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# Into the Future Part 1: Process Definition on Steroids

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# OUTLINE


- Process Goals
- Proven Approach
- Process Improvement Infrastructure
- Process Execution
- Applying Techniques
- Questions

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# Process Goals

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- **Build a process that is**
  - ***Adaptable*** **to changing user needs**
  - ***Maintainable*** **to implement changes rapidly**
  - ***Flexible*** **to support a solid architectural framework**
    - **Modularized components**
    - **Reusable components**

# Process Goals Continued



- **Build a process that is NOT**
  - **Cumbersome to understand (shelfware, big honkin' binder)**
  - **Circumvented when schedule and cost pressures affect a program**
  - **Difficult to maintain**
    - **Changes require redesign**
    - **Fixing one error propagates more errors**
    - **No programmer wants to be assigned to the team**

# Process Goals Continued

- **Build a process that supports**
  - **Daily needs of the engineers and managers**
  - **Various levels of expertise**
  - **Multiple disciplines with a unified process**
  - **Ownership by the engineers**

# Proven Approach – Overview

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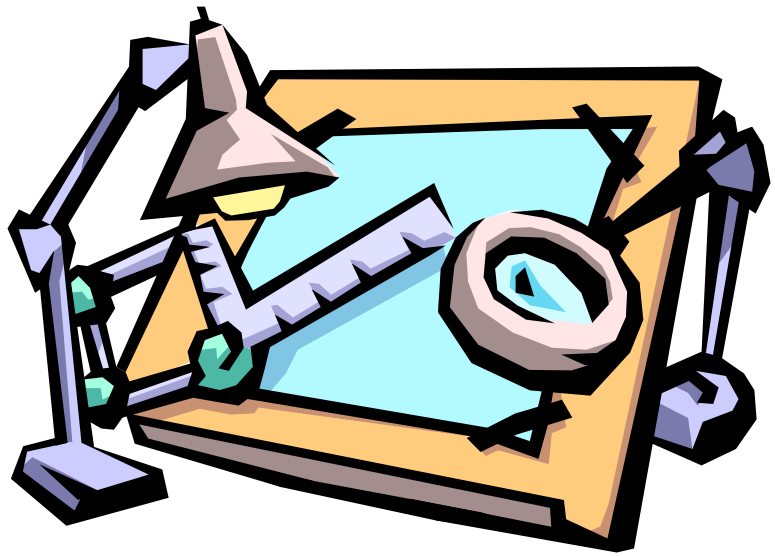
- **Define the Level of Detail**
  - Establish an approach that meets user experience levels
- **Define the Design Components**
  - Cartography, Step Action Table (SATs) and Decision Tables (DTs)
  - Artifacts
- **Define the Environment**
  - Processes
  - Tools
  - Analysis Methods

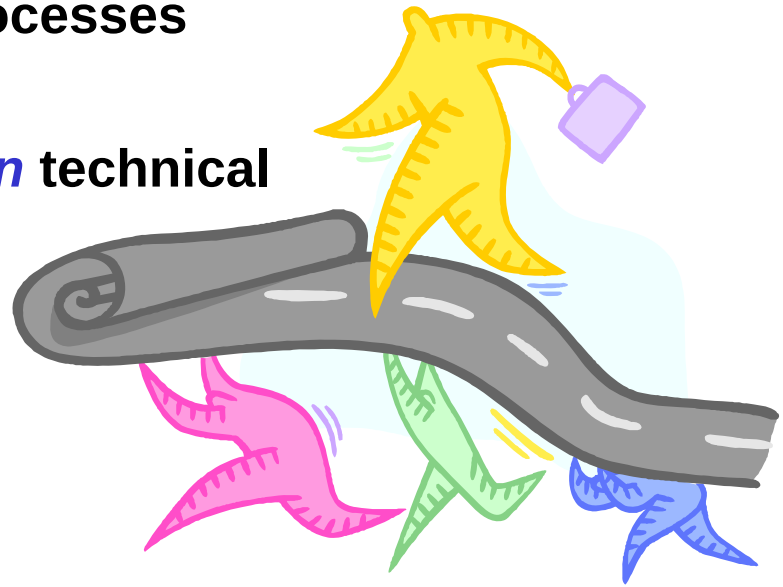


# *Proven Approach – Level of Detail Expert*

- **Cartography is a graphical representation designed for highly experienced engineers that**
  - ***Improves*** **the business objectives**
  - ***Teaches*** **others how to apply the organization's processes**
  - **Designs and implements *innovative* technical solutions**

# Proven Approach – Level of Detail Intermediate

- **Step Action Table (SAT) is a textual representation designed for moderately experienced engineers that**
  - ***Applies*** **the business objectives**
  - ***Executes*** **the organization's processes**
  - **Designs and implements *proven* technical solutions**



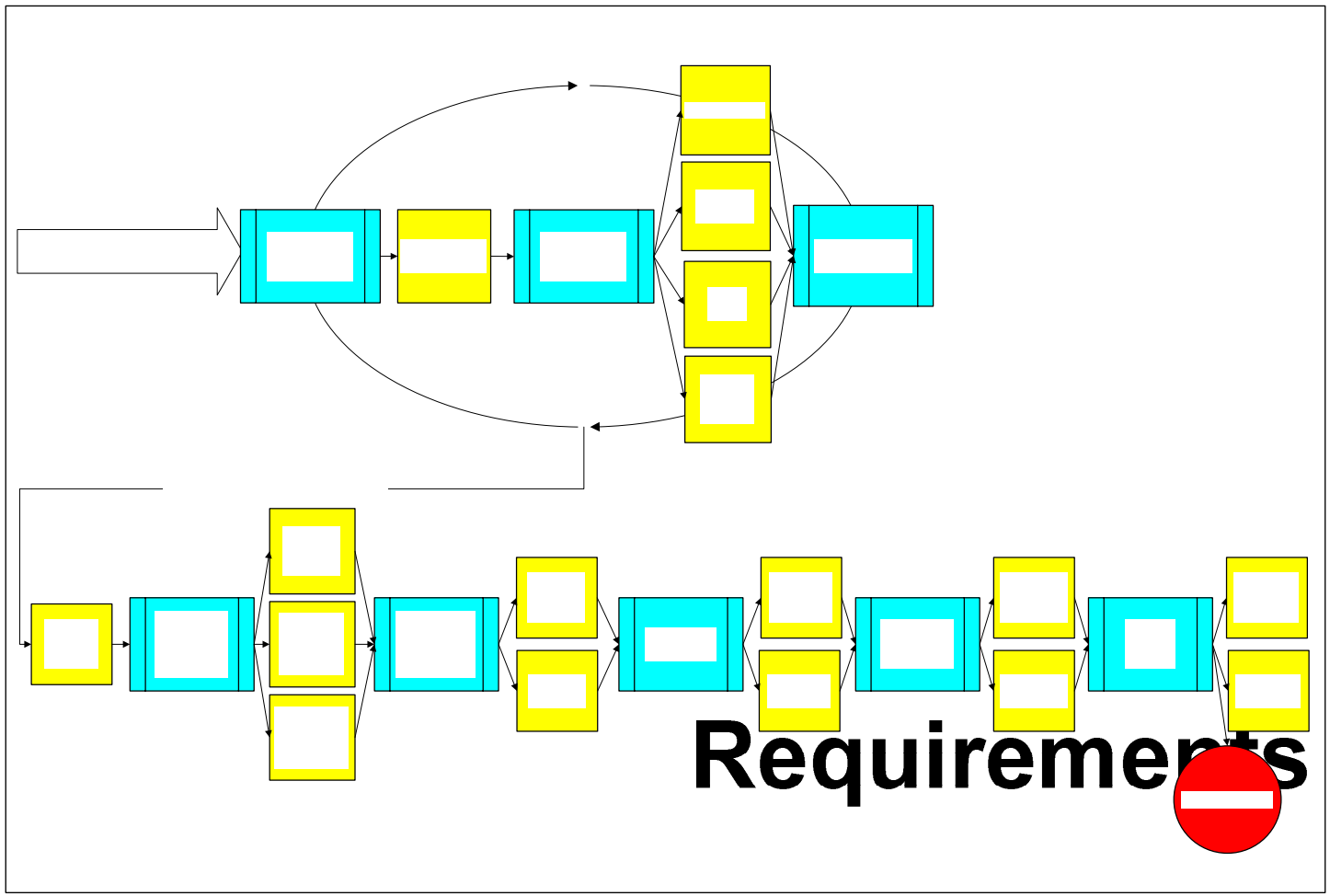
# Proven Approach – Level of Detail Beginner

- **Decision Table (DT) is a tabular representation with tailoring options to include templates and checklists designed for inexperienced engineers that are**
  - ***Understanding*** **the business objectives**
  - ***Learning*** **the organization's processes**
  - ***Assisting*** **with the design and implementation of technical solutions**

# Approach – Design Components Cartography

- Represents high-level overview of process activities to include a link to process-related information such as policy, training, frequently asked questions, Quality Assurance (QA) tips and Best Practices
- Supports point and click process navigation using web pages
- Requires Microsoft Visio to implement t
  to create the graphical symbols

# Approach – Design
# Sample Cartography Component



# Approach – Design Components Step Action Table (SAT)

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- **Defines step-by-step details of the process activities**

- **Supports point and click process navigation using web pages**
- **Requires HTML and Java languages to implement web pages and the automatic numbering for process steps**

# Approach – Design
# Sample SAT Component

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## Requirements Management Step Action Table

**(as of April 2006)**

| Step | Action | Responsible |
|---|---|---|
| | **Verify Entry Criteria** | |
| 1 | Verify that Project initiation has been completed or system requirements allocated to software have been modified | Project Leader(PL) |
| 2 | Record/review the project purpose and for Standard Software Process (SSP) projects, Scope, Goals, and Objectives in the ***Project Tracking Form (PTF)*** Description section, as needed | PL |
| 3 | Acquire the Software Requirements Specification (SRS) Package **?** and record initial data and remaining data as tasks below are completed using the *Requirements Checklist* or an approved group-specific Requirements Checklist, and referencing the *Requirements Compliance Checklist* | PL |
| 4 | Record/review the following data in the ***PTF*** Schedule Breakdown section for the Requirements Management and Project Planning phases:<br>• Requirements as a critical milestone or not<br>• Actual start date<br>• Adjusted effort and date estimates (may use calculate button in PDB to acquire adjusted estimate date based on the actual start date)<br>• Development Team Members | PL |

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| | | |
|---|---|---|
| | **Measurements** | |
| 30 | Referencing the SRS Package, record the total number of initial requirements in the Requirement Volatility Metric in the Project Metrics sheet of the ***Automated Metric Analysis Tool (AMAT)*** | PL |
| 31 | Verify/record actual hours in ***SERTS*** under the Requirements lifecycle activity, tailoring decisions in the ***PTF*** and requirements completion date in the Schedule Breakdown section of the PTF | PL |

# Approach – Design Components
# Decision Table (DT)

- **Defines criteria and action for each critical process decision (i.e., *when* y exists *then* perform x) to identify tailoring options that meet the unique needs of each process user**

- **Supports point and click process navigation using web pages**
- **Requires HTML to implement web pages**

## Software Requirements Specification Package Decision Table

**(as of April 2006)**

| When | Then |
|---|---|
| Software Requirements Specification (SRS) Package exists | Acquire and modify SRS Package, as applicable |
| SRS Package does not exist, and Customer or First Level Supervisor (FLS) / Group Leader (GL) does not require a formal requirements document | Acquire one of the following to complete the SRS Package:<br>• The ***Software Requirements Specification Form (SRSF)***, or<br>• An approved SRS Database that captures all data items listed in the SRSF |
| SRS Package does not exist, and Customer or FLS/GL requires a formal requirements document | Acquire the ***Requirements Traceability Matrix (RTM) Template*** and one of the following to complete the SRS Package:<br>• The ***Condensed SRS (CSRS) Template***, or<br>• The ***SRS Template*** |

# Approach – Design Artifacts Definitions/Checklists

- **Definitions**
  - Clarify terminology based on the organization's processes
- **Checklists**
  - Derived from a template
  - Identify detailed questions to enhance the effectiveness of the process
  - Focus on product and process quality

# Approach – Design Artifacts Forms

- **Forms**
  - **Provides a unified method to collect data consistently**
  - **Identifies minimum data requirements**
  - **Focuses on capturing the right data to measure progress and quality**

# Approach – Design Artifacts Plans

- **Plans are**
  - **Derived from a specific template (Requirements Specification, Test Plan)**

- **Utilized to Identify formal information required by the customer**

- **Focus on product quality**

## Process Overview

| Process | Policy | Training | FAQ | QA Tips | Best Practices |
|---|---|---|---|---|---|
| **General** | - | - | FAQ | QA Tips | None |
| **Acceptance Test** | Policy | Training | FAQ | QA Tips | None |
| **Integration Test** | Policy | Training | FAQ | QA Tips | None |
| **Peer Review** | Policy | Training | FAQ | QA Tips | None |
| **Process Development** | Policy | Training | None | None | None |
| **Project Tracking and Oversight** | Policy | Training | FAQ | QA Tips | None |
| **Rapid Implementation Process** | Policy | Training | None | QA Tips | None |
| **Requirements Management** | Policy | Training | FAQ | QA Tips | Best Practices |
| **System Test** | Policy | Training | FAQ | QA Tips | Best Practices |
| **Technology Change Management** | Policy | Training | FAQ | None | None |

# Requirements Management Process Best Practices

## 1. OSP v5.0

**Artifact Type: Software Requirements Specification Form**

**Description:**

This artifact is a good example of a completed SRSF with clearly defined requirements.

**Link: Artifact**

## Requirements Management Process FAQ

**1. OSP v5.0 4/24/2005**

**As a new project leader in the requirements phase of the project, I wasn't sure if I had to do this step or not. Is it only if you are in the Project Planning phase or later?**

The PMF is required during Requirements to capture your initial requirements, your estimated/actual effort, and peer review defects.

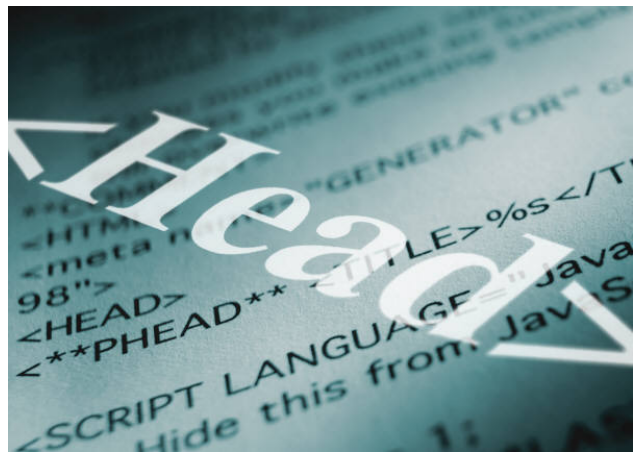
**2. OSP v5.0+ 9/18/2006**

**In the Training Requirements section of the PTF, can the PL modify or remove a skill from the team skill set?**

Yes you can modify or remove a skill from the team skill set. To delete a skill select the skill you wish to modify, this should highlight that skill, and click the delete button to remove.

# Approach – Environment Processes

- **Web-based Processes**
  - **HTML Processes**
    - **Allows for centralized access and easy navigation**
  - **XML Configuration Files**
    - **Allows for easy modifications of changing data and implementation of business rules**




# Approach – Environment Tools


- **Development of In-House Tools**
  - **Standard Engineering Request Tracking System (SERTS) – tracks change requests as well as estimated and actual hours expended**
  - **Process Database Tool (PDB)– centralizes data, captures information to track progress and provides real-time insight into status**
  - **Automated Metric Analysis (AMAT) – extracts data from PDB and SERTS to provide a means to track project goals against organizational goals and perform quantitative analysis on performance**
  - **Shared Knowledge Provider (SKP) – provides access to process improvement tools and project data via a centralized web page**

# Approach – Environment
# Statistical Analysis Methods

- **Statistical Analysis Methods**

  - **Statistical Process Control with moving range to allow for analysis to determine if the processes are stable and under control**
  - **Mini tab tool provides numerous charts and graphs to aide in data analysis**

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# Approach – Environment People

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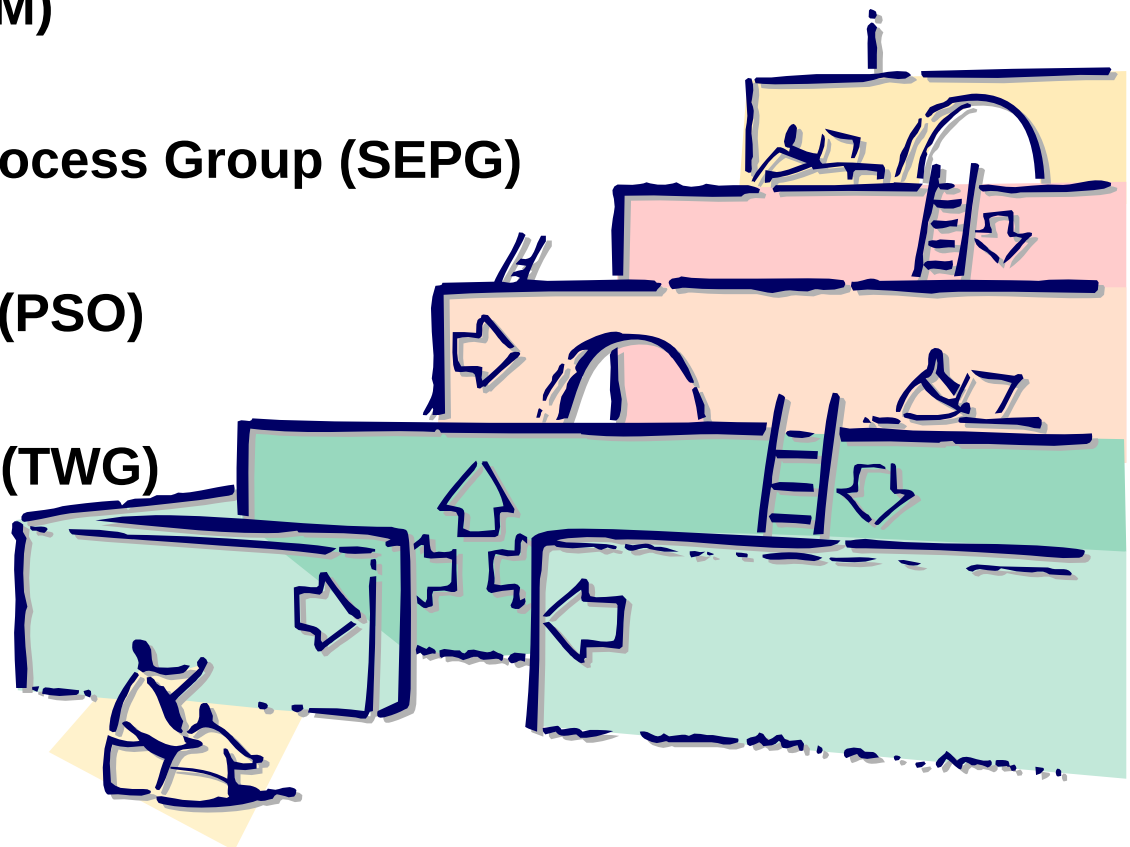
- **Produce Process Champions**

  - **Believe their individual words and actions ultimately improve the project performance and build a more positive work environment**
  - **Display a constant willingness to help others understand, utilize and improve the processes by effectively communicating the direct benefits to the project**
  - **Transform the engineer's frustrations into positive energy and focus towards building a better organization**
  - **Seek to continually add value by improving disciplined processes**

# Process Management Infrastructure - Overview

- Executive Steering Committee (ESC)
- Senior Management (SM)
- Standard Enterprise Process Group (SEPG)
- Project Support Office (PSO)
- Technical Work Group (TWG)
- User Group (UG)
- Target Group (TG)



# Process Management Infrastructure - ESC

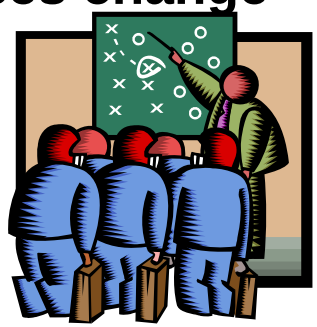
- **Executive Steering Committee (ESC)**
  - **Membership includes 3 Senior Executives and 5 Senior Managers**
  - **Identifies process improvement approach and allocates funding and resources**
  - **Provides oversight to the Organization Standard Process (OSP), policies, charters, Process Improvement Plan (PIP), and budget**
  - **Supports ESC Meetings bimonthly to review progress of planned versus actual tasks**

# Process Management Infrastructure - SM

- **Senior Management (SM)**
  - **Membership includes 5 Senior Managers**
  - **Guides and directs activities to achieve the strategic goals**
  - **Supports SM Meetings bimonthly review SEPG status**
  - **Addresses resource, budget, and training issues**

# Process Management Infrastructure - SEPG

- **Standard Enterprise Process Group (SEPG)**
  - **Membership includes 7 to 10 Group Leaders and the Organization Quality Assurance (QA) Manager**
  - **Facilitates the definition, execution, and improvement of policies and processes**
  - **Represents each target group's interests, processes change requests and addresses action plans**



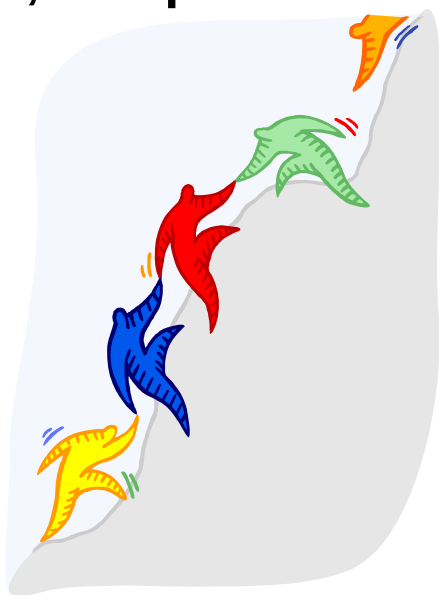
# Process Management Infrastructure – SEPG continued



- **Standard Enterprise Process Group (SEPG)**
  - **Oversees Technical Work Group, Project Support Office, User Group and Training activities**
  - **Performs Causal Analysis and Resolution, Organizational Process Performance, Quantitative Project Management, and Organization Innovation and Deployment activities**
  - **Provides training courses to engineers and all levels of management**
  - **Reports status to ESC and SM**

# Process Management Infrastructure - PSO

- **Project Support Office (PSO)**
  - Composed of 6 permanent and 1 rotating position
  - Performs QA activities, training management, and process maintenance
  - Maintains and creates applications supporting process improvement
  - Provides support to the SEPG



# Process Management Infrastructure – TWG/UG

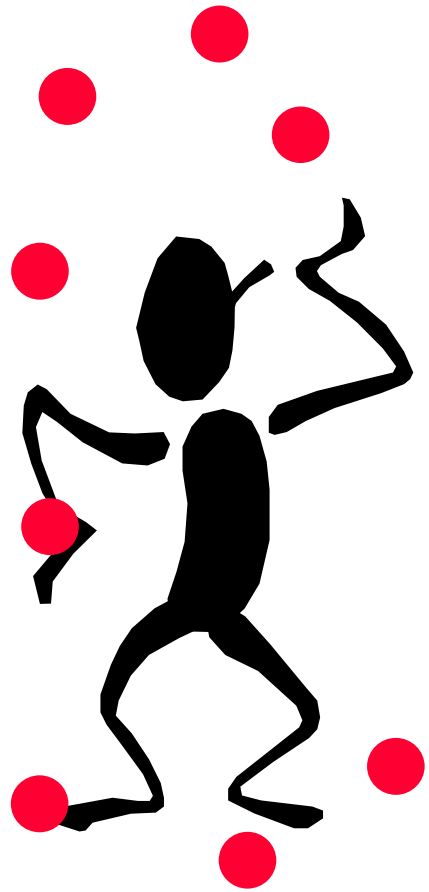
- **Technical Work Groups (TWG)**
  - Composed of engineers representing each target group
  - Develops processes and accompanying artifacts as defined by a charter

- **User Group (UG)**

  - Composed of representatives from all groups
  - Resolves process issues at the engineering level

# Process Management Infrastructure - TG

- **Target Group (TG)**
  - Adheres to Organization Standard Process
  - Addresses Compliance Issues
  - Submits Change Requests
  - Reports Project Status
  - Attends User Group Meetings
  - Supports Technical Work Groups



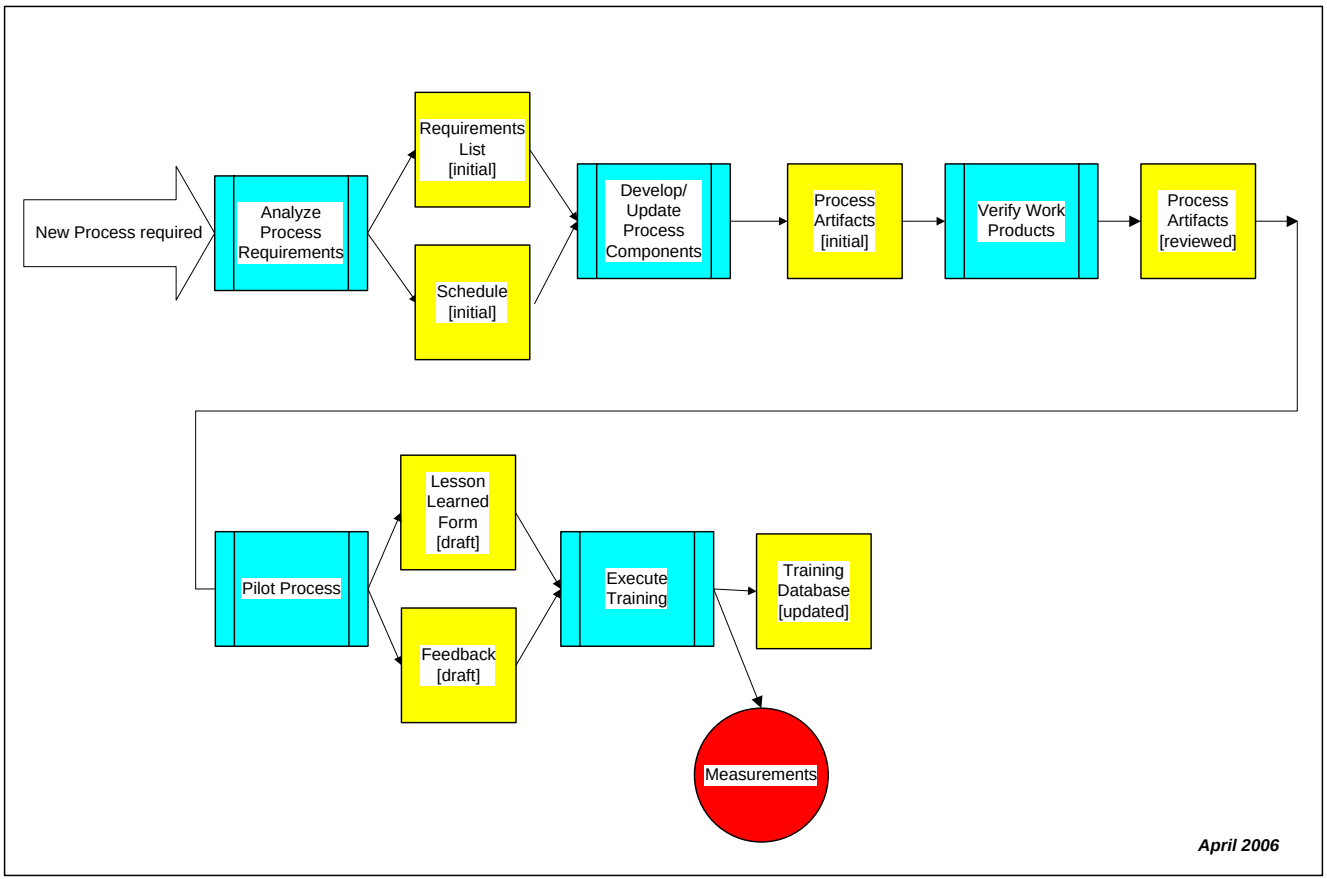

# Process Execution – Overview


- **Process Development Process**
  - **Cartography**
  - **Step Action Table**
  - **Artifacts**
  - **Supporting Processes**
  - **Evaluating Processes**

# Process Execution – Cartography

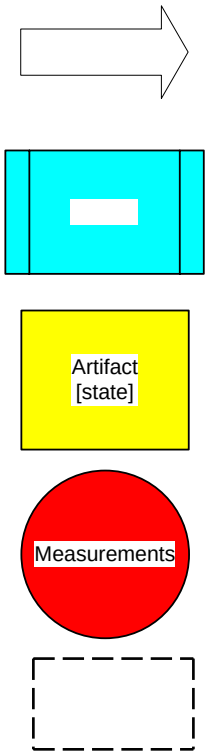
## Process Development

Process Overview



# Process Execution – Cartography Symbols

## Cartography symbols




- Entry Criteria defines conditions that must be met to initiate the process
- Activity Box defines action that results in the creation/modification of an artifact to the next higher state
- Artifact is the direct result of an activity taking place and displays an associated state as the artifact progresses within the development cycle
- Process measurements are collection points for process data
- Dashed lines indicate the component is optional. Activity boxes, artifact boxes and measurement components can be optional

# Process Execution – Cartography Guidelines

- Use predefined cartography symbols
- Include entry criteria, activity box, artifact box and measurement at a minimum
- Include no more than 7 activity boxes per process
- Start Activity Boxes with a verb in the description
- Display optional components with dashed lines
- Link to process-related information (policy, training, best practices, frequently asked questions and QA tips)
- Must have a last updated date

# Process Execution – Step Action Table

- **Process Development Process Steps**
  - Verify Entry Criteria
  - Analyze Process Requirements
  - Develop/Update Process Components
  - Verify Work Products
  - Pilot Process
  - Execute Training
  - Measurements

# Process Execution – Step Action Table Continued

- **Verify Entry Criteria**
  - **Project Leader (PL) verifies a Standard Engineering Request Form (SERF) is received stating a new process must be developed**


- **Analyze Process Requirements**
  - **PL reviews existing process artifacts based upon current requirements**
  - **PL reviews the Lessons Learned Forms (LLFs) to gain insight on process and management lessons learned for process development**
  - **PL identifies resources required (i.e., tools, person hours, hardware, etc.) and provides estimated hours for updating/developing the process to the applicable Configuration Control Board (CCB) and the First Level Supervisor (FLS)/Group Leader (GL)**

# Process Execution – Step Action Table Continued

- **Develop/Update Process Components**
  - **PL develops/updates the following process artifacts according to the Process Development section of the Standards and Style Guide:**
    - **Cartography**
    - **Step Action Table (SATs)**
    - **Forms**
    - **Checklists, as required**
    - **Decision Tables (DTs), as required**
    - **Templates, as required**
  - **PL updates the Standard Definitions, as required**

# Process Execution – Step Action Table Continued

- **Verify Work Products**
  - **PL verifies the process artifacts are complete and correct**
  - **PL provides the process artifacts to the CCB and FLS/GL for review**
  - **PL updates the process artifacts based on the CCB and FLS/GL feedback**
  - **PL submits the process artifacts to CCB for piloting**

# Process Execution – Step Action Table Continued

- **Pilot Process**
  - **Configuration Control Board (CCB) selects project/group to pilot the process artifacts**
  - **CCB defines the piloting period start date and completion date**
  - **CCB trains the Project Leaders (PLs) and Development Team Members (DTMs) on the process being piloted**
  - **CCB solicits feedback from piloting project/group after the piloting period has ended and provides to the PL**

# Process Execution – Step Action Table Continued

- **Pilot Process**
  - **PL updates the process artifacts based on the piloting feedback and generates lessons learned**
  - **PL submits the final process artifacts and the lessons learned to CCB for baseline approval**
  - **CCB submits finalized process artifacts and lessons learned to the SEPG and the QA Managers, if the process needs to be incorporated into the OSP**

# Process Execution – Step Action Table Continued

- **Execute Training**
  - **CCB executes the Training Process with affected individuals**

- **Measurements**
  - **PL, CCB verifies/records actual hours in Standard Engineering Request Tracking System (SERTS) under the Implementation lifecycle activity to develop, review, update and train the process**

# Process Execution – Artifacts

- Requirements List
- Schedule
- Process Artifacts
- Feedback
- Lessons Learned Form
- Updated Training Database

# Process Execution – Supporting Processes

- **Training Process**
  - **Executed by the Organization Training Manager to**
    - **Identify training needs**
    - **Schedule classes**
    - **Track attendance**
    - **Acquire feedback on training effectiveness**

# Process Execution – Evaluating Processes

- Capture the estimated and actual effort expended to define, implement, review and test the new process

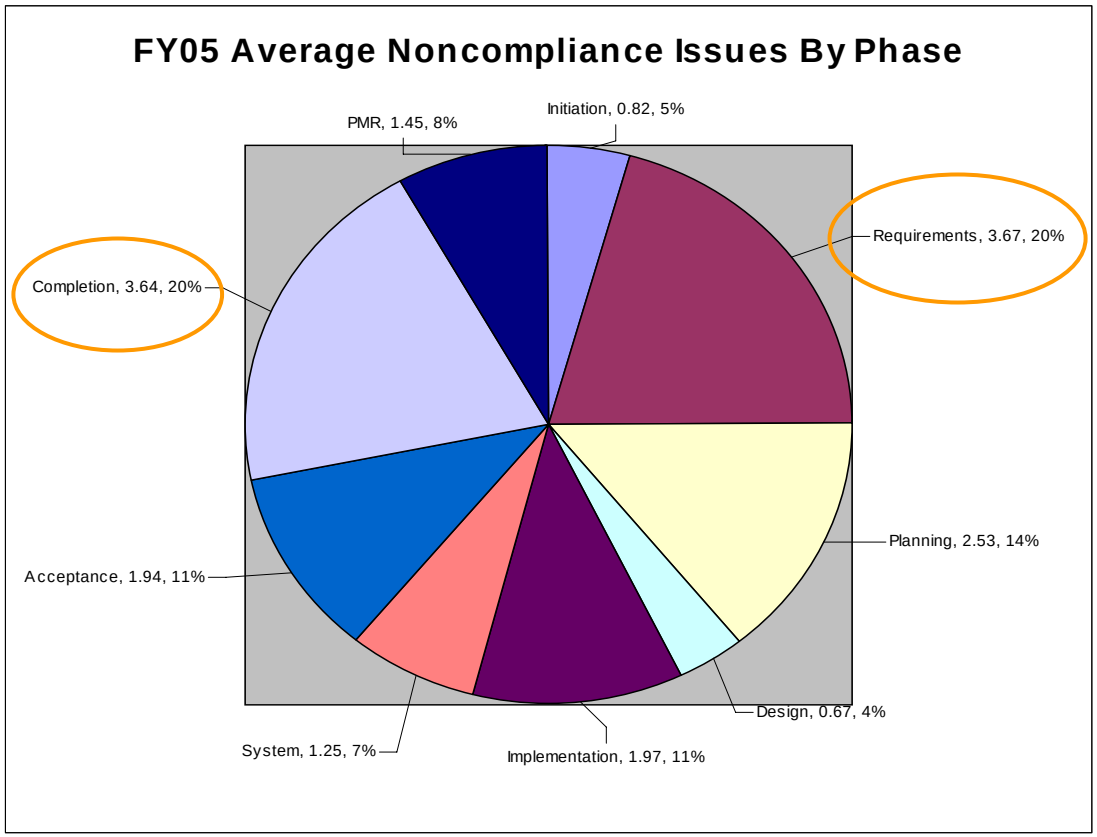
- Capture the estimated and actual start and completion dates for the new process

- Capture the resources (number of people, tools, training, etc.) utilized on the new process

- Capture number of post release defects associated with the new process

# Process Execution – Evaluating Processes Continued

- Capture the number of compliance issues encountered while executing the Process Development Process



# *Applying Techniques*


# Applying Techniques


- **Demonstrate Shared Knowledge Provider (SKP) Functionality**
  - **Show links to applications**
  - **Show structure of the menu bar**
  - **Show process assets**
  - **Show point and click navigation of the processes**

# Applying Techniques



- **Execute Process Definition Exercise**
  - **Apply process and techniques learned to create a process as a group**
  - **Expand process to address the enterprise level**

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# Questions

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# Acronyms



- AMAT – Automated Metric Analysis Tool
- CCB – Configuration Control Board
- CG – Communications Group
- CM – Configuration Management
- DT – Decision Table
- DTM – Development Team Member
- ESC – Executive Steering Committee
- FLS – First Level Supervisor
- GL – Group Leader
- LLF – Lessons Learned Form
- OSP – Organization Standard Process
- PDB – Process Database

# Acronyms



- PIP – Process Improvement Plan
- PL – Project Leader
- PSO – Project Support Office
- QA – Quality Assurance
- SAT – Step Action Table
- SEPG – Standard Enterprise Process Group
- SERTS – Standard Engineering Request Tracking System
- SKP – Shared Knowledge Provider
- SM – Senior Management
- TG – Target Group
- TWG – Technical Work Group
- UG – User Group

# References


- Gamberini, Rudy, Reuters Inc., “Process Cartography: A Graphical Approach to Process Definition”, SEPG 2000.
- Olson, Timothy G., Quality Improvement Consultants (QIC), Inc., “How to Define Processes in Expert Mode”, SEPG 2000