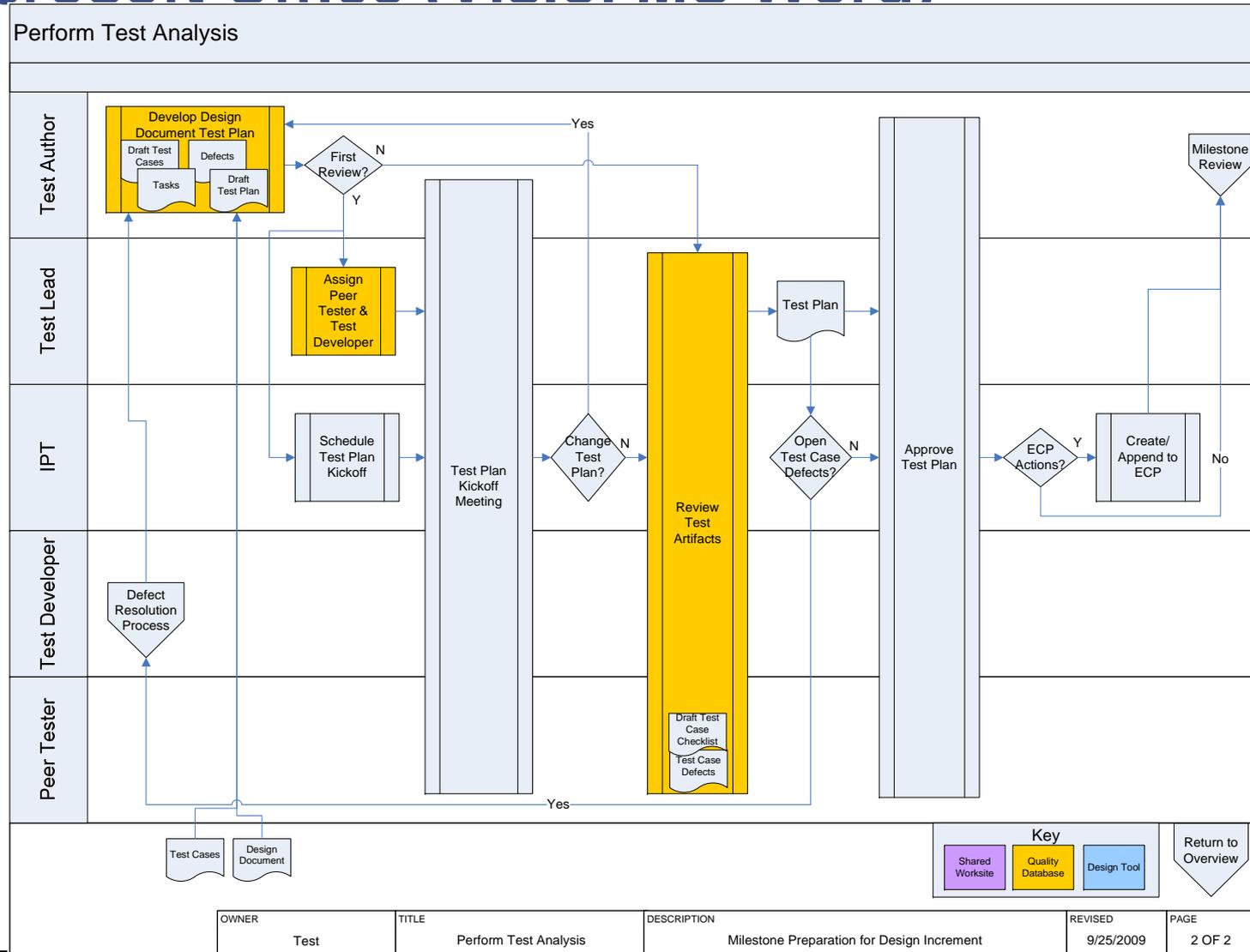
Process Documentation Example 1:
Microsoft Office (Visio, MS Word)

Last Saved on: 2 November 2009¶

SIAP JPO¶
Perform Test Analysis Process Description¶

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SIAP
Single Integrated Air Picture
Joint Program Office

Version 0.2¶
17 October 2008¶

Page Break

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Activity Documentation Example 1:
Microsoft Office (Visio, MS Word)

1.3.1.1 Develop Design Document Test Plan

Purpose:
To scope work require to verify the design objective is implemented in product. Scoping of work involves developing Draft Test Cases that verify the objective(s) of the design. Objectives are capabilities described in the Design Document; objectives may or may not be covered by derived requirements. In the process of drafting the test cases all efforts required (either by Tester, Test Developer, or Developer) to complete and execute the test cases are documented.

Roles:
Test Author

Entry Criteria:
A task has been assigned and opened to the Test Author to develop a Design Document Test Plan for the assigned design objective. Design Document has passed the first milestone; Task is assigned to the Test Author to develop Draft Test Cases for the design objective.

Input:
Design Document, Test Cases, Test Case Defects, Task

Steps:
1. After reading the body of the Design Document, determine the objectives of the design. This can generally be determined by sections, key point of a paragraph, or group of paragraphs.
2. Determine what objectives are not addressed by the design's assigned requirements.
3. For each objective:
   a. If the objective can be covered by an existing test case:
      i. Make a copy of the test case
      ii. Append the Test Case name with "DD <number> - "
      iii. Continue to **step 10,**
   b. Else continue to **step 4.**
   c. If the objectives that are met by existing requirements and have test cases written, continue to **step 10,** else continue to **step 4.**

Repeat steps 4 to 10 for each draft test case developed to cover a requirement or a design objective.
4. Per the *Quality Center Guidebook* and the Test Case Template, create Draft Test Cases to addressing a requirement or a design objective.
5. Per the *Quality Center Guidebook* link the Draft Test Case to the requirement or design objective.
6. Create new Issues (per the *Quality Center Guidebook*) for issues found in the Design Document that are inhibiting the completion of the test case.

7. Create Tasks (per the *Quality Center Guidebook*) for additional tools, log points, or test environment changes required to execute the test case or perform post analysis.
8. Review the Test Scenario descriptions in Quality Center to determine if one or more existing scenarios can be used to verify the requirement. (Test Author)
   a. Create Tasks for creating/updating scenarios per the *Quality Center Guidebook.*
9. Create tasks for creating/updating scripts per the *Quality Center Guidebook.*
10. Review test cases, which cover the design objective(s) or requirements, using the *Draft Test Case Checklist for Tester.*
    a. Correct any action from the *Draft Test Case Checklist for Tester.*
    b. Correct any test case defects from the peer review
    c. Mark the test case defects as 'Checked In' once completed

11. Generate the Design Document Test Plan.
12. Notify the Test Chief/Lead and IPT Lead that the Design Document Test Plan is ready for review.

Exit Criteria:
The design objective and linked requirements are covered by test cases; tasks required to complete and execute the test case have been written; any discrepancies with the Design Document have been documented; test cases, tasks and Design Document defects are documented in Quality Center.
The IPT and Test Chief/Lead are notified the artifacts (test cases, draft test cases, defects, tasks, and Design Document Test Plan) are ready for review.

Output:
Test Cases, Draft Test Cases, Tasks, Design Document Defects, Design Document Test Plan

Supporting Procedures:
(None)

Checklists:
Draft Test Case Checklist for Tester

Related Documentation:
Design Document Test Plan Template
Test Case Template
Quality Center Guidebook

Metrics:
Time it takes to develop draft or update a test case

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Process Documentation Example 2:
Eclipse Process Framework (COTS/Freeware)

Build Reusable "Method Content"

- Roles, Work products, Tasks, Guidance

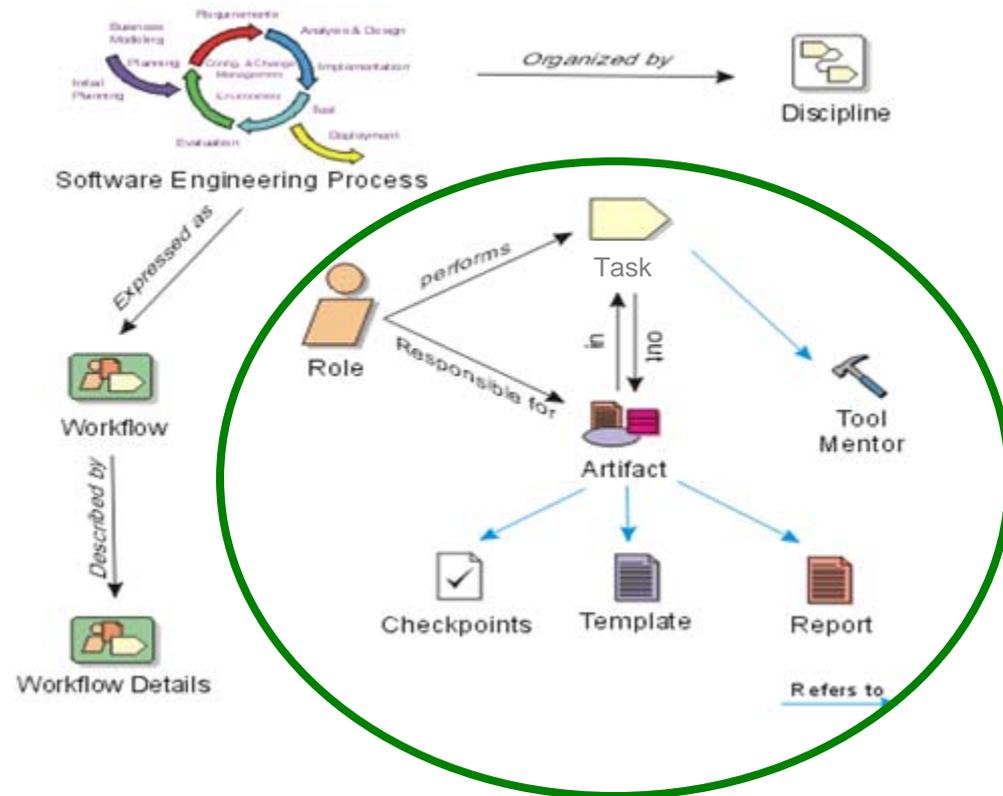Use Method Content to build "Capability Patterns" and "Delivery Processes"

- Lower-level reusable processes (like Peer Reviews, or Milestone Reviews) are referred to as capability patterns
- Higher-level processes are made up of Method Content and Capability Patterns, and are arranged hierarchically
  - Task
  - Activity
  - Capability Pattern
  - Phase

Publish your process to a website and add links to relevant web pages as assignments are made.

Method Content Development Example 2

Method Content is the description of work that can be reused as key building blocks. Method content describes tasks, roles, work products, guidelines, etc. that are involved in completing work

Method Content Architecture Example 2

Example:
Requirements->
Workflow Detail->
Define the System

Business Rules

Vision

Stakeholder Requests

Vision (refined)

Supplementary Specifications

Requirements Management Plan

Requirements Attributes

System Analyst

Develop Vision

Manage Dependencies

Requirements Attributes (refined)

Capture a Common Vocabulary

Find Actors and Use Cases

Use-Case Model (refined)

Glossary

Glossary (refined)

Use-Case Modeling Guidelines

Business Use-Case Model

Business Object Model

Use-Case Model

Use Case (outlined)

Process Development Example 2

Processes are the order of doing work. They provide the order for the method content. Processes will differ depending on project type, size, or other characteristics.

Two types:

- Delivery Processes – End-to-End complete project lifecycles
- Capability Patterns – Process fragments that can be used to compose Delivery Processes

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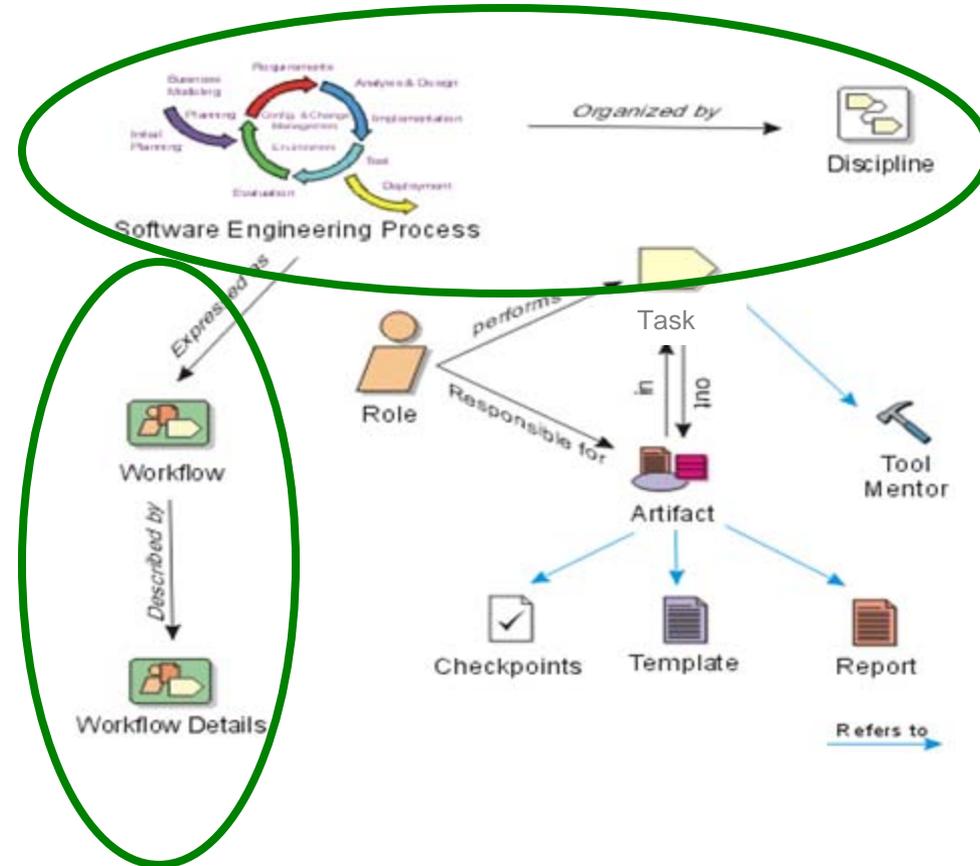
Publishing Example 2

Configurations can be published based on required contexts

One repository can publish to numerous configurations, thereby keeping process assets in one centralized location, and their instantiations separate
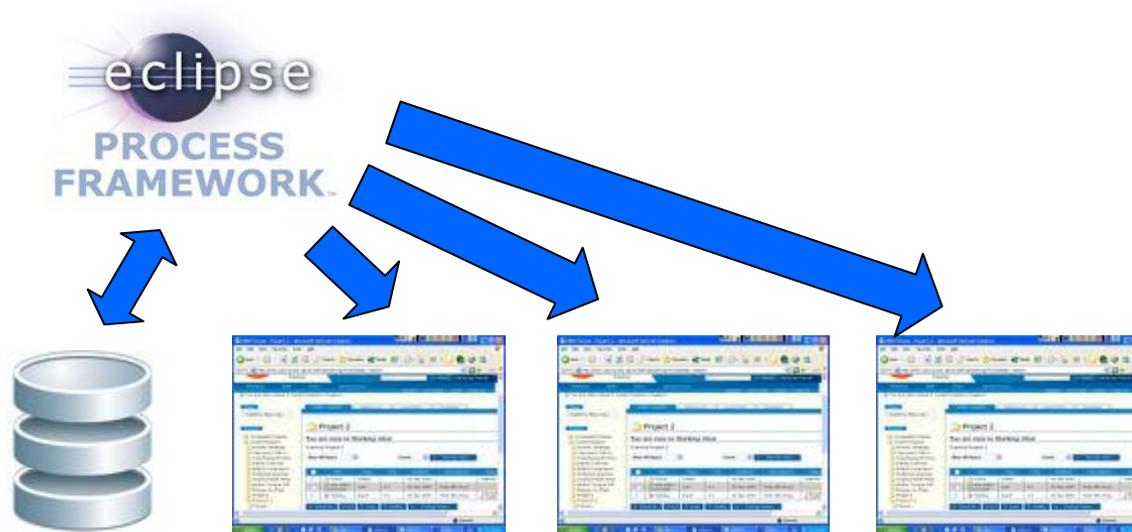
EPF Method Content Screenshot

EPF Delivery Process Screenshot

EPF Web Page Screenshot

Summary

Our experiences with process definition at the SIAP Joint Program Office pointed out some areas where there is not a lot of practical guidance. We hope our experience helps improve yours.

- Try to integrate your process definition environment with your project management tools.

- Process Definition Tools. You have choices to make. Some organizations will tend towards a Microsoft environment, and others will seek a more integrated solution. Make sure the choice you make works for you, and your stakeholders.

- Your tool selection will not provide you with a silver bullet. However, a good tool, implemented correctly, should help you get good at "institutionalizing."

- Don't forget that your primary stakeholders are management, and "users." The process definition effort must provide some tangible increase in productivity, that makes the user more productive, and management happy.

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