

204362 – Object-Oriented Design

Object Interaction (Part II)

Adapted for 204362
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Bennett, McRobb and Farmer, *Object Oriented Systems Analysis and Design Using UML*
4th Edition, McGraw Hill, 2010

In This Lecture You Will Learn:

- how to model object interaction using an interaction communication diagram.
- how to model interactions using interaction overview diagrams;
- how to model interaction using an interaction sequence diagram;
- how to use timing diagrams.

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Object Interaction – Communication Diagram

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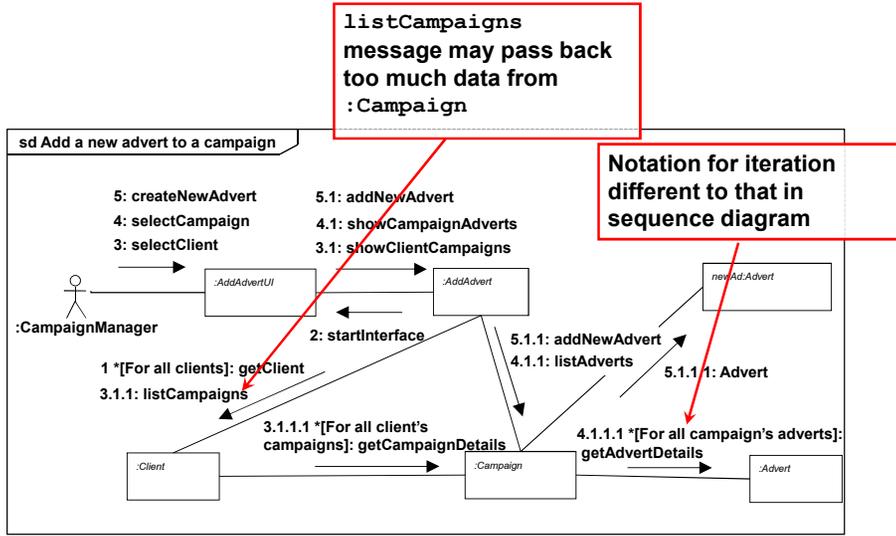
Communication Diagrams

- Hold the same information as sequence diagrams.
- Show links between objects that participate in the collaboration.
- No time dimension, sequence is captured with sequence numbers.
- Sequence numbers are written in a nested style (for example, 3.1 and 3.1.1) to indicate the nesting of control within the interaction that is being modelled.

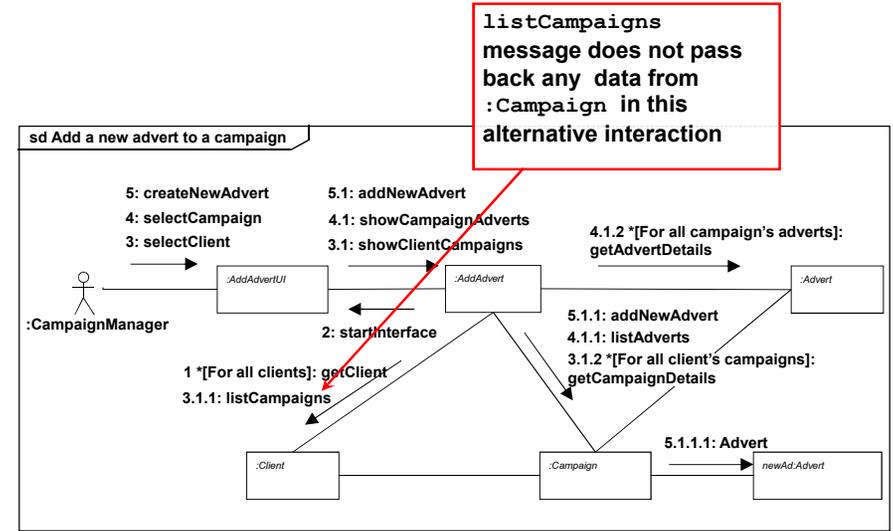
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Communication Diagrams



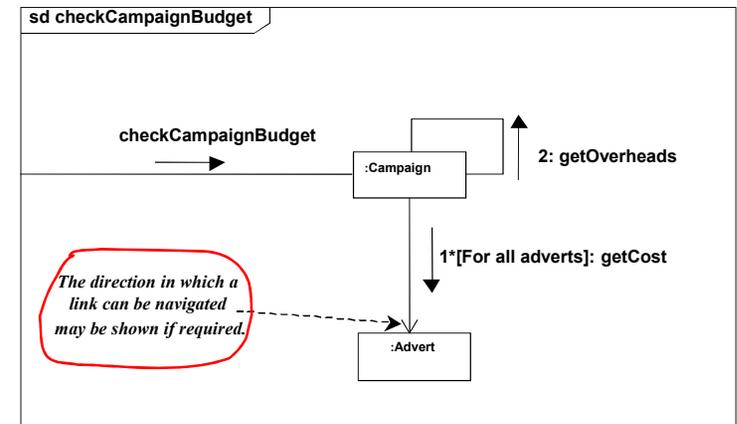
Communication Diagrams



Message Labels

Type of message	Syntax example
Simple message.	4: addNewAdvert
Nested call with return value. <i>The return value is placed in the variable name.</i>	3.1.2: name = getName
Conditional message. <i>This message is only sent if the condition [balance > 0] is true.</i>	5 [balance > 0]: debit(amount)
Iteration	4.1 * [For all adverts]: getCost

Navigating Links



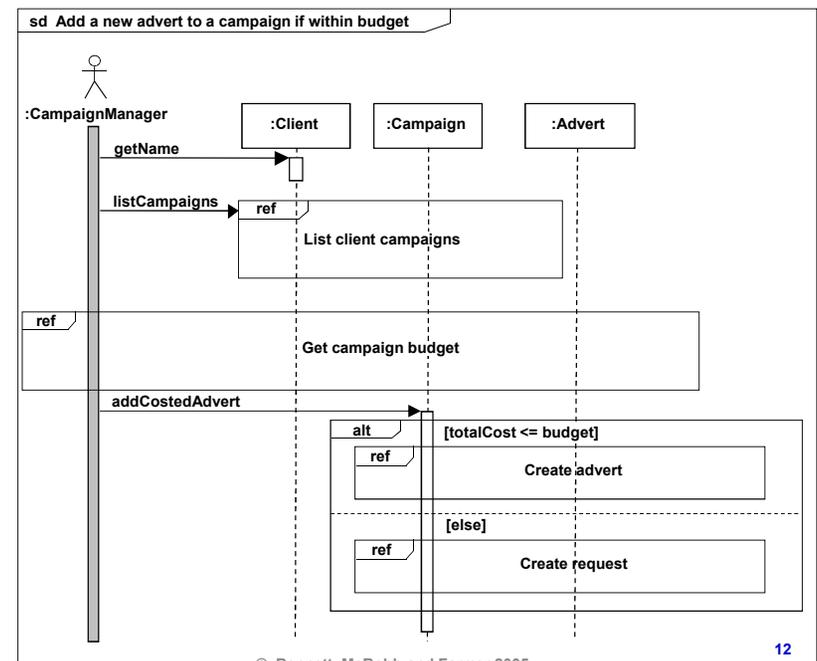
Object Interaction – Interaction Overview Diagrams Timing Diagrams

Interaction Overview Diagrams

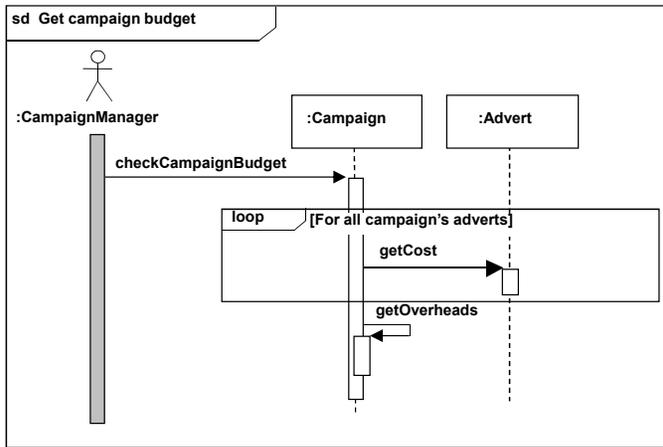
- Variants of activity diagrams
- Focuses on the flow of control in an interaction
- Nodes in the diagram may be interactions or interaction occurrences
- Interaction needs to be broken down into its key elements.

Interaction Overview Diagrams

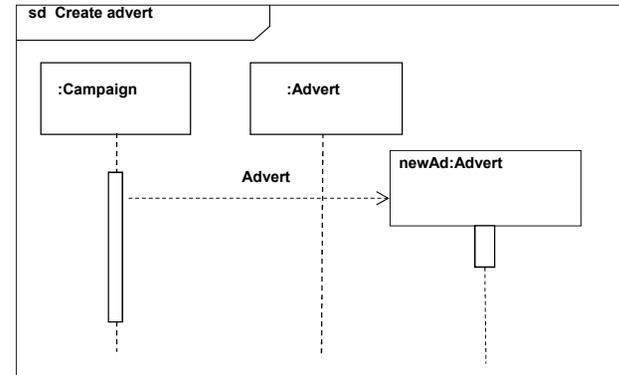
- An alternative version of the sequence diagram Add a new advert to a campaign if within budget is shown on the next slide and is used to develop an interaction overview diagram



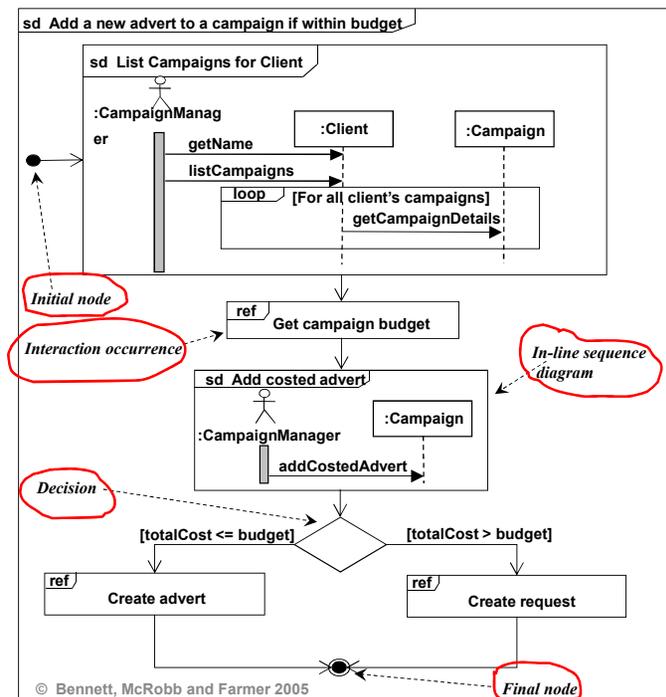
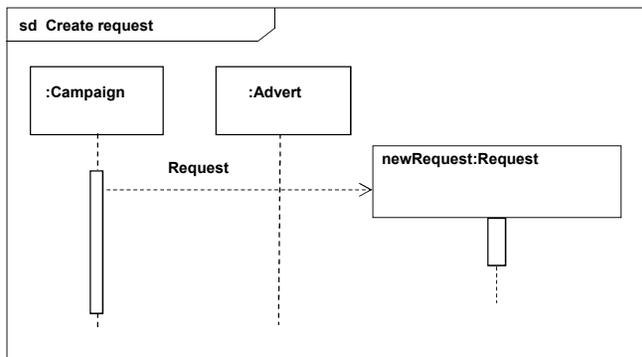
Interaction Fragment Used



Interaction Fragment Used



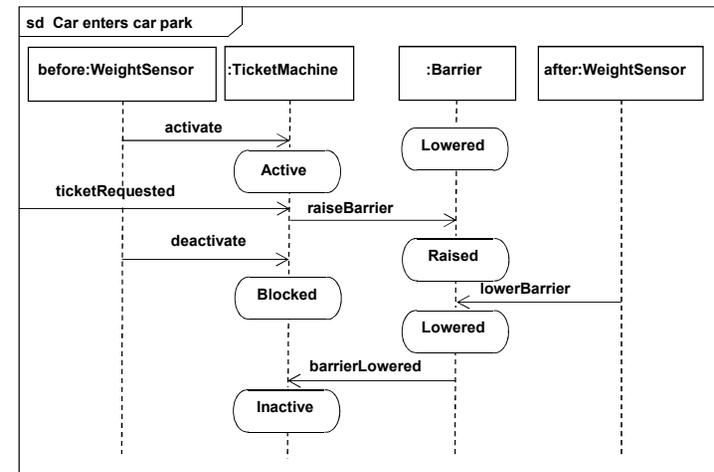
Interaction Fragment Used



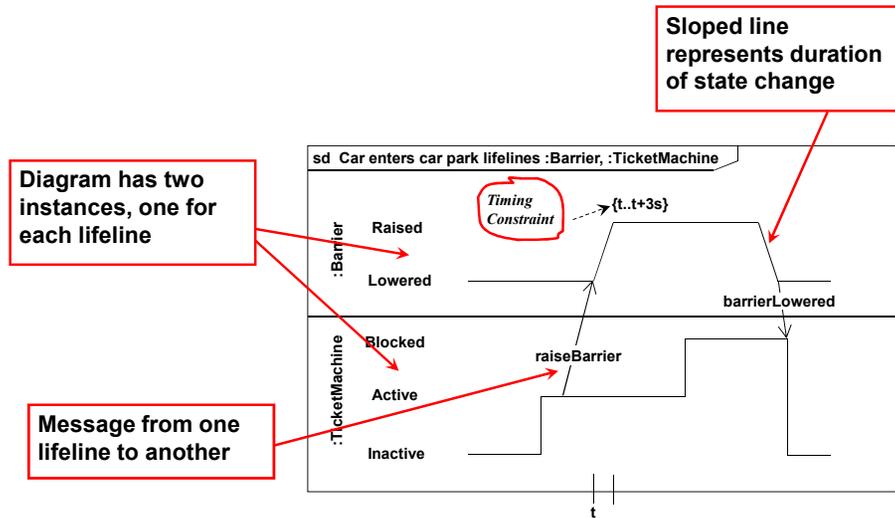
Timing Diagrams

- A new feature in UML 2.0
- Show how time constraints affect interactions between lifelines
- The sequence diagram Car enters car park is the basis for the subsequent timing diagram

Timing Diagrams



Timing Diagrams



Model Consistency

- Timing diagrams must be consistent with the relevant sequence diagrams and state machines.

Summary

In this lecture you have learned about:

- how to model object interaction using an interaction communication diagram.
- how to model interactions using interaction overview diagrams;
- how to model interaction using an interaction sequence diagram;
- how to use timing diagrams.

References

- UML Reference Manual (OMG, 2009)
- Bennett, Skelton and Lunn (2005)
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(For full bibliographic details, see Bennett, McRobb and Farmer)