Object orientation (2)

Content

- Aggregation and generalisation Review
- Use-cases
- Sequence diagrams
- State transition diagrams
- Place in ISD
- Evaluation of Object orientation
- Reading list

Aggregation/ whole/part class

Generalisation/Specialisation

Techniques used in Object orientation

- Object model – object diagrams
- Dynamic model – state transition diagrams, Object interaction models (Sequence and collaboration diagrams)
- Functional model – action data flow diagrams, use case ADD
- System definition - Rich pictures
- Actor table or use case diagrams

Difference in view?

- Emphasis on use-case as basis of all further activities
- Requirements
- Analysis?
- Design?
- Iteration!!
- Increments!!
What is a use case?

• a particular form or pattern or exemplar of usage, a scenario that begins with some user of the system initiating some transaction or sequence of interrelated events. (Jacobson, 1992)
  Or
• A use case is a sequence of actions that the system performs to offer some results of value to an actor
  Or
• A pattern for interaction between the system and actors in the application domain (Mathiassen et al., 2000)

What is an actor?

• A type of user
  • An abstraction of users or other systems that interact with the target system (Mathiassen et al., 2000).
  • Also roles of actors

Example of an actor

• System interact with a type of user that will use the system to order goods, pay invoices, receive goods etc. – Can call this a buyer

Use case

• Represented in the use case diagram as an ellipse

Use case diagram for Billing and payment system

Example of an use case description for Pay invoice

• Brief description
  The use case Pay Invoice is used by a buyer to schedule invoice payments. The Pay Invoice use case then effects the payment on the due date.

• Initial step-by-step description
  Before this use case can be initiated, the Buyer has already received an invoice (delivered by another use case called Invoice Buyer) and has also received the good or services ordered:
  1. The buyer studies the invoice to pay and checks that it is consistent with the original order
  2. The Buyer schedules the invoice for payment by the bank.
  3. On the day payment is due, the system checks to see if there is enough money in the buyer’s account. If enough money is available, the transaction is made
Object interaction Models

- Sequence diagrams illustrate interactions that occur between the actors and objects in the system in order to carry out the behaviour specified in the scenario (Modelling behaviour, p. 103). Arranged in time sequence.
- Collaboration diagrams shows interaction organized around objects and their messages to each other (Satzinger and Orvik, 2001)

Sequence diagrams

State transition diagrams

- Defines allowable changes for data objects.
- State: is a set of values an object can have.
- Transition: event causing a change to the set of values

Icons used in state transition diagrams

- Label line with event and process

Step in drawing a diagram

- Draw one diagram for each object/class
- Identify the possible states the class/object can take
- Draw circles on a diagram labeling each with a state
- Connect the states show transition from one state to another
- Label transition lines to identify the events
- Label the lines with the process that manage the the event

Example of a state transition diagram
Advantages/ Benefits of object orientation

- It unifies many aspects of the information systems development process.
- It facilitates re-use of software code – make application development quicker and more robust
- Ability to tackle more complex problems
- Improve user/analyst relations ??
- Improvement in the consistency of results
- Represent factors for change in the model

Disadvantages of object orientation

- Only now starting to be used
- Case tools are not readily available
- Not easily understood by novice users
- Difficult to master for some analysts + designers + programmers
- Inefficiency (need a lot of ‘power)
- Others??

Thinking in Object orientation

- Hard Vs Soft ??
- Perspective
  – Objective vs Subjective
  – Nature of the organisation

Evaluation of Object oriented modelling

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Object orientation view of ISD

Development group → Object system → Objectives

Object system → Change process → Environment

Reading for next week

- To be announced