Comparing Scrum And CMMI
How Can They Work Together

Neil Potter

The Process Group
help@processgroup.com
www.processgroup.com

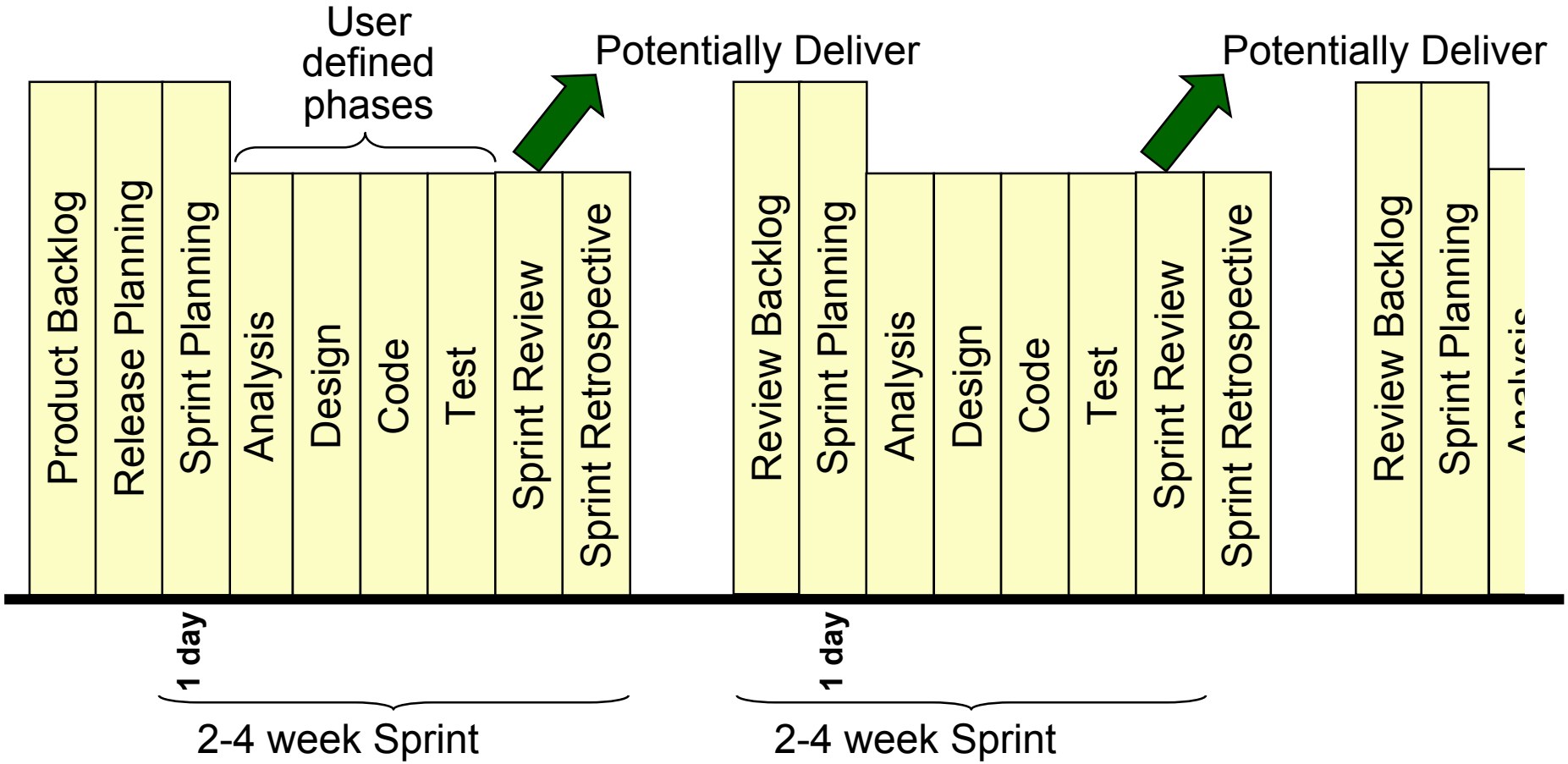
Agenda

- Definition of Scrum
- Agile Principles
- Definition of CMMI
- Similarities and Differences
- CMMI and Scrum Mapping
- How About Other Components of Level 2?
- How About Level 3?
- Summary

Full comparison at: http://www.processgroup.com/pgpostmar09.pdf

Definition of Scrum

- **Scrum is a pre-defined development lifecycle based on Agile principles.**



Agile Principles - 1

- ✓ **Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.**
- ✓ **Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.**
- ✓ **Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.**
- ✓ **Business people and developers must work together daily throughout the project.**
- ✓ **Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.**

✓ CMMI compatible

Source: http://agilemanifesto.org/

Agile Principles - 2

- ✓ The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- ✓ Working software is the primary measure of progress.
- ✓ Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- ✓ Continuous attention to technical excellence and good design enhances agility.
- ✓ Simplicity -- the art of maximizing the amount of work not done--is essential.
- ✓ The best architectures, requirements, and designs emerge from self-organizing teams.
- ✓ At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

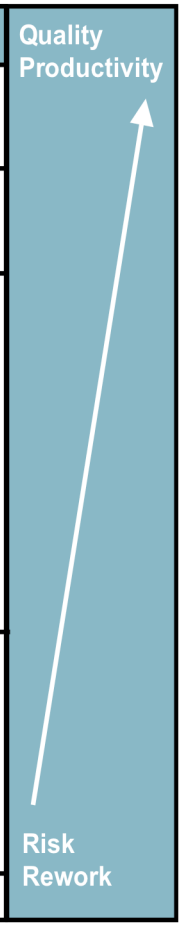
Scrum + -'s

+ **2-4 week cycles creates team momentum, and early feedback on progress and technical solutions.**
+ **Scrum process can be learned and used in less than 2 days.**
– **Speed can be mistaken for progress:**
  – There is no "Get good requirements" phase, only "Get a list of 1-liners and prioritize." (Although some teams do more than that.)
  – There is no architecture / analysis phase, so you could implement yourself into a corner.
  – This is fixable by making the focus of each Sprint different.
– **Applying Scrum to large teams and systems takes extra work.**
  – e.g., System definition, integration and coordination.

90% Analysis, 10% Code
80% Analysis, 20% Code
70% Analysis, 30% Code
60% Analysis, 40% Code
50% Analysis, 50% Code

Definition of CMMI v1.2

Level	Focus	Process Areas
5 Optimizing	*Continuous Process Improvement*	Organizational Innovation and Deployment Causal Analysis and Resolution
4 Quantitatively Managed	*Quantitative Management*	Organizational Process Performance Quantitative Project Management
3 Defined	*Process Standardization*	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition +IPPD Organizational Training Integrated Project Management +IPPD Risk Management Decision Analysis and Resolution
2 Managed	*Basic Project Management*	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
1 Initial		



- CMMI is a collection of practices that an organization (software, hardware and IT) can adopt to improve its performance.
- Maturity Level 2 Process Areas focus on change and project management.
- Maturity Level 3 focuses on engineering skills, advanced project management and organizational learning.

Model Source: http://www.sei.cmu.edu/cmmi/models/index.html

Similarities and Differences

Level	Focus	Process Areas
5 Optimizing	*Continuous Process Improvement*	Organizational Innovation and Deployment Causal Analysis and Resolution
4 Quantitatively Managed	*Quantitative Management*	Organizational Process Performance Quantitative Project Management
3 Defined	*Process Standardization*	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition +IPPD Organizational Training Integrated Project Management +IPPD Risk Management Decision Analysis and Resolution
2 Managed	*Basic Project Management*	Requirements Management Project Planning Project M… …and Analysis …rocess and Product Quality Assurance Configuration Management
1 Initial		

Quality Productivity

Risk Rework

Approx. 47% coverage of Level 2

In Scrum?

Level 3 coverage - very dependent on how YOU define the phases

- No

- Some Requirements
- Some Design
- Coding
- Some test
- Some lessons learned

- Most Requirements Management
- Most Planning
- Most Project Monitoring/Control
- Most Measurement Analysis (effort and progress)

CMMI and Scrum mapping

Requirements Management

REQM	CMMI Practice	Scrum Practice
SP 1.1	Develop an understanding with the requirements providers on the meaning of the requirements.	• Review of Product Backlog (requirements) with Product Owner and team.
SP 1.2	Obtain commitment to the requirements from the project participants.	• Release Planning and Sprint Planning sessions that seek team member commitment.
SP 1.3	Manage changes to the requirements as they evolve during the project.	• Add requirements changes to the Product Backlog. • Manage changes in the next Sprint Planning meeting.
SP 1.5	Identify inconsistencies between the project plans and work products and the requirements.	• Daily Standup Meeting to identify issues. • Release planning and Sprint Planning sessions to address inconsistencies. • Sprint Burndown chart that tracks effort remaining. • Release Burndown chart that tracks story points that have been completed. This shows how much of the product functionality is left to complete.

- **No traceability in Scrum**

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Project Planning

PP	CMMI Practice	Scrum Practice
SP 1.1	Establish a top-level work breakdown structure (WBS) to estimate the scope of the project.	• The standard tasks used in a Scrum process combined with specific project tasks (Scrum Backlog).
SP 1.2	Establish and maintain estimates of the attributes of the work products and tasks.	• Story Points, used to estimate the difficulty (or relative size) of a Story (requirement).
SP 1.3	Define the project life-cycle phases upon which to scope the planning effort.	• The Scrum process.
SP 1.4	Estimate the project effort and cost for the work products and tasks based on estimation rationale.	• Scrum Ideal Time estimate (similar to billable hours or Full-time Equivalents).
SP 2.1	Establish and maintain the project's budget and schedule.	• Scrum estimates (in Ideal Time). • Estimates of what work will be in each release. • Sprint Backlog. • Project Taskboard.
SP 2.4	Plan for necessary resources to perform the project.	• Scrum estimates in Ideal Time • Release Plan, Sprint Backlog and assignments.
SP 2.6	Plan the involvement of identified stakeholders.	• Scrum process roles (including team, Scrum Master, Product Owner). • [Note: The stakeholders listed in Scrum might not be the complete list of stakeholders for the project, e.g., customers, other impacted teams.]
SP 3.2	Reconcile the project plan to reflect available and estimated resources.	• Sprint Planning meeting. • Daily Scrum meeting.

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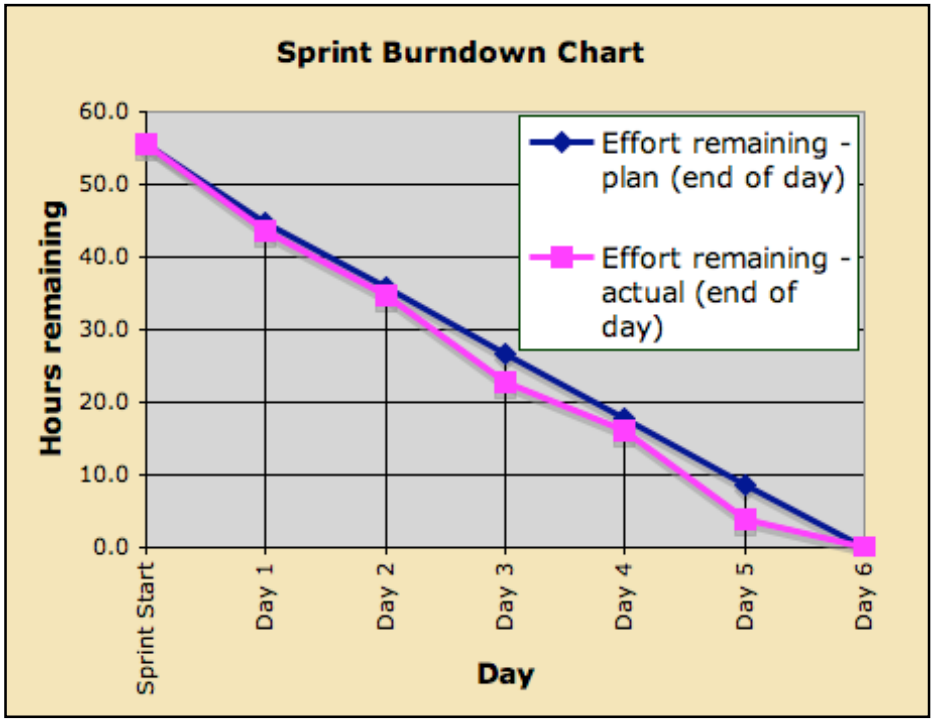
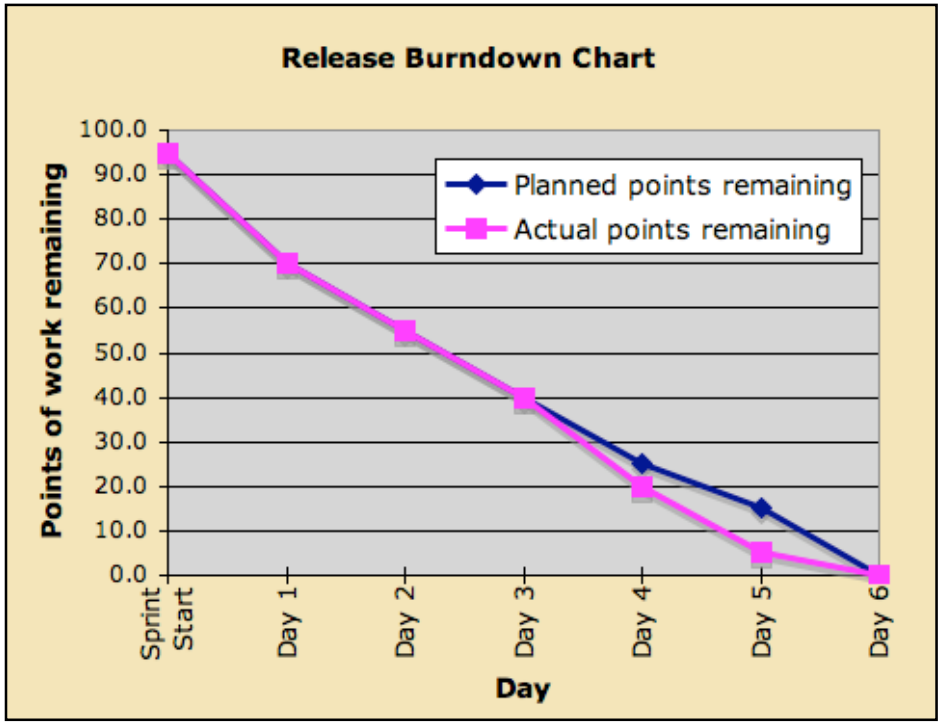
Project Monitoring and Control

PMC	CMMI Practice	Scrum Practice
SP 1.1	Monitor the actual values of the project planning parameters against the project plan.	• Sprint Burndown chart that tracks effort remaining. • Release Burndown chart that tracks completed story points. This shows how much of the product functionality is left to complete. • Project Task Board used to track stories (requirements) that are done, in progress, or ones that need verification.
SP 1.2	Monitor commitments against those identified in the project plan.	• Discussions on team commitments at the: – Daily Scrum meeting. – Sprint Review meeting. • Sprint Burndown chart that tracks effort remaining. • Release Burndown chart that tracks Story Points that have been completed. This shows how much of the product functionality is left to complete.
SP 1.6	Periodically review the project's progress, performance, and issues.	• Daily Scrum meeting. • Sprint Review meeting. • Retrospectives.
SP 2.3	Manage corrective actions to closure.	• Tracking of actions from: – Daily Scrum meeting. – Sprint Review meeting. • [Note: This assumes that teams will track (and not lose) actions.]

- **No risk assessment / tracking in Scrum**

Burndown Charts





Implements PMC sp1.1

Monitor the actual values of the project planning parameters against the project plan.

Measurement and Analysis

SP 1.2	Specify measures to address the measurement objectives.	• Sprint Burndown chart that tracks effort remaining. • Release Burndown chart that tracks story points that have been completed. This shows how much of the product functionality is left to complete. • [Note: These two measures could be used to track the progress of declared project objectives, such as "On time," and "On budget."]
SP 1.4	Specify how measurement data will be analyzed and reported.	• The Scrum process does describe the purpose and use the Sprint and Release Burndown charts. • [Note: CMMI expects clearly defined analysis].
SP 2.1	Obtain specified measurement data.	• Daily Scrum meeting where Sprint and Release Burndown data are collected.
SP 2.2	Analyze and interpret measurement data.	• Daily Scrum meeting where Sprint and Release Burndown data are analyzed.
SP 2.4	Report results of measurement and analysis activities to all relevant stakeholders.	• Daily Scrum meeting where Sprint and Release Burndown charts are reviewed. • [Note: Not all interested stakeholders will necessarily be at the Scrum meeting.]

How About the Other Components of Level 2?

- **Configuration Management (CM):**
  - CM is not specifically called out in Scrum. However, in an Agile environment it is pretty easy to add a layer of CM to protect your work.
- **Product and Process Quality Assurance (PPQA):**
  - Some basic PPQA activities are being done naturally when the Scrum Master checks that the Scrum process is being followed.
  - Scrum does not specifically call out a level of objective process and product check, nor does it state that particular standards or processes should be defined and used.
- **Supplier Agreement Management (SAM):**
  - Not included in SAM.

How About Level 3?

- **The following Level 3 components therefore are not readily implemented by Scrum without additional work:**
  - Organizational Process Focus
  - Organizational Process Definition
  - Organizational Training
  - Integrated Project Management
  - Risk Management
  - Decision Analysis and Resolution
  - Engineering PAs (e.g., RD, TS, PI, VER, VAL)
  - Generic Goal 3 (i.e., using an organization-wide and tailored process with measurements and lessons-learned)

Summary

- Scrum is a good implementation for many of the practices in Level 2.
- A group can easily use Scrum and CMMI together.
- All the remaining practices in Levels 2 and 3 can be implemented while using Scrum.
- An organization at Level 2 or 3 could adopt Scrum as an additional lifecycle choice.

References

1. *Implementing Scrum (Agile) and CMMI Together. Process Group Post newsletter,* March 2009. http://www.processgroup.com/pgpostmar09.pdf
2. Potter, N., Sakry, M., *Making Process Improvement Work - A Concise Action Guide for Software Managers and Practitioners*, Addison-Wesley, 2002.
3. Scrum definition: http://www.scrumalliance.org/
4. SEI / CMU. CMMI: *Guidelines for Process Integration and Product Improvement*. Boston: Addison-Wesley, 2003.

Generic Practices?

- **Approximately half of the Level 2 GPs of REQM, PP, PMC and MA are implemented by Scrum.**

GP 2.2	Establish and maintain the plan for performing the REQM/PP/PMC/MA process.	• The Scrum lifecycle definition and the milestones to perform Scrum.
GP 2.3	Provide adequate resources for performing the REQM/PP/PMC/MA process, developing the work products, and providing the services of the process.	• The resources and schedule time allocated to perform Scrum planning, monitoring and requirements activities.
GP 2.4	Assign responsibility and authority for performing the process, developing the work products, and providing the services of the REQM/PP/PMC/MA process.	• The resource assignments allocated to perform Scrum planning, monitoring and requirements activities.
GP 2.6	Place designated work products of the REQM/PP/PMC/MA process under appropriate levels of control.	• [Note: Scrum does not explicitly require CM to be done. However, this can be performed using a digital camera, backed up drive, or share drive with versioning and controls turned on.]
GP 2.8	Monitor and control the REQM/PP/PMC/MA process against the plan for performing the process and take appropriate corrective action.	• Scrum Master monitoring that the steps of Scrum are followed.