CMMI SM

Raytheon

Use of Competency Guidelines to Address CMMI GP 2.5

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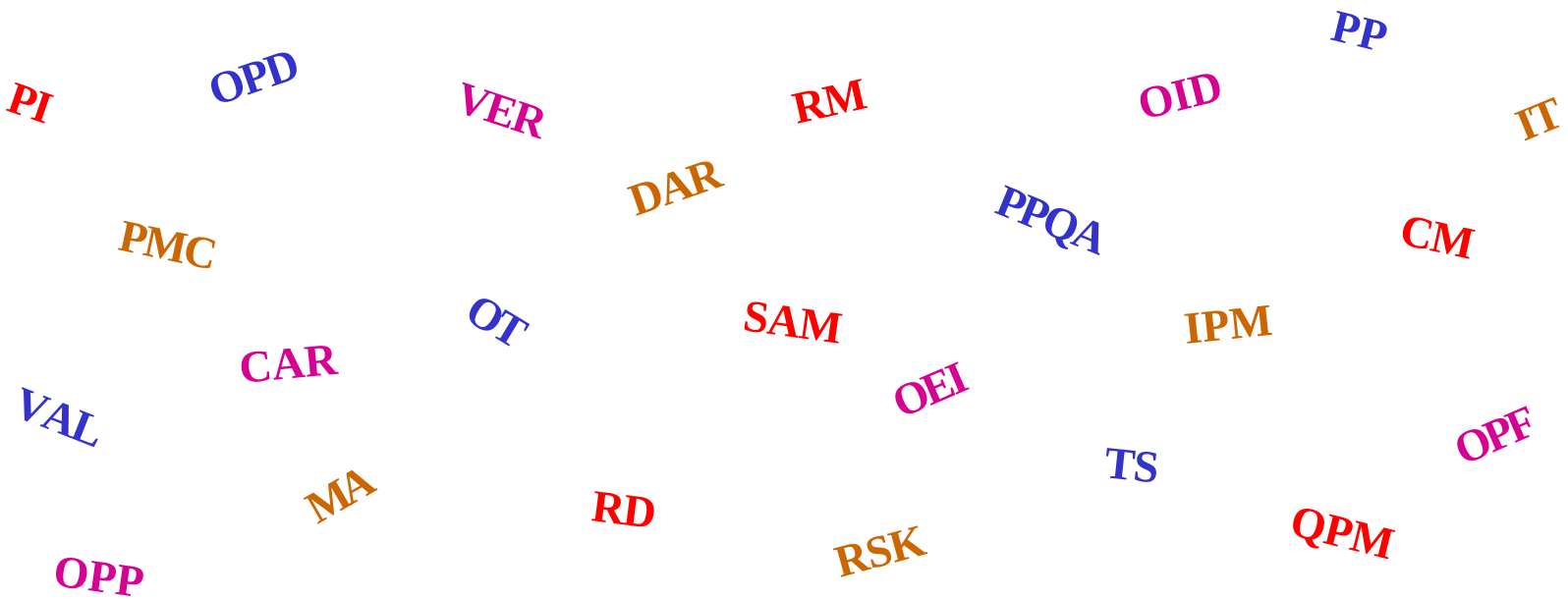
Generic Practice 2.5

- Practice
  - Train the people performing or supporting the process as needed.
    - As a level two generic practice, applies to all process areas
- Issue
  - How do you make sure each team member has the appropriate training to perform all assigned tasks?



Approach - 1

- Each department defined roles for all employees who are
  - Involved on a program
    - Configuration/data management
    - Contracts Administration
    - Engineering
    - Pricing and Parametric Estimation
    - Program Management
    - Program Controls
    - Quality
    - Security
    - Supply Chain Management
  - Performing an organizational role covered by the CMMI
    - Engineering Process Group
    - Training

Approach - 2

- Competency guidelines were created mapping skills, illustrative behaviors, and training for each role
  - Tool to identify skill development opportunities for every contributor by role
    - Core competencies apply to all employees
  - Development opportunities used to establish employee Individual Development Plans (IDPs) and facilitate employee career development and planning
    - Initial assessment made by employee and then discussed with supervisor in twice a year performance reviews
    - Reviewed upon new assignment
  - IDPs feed into the annual Tactical Training Plan
    - Still requires business areas and departments to identify leading edge technologies or process improvements requiring training in new areas
- Conducted pre-pilot trial and pilot before rollout to focus programs

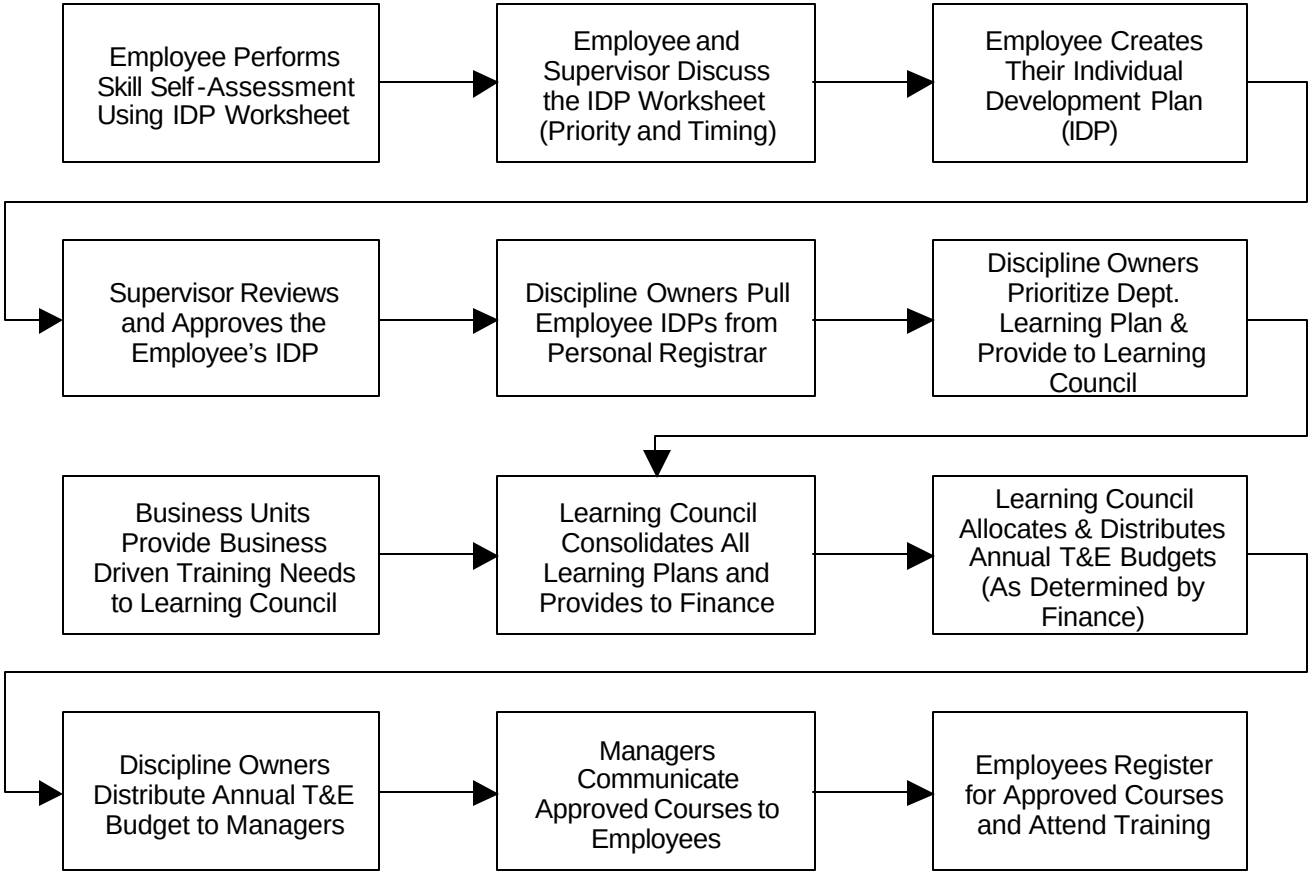
Definitions

- *Roles* are organizational responsibilities requiring a combination of skills and behaviors needed for an employee to perform a given assignment. An employee may perform a combination of roles.
- *Skills* are distinguishing characteristics of successful performance within an established role.
- *Illustrative Behavior* is the action exhibited by the person performing the role.
- *Learning* is the method by which employees obtain the skills and knowledge necessary to perform a given role.
- *Opportunities* are the differences
  - between an employee's current skill and the level required to perform a particular role
  - between an employee's current skill and the level relative to exemplary performance in a current or future role

Sample from the EPG Role

Role	Skill	Illustrative Behavior **Capability Level=** *=entry, **=middle, ***=high, ****=expert	Suggested Source of Learning **(R) = required**
Engineering Process Engineer	· Process Development/ Maintenance	• Develop and maintain local processes consistent with Raytheon requirements, SEI models, and ISO to improve organizational process performance. Track process actions to closure. • Maintain currency and change control/closed-loop corrective action for process documentation • Evaluate processes for impact on risk reduction • A working knowledge of the policies and procedures applicable to developing, maintaining, and deploying processes; lessons learned; PAL; program tailoring; and metrics. • In-depth knowledge of all Garland standard peer review processes	• Engineering Processes: SW, SE, HW, PA, CM, PM, Risk, EVMS (e.g, SE Mgmt, SE Requirements, SE, Design, SE IV&V, SW GRSP, SEW100, IMP/IMS, SE Process overview, SE Analysis, SEMP Overview, Tailoring the SW Process • Cost and Estimation • Statistics • Modeling
	• Process Management/ Continuous improvement	• Define and analyze process measurements • Continuously improve processes through new external information and internal feedback • Collect and analyze lessons learned to improve processes • Utilize process and product metrics to determine root cause as input to process improvement opportunities	• Operations Research • Statistical Awareness and Methods
	• Software Engineering Institute Maturity Models	• Plan and execute Software, Systems and integrated Software/Systems Engineering assessments	• SEI: Introduction to CMMI, Intermediate Concepts of CMMI, SCAMPI Lead Assessor Training

Process Flow



Lessons Learned

- There are lots of stakeholders!
  - Development of the guidelines was a joint effort by a diverse Process Action Team (PAT), Human Resources, and the various Functional/Department leads
    - PAT sponsor was the VP of Human Resources and a very active participant
- Provide detailed instructions to the actual guideline developers. Corporate discipline competency models lead different areas in different directions.
- Need to identify specific classes whenever possible
  - Worksheets derived from the guidelines annotated preferred classes
- Allow plenty of time for the pilot effort
- Our requirement to formally inspect the individual guidelines spread knowledge and buy-in for the formal inspection process
  - Conducted five formal inspection classes to deploy the process outside the software and systems engineering disciplines

Next steps

- Inspect the guidelines as a total product to identify & remove inconsistency across disciplines
- Roll out to all roles in all departments
  - Human resource initiative outside the CMMI effort