

CMMI and Agile Processes:



(AINT WE
ALL JUST
GET ALONG?)

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Overview

- ❖ Software development problems are ubiquitous
- ❖ CMMI and Agile Methods have been seen as didactic
- ❖ Mapping agile to CMMI elements
- ❖ Process maturity requirements for agility
- ❖ The bottom line



*Like Alice's White Rabbit,
software always seems to be late*

The Situation



*An ambiguous vision of the SW
development grail*

- ❖ We're all searching for a solution to the software problem
- ❖ CMMI and process improvement attempt to ensure consistency and predictability
- ❖ Agile is a response to over-specified processes and dehumanization
- ❖ Misunderstanding abounds

Comparing CMMI and Agile Characteristics

General Characteristics

- ❖ **Primary goals**
 - ❖ Predictability, Stability, high assurance
 - ❖ Customer satisfaction, Speed
- ❖ **Scope**
 - ❖ Broad, Inclusive and Organizational
 - ❖ Small, Focused
- ❖ **Improvement focus**
 - ❖ Process
 - ❖ People
- ❖ **Motivation**
 - ❖ Both want to develop high performance organizations

Comparing CMMI and Agile Characteristics

Management Characteristics

❖ Planning

- ❖ Composite, explicit, as-detailed-as-possible planning
- ❖ Collaborative, tacit, just-enough-detail planning

❖ Trust

- ❖ Process Infrastructure
- ❖ Working S/W, Participation

❖ Organization

- ❖ Hierarchical Committees
- ❖ Individuals and teams

❖ Size and scaling

- ❖ Large projects and teams, scaling down difficult
- ❖ Small projects and teams, scaling up largely

❖ Rules

- ❖ Rules are important in both

Comparing CMMI and Agile Characteristics

Technical Characteristics

- ❖ **Architecture**
 - ❖ Thoughtful, predictive
 - ❖ Simple and emergent
- ❖ **Rework**
 - ❖ Avoid rework, rework costs increase over time
 - ❖ Continuous rework, rework costs low and constant
- ❖ **Requirements, Documentation, and Quality Assurance**
 - ❖ Comprehensive requirements and test documentation; independent test and quality assurance.
 - ❖ Customer participation and operational test cases; minimal documentation; team-based defect removal via refactoring
- ❖ **Knowledge management**
 - ❖ Process Assets
 - ❖ People

Comparing CMMI and Agile Characteristics

People Characteristics

- ❖ **Practitioners and advocates**
 - ❖ Disciplined, Follow Rules and Risk Managers
 - ❖ Informal, Creative and Risk Takers
- ❖ **Skill Level**
 - ❖ Mix of skills with few experts
 - ❖ Multi-skilled with more experts
- ❖ **Communication**
 - ❖ Macro, Organizational
 - ❖ Micro, Person to Person
- ❖ **Problem Solving**
 - ❖ Words and Plans
 - ❖ Product and Priorities

CMMI vs. Agility – The Process Area View

- ❖ Project Planning
- ❖ Project Monitoring and Control
- ❖ Supplier Agreement Management
- ❖ Integrated Project Management
- ❖ Risk Management
- ❖ Integrated Teaming
- ❖ *Quantitative Project Management*
- ❖ Requirements Management
- ❖ Requirements Development
- ❖ Technical Solution
- ❖ Product Integration
- ❖ Verification
- ❖ Validation

KEY {GREEN : Complementary, BLACK: Neutral, *RED: Rough Edges*}

CMMI vs. Agility – The Process Area View

- ❖ **Organizational Process Focus**
- ❖ Organizational Process Definition
- ❖ **Organizational Training**
- ❖ Organizational Process Performance
- ❖ **Organizational Innovation and Deployment**
- ❖ **Configuration Management**
- ❖ Process and Product Quality Assurance
- ❖ Measurement and Analysis
- ❖ **Decision Analysis and Resolution**
- ❖ **Organizational Environment for Integration**
- ❖ Causal Analysis and Resolution

KEY {**GREEN** : Complementary, BLACK: Neutral, **RED: Rough Edges**}

CMMI vs. Agility – The Improvement Path View

❖ “LEVEL 1”

- ❖ Identify scope of work
- ❖ Perform the work

❖ “LEVEL 2”

- ❖ Organizational policy for plan, perform
- ❖ Requirements, objectives and plans
- ❖ Adequate resources
- ❖ Assign responsibility and authority
- ❖ Train the people
- ❖ CM for designated work products
- ❖ Identify and involve stakeholders
- ❖ Monitor and control to plan and take action if needed
- ❖ Objectively monitor adherence to process and QA products/services
- ❖ Review with upper management and resolve issues

KEY {GREEN : Complementary, BLACK: Neutral, RED: Rough Edges}

CMMI vs. Agility – The Improvement Path View

❖ “LEVEL 3”

- ❖ Maintain as a defined process
- ❖ *Measure the process performance to support environment*

❖ “LEVEL 4”

- ❖ *Establish and maintain quantitative objectives for the process*
- ❖ *Stabilize the performance of one or more sub-processes to determine its ability to achieve*

❖ “LEVEL 5”

- ❖ Ensure continuous improvement to support business goals
- ❖ Identify and correct root causes of defects

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How Higher Process Capability Supports Agility

- ❖ **Process experience**
 - ❖ Helps decide what process components are critical and which can be removed
 - ❖ Instinctive use of minimal process with few artifacts while maintaining the required discipline for success
- ❖ **Process data**
 - ❖ Understanding the impact of processes
 - ❖ Estimation mastery and knowing how far you can push the envelope and still survive
- ❖ **Process assets**
 - ❖ Encourage reuse and quick startups
 - ❖ Help maintain and transition knowledge

Agility and Maturity Level 5:

Agile Practices in Support of CMMI Level 5 Objectives *

- ❖ Improvements are selected based on an understanding of their expected contribution to achieving the organization's process improvement objectives versus the cost & impact.
 - ❖ "Optimizing processes that are agile and innovative depend on the participation of an empowered workforce aligned with the business values and objectives of the organization." **
 - ❖ The organization's ability to rapidly respond to changes is enhanced by finding ways to accelerate and share learning.
- ❖ Alternative practices must clearly and unequivocally accomplish a result that meets the goal.
- ❖ CMMs enable creativity and improvement within a contextual framework
 - ❖ Many CMM practices are informative; providing insight as to what might be done to accomplish expected practices
 - ❖ Practitioners should be encouraged to improve the practices that are used to accomplish project and organizational objectives

* "Minimizing Unintended Consequences of Process Streamlining," STC2002, May 2002 presentation, Joe Jarzombek

** "Agile Development and the CMMI: Anti-Matter and Matter or Reconcilable Differences?" Presentation at STC, May 2002, Steve Ornburn & David Kane.

Conclusions

- ❖ Differences are often in approach rather than substance
- ❖ Perceptions (on both sides) are not necessarily valid
- ❖ “Liberal” interpretation of CMMI generally consistent with agile
 - ❖ Organizational facets of CMMI are most “out of synch”
 - ❖ Levels 3 and 4 are most problematic because they tend to be most process-centric
- ❖ Communication between the advocates will help reconcile differences and correct misconceptions

