CMMI GP 2.8 Interpretation and Implementation: Is The Practice Just About Numbers?

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Agenda

- Review
- Three Keys
- Evolutionary Understanding
- Balancing Variables
- Measures For Success
- Implementation Pitfalls
- Appraisal Considerations

Measure Process Performance Against Goals
Analysis & Corrective Action
Report, Store and Feedback Performance Info
GP 2.8 Monitor and Control the Process

- Monitor and control the process against the plan for performing the process and take appropriate corrective action.
  - Perform the direct day-to-day monitoring and controlling of the process
  - Visibility into the process is maintained so that appropriate corrective action can be taken when necessary.
  - Measure appropriate attributes of the process or work products produced by the process.

- Refer to the Project Monitoring and Control process area for more information about (the topics of) monitoring and controlling the project and taking corrective action

- Refer to the Measurement and Analysis process area for more information about (using) measurement (as the reporting mechanisms in preparation for higher maturity level)
## Involves Three Keys

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<th><strong>Monitoring</strong></th>
<th><strong>Measurement &amp; Analysis</strong></th>
<th><strong>Control</strong></th>
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<tr>
<td><strong>Defined as:</strong></td>
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<td>The collection, recording, tracking and reporting of important activity information</td>
<td>The development and sustainment of a quantitative capability to support sub-process or process (later for project and organizational needs)</td>
<td>Managing changes and corrective actions necessary to bring actual performance into agreement with plan</td>
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### Example Activities:

**Monitoring:**
- Progress & status reporting of activities and products
- Updates to lists of action items, risks, problems, and issues
- Comparisons of actual process data against established goals, the cost / benefit analysis used when establishing a process

**Measurement & Analysis:**
- Specifying goals and measures to collect
- Analysis mechanisms, baselines and decision thresholds
- Comparisons against goals and objectives
- Data storage and retrieval mechanisms (data management)

**Control:**
- Updates to the plan and schedule, to reflect actual progress
- Resolution of items that were unknown or that have changed since the implementation / modification of a process

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**To watch, keep track of, or check for a special purpose**

**Using numbers to determine goal satisfaction (limits)**

**To exercise restraint or direct influence over: i.e., replanning**
In An Evolutionary Manner, It Helps:

- Develop the rudimentary mechanisms to:
  - Identify what to collect to meet needs
  - Developing the capability to collect the right data and document and share best practices for a process area or sub-process
- Begin to establish the patterns for modeling and analysis for a collection of similar capabilities for a project
- Set the stage for understanding of the current strengths and weaknesses of the organization's processes and process assets
- Continue to support data needs for the advanced capability to achieve quantitative project and organizational objectives for quality and process performance through
  - Common measures
  - Process performance baselines
  - Process performance models
Additionally, It Is About

- Balancing these variables:
  - Needs – urgent want or necessity arising from circumstances
  - Verification – is it (or isn't it) satisfying process requirements based on needs
  - Change – do we or don’t we change the process based on outcomes and variations compared against needs

“Process will always affect Project Performance!”
P. Lewis, Project Planning, Scheduling and Control
What Balance Translates Into

- Improving process performance together with management of the project
- Revealing problems early so that action can be taken
- Ensuring the quality of project work (e.g. process usage) does not take a back seat to schedule and cost concerns
- Verifying that in-place processes are used correctly (via expected outputs)
- Identifying areas where other project / process segments should be managed differently (what we did doesn't fit)
- Keeping clients / stakeholders informed of process / product / project status
- Reaffirming the organization's commitment to the project (continuous alignment with goals and objectives) [for the benefit of the team and stakeholders]

Ensuring that the established process is retained during times of stress
Process Data Collecting

Data collected and reported should fall into these categories:

✓ Frequency counts per time period - e.g. defects per thousand
✓ Raw numbers in ratio – actual amounts used / produced against a limit
✓ Subjective numeric ratings – ordinal rating of performance but can’t be mathematically processed
✓ Inferential – using indicators as surrogates for direct measures
✓ Verbal characterizations – e.g. team work, stakeholder coordination
✓ Qualitative – cultural characterizations about the process experience from implementers / users
Example PPQA
Evolutionary Measures For Maturity Level Success

- QA milestone completions compared to plan
- Work completed, effort expended compared to plan
- Number of product audits and activities reviews compared to plan
- Number of process audits and activities vs. those planned
- Amount of time / effort spent on rework
- Amount of time / effort spent in each phase of life cycle
- Number of defects per release, build
- Total number of defects found by internal reviews and verification activities vs those found by customer after delivery
- Number of defects injected in each phase of the life cycle
- Number of noncompliance's / nonconformance's written vs. resolved vs. escalated

2 Variance of objective process evaluations planned and performed
2 Variance of objective work product evaluations planned and performed

3 Number of process-improvement proposals submitted, accepted, or implemented
3 Defect density of each process element of the organization’s set of standard processes

4 Profile of subprocesses under statistical management (e.g., number planned to be under statistical management, number currently being statistically managed, and number that are statistically stable)
4 Number of special causes of variation identified
Generic Implementation Interactions

GP 2.8  Monitor and Control the Process

Day to day sub/process usage & output from a practitioner view
Against requirements and needs → Goals / limits

Objective verification of sub-process usage / product production
Review / roll-up of sub-process to determine compliance & improvements

2.10 Review Status with Higher Level Management

Summary reporting against goals
Progress against overall process or system
Process noncompliance resolution

Data driven decisions

2.9 Objectively Evaluate Adherence
It is all about data. And much more…

Misunderstandings
- Any process measurement will fill the void
- Doesn’t include qualitative expressions of process monitoring and control
- Really only use data at CL / ML 3 and above
- Information doesn’t always translate into dollars or ROI
- Is not proactive
- It doesn’t include mistake prevention or proofing
- Emphasizing short run results at the expense of long-run objectives (myopia)

Understandings
- Start with the end in mind – what do you NEED
- Data comes from actual activity or sub-process use rather than generated CMMI model examples
- Often use qualitative information from “water cooler” to set context for numbers
- Set the initial mechanisms in place for eventually determining whether a process is in control or out of control (quality control, rework, etc)
- It is about learning error prevention vs. just correction
Implementation Pitfalls

- Jumping right into CL/ML 2 without understanding the processes or relationships among them (process areas over business processes)
- Too many/few measures - what isn’t counted doesn’t count
- Monitoring activity vice results
- Confusion over monitoring process inputs, rather than outputs
- Data easily gathered rather than those important for control
- Gold-platting
  - Using Earned Value on every small / very short during projects
  - Using production measures on documents
  - Demanding detailed completion data and confusing it with reality
- Difficult infrastructure for reporting
- Misalignment with organizational scorecards (e.g. Balanced ScoreCard, metrics dashboards, etc.)
- Not a closed loop system – collecting but not using
Appraisal Considerations

- Stacking deck to misrepresent or camouflage dysfunctional process, project or organizational activities
- Generic practice 2.8 implementation across all PAs (CL/ML L2→L5)
  - Can you show collection, usage, alignment, limits
- Direct Artifact Example:
  - Records of evaluations or audits being performed as planned (e.g., reports, completed checklists).
  - Noncompliance issues resulting from objective evaluation of adherence to processes, objectives, and standards.
- Indirect Artifact Example:
  - Revisions and change history to plans and commitments (e.g., replanned schedule, costs, resources).
  - Effort spent on the Process Area (e.g., reviews and action items regarding activities and Process Area)
  - Evidence of reviews of activities, status, and results of the process held with immediate level of management responsible for the process and identification of issues; (e.g. briefings, reports, presentations, milestones).
  - Issues and corrective actions for deviations from plan for executing the activities or Process Area (e.g., action items, variance reports, change requests).
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