UML Diagrams

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for UML 1.xx

9 Diagrams

- Use Case
- Class
- Collaboration
- Sequence
- Object
- State Chart
- Activity
- Component
- Deployment

Classifying 9 Diagrams & their Relations

* Others are not Object Oriented!

UML 2.0

- 3 more diagrams:
  - Interaction overview
  - Composite Structure
  - Timing
- Change:
  - Collaboration <- Communication

Component Diagrams

- Piecing together of software applications
- There is a body and an interface for any class

Component Diagrams: 2

- Dependencies {compilation dependency}
**Component Diagrams: 3**

- **SUBSYSTEMS:** various components could be grouped to form the structural elements

![Component Diagram](image)

**Packages**

- Various components could be grouped with respect to LOGICAL Criteria
- Contain other packages, classes, objects, relationships, components, nodes
- Every element belongs to a package
- Imports relation = dependency
- Packages can be nested

![Package Diagram](image)

**Deployment Diagram**

- Nodes are connected for "communication"
- Multiplicity is allowed on the connections

![Deployment Diagram](image)

**Statechart Diagrams**

- A state machine representation – corresponding to one "class"
- Actions happen during entry or exit from a state
- Activities last longer, can take place in a state
- States can be aggregated and generalized
- Transactions can be "guard"ed by conditions

![Statechart Diagram](image)
Activity Diagrams
- A Statechart Diagrams variation: organized according to actions.
- Automatic transitions, decisions, and synch bars

Activity 1
Automatic transition
Activity 2

Activity 2
[two cold]
Activity 3
[two hot]

Activity Diagrams: 2
- Synchronization bars represent fork and join controls

Cool down

Open windows
Measure temperature

Activity Diagrams: Swimlanes

Client

Inquire

Salesman

Setup an estimate

Order

[made]

Order

[payed]

Pay

Bill

[guard 1]
[guard 2]

Segment A

Segment B

Segment C

Intruction Overview Diagrams

Interaction Overview Diagrams

Composite Structure Diagrams
- “Element” roles at run-time, for a classifier
- internal structure of a classifier and its interaction points to other parts of the system
- Classifier: General model element that has instances - (use case, collaboration, class, node…)
- Element: An abstract base class for UML, mechanisms can be attached – (class, object, state, activity, use case, node, interface, package, comment, component, message, event…)
Composite Structure Diagrams - 2

Tire Storage

<table>
<thead>
<tr>
<th>Tire Bin: Storage Bin</th>
<th>Packaged Tire</th>
<th>Loose Tire</th>
</tr>
</thead>
</table>

Car

- Leftfront Tire
- Rightfront Tire
- Leftback Tire
- Rightback Tire

Classifiers

Types of UML Classifiers
- Class
- Component
- Datatype
- Interface
- Node
- Signal
- Subsystem
- Use Case

Predefined UML Classifiers
- Actor
- Association
- Class
- Component
- Datatype
- Interface
- Node
- Signal
- Subsystem
- Use Case