Modelling Object Oriented Systems
Using Rational Rose and
Unified Modelling Language
(UML)
Modeling Object Oriented Systems Using Rose 2000e

• What we will cover
  – Rational Rose’s origin and background.
  – The Rose Interactive Development Environment.
  – Creating Use Case Diagrams.
  – Creating Class Diagrams.
  – Getting Help.
Modeling Object Oriented Systems

Why Model?

Can we improve this process using Computer Aided Software Engineering (CASE)?
The Development of the Unified Modeling Language (UML).

- The Rational Rose CASE tool uses Unified Modelling Language (UML)
  - December 2002  IBM buy Rational for $2.2 Billion
  - The combination of the work of three world renowned methodologists.
    - James Rumbaugh
    - Grady Booch
    - Ivar Jacobson
  - Also known as the “The Three Amigos”
The Development of the Unified Modeling Language (UML).

Rational has gone through the following development cycles since 1997.
Background To Rational Rose

- Rose supports Rational’s OO Methodology - Rational Unified Process (RUP)
- The method is divided into 4 major phases
  - Inception. Used to establish the business case for the system and to delimit the project Scope.
  - Elaboration. Is the detailed analysis of the problem domain and requirements capture.
  - Construction. The development and testing of the system to be delivered.
  - Transition. Is to deliver the completed system to its users.
Background To Rational Rose

- The RUP Model

![Diagram of RUP Model](image)
Background To Rational Rose

• Obviously this is a very large subject area, so we only have time to concentrate on the key areas.

• The UML modelling techniques that you will be introduced to as part of BSD 2 Analysis and Design are
  – Use Case Diagrams.
  – Class Diagrams.
  – Sequence Diagrams.
  – Object Communication Diagrams.
  – Activity Diagrams.
  – State Diagrams.
The Rational Rose Enterprise 2000 Application

• You can find this on the program menu on the Start Bar, as “Rational Rose Enterprise Addition.

• Look for ;
Starting Rose

• When you start Rose you will be presented with the following window.

• Select Rational Unified Process.

• Or if you have an existing project you can load it using Existing.
Using The Rose IDE
Using The Rose IDE

• When you open Rose you are presented with an open diagram with a welcome message.

• This means that you are in the Logical View Design model. Close this diagram.
Using The Rose IDE

• The Rational IDE is made up of the following elements.
  – Upper menu and toolbar.
  – Navigation window.
  – Diagram toolbar.
  – Documentation window.
Using The Rose IDE

- The Upper Menu and Toolbar

- Holds standard editing and reporting functions.

- Note the diagram icons which provide a listing of diagrams of a particular diagrammatical type allowing rapid creation and navigation.
Using The Rose IDE

- The Navigation Window.
- This allows you to select and navigate through your diagrams.
- To access, edit and delete artefacts that have been placed on diagrams.
Using The Rose IDE

- The Diagram Toolbar
- Allows the selection of artefacts to place on the Diagram that you are working with.
- The icons available for the diagram match the default artefacts for that particular diagram’s notation.
Using The Rose IDE

• The Documentation Window.
• This displays contextual information and advice for using UML and RUP.
• This will also contain any description that you have placed within any individual artefact's specification.
Creating a Use Case

• There are three representations of Use Cases in Rose.
  – The Main view.
  – The Business Use Case model
  – The Use Case global view.

• Main is made up of the Business and global view.

• To begin with use the Business Use Case model.
Creating a Use Case

• Select the Global View of Business Actors and Business Use Cases from the Business Use-Case Model.

• The notes on the diagram are there to give guidance, these can be deleted.
Creating a Use Case

• Note that the Diagram toolbar now contains artefacts that can be placed on a Use Case diagram.
• The most important of these are the Actor and Use Case icons.
Creating a Use Case

• To place an actor on the Screen, select the Actor icon then position the cursor on the diagram where you wish the actor to be placed.
• Actors are treated as a new class.
• Double click on the actor to access the artefact Specification window
Creating a Use Case

• The Specification Window.
• Allows you to define the properties of an artefact.
• You can also attach files to the artefact using the files tab.
Creating a Use Case

• You can add Use Cases in the same manor.
• To add an association between an actor and Use Case.
  – Select The actor or Use Case that the association derives from and click on the Use Case or Actor associated with it.
• To identify an includes or extends relationship, select “Stereotype” from the Specification window.
Creating a Class Diagram

- To Create a Class Diagram
  - Select the Business Object Model from the Logical View in the Navigation Window.
  - Click the right-hand mouse button and select new.
  - From the dropdown menu select class diagram.
  - A new class diagram will open in the diagram window and the diagram toolbar will contain artefacts for a Class Diagram.
Creating a Class Diagram

• Adding Classes
  – Select the class icon from the Diagram toolbar.
  – Rename the Class, the current name is “New Class”.

• Adding Attributes and Operations
  – Highlight the class and click on the right-hand mouse button.
  – Select “New Attribute” or “New Operation” from the dropdown list. Enter the name of the new attribute or operation.
Creating a Class Diagram

• Adding Associations
  – Select the Required Association type from the Diagram toolbar.
    • Unidirectional
    • Bi-directional
    • Association
    • Generalization
  – Click on the class that you wish the relationship to originate from and drag the cursor to the class it is going to.
Class Diagrams
Object Communication Diagrams

• To Create a Communication Diagram
  – Select the Business Object Model from the Logical View in the Navigation Window.
  – Click the right-hand mouse button and select new.
  – From the dropdown menu select Collaboration Diagram.
  – A new communication diagram will open in the diagram window and the diagram toolbar will contain appropriate artefacts for the Diagram.
  – This is also the approach use for Activity, Sequence and State diagrams.
Communication Diagrams
Activity Diagrams
State Models
Creating a Class Diagram

• Adding Artefacts to the Diagram Toolbar
  – Sometimes artefacts are missing from the Diagram Toolbar. These can be added by right-clicking on the Toolbar and selecting “Customize”.

Creating a Class Diagram

• Customizing the Diagram Toolbar.

– Select the artefact you wish to add and click on the add button. Once complete Select Close.
More Help.

• Use the Internet


• www.sdmagazine.com