

Software Process Design and Analysis

Standards, Models and Measurement

This two-day course is designed to develop practical skills that can be readily applied to modelling software life cycle processes.

The course incorporates a well-defined and consistent approach to modelling processes that is based on the Object Management Group's (OMG) UML/SPEM standard. The course shows how to supplement the SPEM standard with a range of formal and defacto standards that include the CMMI, Unified Process (UP), ISO and IEEE standards.

In addition to the more widely used standards, the course also discusses the emerging "agile" methods and their relationship to software life cycle models.

The course provides a comparison of some of the most important process frameworks and offers guidance on how to select a framework that is best suited to a particular purpose.

The course concludes with an introduction to process measurement that offers a "starter set" of key process measures.

Course Features

- Based on widely used standards.
- Presents a visual modelling approach to defining software life cycle processes
- Compatible with CMMI but does not focus exclusively on CMMI
- Highlights the role of measurement

Participant Benefits

- Ability to define software life cycle processes using visual models
- Ability to select appropriate process framework
- Ability to define an organisation standard life cycle process
- Ability to tailor life cycle process to meet the specific needs of projects

Who Should Attend

- Software Engineering Process Engineering Groups (SEPGs) who need to define an organisation standard process during implementation of the CMMI or ISO 15504 (SPICE);
- Software developers and systems engineers who need to tailor the ISO/IEEE 12207 software lifecycle standard or the ISO 15288 system life cycle standard to meet the needs of their organisation;
- Project managers who need to develop work breakdown structures (WBS) or project processes in order to comply with the PMBOK or IEEE 1058 project management standards; and
- Other managers, developers, engineers, process improvement and quality groups who need to define, document and describe software life cycle processes.

Course Duration

2 days

Contact

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Course Agenda

Introduction

Modelling Processes

- Object Management Group (OMG)
- Software Process Engineering Metamodel (SPEM)
- SPEM Conceptual Model
- Process Elements
 - Work Products
 - Specialisation
 - Aggregation
 - Dependencies
 - Information Elements
 - Associations
 - Process Role
 - Activity and Step
 - Activity Diagrams
 - Control Flows
 - Object Flows
 - Concurrent Activities
 - Decisions
 - Guidance
- Process Components
 - Process Packages
 - Processes and Discipline
 - Life Cycles, Phases and Iteration
- A Simplified Version of the SPEM Metamodel
- Decomposition of Work Definitions

Enacting Processes

- Influences in the Process Environment
 - Software Product
 - Technology
 - Project
 - Organisation
 - Contract
- Adding Process Influences to SPEM
- Using Force Field Analysis to Assess Process Influences
- Processes Influences and Risk
- Process Risk Avoidance Disciplines

Process Capability

- The Plan—Do—Check—Act Cycle (PDCA)
- Software Projects and the PDCA Cycle
- Process Capability Levels
- Ad-Hoc Process (1)
- Managed Process (2)
 - Project Management
 - Configuration Management
 - Quality Management
- Defined Process (3)
- Quantitatively Managed Process (4)
- Optimising Process (5)

Process Life Cycle Models

- The “Code and Fix” Life Cycle
- Comparison With Building Construction
- The Basic Waterfall Life Cycle
- Problems With the Waterfall Life Cycle
- Why Building Construction is Different to Software Development
- Two Extremes of Software Design
 - Model-Based Development (UML)
 - Extreme Programming (XP)
- Life Cycle Models
 - Waterfall With Risk Reduction
 - Waterfall With Prototyping
 - Incremental
 - Iterative
 - Unified Process
 - Spiral

Process Frameworks

- Choosing a Life Cycle Model
- ISO 12207
 - Overview
 - Related ISO Standards and Guides
 - Related IEEE Standards and Guides
 - Life Cycle Models and Disciplines
 - Processes
 - Activities
 - Steps
 - Roles
 - IEEE 12207 Work Products
- CMMI
 - Overview
 - Related Standards and Guides
 - Life Cycle Model and Roles
 - Processes
 - Steps
 - Work Products
- Unified Process (UP)
 - Overview
 - Life Cycle Model
 - Disciplines
 - Activities and Roles
 - Work Products
- eXtreme Programming (XP)
 - Overview
 - Life Cycle Model
 - Disciplines (Practices)
 - Activities and Steps
 - Roles
 - Work Products
- Other Frameworks



Defining Processes

- Why Define an Organisation Process?
- Scope of the Organisation Process
- Identifying Process Requirements
 - Process Frameworks
 - Organisation Process Requirements
 - Work Products
 - Activities
 - Roles
 - Small Organisations and Projects
 - Configuration Management Example
- Defining the Standard Organisation Process
 - Select Life Cycle Model
 - Define Work Products
 - Define Activities
 - Define Process Roles
- The Standard Organisation Process
 - Online Process Guide
 - Tailoring Guidelines
- Implementing the Standard Organisation Process

Tailoring Processes

- The Project Process
- Tailorable Attributes
 - Life Cycle Models
 - Work Products
 - Activities
 - Process Roles
- Identify Process Requirements
- Tailoring Guidelines
 - Work Products
 - Activities
 - Roles

Measuring Processes

- Why Measure?
- Measurement Success Factors
- Information Needs
- What to Measure?
- Measurement Standards

Review and Conclusion

