XXII. Interface Objects

Three-Tier Architectures
The Presentation layer
Sequence Diagrams for User Interface Classes
Prototyping the User Interface
User Interface Class and Package Diagrams
Model-View-Controller Architecture Revisited
Statechart Diagrams for Dialogue Dynamics

The Three-Tier Architecture, Revisited

- (Remember that...) User interfaces for are part of the presentation layer in a three-tier architecture.
- The three-tier architecture separates cleanly user interfaces from application logic/business classes and from data storage components of the system.
- Business classes “know nothing” about how their (business) objects will be presented to the users.

Check Campaign Budget

Select a client

Add a Dialog Box Object

Prototyping the Dialogue

- Prototyping can be used to determine what the interface will look like.

Class Diagram for Interface Classes

Composition specifies that a dialogue box is made up of other components.
Another Class Diagram

CBWindow can also be represented as a class with the graphical components that make it up as attributes.

[This is OK only if you don't want to say much about the different elements of CBWindow.]

Packages for Interface Classes

- Packages diagrams show the dependencies among interface classes in different packages.

Revised Class Diagram

- Composition shows that a dialogue box is made up of other components from the AWT package.

Prototyping the Dialogue

- There are several ways for entering the Client and Campaign name:
  - Use a separate look-up window for each class;
  - Allow the user to enter a part of a name, then have the system return a list of close matches;
  - Use a tree data structure to show clients and campaigns in a tree-like hierarchy.

Alternative Dialogue Prototypes

- Separate window for look-up

Alternative Dialogue Prototypes: Tree View Control
Updating the Sequence Diagram

Choice:
- Client (CL)
- Campaign (CA)
- Lookup

Updating the Class Diagram

Model-View-Controller

The Java ActionListener Approach

Modeling the Dynamic Behaviour of the Interface
- The sequence diagrams show the sequential view of the user working through the fields on the screen from top to bottom.
- But in GUI interfaces the user can click on the interface object out of sequence.
- What happens if the user clicks on the Check button before a client and a campaign have been selected?
- To specify what happens, we can use state diagrams!
**CheckButton, BudgetTextbox**

Load State:  
- Disabled  
- Enabled

CheckButton:  
- enable()  
- disable()  
- repaint()

BudgetTextbox:  
- clear()  
- setText(String)

Load State:  
- Clear  
- Entry: set()  
- Value: Displayed

**Additional Readings**