

# Building Mature Software Processes

## Four or Five Day Seminar\*

### Seminar Description

Are you struggling with software process improvement? Is it difficult to determine what project management techniques will help achieve Level 2 against CMMI or ISO/IEC 15504? Are there questions about the value of the organizational learning that underlies Level 3? Is there broad resistance to the idea of statistical thinking, which is necessary to reach Level 4 or 5? Are you concerned about the new high maturity qualifications required by the SEI of assessors?

This seminar addresses the software engineering and management practices of high maturity organizations as rated against CMMI. High maturity is addressed from three perspectives: 1) recommended best practices for a variety of environments; 2) empirical data on what high maturity organizations do; and 3) interpreting the practices in models such as the Software CMM and CMMI.

Effective project management is a prerequisite for meeting commitments, yet all too many software projects fail to meet customer expectations for budget, schedule, functionality, and quality. Effective project management requires more than implementing a set of basic functions, however. It implies selecting qualified people who can work together effectively, structuring decision making processes both internally and externally, managing customer expectations, monitoring progress, managing risks, and taking corrective action as appropriate. This seminar is therefore a broad survey of a variant of project management styles and techniques, as used in diverse environments. The perspective of the discussion is that of “mature” processes, i.e., processes that are well-defined, managed, measured, controlled, and effective.

This seminar describes lessons learned in analyzing, defining, and deploying software processes. Models such as the Capability Maturity Model for Software and the staged representation of CMMI are intended at Level 3 to transform organizations by instilling a capacity for organizational learning – coming to understand what processes work well in your business environment, capturing those lessons in the form of defined processes, and deploying tailored processes that incorporate those lessons across projects, while catering to the unique needs of the projects. Models and standards such as CMMI build on organizational learning and change management that has been studied for many years from a diverse set of perspectives.

In studying the concepts and practices underlying mature processes, the seminar addresses the application of measurement and statistical insight to software development and maintenance.

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\* This seminar can be delivered over either four or five days. Longer seminars involve more case studies, exercises, and role plays, as well as a more in-depth study of the material. Shorter forms of this material can be presented also, but this seminar includes material from the seminars on mature software project management, organizational learning for software process improvement, understanding high maturity, and statistical thinking for software professionals. Shorter versions therefore essentially cut out the exercises, and “lecture only” learning is limited, thus shorter versions of this seminar are discouraged.

This includes issues associated with effectively implementing statistical thinking to manage and improve software processes.

The seminar includes recommendations on “how” to implement these processes that go beyond the scope of “what” should be done. Best practice frameworks such as CMMI are intrinsically limited by the need to cater to a broad user community without constraining the variety of implementations possible. This seminar is not constrained by such considerations and will unabashedly advocate and condemn various improvement practices.

Topics include:

- Business value of SPI
- The soft side of SPI
- Team building
- Managing expectations and relationships
- Choosing a life cycle and planning
- Tracking progress
- Process groups
- Appraisals, assessments, evaluations, capability determinations, audits, ...
- Defining good processes
- Defining high maturity in CMM(I) terms
- Statistical thinking: understanding variation
- Quality culture: empowerment and participation

### **Who Should Attend**

- Executives and managers who sponsor improvement programs
- Process experts who are responsible for assessing or improving software processes
- Software professionals who are involved with process management and improvement

### **Course Prerequisites**

There are no pre-requisites for this workshop.

### **Course Objectives**

After completing this seminar, participants should be able to:

- Describe the objectives of a variety of project management methodologies, such as Scrum and critical chain
- Describe a broad set of project management tools and techniques that should be available to a project manager, such as earned value, critical path, and iterative life cycles
- Characterize common management mistakes
- Describe what a "best practice" is and how they know it's really best.
- Characterize a "good" standardized process description.
- Communicate the kind of knowledge best captured in a process description versus training, tools, and job aids.
- Describe the challenges to deploying standard processes effectively.
- Characterize the “iron cage” of institutionalization

- Explain the principles of goal-driven measurement
- Understand the concepts of statistical thinking
- Apply some simple statistical techniques, including XmR charts
- Identify common statistical mistakes and misconceptions
- Understand the importance of empowerment and participation to high maturity

## **Module Description**

### Module 1 – An Introduction to Software Process Improvement

- The business case for SPI
- The quagmire of improvement frameworks
- Success factors for SPI
- The tipping point between Working Harder and Working Smarter

### Module 2 – Project Management Methodologies

- The Project Management Body of Knowledge
- Software Program Manager's Network's 16 Critical Software Practices
- Critical chain project management
- McConnell's Rapid Development

### Module 3 – Software Project Planning

- Picking a life cycle
- Approaches to estimating
- Core measures
- Crashing, fast tracking, and concurrent engineering
- The impossible region

### Module 4 – Tracking Progress

- Earned value management
- Scrum daily management
- Buffers in critical chain project management
- Risk management
- Support processes

### Module 5 – Decision Making and Control

- Rational decision making
- Rational fallacies
- Control systems
- Multitasking and fragmentation

### Module 6 – Relationship Management

- Customer relationship management
- Defining customer satisfaction
- Supplier relationship management
- Stakeholder relationship management

### Module 7 – The People Side of Management

- Team building
- Psychology vs sociology
- Emotional and social intelligence

### Module 8 – Establishing the Infrastructure for SPI

- Process groups
- The SEPG guide

- What I would do differently today
- The diversity of assessments

#### Module 9 – Good Process Definitions

- Minimum essential information
- Processes vs procedures vs tools vs training
- Process simplification
- A hierarchy of processes

#### Module 10 – Deploying Standardized Assets

- A set of standard software processes
- Process automation, tools, and the Web
- Training
- Interpreting and tailoring – keeping it real
- Institutionalization of a quality culture

#### Module 11 – Learning: The Thing That Makes It Improvement!

- Learning from experience
- Concepts of organizational learning
- Double loop feedback

#### Module 12 – Defining High Maturity

- The Software CMM on high maturity
- CMMI on high maturity
- Workshops and surveys on high maturity
- The concept of high maturity
- Statistical thinking

#### Module 13 – Statistical Thinking

- Establishing a measurement program
- Operational definitions
- Basic SPC tools
- XmR charts

#### Module 14 – Project Maturity

- Real-time control
- Core project measures

#### Module 15 – Organizational Maturity

- Organization process performance and capability baselines
- Balanced scorecard measures
- Continual, measurable improvement
- Alignment with corporate TQM programs

#### Module 16 – Challenges to High Maturity

- The problem of dysfunctional behavior
- The problem of difficult customers
- Participation and empowerment

### **Activities and Exercises**

Activities and exercises include case studies, situational analyses, role playing, and interactive lecturing.