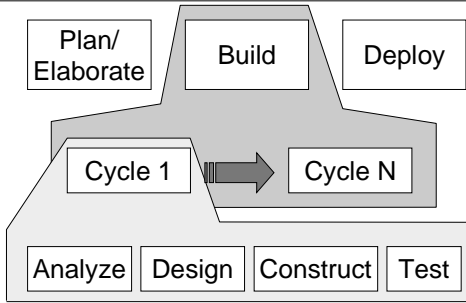
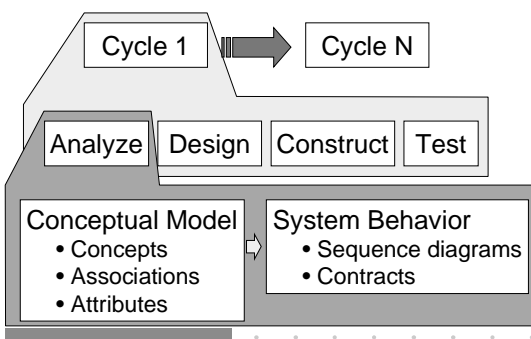


Checking the Road Map



Analysis Details



System Behavior

• **System viewed as “black box”**

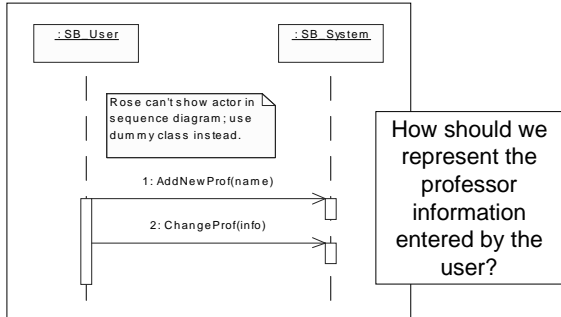
- Internal operations not visible
- External interactions only

• **Describe what it does**

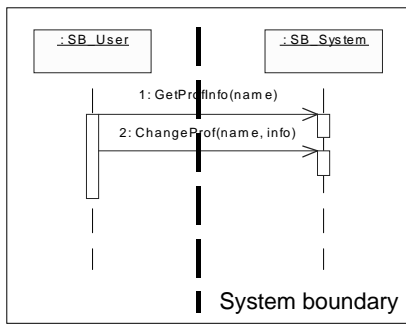
- External events
- System responses
- Agreed-upon results

Note: conceptual model was about static structure; now we're talking about dynamic behavior!

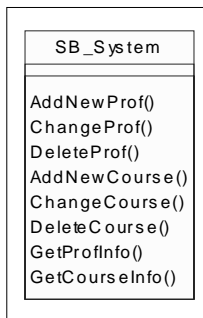
System Sequence Diagram



Another Sequence Diagram



System Operations



System operations may have arguments, return values that are not shown directly in the UML class diagram.

Note that this is not yet design; there may not be any actual methods with these names!

System Behavior Notes

- **Role of use cases**
 - System events often come directly from use case text
- **Naming system operations**
 - General, not specific, expression
 - Like “essential” versus “real”
- **System boundary can be fuzzy**
 - Especially with GUI (more later)

System Behavior Contract

- **Describes system operation**
 - What it commits to achieve
- **Declarative, not procedural**
 - Says what will happen
 - Not how it will be done
- **Specifies changes in system state**
 - How state will differ after operation

Contract Details

- | | |
|---------------------------|-----------------------------------|
| • Name | • Exceptions |
| ▪ Parameters | |
| • Responsibilities | • Outputs |
| ▪ Informal purpose | ▪ Non-UI (boundary) |
| • Type | • Preconditions |
| ▪ Concept, class, ... | ▪ Requirements |
| • Cross references | • Postconditions |
| • Notes | ▪ Promises |
| | ▪ Declarations about system state |

Postconditions

• State changes promised by operation

- Assuming preconditions were met
- Mechanisms not specified

• Common categories

- Instance creation and deletion
- Attribute modification
- Associations formed and broken

Example Contract (1)

Name: AssignSection (profname, coursenum, sectnum, newcourse, newtext)

Responsibilities: Record assignment of a course section to a professor.

Type: System

Cross references: ...

Notes: May be done by drag & drop.

Exceptions: If invalid parameters, indicate error.

Preconditions: Professor, course, and section exist; section not already assigned to same professor; ...

Example Contract (2)

Postconditions:

- *WorkloadSection* was created.
- *WorkloadSection* was associated with the *Professor* matching *profname*
- *WorkloadSection* was associated with the *Section* matching *coursenum* and *sectnum*
- *WorkloadSection.NewCourse* was set to *newcourse*
- *WorkloadSection.NewText* was set to *newtext*
