

### XXIV. Interface Objects

Three-Tier Architectures  
The Presentation layer

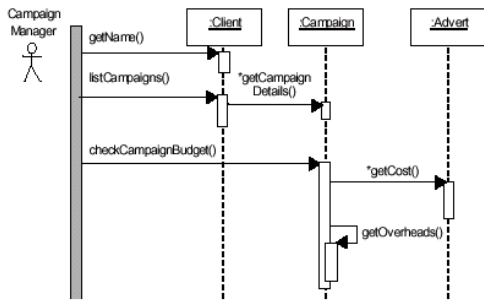
- Sequence Diagrams for User Interface Classes
- Prototyping the User Interface
- User Interface Class and Package Diagrams
- Model-View-Controller Architecture Revisited
- Statechart Diagrams for Dialogue Dynamics



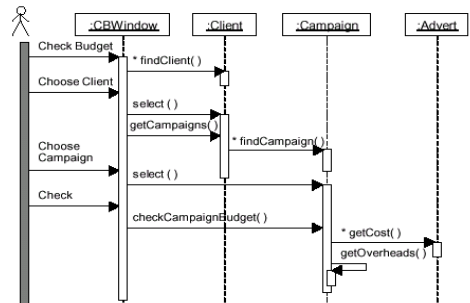
### The Three-Tier Architecture, Revisited

- 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



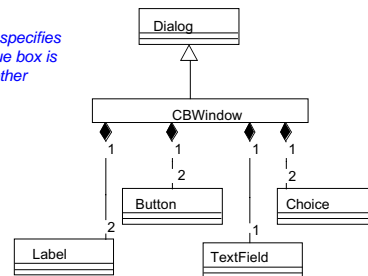
### Prototyping the Dialogue

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



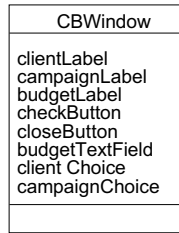
### Class Diagram for Interface Classes

Composition specifies that a dialogue box is made up of other components



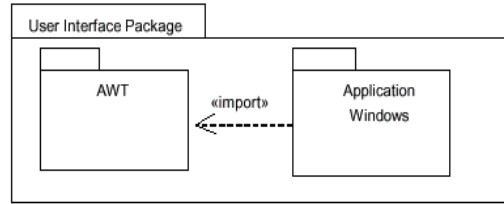
### Another Class Diagram

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



### Packages for Interface Classes

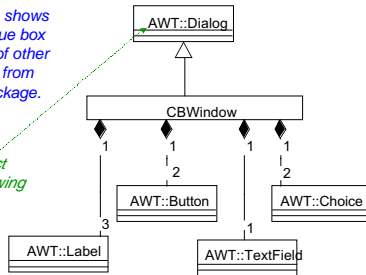
- Package diagrams show the dependencies among interface classes in different packages.



### Revised Class Diagram

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

(Java)  
Abstract  
Windowing  
Toolkit

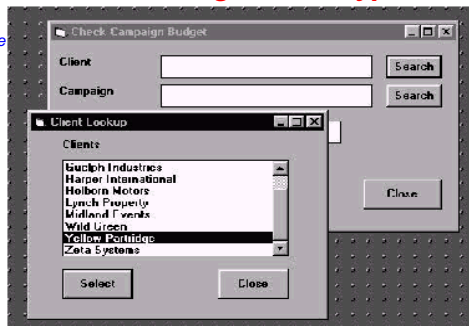


### Prototyping the Dialogue

- 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.

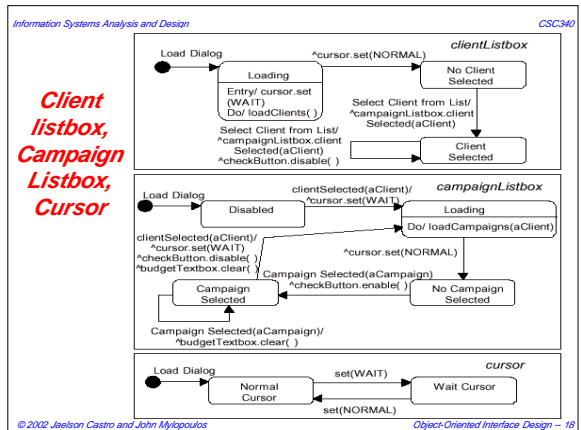
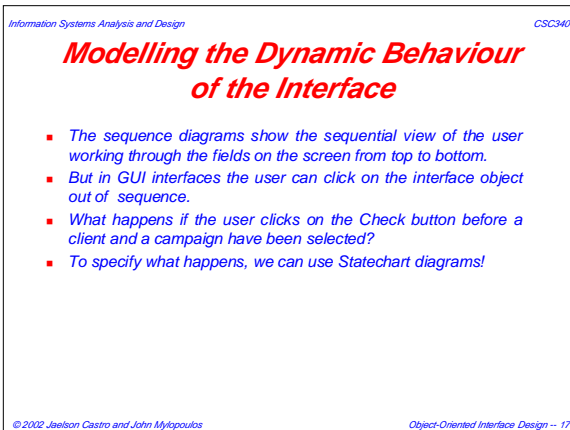
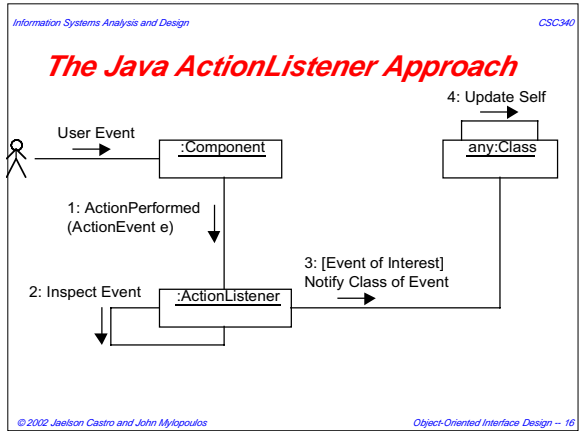
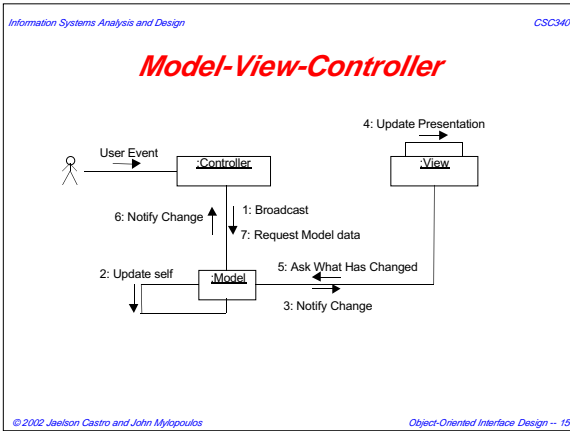
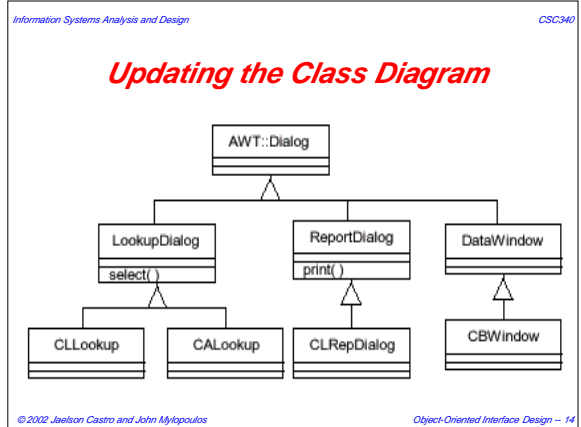
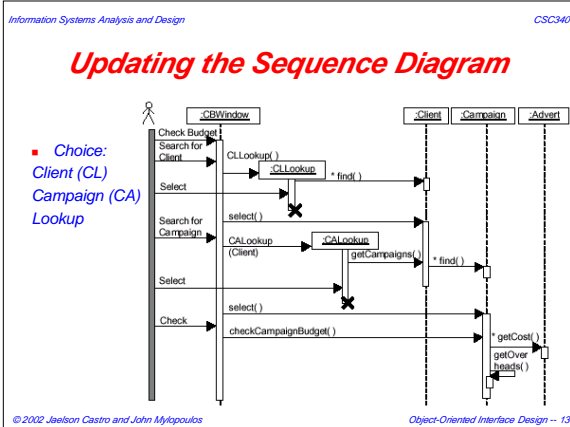
### Alternative Dialogue Prototypes

- Separate window for look-up

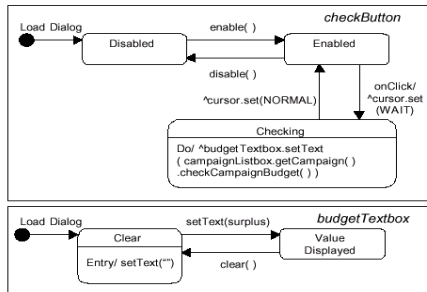


### Alternative Dialogue Prototypes: Three View Control





## CheckBox, BudgetTextbox



## Additional Readings

- Bennett S, Farmer R and McRobb S (1999) *Object-Oriented Systems Analysis and Design Using UML*. McGraw-Hill. Chapter 16 - Designing interface objects.
- Larman C (1998) *Applying UML and Patterns*. Prentice-Hall. Chapter 22 - Issues in System Design.