IV. State Diagrams

State Diagrams

Events and States

Superstates

State Diagrams (Statecharts)

State diagrams model processes (business processes, machine processes, or anything in-between.)

- States
- Transitions
- Events, conditions and actions (all optional)
  - Event[Condition]/Action
- Initial and final states

State Diagram for Purchase Order

Events

- An event is a happening that the system needs to know about.
- In UML, there are four types of events:
  - Change events occur when a condition becomes true, e.g., when(balance < 0);
  - Signal events designate the receipt of an explicit (real-time) signal from outside;
  - Call events indicate the receipt of a call for execution from outside;
  - Time events mark the passage of a designated period of time from the moment a state was entered/exit,
    e.g., after(10 seconds)

States

- A state represents a time period during which
  - A predicate is true, e.g., budget - expenses > 0,
  - An action is being performed, or
  - Someone waits for an event to happen.
- A state can be "on" or "off".
- States can have associated activities. Special activity constructs include:
  - do(stateDiagramName(parameterList)) -- "calls" another state diagram;
  - entry/action -- carry out the action when entering the activity;
  - exit/action -- carry out the action when exiting;
createCourse/ count=0; CourseRoster.Create()

addStudent[ count<10]

cancel

cancel

CourseRoster.Delete()

quarterStarted

Closed

do/FinalizeCourse

Cancelled

entry/RegisterStudent

exit/ CourseRoster.AddStudent(student)

Initialization

do / Initialize

Course Lifetimes, Again

Superstates

- A superstate consists of two or more substates.
- There are AND and OR superstates.
- When an AND superstate is “on”, all its states are also “on”.
- When an OR superstate is “on”, one of its states is “on”.

An OR Superstate

An AND Superstate

…More on Transmission

Additional Readings