XXIV. 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

- User interfaces for an information system 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

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.

```
CBWindow
clientLabel
campaignLabel
budgetLabel
closeButton
budgetTextField
clientChoice
campaignChoice
```

Packages for Interface Classes

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

```
User Interface Package

AWT

Application Windows
```

Revised Class Diagram

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

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

(Java) Abstract Windowing Toolkit
```

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

```
Separate window for look-up
```

Alternative Dialogue Prototypes: Three View Control

```
Three View Control
```
Updating the Sequence Diagram

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

Updating the Class Diagram

- Client
- Campaign
- Lookup

Model-View-Controller

- User Event
- Controller
- View

The Java ActionListener Approach

- User Event
- Component
- Action

Modelling 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 Statechart diagrams!
Additional Readings