



**Improving Performance of Your CMMI
Mature Organization Through
Lean and Agile Techniques**

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Report Documentation Page

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CMMI & Agile at Odds?



CMMI



Agile

*CMMI – Capability Maturity Model
Integration*

*Will demonstrate multiple Lean
& Agile techniques that can help
improve performance without
jeopardizing CMMI compliance*

**Goal of CMMI V1.3 is to improve model's coverage of
Agile approaches**

Not theory, based on actual client case studies...

Presentation Structure: What You Will Learn (9 Techniques)



✓ Case Study 1 (LACM)

- 4 Techniques increase agility CMMI Level 3 Organization

*And how techniques can
improve CMMI implementation*

✓ Case Study 2 (RAVE)

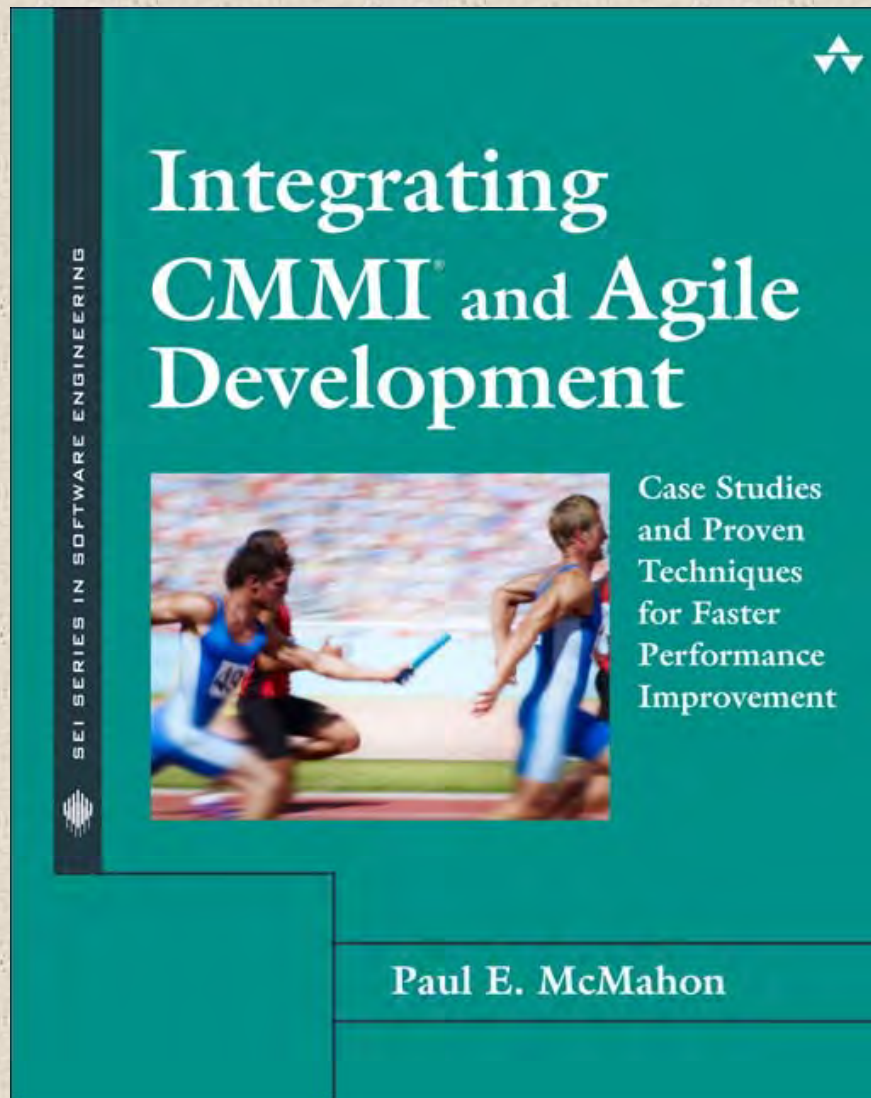
- Alternate technique increase agility Level 5 Organization

And advantages and disadvantages

✓ Case Study 3 (DART)

- 4 Techniques using “hybrid” agile in CMMI Organization

Focus on people challenges



**Case Studies
discussed in
presentation
described in
greater detail in
book.**

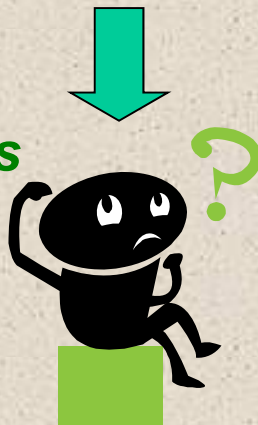
Fundamental Guidance



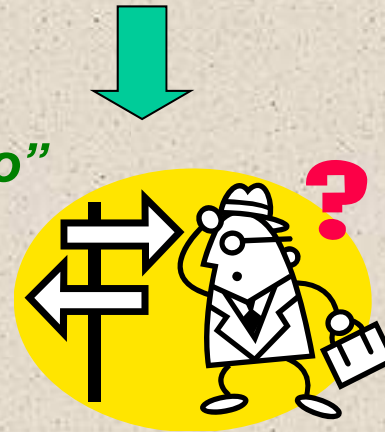
Not dictated practices

CMMI is process improvement reference model intended to help you ask the right questions leading to best decisions for your organization

Example questions



Agile provides potential “how-to” options



**CMMI is about “What” must do
Agile techniques provide potential “How-to” options**

Case Study 1 Background: LACM

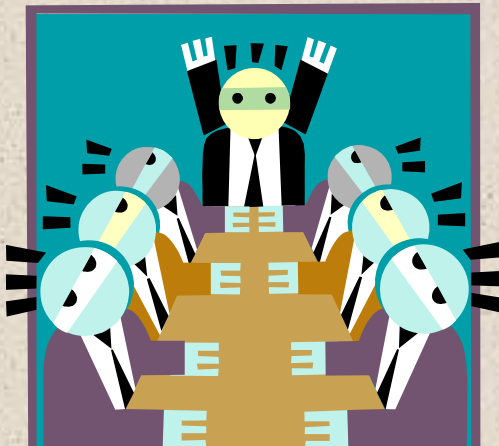


LACM successful high tech organization

Focus on U.S. defense market

2007- Over 50 active projects; Only 2 any difficulty

CMM Level 3 many years ago; 2008 CMMI Level 3

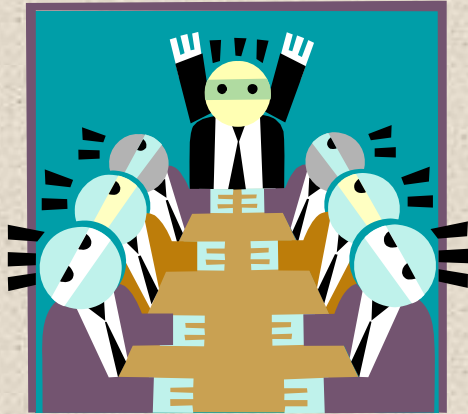


2008 CMMI motivation:

- *Vice-President (VP) understood could use CMMI to address changing customer needs*
- *He knew his organization needed to change improving performance in key areas*

Where do we start?

Where Start To Improve Performance When Using CMMI?



- ◆ Not single required starting point

LACM one of best...

- ◆ VP knew needed changes, also cautious not to break what was working



*Presentations,
Open forum discussions..*



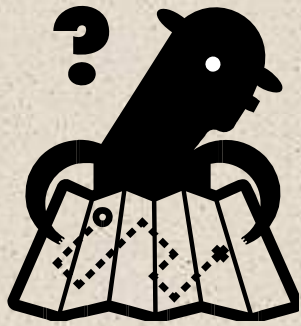
*This is way LACM
CMMI effort started...*

✓ *“Why are our customers coming back to us now over the competition?”*

✓ *“What is the unique value this organization brings to its customers?”*

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Technique 1: Start by Asking Key Questions to Focus Objectives



All CMMI
Expected
Practices...

Common
“non-lean”
approach

◆ Many don't start this way

◆ Reason: Most don't have unlimited
process improvement budgets

Recommended start point

*Specific Practices
in CMMI model

“Establish..... process... objectives ...”*

“Establish measurement objectives”*

Help you focus improvement
efforts on performance



Measurement
Example



What Data Should You Collect?



Many organizations using CMMI first collect data related to each process area and figure out later how might use



The “lean approach” ...ask following questions first...



- ✓ *“Who will use data if collect it?”*
- ✓ *“How does data relate to objectives?”*



Makes sense if already using CMMI and looking to improve, or just starting out with CMMI effort



Why involve workers?



Why Involve Your Workers?

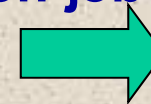


***Presentations..
Encouraged open forum
discussions...***

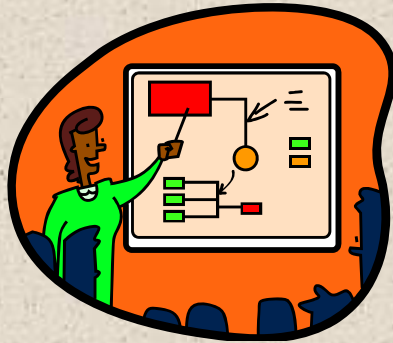
***...including those who
understood how
work got done***

- ◆ Led to realization of value company received from product reuse-- but most processes written for new development
- ◆ Discussions also led to a cause of employee turn-over
 - ✓ Recent exit interviews had found people leaving because felt little relevant training
- ◆ Company did have training program, but training & processes not aligned with real issues faced on job

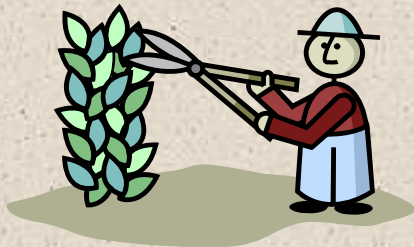
Led to Technique 2



Technique 2: Pruning the Processes



- ◆ Built flow diagrams of what people really did to get their job done
 - ✓ Annotated with process assets really used
 - ✓ Not theoretical diagrams



- ◆ Anything not on a diagram became a candidate for elimination
- ◆ Led to more questions:

- ✓ *“If no one used something, why there?”*
- ✓ *“Were we wasting time training use of certain process assets?”*
- ✓ *“Did we believe if used, it would help get job done?”*

“Pruning the Processes” led to streamlined processes & improved training

Next: Example

Pruning Example: Peer Review Process



- ◆ Peer Review process required:
 - ✓ Great deal of data collected about each defect
 - ✓ Periodic analysis of the collected data
- ◆ Flow diagrams showed people entered the data, but no one analyzed it
- ◆ Further investigation showed requirements for data had been added to process because someone wrongly thought CMMI required it

*Example: Helped
improved
performance!*

Pruning/Streamlining
led to more effective
peer review process

*Also, onerous review process
had discouraged comments*

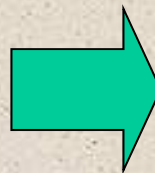
Insight

Historical tendency: Read things into CMMI model that aren't there

Creates unnecessary non-value-added work

By using CMMI as intended, can align real processes with real process objectives

Goes back to fundamental guidance... not set of dictated practices...



But how was LACM able to do this?

And why don't more organizations do this?...(2 pieces to answer...)



Before formal...

Technique 3: Use CMMI Model Less Formally

◆ LACM used the CMMI model first to:

- ✓ Help discover where needed improvements to help performance
- ✓ Then prioritized work and focused on those value added improvements

What happens too often...

Lesson:

When process improvement teams face pressure to achieve a formal CMMI level and aren't given adequate time to work real issues, real performance improvements are rarely achieved

1st Reason why more don't do this:

Next: 2nd reason relates to what pruning really requires...

What Pruning Really Requires



- ◆ People in trenches who really understand how job done

Process professionals can facilitate

- ◆ Often these people in the trenches are the best performers & the busiest people in the company

Nevertheless...

If experiencing similar symptoms as LACM, consider allocating percentage of time of key people to this effort

Small investment in pruning might pay high dividends in long run

What Should Your Process Repository Look Like?



Some wrongly believe the CMMI requires a “heavyweight” process repository superstructure

- ✓ LACM is large and product centric
- ✓ LACM mandates tools, and standards
- ✓ LACM has some detailed work instructions

- ✓ BOND is small and service centric
- ✓ BOND mandates few tools, few standards
- ✓ BOND has no detailed work instructions

LACM & BOND

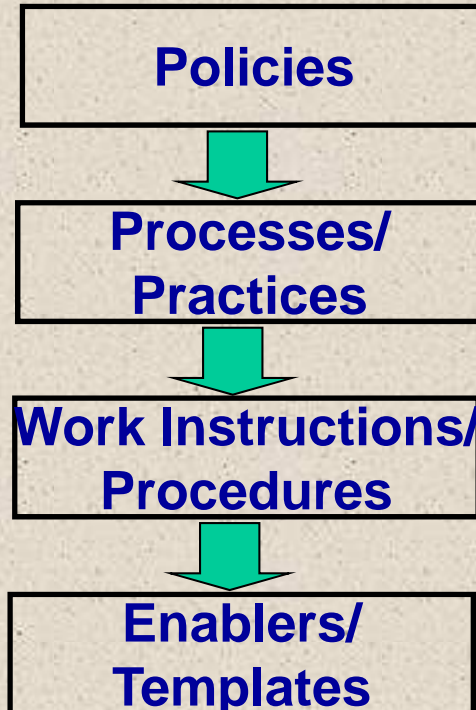
Note: LACM and BOND different business needs... are CMMI Level 3

Process repository structure depends on your business need

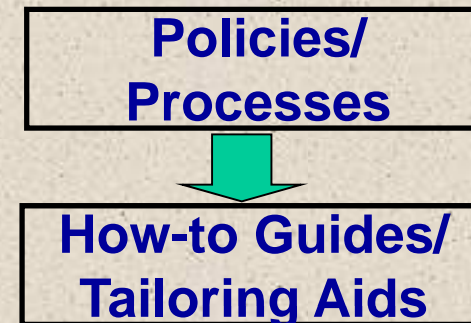
Process Repository Structures



Traditional (LACM like structure)




Agile (BOND like structure)



**Different Repository Structures, Both CMMI "Compliant" **
CMMI doesn't mandate repository structure**

****Achieves intent**

**But if you want to encourage
agility & improve performance....** 

Technique 4: Use Agile/Lean Process Repository Structure



And process packaging guide...

Keep “must dos” packaged separately from “guidelines”

Agile/Lean structure

Policies/
Processes



How-to Guides/
Tailoring Aids

“Must dos”
No one tailors

Rationale 1:
Simplifies Tailoring
Don't need discuss

Aids tailoring,
Integrated with
Project Planning

“How to”
decisions

Rationale 2: Also, addresses concern many have related to myth that agile organizations don't follow processes

Note: LACM through “pruning” is evolving toward this structure
e.g. eliminating work instructions not used

Case Study 2 Background: RAVE



RAVE Large CMMI Level 5 Organization

Focus on U.S. defense market

Grassroots

2005 recognized “stealth agile” movement

CMMI Level 5 processes didn’t recognize

Different approach to agility:

• Did not modify existing CMMI processes

• Handle agile through “tailoring” process & “agile developers guide”

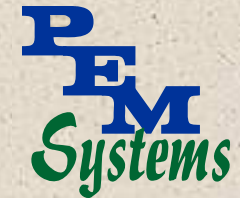
Used during project startup planning..



Pros/Cons?



Technique 5: Consider Developer's Guide to Aid Agility



◆ Advantages

- ✓ No risk to proven level 5 processes
 - (advantage if working well)
- ✓ Doesn't require critical personnel in "trenches"

Note: Consider right answer for you could be combination of LACM & RAVE approach

◆ Disadvantages

✓ If hearing:

- "processes don't help"
- "create work without value"

...then this approach won't help

...also may result in redundant efforts

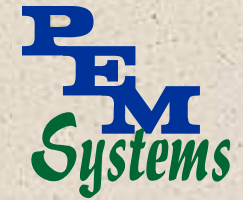
- E.g. product reviews, progress reporting

...or may result in loss of key "must dos" when tailor

People challenges



Case Study 3 Background: DART



DART – Legacy modernization project in traditional CMMI Level 3 organization

Employed “hybrid” agile-traditional approach due to project constraints and lack of agile knowledgeable people

**Could not deliver incrementally to end user
Delivered every 30 days to lab environment**

- **Key Challenge: Deliver in 6 months**
- **Results:**
- **Team accepted challenge**
- **Unfortunately took 12 months**
- **Customer pleased**
- **Differing views how well managed**



What are common people issues with hybrid efforts?



Three (3) Common People Issues On Hybrid Agile Projects

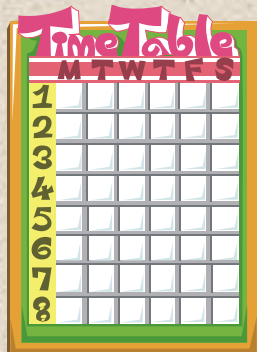


- ✓ **Difficulties Scheduling & Estimating the Work**

- ✓ **Difficulties Collaborating Closely With a Customer**
 - **Difficulties Managing Scope**

- ✓ **Lack of & Wrong Type of Training**

Common Issue 1: Difficulties Scheduling & Estimating the Work



Important to →
hitting schedule!

- ✓ Why did team think could hit 6 months & then miss by so much?
Scrum teams known for hitting schedule!
- ✓ Answer related to how work scheduled & estimated
 - With Scrum work high value, high risk areas early
 - Team members participate in scheduling, estimating & negotiating work

So why is this an issue particularly with “hybrid agile”?



A Common Pitfall On Hybrid Agile Efforts

Traditional projects often don't ask team members or train them in how to estimate & negotiate...



On DART because schedule was aggressive, & team members didn't have previous agile experience, team leader estimated & scheduled alone

✓ Unfortunately didn't have adequate knowledge of high risk areas

Common Pitfall: Not engaging & training team in the scheduling, estimating & negotiating

How address?



Next technique

Technique 6: Sutherland 10% Rule



- ✓ Jeff Sutherland, co-founder of Scrum, recommends allocating 10% of project team's time to work next Sprint's backlog

Too often under pressure think best to keep team "heads down" working

You'll get to the goal faster working together

Even if "small" amount of time

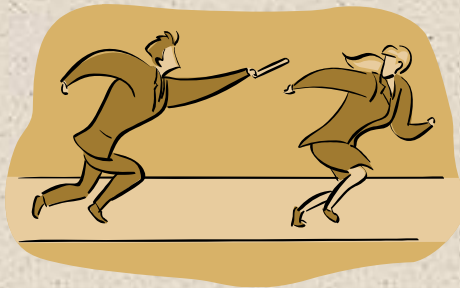
Engage your team members who know best where high risk areas exist in scheduling & estimating

Note: You may need to spend more time mentoring them in "self-estimating" & negotiating

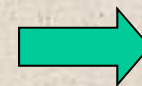
Common Issue 2: Difficulties Collaborating Closely With a Customer



- ✓ On DART original requirements grew due to demanding customer working closely with a developer who didn't know how to interact appropriately with that customer



So how do you help your people learn to collaborate?



Next technique

Technique 7A: Manage Collaboration Through Scope Artifact



- ✓ With agile approaches don't do all requirements up front
- ✓ Collaborate to ensure getting best value for customer

But this can be risky if people lack experience & have fixed cost and schedule...

Need techniques to bound work...

Scope artifact is complete, but high level requirements, written at "what" not "how" level & doesn't grow like Product Backlog

But not a guarantee-- can be misused



Related Issue: Difficulties Managing Scope

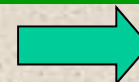


- ✓ DART developed Scope Artifact & got some stakeholders to agree, but didn't get all key team members to use it

Scope artifact on DART was set of high level Use Cases...

Common Pitfall:
Building a scope artifact, but failing to flow it down

So how do you teach your people to collaborate appropriately with a scope artifact?



Next technique

Technique 7B: Use “Push-Pull” For Effective Collaboration



Negotiate →

Train customer too! →

- ✓ Scope artifact not intended to curtail agility and collaboration
- ✓ Because scope artifact written at the “what”, “not how” level, it allows flexibility in implementation
 - This can aid collaboration
- ✓ Team members taught “push-pull”

Push-pull means can pull higher priority work in, but only if push equal value work out

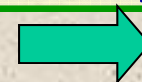
***Scope artifact is reference for “push-pull”
Must “pull” from agreed to scope***

Common Issue 3: Lack of & Wrong Type of Training



- ✓ It is a common myth that when using agile approaches people require less training
- ✓ Traditional comprehensive “fire-hose” approaches to training lack effectiveness
 - Can be overwhelming
 - Often can’t find what need later when need it
- ✓ Too often train wrong things
 - E.g. need training negotiation (push-pull)

So how can you provide the right training your people need in a more agile/lean way?



Next technique

Technique 8: Use “Just in time” Scenario Training



- ✓ Break training down into specific scenarios that can be rapidly accessed on-line when needed
- ✓ Supports “rapid refresh” when need
 - Focus on key “stretch areas” or weaknesses
- ✓ Can reduce overall training cost

Think of “Scenario Training” as “Just-in-time” coaching

Example: “Just in time” Scenario Training



- ✓ Recall pruning at LACM led to streamlining of onerous peer review process
 - Peer review users guide was over 50 pages

- ✓ Just in time scenario developed:
 - Initiating a Peer Review
 - Making a Peer Review comment
 - Processing a Peer Review comment
 - What data required and why!

- ✓ Each scenario individually accessible on-line for quick refresh when need

*Could also develop
“push-pull” training
Scenarios...*

Summary Techniques

- ✓ 1. Ask key questions to focus objectives
- ✓ 2. Prune the processes
- ✓ 3. Use CMMI model less formally
- ✓ 4. Use Agile/Lean repository structure
- ✓ 5. Consider Developer's Guide to aid agility
- ✓ 6. Use Sutherland 10% rule
- ✓ 7A. Manage collaboration through scope artifact
- ✓ 7B. Use "push-pull" for effective collaboration
- ✓ 8. Use "just in time" scenario training

*Don't try implement all.
Pick ones that can
bring greatest value
in your situation*

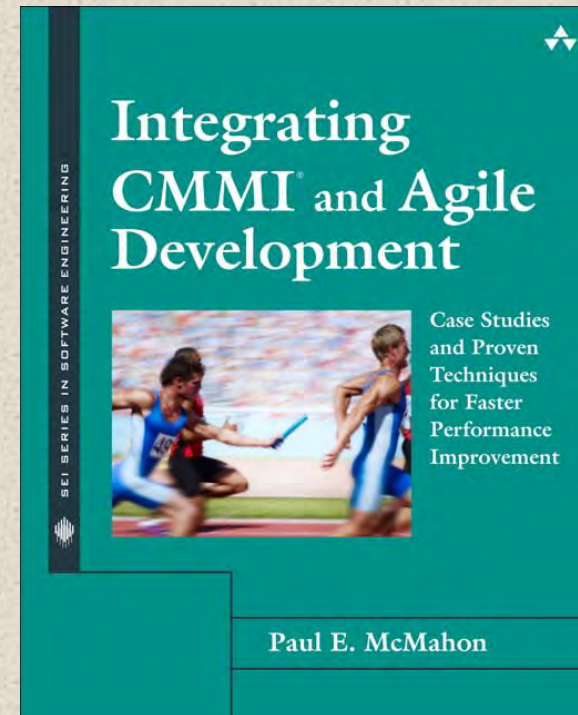
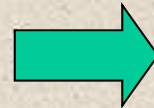
Practical techniques you can implement in your organization today

Questions and Contact Information

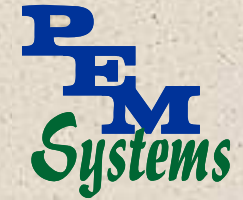


Questions ???

- ◆ **Contact Information**
 - ✓ pemcmahon@acm.org
 - ✓ www.pemsystems.com
- ◆ **More information**



Acronyms



Acronyms

CMMI – Capability Maturity Model Integration

Scrum– Not an acronym, mechanisms in game of rugby for getting an out-of-play ball back into play