

Choosing How to Implement CMMI

**Software Engineering Process Group Conference
17-20 March 2008**

Rick Hefner, Ph.D.
Director, Process Management
Northrop Grumman Corporation
rick.hefner@ngc.com

Background

- An underlying principle of the CMMI model is the concept of conscious choices about the nature in which each process area will be implemented
- This presentation will outline the decisions to be made, and the options available, in planning a CMMI-compliant project
- These decisions must also be communicated to appraisers for them to understand the model in the context of the project



Applying the CMMI Model Properly

“CMMI practices purposely use nonspecific phrases such as ‘relevant stakeholders,’ ‘as appropriate,’ and ‘as necessary’ to accommodate the needs of different organizations and projects. The specific needs of a project may also differ at various points during its life.”

- CMMI-DEV. V1.2

- **The CMMI was written to apply to a variety of project environments**
 - Defense, commercial
 - Development, maintenance, services
 - Small to large project teams
- **The CMMI authors expected that different choices would be made concerning how they were applied**
 - How a particular practices would be performed
 - How much or how often a practice would be performed

Spotting Opportunities to Make Choices - 1

- Certain phases imply that choices must be made, e.g., “adequate”, “appropriate”, “as needed”, “selected”, and “identify”
- Example

GP 2.5 Train People

Train the people performing or supporting the <x> process as needed.

- Who needs training?
- How much training (i.e., course duration)?
- What topics should be covered?
- What delivery mechanisms (e.g., classroom training, mentoring, web-based training, guided self-study, on-the-job training)?
- Under what conditions could training be waived?

Spotting Opportunities to Make Choices - 2

- **“Select” or “identify” imply a choice to be made**
 - Often associated with a “Prepare for” goal
- **Example**

SG 1 Prepare for Verification

Preparation for verification is conducted.

SP 1.1 Select Work Products for Verification

Select the work products to be verified and the verification methods that will be used for each.

- **Shall we verify requirements, design, components, system?**
- **What verification mechanisms should be used?**
 - E.g., peer review, unit testing, component testing, subsystem testing, system testing, white-box, black-box, regression, etc)
- **Shall we use many verification mechanisms or just a few?**

The Importance of Making Choices



- **The choices made by a Project Manager reflect their perspective on how the project should be run -- their “strategy”**
 - What is needed to provide the performance and quality expected by the customer?
 - What is possible given the staff, environment, and culture?
 - What choices provide an acceptable level of risk?
- **The choices should be documented to communicate expected behaviors to the project personnel**
 - Typically in plans
 - This documentation also directs CMMI appraisers on how the CMMI practices are implemented
- **Organizational personnel must recognize that they also limit the choices, through how the process assets are defined**
 - Policies, organizational standard processes and tailoring guidelines, organizational training, etc.

A List of Project Choices

- Which processes and work products to audit and how often
- Which work products are under configuration control and what control methods are used
- Which measurements to make and how to make them
- Which decisions are subject to formal decision making and the decision making method
- Which problems to subject to causal analysis and what analysis to perform
- Which work products undergo verification and validation, and what methods are used