Formal Specification of Software

The Unified Modeling Language

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The History of UML

Mid ’90s

Grady Booch, James Rumbaugh, Ivar Jacobsen
plan to end the “notation war”

1997

Object Management Group (OMG)
publishes UML 1.0

1999

The Object Constraint Language (OCL) becomes part of UML 1.1

Current version:

UML 1.4   (UML 2.0 planned for 2004)

Purpose of UML Models *Rumbaugh et al.*

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A model is a statement of potentiality, of the possible collections of objects that might exist and the possible behavior history that the objects might undergo.

The static view defines and constraints the possible configurations of values that an executing system may assume.

The dynamic view defines the ways in which an executing system may pass from one configuration to another.

Diagram Types

Modeling static (structural) aspects

- Class diagrams
- Object diagrams
- Component diagrams
- Deployment diagrams

Modeling dynamic (behavorial) aspects

- Statechart diagrams
- Interaction diagrams
- Use case diagrams
- Activity diagrams

Diagram Types for Modeling Static Aspects

Class diagrams

- Model the static design view
- Define the vocabulary (signature)
- Can be enriched with OCL constraints

Object diagrams

- Model instances of class diagrams (snapshots)

Component diagrams

- Model the implementation (physical) view
- Can be seen as a special kind of class diagrams

Deployment diagrams

- Model the topology of the hardware
- Can be seen as a special kind of class diagrams

Diagram Types for Modeling Dynamic Aspects

Statechart diagrams

- Model the states of a system and the transitions between them
- Can be enriched with OCL constraints

Interaction diagrams

- Model (prototypical) interactions (messages) between objects

Use case diagrams

- Model use cases, including actors and their relationships

Activity diagrams

- Model activities and the control flow between them
- Can be seen as a special kind of statechart diagrams