Using CMMI to Improve Your Software Development Capability

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Introduction

• Objectives
  – To provide an overview of the Capability Maturity Model Integration® (CMMI), focusing primarily on:
    • Aspects of successful implementation and sustainment
  – To describe senior management’s role in implementing and sustaining CMMI-based process improvement

• This will not cover model specifics
CMMI Model

• Sponsored by the DoD and the National Defense Industrial Association
• Involved collaboration between industry, government, and the Software Engineering Institute (SEI)
• Improves the usability of capability maturity model technology across multiple disciplines
  – Uses common terminology, components and model construction
  – Reduces redundancy and inconsistency between standalone models
• Integrated Appraisal Method provides a consistent method for both internal assessments & external evaluations
What CMMI Is and Is Not

• Is a model for organizational improvement
  – Benchmarks the process, not the product
  – Provides a framework for staged growth, i.e. process and capability maturity
  – Continuous process improvement stressed

• Is an underlying structure for reliable and consistent CMMI-based appraisals

• Is a community-owned guide; the result of a national consensus
  – Use of standardized language and goals facilitates adopting best practices from across the software community

• Is not an academic “ivory tower” exercise

• Is not limiting
  – Does not limit the choice of life cycle
  – Does not require or preclude specific software, technologies or language
  – Does not require that documentation conform to any particular set of standards
Why Organizations Use The CMMI

• Offers a “common sense engineering” approach to a pervasive need for process improvement
  – Provides objective, state-of-the-practice guidance to make judgments

• Has worldwide recognition and respect

• Use is demanded by some customers

• Competitors are using it to improve their performance, quality, and capability
Benefits Of Mature Process

- Improved Quality
- Improved Productivity
- Reduction in Waste
- Increased Predictability
- Stronger Team Interaction
- Improved Communication
- Competitive Edge
- Defined Roles/Responsibilities
- More Product Demand & Increased Market Share
- Framework for Continuous Improvement

Organizational Quality Awareness!
Benefits to the Individual Practitioner

- Less frustration
- Fewer surprises
- Feeling that their input is important
- Data to support estimates are available
- Less time spent in crisis mode
- More time to be creative
CMMI Basic Fundamentals

- CMMI describes “what” is done, not “how” it is done
- CMMI consists of best practices that address the development and maintenance of products and services covering the product life cycle from conception through delivery and maintenance
- The CMMI model has levels of process maturity, and achieving a specific level of maturity results in increased process capability
- CMMI is a set of recommendations for quality software engineering; it prescribes guidance and checkpoints
CMMI Representations

• Staged Representation
  – Roadmap for a sequence of steps to take for process improvement
  – Each maturity level provides foundation for next level
  – Process areas are fully contained within a single maturity level

• Continuous Representation
  – Allows flexibility in addressing process areas most critical to an organization’s business objectives
  – Each process area has generic and specific practices at capability levels
  – Provides guidance for incremental improvement approach within each process area
What Does it Really Take to Make it Work?

How to Make CMMI Work for You
Management Responsibilities

- Providing strategic vision and tactical direction
- Setting quality and process goals
- Reviewing the effectiveness and suitability of the process improvement program
- Ensuring that lessons learned and best-in-class examples are disseminated
- Addressing change in goals, dates, budget, scope, etc.
- Communicating with the organization’s business partners
- Addressing obstacles, issues and risks that impact improvement goals
- Reviewing results of PPQA reviews and process appraisals
- Reviewing process and product metrics
EPG Responsibilities

• Oversee development, implementation, and usage of processes
• Serve as the Change Control Board (CCB) for the change request processes
• Review and approve or reject process change requests
• Prioritize process changes
• Form and oversee individual PATs chartered to address specific process needs
• Review results of PPQA reviews
• Review process implementation results with the management team
• Provide training on the organization’s standard processes, including new processes and process updates
• Communicate process issues to the organization
• Serve as keeper of the Process Asset Library
• Collect project and organization lessons learned
• Share information about experiences implementing and using the processes
Who Are the EPG?

• They are the Change Agents!

• They have the skills to be:
  – Visionary
  – Advocates
  – Navigators
  – Confidants and Supports
  – Coaches
  – Subject-matter experts
  – Role models
Additional EPG Required Skills

• Knowledge and experience of business

• Are able to:
  – Teach other people
  – Explain how methodologies may or may not be useful
  – Respond convincingly and accurately to questions
  – Help organization understand current status of organization
  – Guide the management team in development of strategy and plans appropriate to organization’s status and needs
Common Complaints
Common Complaints

Too Much Process!!

Adds too much time and expense to my project

The client won’t pay for that!
Is This Thing On?

- It isn’t the 80s or 90s anymore!
- Heavy processes are no longer “in”
- Processes should work within the parameters of your organization’s development methodology
  - Agile or Lean included!
- The point is to:
  - Take advantage of years of experience by successful companies
  - Reduce rework and costs
Recent Model Changes

• The model isn’t stuck in the 80s either; it changes to reflect the changing times
  – Agile references have been added to the model
  – No more “IPPD”
  – The 16 core process areas have been “commonized”
  – The Intro to CMMI training class has been completely revised
  – Some glossary definitions have been updated to be more inline with ISO definition
  – Introduced verbiage in IPM to show the importance of casual analysis and resolution at a lower maturity level
Summary

• The CMMI is an excellent framework for process improvement
  – Worldwide there has been success in using CMMI
  – CMMI is adaptable to many different environments

• Success will depend on how well process improvement is managed and how well the concepts of successful change management are practiced
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