



Economical and technical benefits of model based development

The seminar discusses key economical and technological benefits of model based development including an introduction to UML (Unified Modeling Language) and SysML (Systems Modeling Language).

Length: ½ day

Seminar Description

The use of UML 2.0 and SysML is a major step forward for model driven development and provides comprehensive support for all phases from analysis of business needs and specification of requirements, to construction and acceptance of deliverables. With UML 2.0 and SysML it is possible to achieve high precision and quality on specifications, planning of realization, investment decisions, construction blueprints and validation of deliverables.

The seminar discusses the key economical and technical benefits for model driven development based on the UML 2.0 and SysML standards with a primary focus on successful analysis of business needs, requirements specification, system specification and validation of deliverables for technical and information systems. The seminar also discusses the primary root causes for budget overruns, delayed delivery, high maintenance costs and the key focus areas to eliminate these cost driving factors.

The seminar also includes practical modeling examples on the application of UML 2.0 and SysML for business process mapping, requirements specification, product specification, size estimation, planning and acceptance testing.

UML is defined as a “graphical language for visualizing, specifying, constructing, and documenting the artifacts of a software-intensive system. The UML offers a standard way to write a system's blueprints, including conceptual things such as business processes and system functions as well as concrete things such as programming language statements, database schemas, and reusable software components. The UML represents a collection of the best engineering practices that have proven successful in the modeling of large and complex systems.”

Systems Modeling Language (SysML) is a general-purpose modeling language extending UML for systems engineering applications. SysML supports the specification, analysis, design, verification and validation of a broad range of complex systems. These systems may include hardware, software, data, personnel, procedures, and facilities. SysML is also aligned with the ISO 10303 AP233 STEP standard. AP233 is in addition a part of the ISO 10303 AP 239 PLCS standard. SysML also includes a standardization of textual requirements traditionally managed with word processors like MS Word or proprietary requirements tools. This enables tight integration of traditional requirements specification with functional and structural models in one integrated model based on the UML/SysML industry standards.

UML/SysML models have superior precision and information density compared with traditional text based requirement specifications and enable the precise specification of complex logic. UML/SysML also enables early verification of correctness and completeness of requirements and system specifications. UML also has wide acceptance as an industry standard for information system blueprints now extended with SysML for systems engineering.

The seminar also discusses evaluation and improvement of development organizations with the Capability Maturity Model (CMM) and Six Sigma quality system.

Objectives

Upon completion you have a good understanding of the key benefits of model driven development with UML 2.0 and SysML to achieve successful identification of customer needs, specification of solution, planning of realization and validation of delivery.

Audience

Purchasers of systems development, CEO's, CIO's, IT managers, business managers, project managers, system analysts and all that are interested in economical and technological aspects on model driven development with UML 2.0 and SysML.

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Content

The primary cost drivers for information systems development

Project resolution history
Major sources for defects
Dominating cost drivers
Value of UML 2.0 and SysML blueprints

Investment model

Phases, disciplines and focus areas
Investment model for fixed price procurement, realization and validation of deliverables
Value of blueprints and UML based metrics
Continuous control of cost and risk
The customer-supplier interface
The business map and mapping to the requirements specification
Calculation of information system size with Function Point metrics based on UML blueprints
The waterfall process and iterative development
Verification and validation of specifications

Business maps and requirements specification with UML

The business map
The SysML requirements hierarchy
The SysML functional hierarchy
The SysML structural hierarchy
Actors and use cases
Seamless integration of business maps and specifications with activity diagrams
Organization of functional requirements
Classification of requirements
Bid specifications based on UML/SysML blueprints
Objects, structure and lifecycle diagrams
Traceability business map – requirement specification – product specification - implementation
Validation of delivery (Acceptance testing)
Cross-reference diagrams business map - information system

Measurement and size estimation

Metrics for Cost Of Quality (COQ)
Measurements of information systems size with function points
Analysis of IT value
Process analysis
Investment calculation
Payment model based on utilized functionality

The SEI – CMM/CMMI model

The CMM/CMMI models five levels and mapping to productivity and quality
Key process areas
Visibility into the Software Process for each level
Examples on measured data for defect density, development cost, estimation precision etc. for various CMM levels

UML = Unified Modeling Language <http://www.uml.org>
SysML = Systems Modeling Language <http://www.sysml.org>
SEI = Software Engineering Institute <http://www.sei.cmu.edu>
CMM = Capability Maturity Model <http://www.sei.cmu.edu/cmm>
CMMI= Capability Maturity Model Integrated <http://www.sei.cmu.edu/cmmi/cmmi.html>

The seminar includes documentation, examples of models in UML/SysML notation and function point estimation in excel format for UML/SysML models.