What the CMMI Doesn’t Say About Training (But Should!)

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Agenda

- Key questions on Organizational Training (OT) capability
- Introduction to OT in CMMI
- CMMI requirements for the OT process area
  - The Kirkpatrick model
- CMMI requirements for the Training generic practice
- Strategies for Organizational Training

CMMI is a service mark of Carnegie Mellon University
Key Questions in Establishing an Organizational Training Capability

- How much training is enough?
- Should training be developed in-house or bought from a vendor or university?
- How should training be paid for?
- How do you determine whether training is effective?
- How does the training needs of project personnel, staff groups, and management differ?
- Are alternatives to classroom training (informal mentoring, web-based training, guided self-study, on-the-job training) effective? Under what conditions?
- How do you address technical, process, organizational, and contextual knowledge?

*The CMMI provides guidance based on industry best-practices*
## Organizational Training - Level 3 Process Area

<table>
<thead>
<tr>
<th>Level</th>
<th>Focus</th>
<th>Process Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Optimizing</td>
<td>Continuous process improvement</td>
<td>Causal Analysis and Resolution Organizational Innovation and Deployment</td>
</tr>
<tr>
<td>4 Quantitatively Managed</td>
<td>Quantitative management</td>
<td>Quantitative Project Management Organizational Process Performance</td>
</tr>
<tr>
<td>3 Defined</td>
<td>Process standardization</td>
<td>Organizational Process Focus Organizational Process Definition Organizational Training Integrated Project Management Risk Management Decision Analysis and Resolution Requirements Development Technical Solution Product Integration Verification Validation Organizational Environment for Integration Integrated Teaming Integrated Supplier Management</td>
</tr>
<tr>
<td>2 Managed</td>
<td>Basic project management</td>
<td>Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management</td>
</tr>
<tr>
<td>1 Performed</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Organizational Training Process Area

- **Purpose**
  - Develop the skills and knowledge of people so they can perform their roles effectively and efficiently

- **Key actions**
  - Identifying the training needed by the organization
  - Obtaining and providing training to address those needs
  - Establishing and maintaining training materials
  - Establishing and maintaining training records
  - Assessing training effectiveness
Training Scope

- **Skills and knowledge may be:**
  - **Technical** – ability to use the equipment, tools, materials, data, and processes
  - **Organizational** – behavior within and according to the employee's organization structure, role and responsibilities, and general operating principles and methods
  - **Contextual** – self management, communication, and interpersonal abilities needed to successfully perform in the organizational and social context of the project and support groups

- **Training options**
  - Classroom training
  - Web-based training
  - Guided self study
  - Formalized on-the-job mentoring
Is the Staff Qualified to Do Their Work?

- What are the minimum skills and knowledge needed to perform their job function?
- Does each individual possess these skills?
  - If not, training is expected to address the gaps

How does the organization maintain a skilled and knowledgeable workforce?

An organizational responsibility!
Organizational Training Goals

- **SG 1 Establish an Organizational Training Capability**
  A training capability that supports the organization's management and technical roles is established and maintained.

- **SG 2 Provide Necessary Training**
  Training necessary for individuals to perform their roles effectively is provided.

- **GG 3 Institutionalize a Defined Process**
  The process is institutionalized as a defined process.
Expected Practices - Goal 1 (Establish an Organizational Training Capability)

- **SP 1.1 Establish the Strategic Training Needs**
  Establish and maintain the strategic training needs of the organization.

- **SP 1.2 Determine Which Training Needs Are the Responsibility of the Organization**
  Determine which training needs are the responsibility of the organization and which will be left to the individual project or support group.

- **SP 1.3 Establish an Organizational Training Tactical Plan**
  Establish and maintain an organizational training tactical plan.

- **SP 1.4 Establish Training Capability**
  Establish and maintain training capability to address organizational training needs.

- **Strategic needs** address long-term maintenance of a qualified work force

- **Tactical plans** address this year’s training

- The organization may choose to meet some needs, and leave other to individual projects

- Capability includes
  - Classrooms
  - Training materials
  - Instructors
  - Administrative staff
Instructor Qualification

- **Qualify Instructors**
  - Based on their knowledge, experience and skills
  - Have a process for approving instructors before they start teaching

- **Maintain a list of qualified instructors**
  - Show who is qualified to teach which course
  - Update the list to include new instructors from time to time

- **Re-train the instructors**
Expected Practices - Goal 2 (Provide Necessary Training)

- **SP 2.1 Deliver Training**
  Deliver the training following the organizational training tactical plan.

- **SP 2.2 Establish Training Records**
  Establish and maintain records of the organizational training.

- **SP 2.3 Assess Training Effectiveness**
  Assess the effectiveness of the organization’s training program.

The purpose of training records is to:
- Determine who is qualified for each assignment
- Determine how many people still need to take each required training course (drives budgets)

Effectiveness – how well did the training impart the desired skills and knowledge?

Training Feedback form taken at the end of training course is not measuring effectiveness
Effectiveness – The Kirkpatrick Model

**Level 1** – Collect student and instructor reaction to the training

**Level 2** – Measure student learning through testing

**Level 3** – Measure transference of learning to the job

**Level 4** – Measure impact on job performance
Expected Practices – Generic Goal (Institutionalize a Defined Process)

- GP 2.1 Establish an Organizational Policy
- GP 2.2 Plan the Process
- GP 2.3 Provide Resources
- GP 2.4 Assign Responsibility
- GP 2.5 Train People
- GP 2.6 Manage Configurations
- GP 2.7 Identify and Involve Relevant Stakeholders
- GP 2.8 Monitor and Control the Process
- GP 2.9 Objectively Evaluate Adherence
- GP 2.10 Review Status with Higher Level Management
- GP 3.1 Establish a Defined Process
- GP 3.2 Collect Improvement Information

**Often neglected areas:**
- Training for instructors and administrative staff
- Configuration control of course materials, student records
- Process and product audits
- Defined processes for needs identification, student selection, course revisions, etc.
Generic Practice for Training
(Applies to all Process Areas)

- **GP 2.5 Train People**
  Train the people performing or supporting the process as needed.

| GP 2.1 (CO 1) | Establish an Organizational Policy |
| GP 2.2 (AB 1) | Plan the Process |
| GP 2.3 (AB 2) | Provide Resources |
| GP 2.4 (AB 3) | Assign Responsibility |
| GP 2.5 (AB 4) | Train People |
| GP 3.1 (AB 5) | Establish a Defined Process |
| GP 2.6 (D1 1) | Manage Configurations |
| GP 2.7 (D1 2) | Identify and Involve Relevant Stakeholders |
| GP 2.8 (D1 3) | Monitor and Control the Process |
| GP 3.2 (D1 4) | Collect Improvement Information |
| GP 2.9 (VE 1) | Objectively Evaluate Adherence |
| GP 2.10 (VE 2) | Review Status with Higher-Level Management |
Strategies for Organizational Training - 1

- Start by defining the key job functions in the organization
  - E.g., project manager, software engineer, quality assurance specialist
- Identify the requisite knowledge associated with each function
- Define a set of course modules that impart this knowledge
  - Map modules to job functions
  - Some modules will be common to multiple job functions
- Acquire training materials and trainers
  - Should reflect the organization’s policies and processes
  - Unlikely that standard vendor/university courses will fit
- Ensure all the CMMI process areas are addressed
  - Knowledge needed to perform the process, NOT a course about the CMMI requirements for that process area
  - Include performers of the process, and those that support the process
Strategies for Organizational Training - 2

- Identify each employee by their job function(s), map to required courses
  - If the employee already has the identified minimum knowledge, they do not need to take the course
- Establish student records
  - Who has completed what course, waivers
- Review required training with employees
  - Career-planning, promotions, new hires
- Where additional project-specific training is required (e.g., tools, methods), adopt a similar approach at the project level
  - Project Planning SP 2.5 addresses project specific training
References and Contact Information

- CMMI: Guidelines for Process Integration and Product Improvement by Mary Beth Chrissis, Mike Konrad and Sandy Shrum

- CMMI Distilled by Dennis Ahern, Aaron Clouse and Richard Turner

Thank You

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