



Object-Oriented Design

Lecturer: Raman Ramsin

Lecture 1: UML Overview



UML – Unified Modeling Language

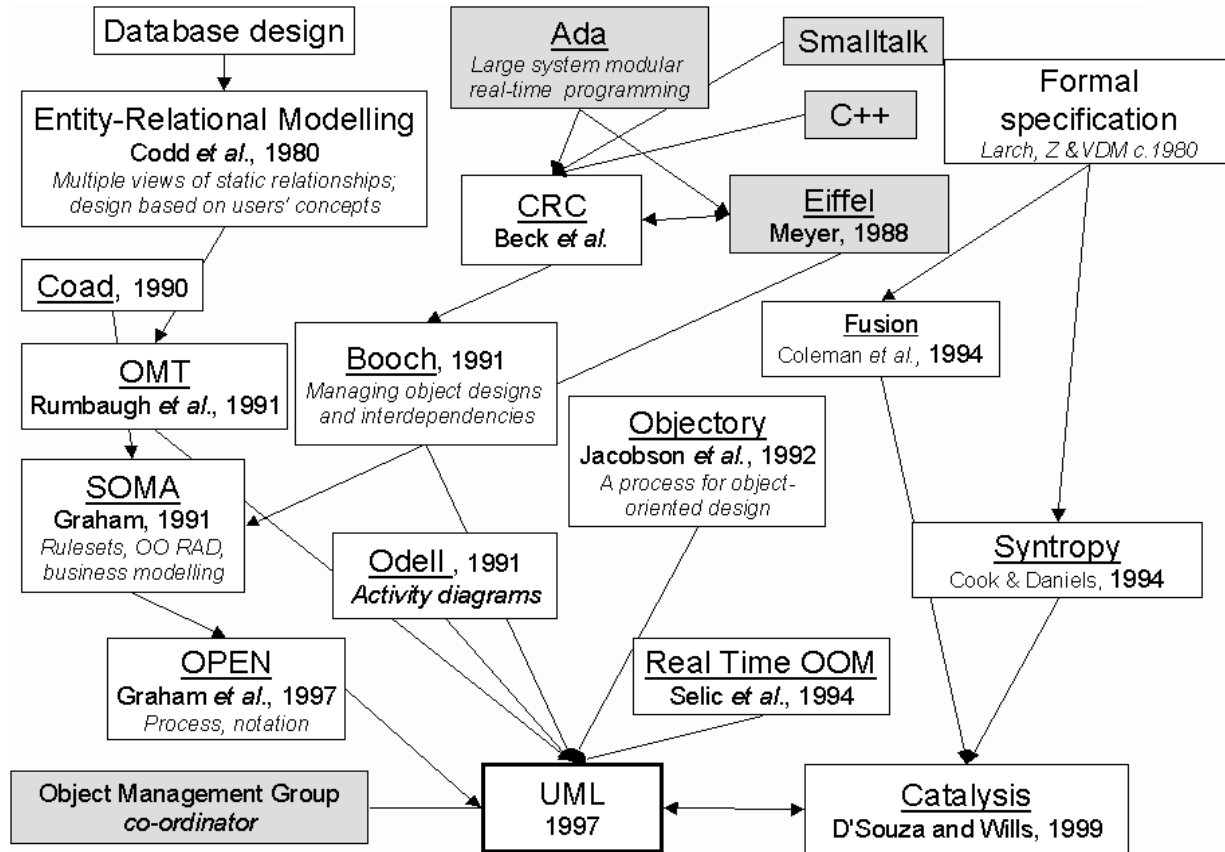


The Unified Modeling Language (UML) is a standard language for specifying, visualizing, constructing and documenting the artifacts of software systems, as well as for business modeling and other non-software systems.

The UML represents a collection of best modeling practices that have proven successful in the modeling of large and complex systems.



Influences on UML



[Graham 2001]

UML 2 Diagram Superstructure

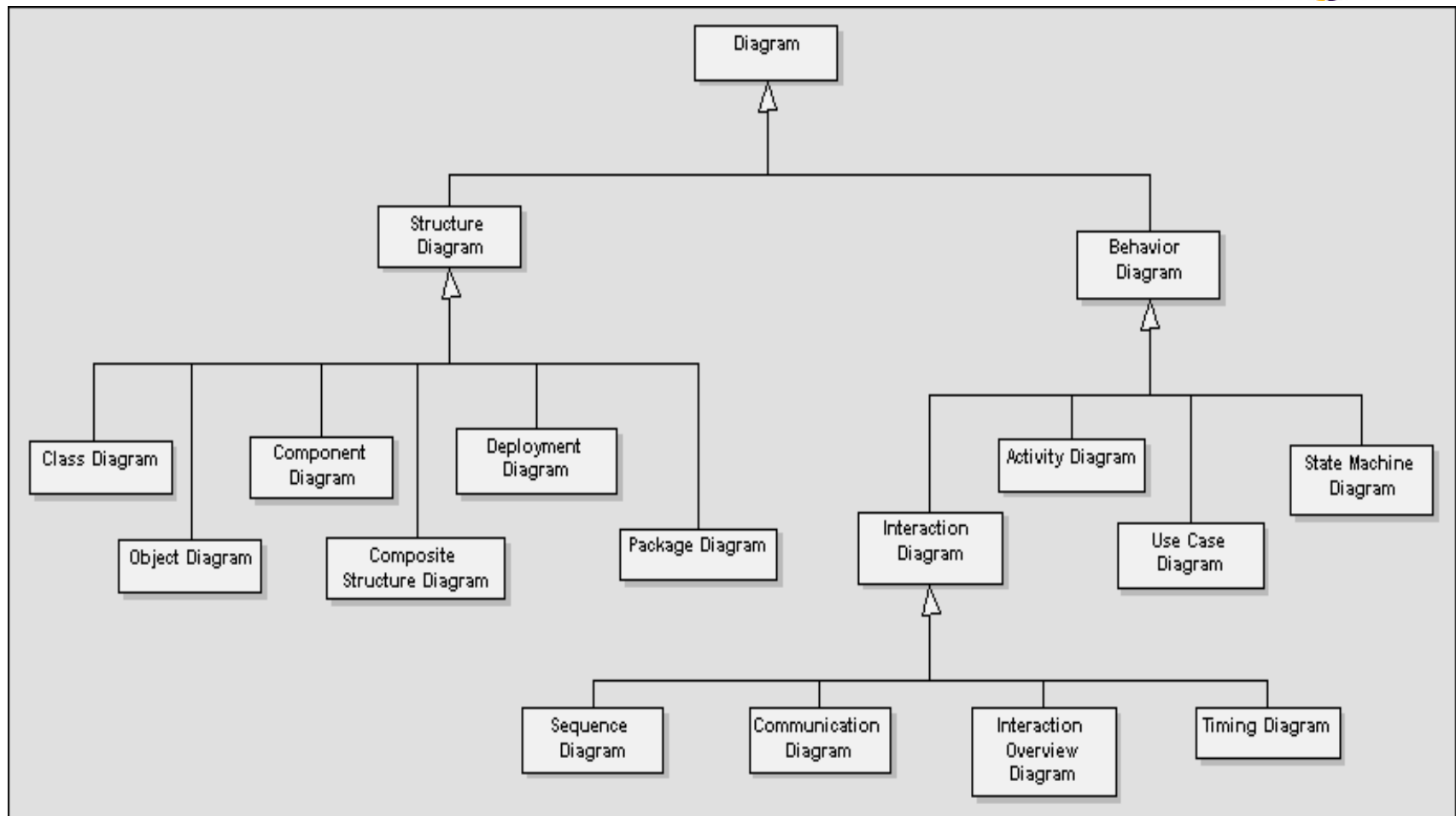




Diagram	Book Chapters	Purpose	Lineage
Activity	11	Procedural and parallel behavior	In UML 1
Class	3, 5	Class, features, and relationships	In UML 1
Communication	12	Interaction between objects; emphasis on links	UML 1 collaboration diagram
Component	14	Structure and connections of components	In UML 1
Composite structure	13	Runtime decomposition of a class	New to UML 2
Deployment	8	Deployment of artifacts to nodes	In UML 1
Interaction overview	16	Mix of sequence and activity diagram	New to UML 2
Object	6	Example configurations of instances	Unofficially in UML 1
Package	7	Compile-time hierarchic structure	Unofficially in UML 1
Sequence	4	Interaction between objects; emphasis on sequence	In UML 1
State machine	10	How events change an object over its life	In UML 1
Timing	17	Interaction between objects; emphasis on timing	New to UML 2
Use case	9	How users interact with a system	In UML 1

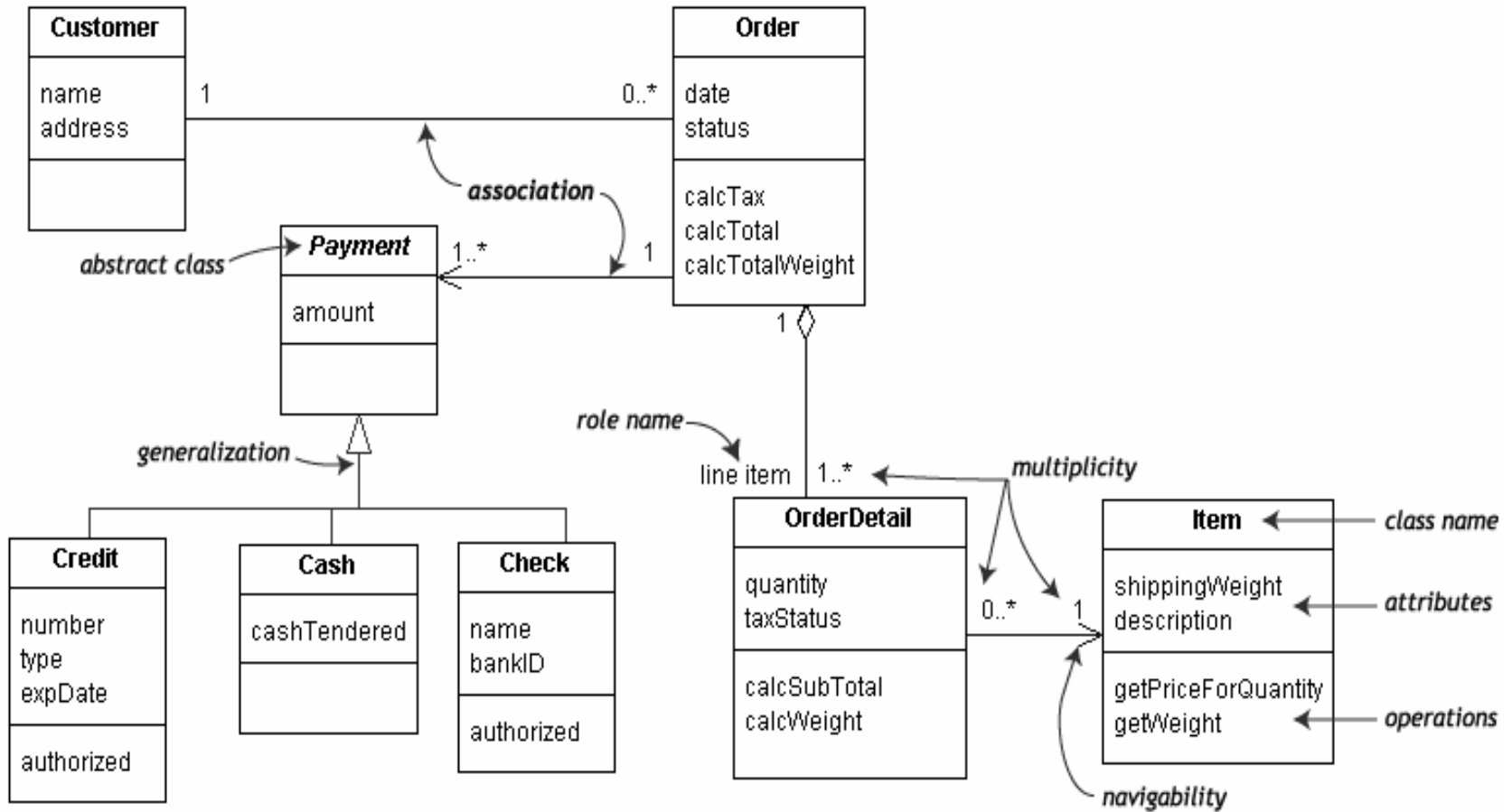


[Fowler 2004]



Structure Diagrams

↳ Class Diagram

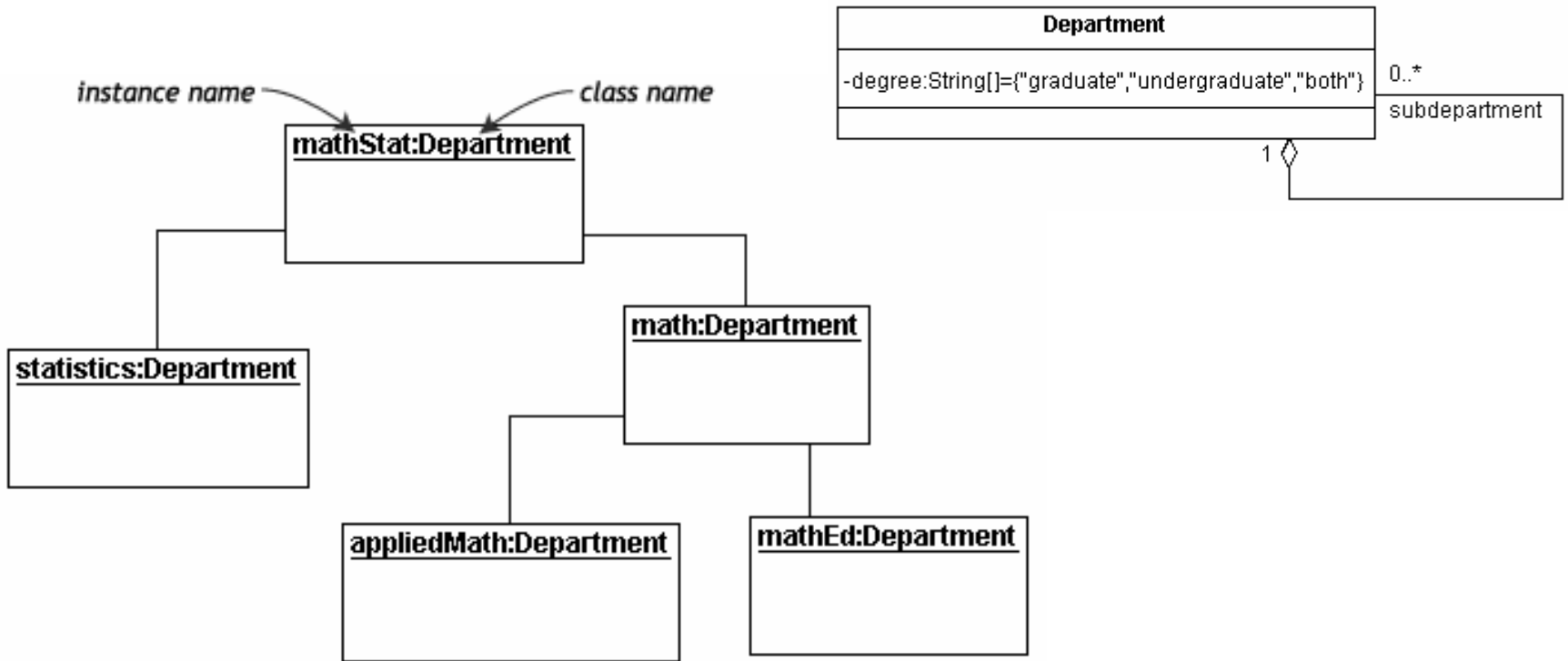


[Fowler 2004]



Structure Diagrams

↳ Object Diagram (1)

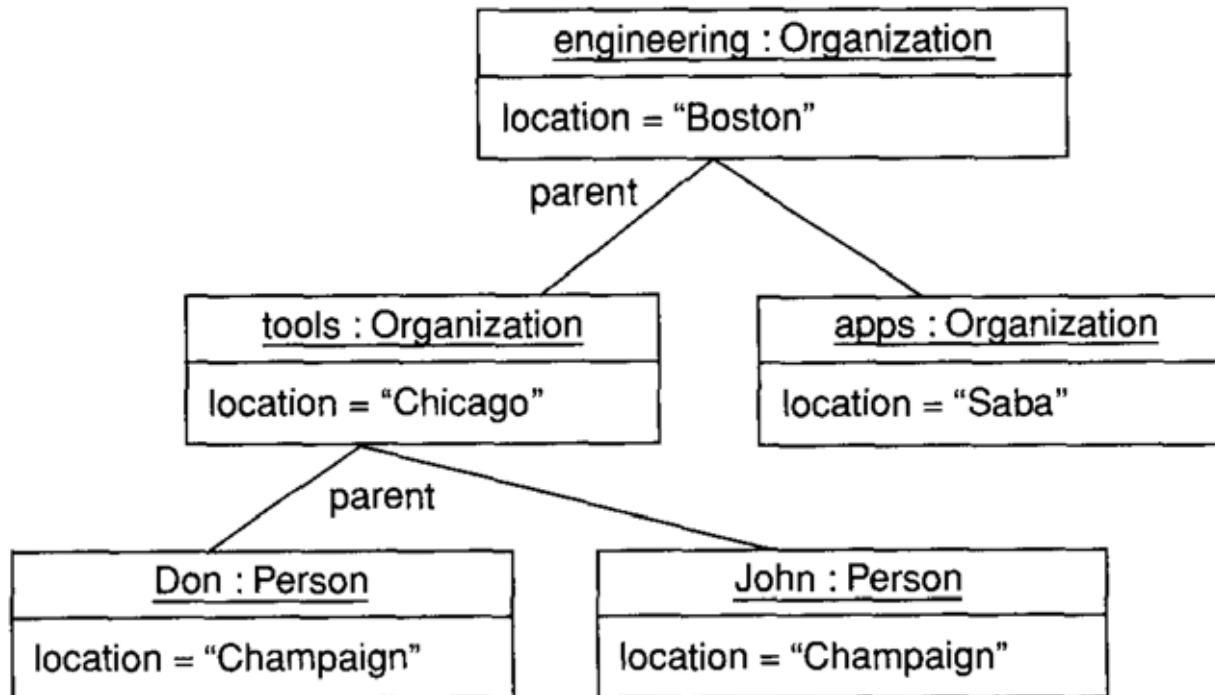


[Fowler 2004]



Structure Diagrams

↳ Object Diagram (2)

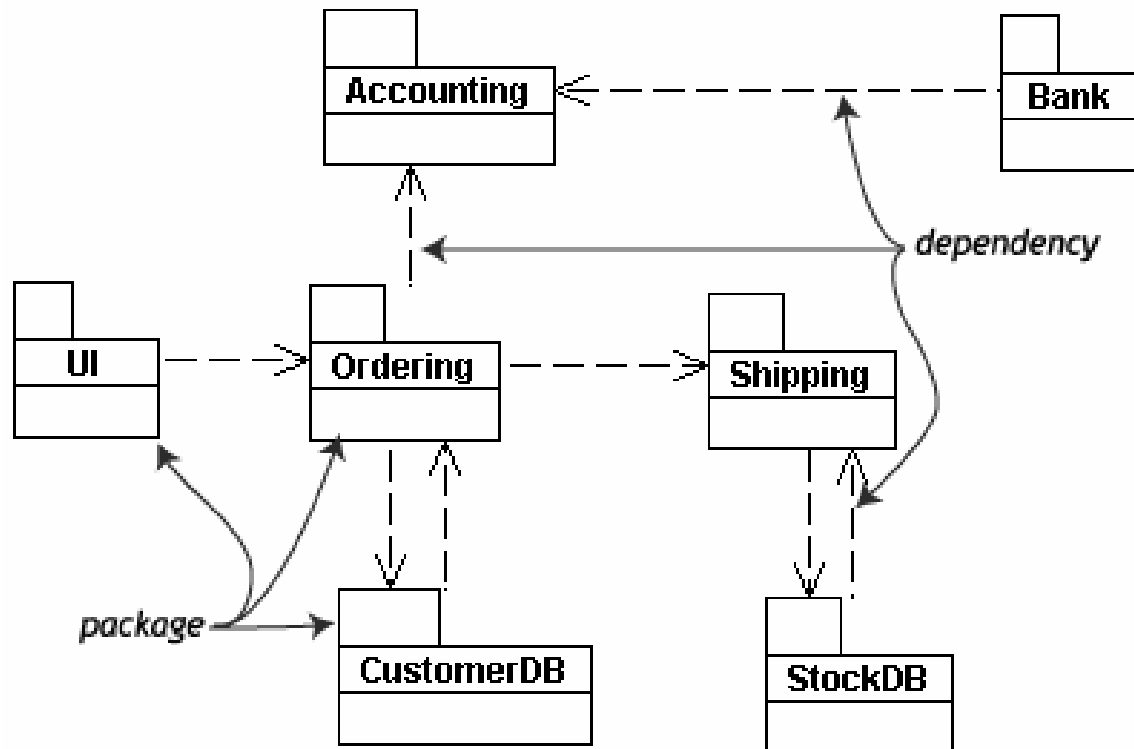


[Fowler 2004]



Structure Diagrams

↳ Package Diagram

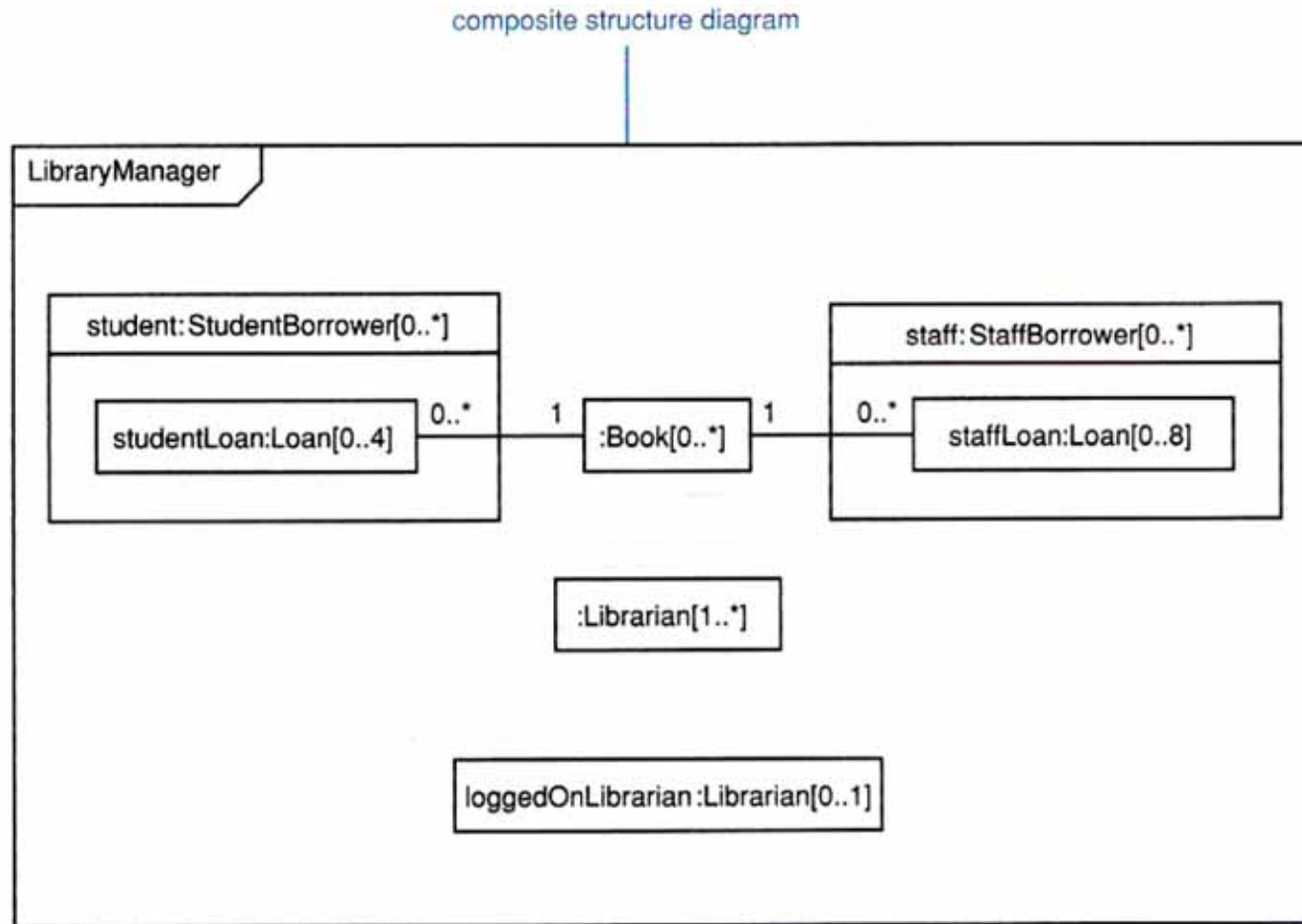


[Fowler 2004]



Structure Diagrams

↳ Composite Structure Diagram

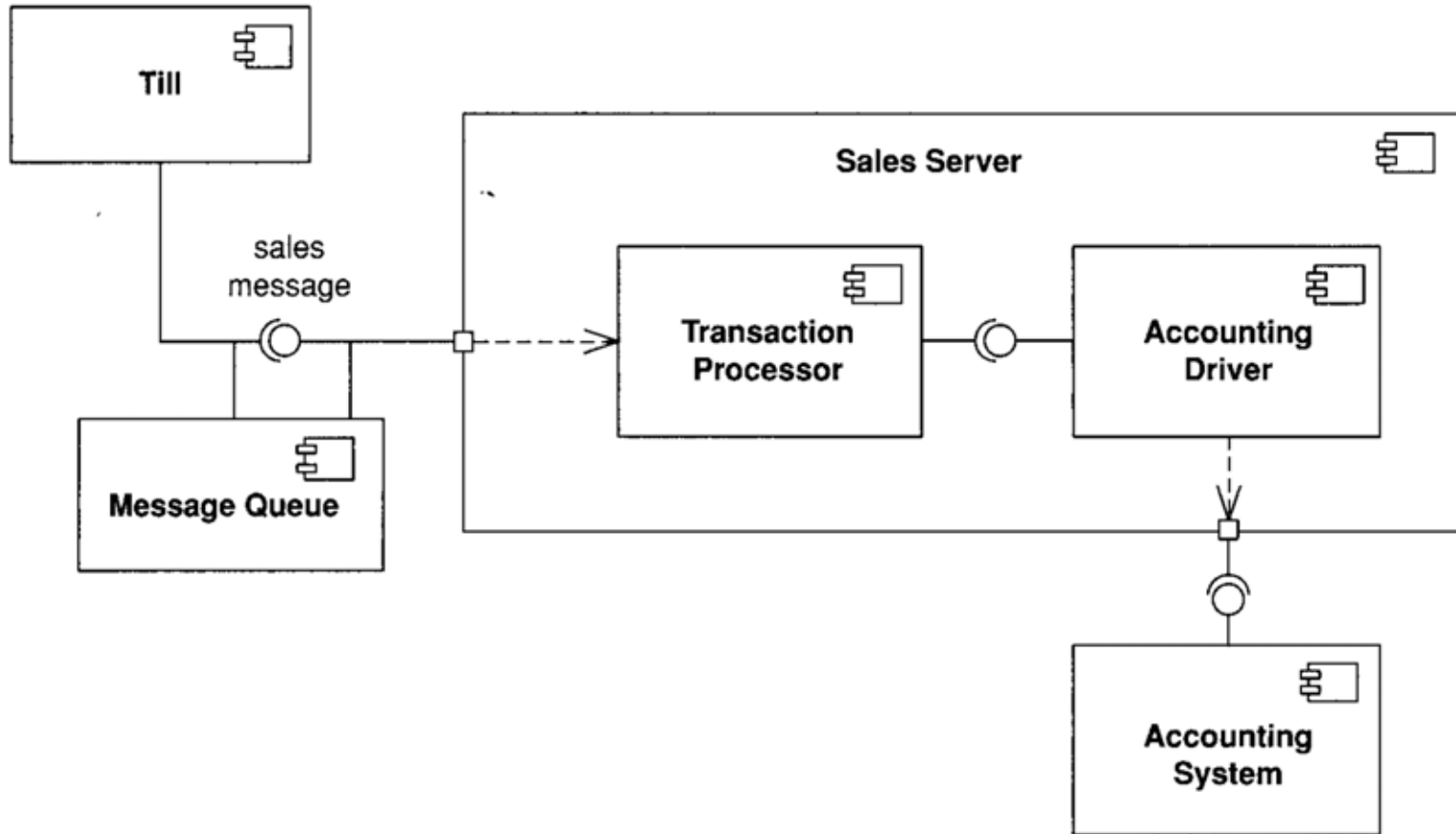


[Fowler 2004]



Structure Diagrams

↳ Component Diagram

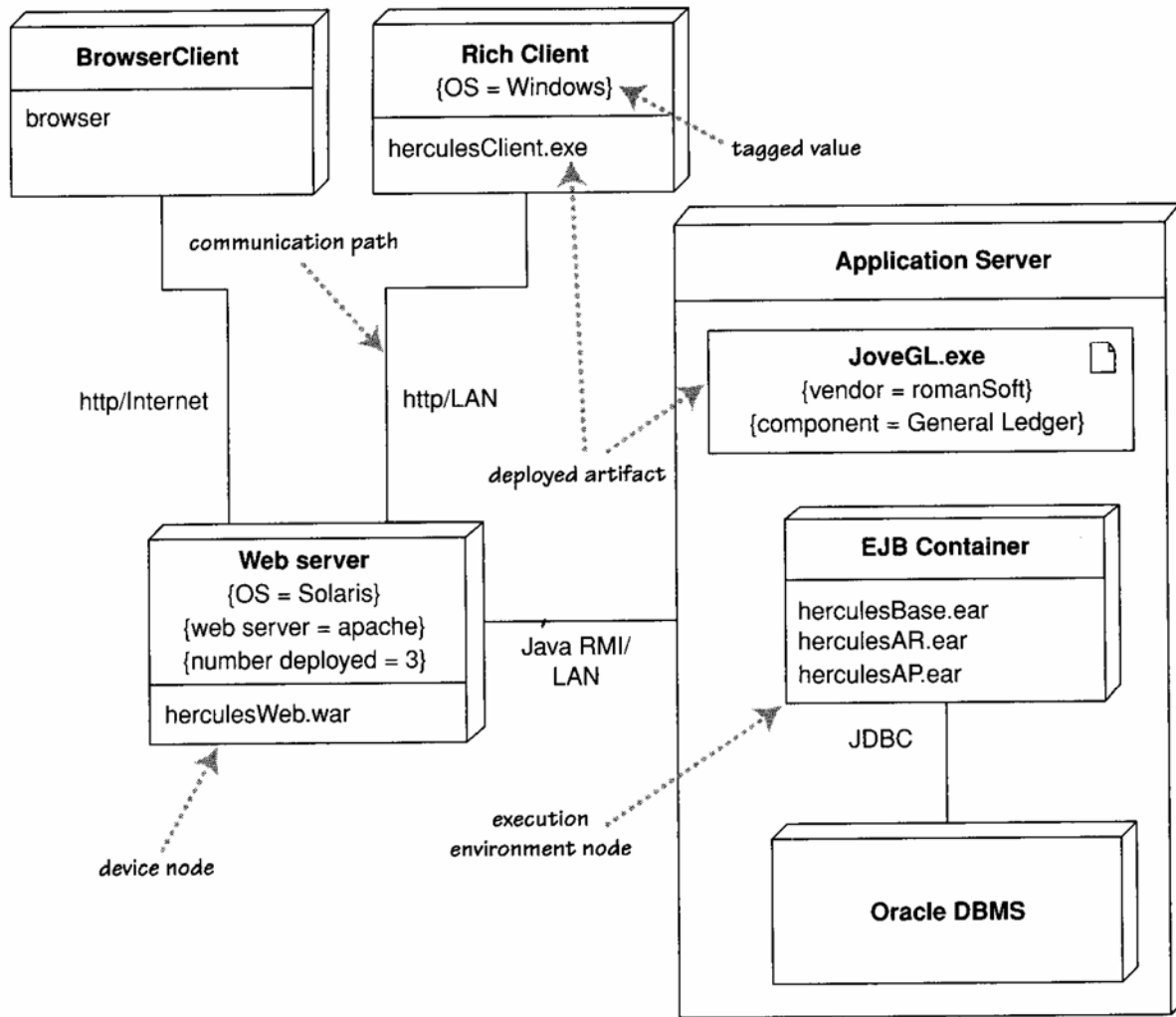


[Fowler 2004]



Structure Diagrams

Deployment Diagram

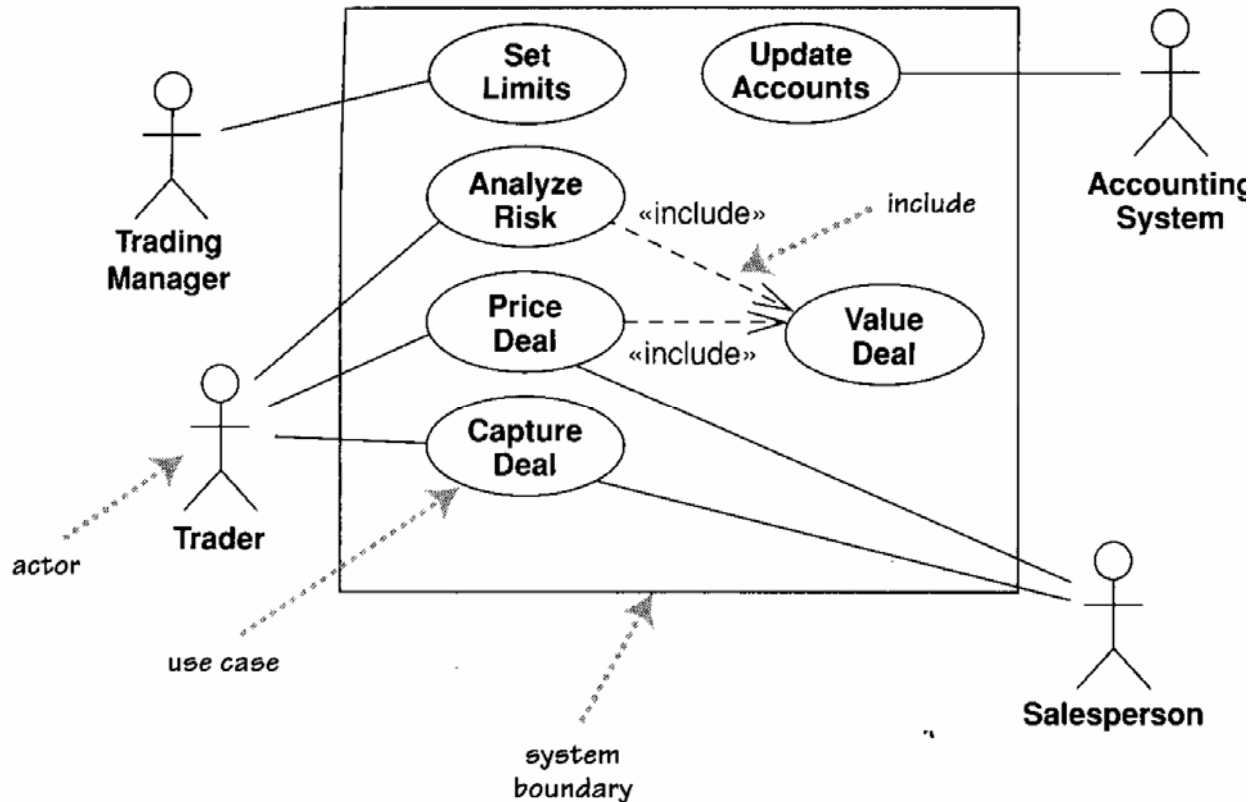


[Fowler 2004]



Behavior Diagrams

Use-Case Diagram

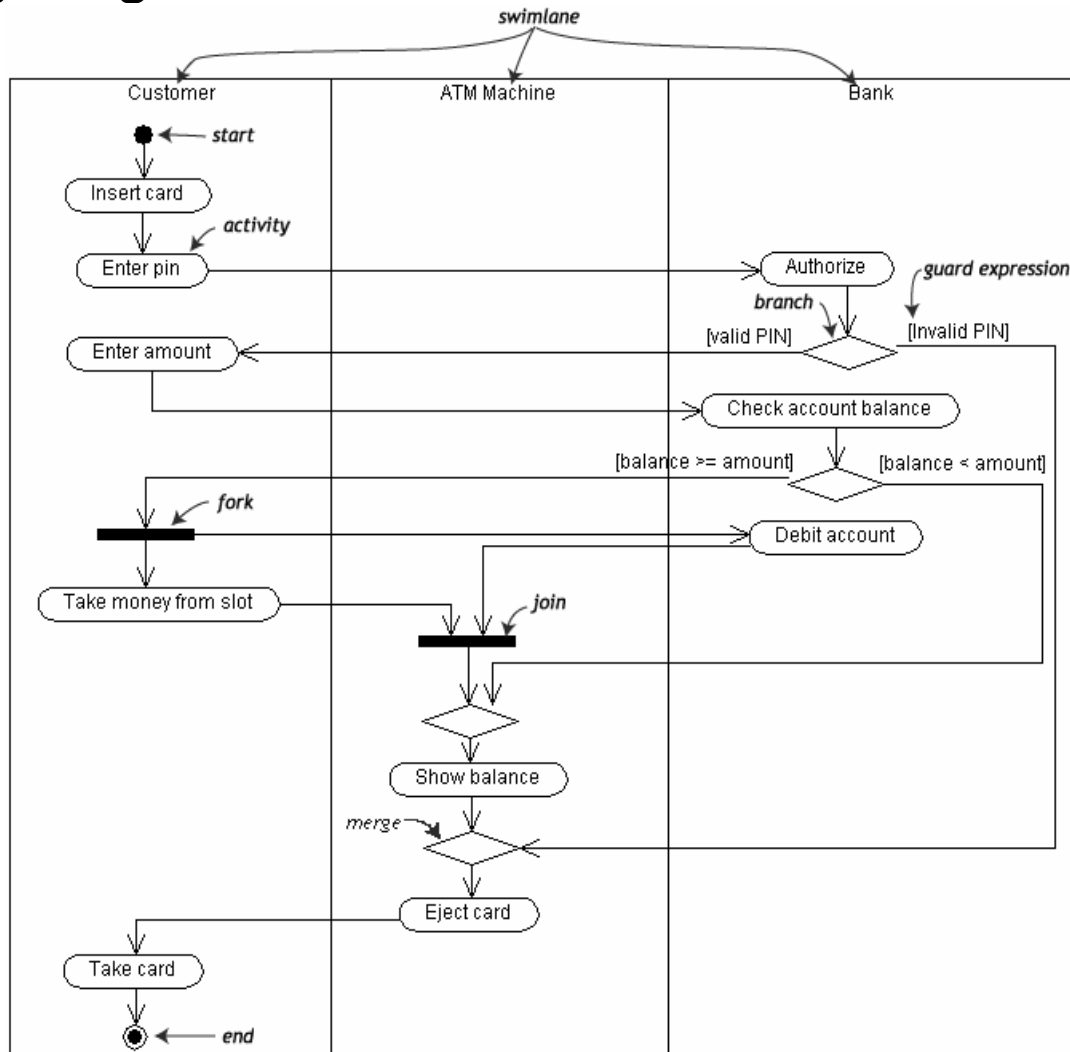


[Fowler 2004]



Behavior Diagrams

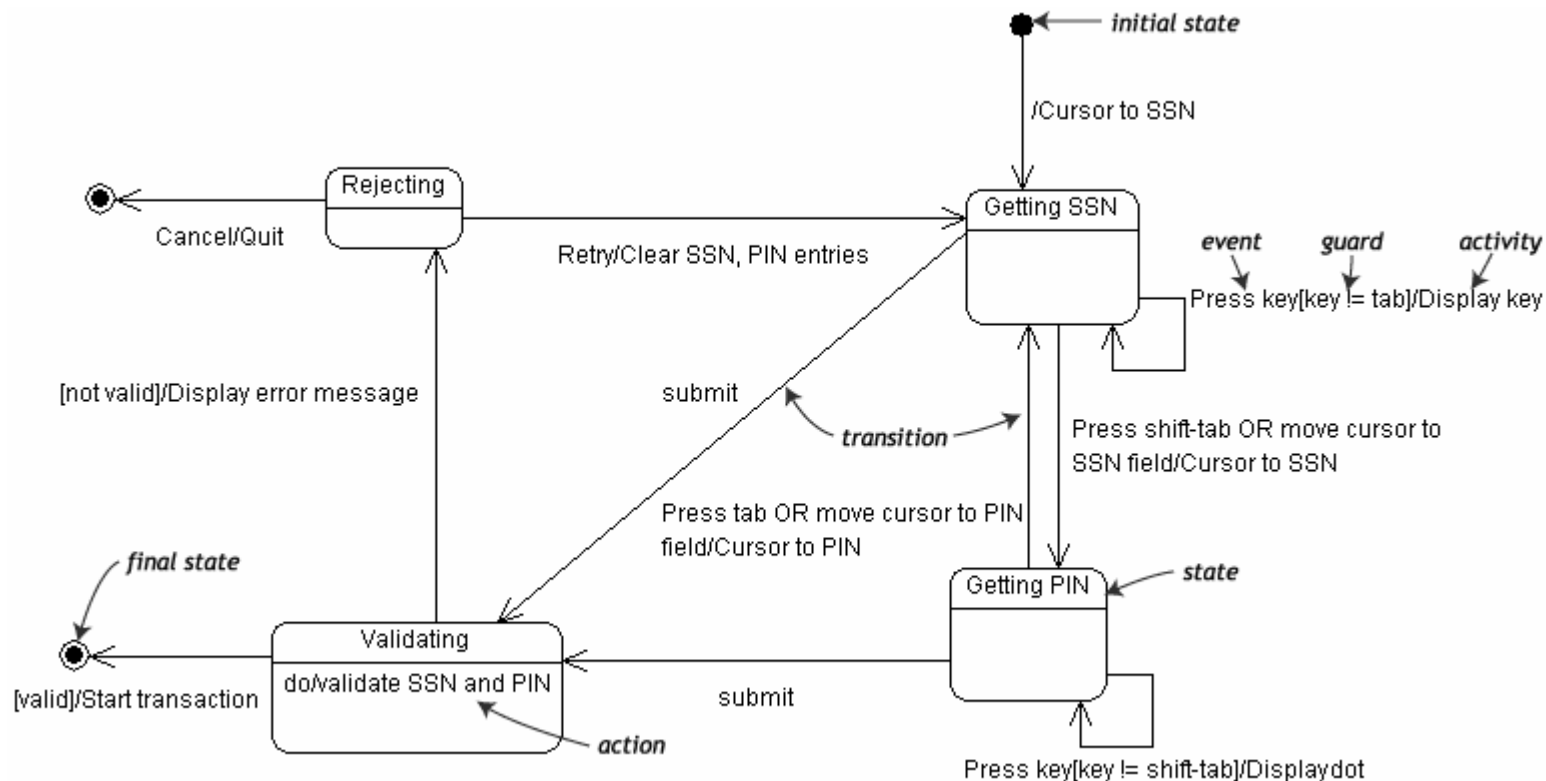
Activity Diagram





Behavior Diagrams

State Machine Diagram

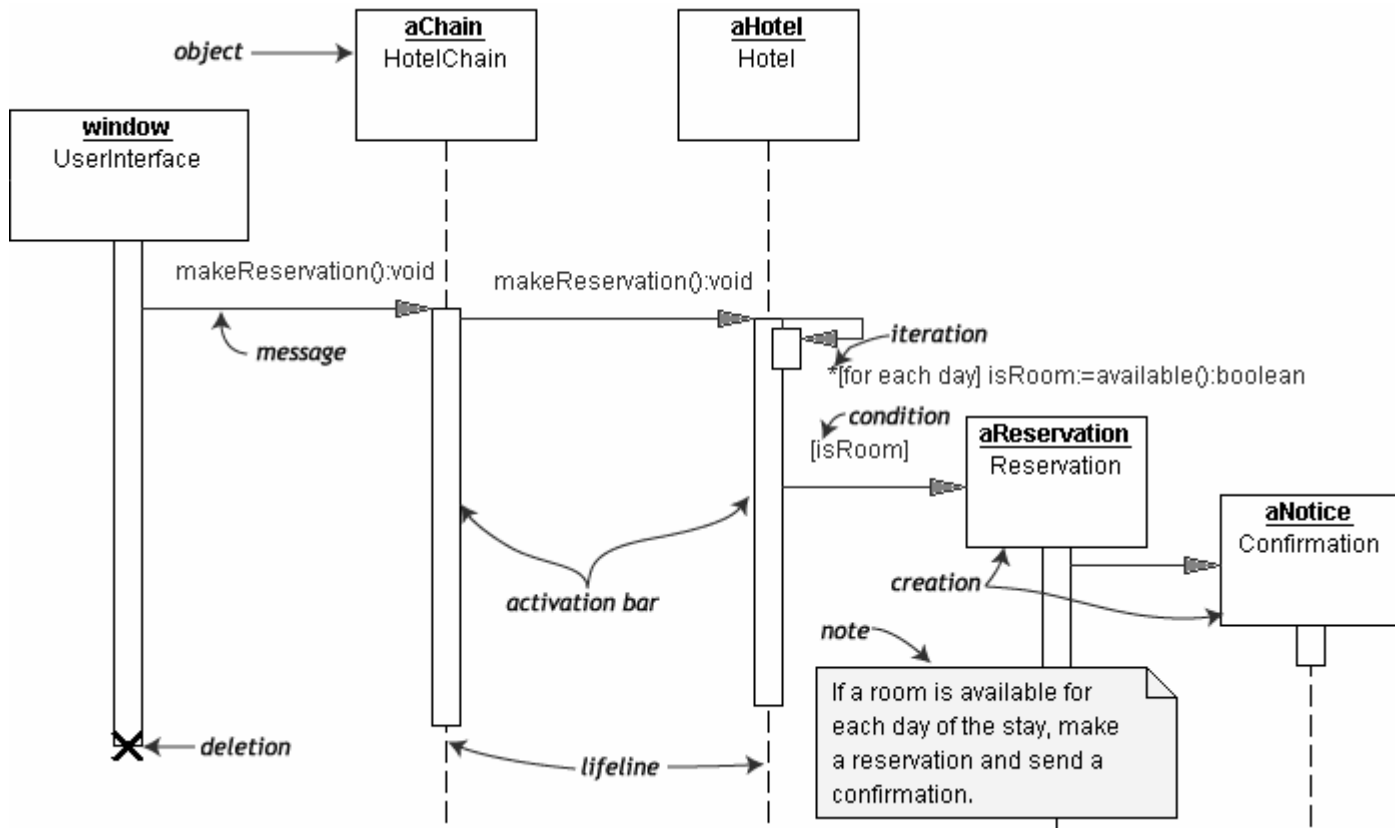


[Fowler 2004]



Behavior Diagrams: Interaction Diagrams

↳ Sequence Diagram

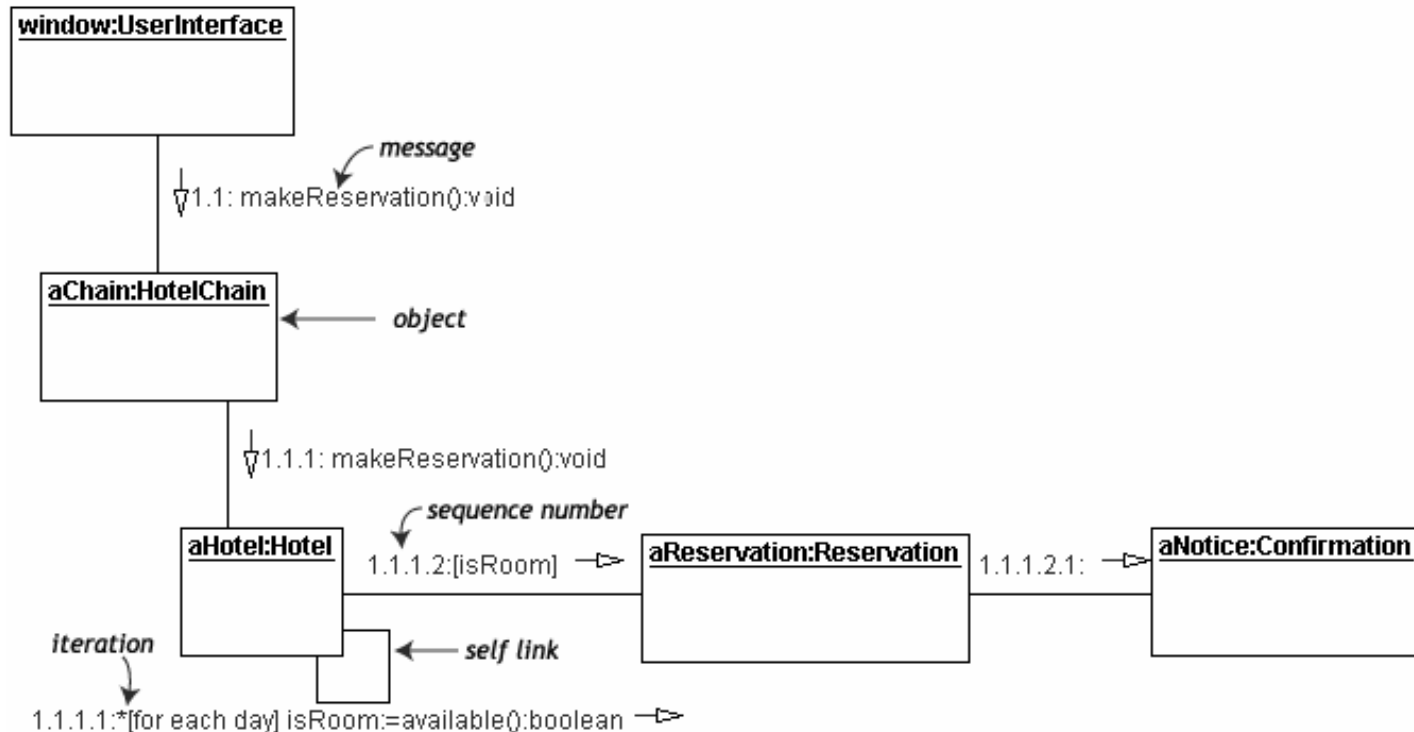


[Fowler 2004]



Behavior Diagrams: Interaction Diagrams

↳ Communication/Collaboration Diagram

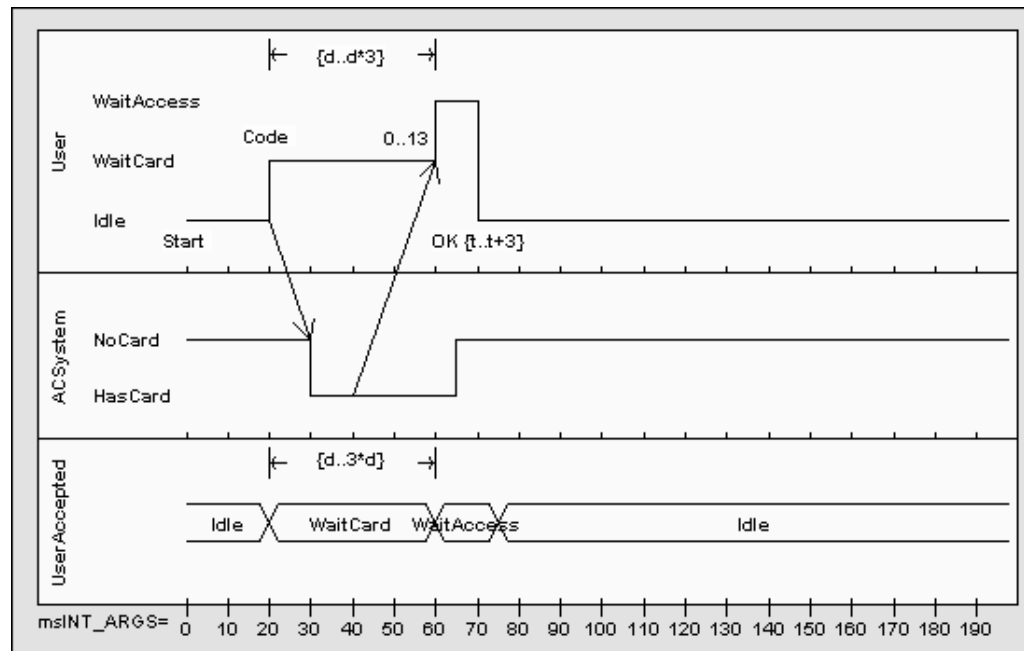


[Fowler 2004]



Behavior Diagrams

↳ Timing Diagram (1)

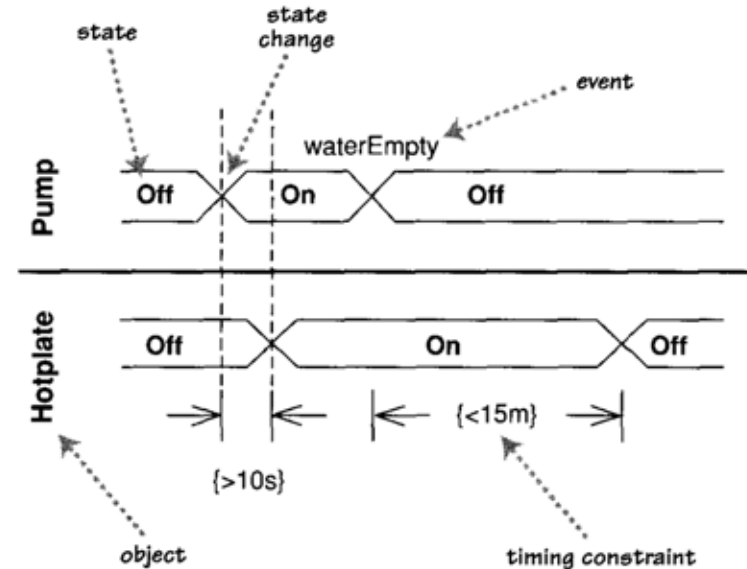
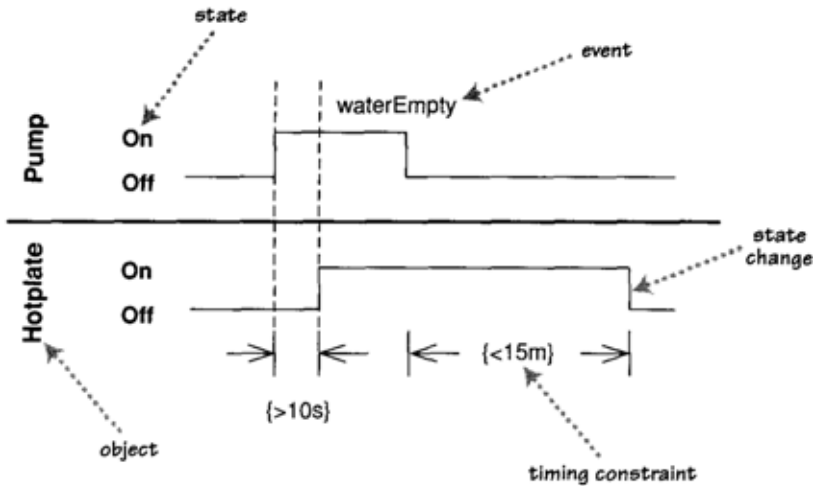


[Fowler 2004]



Behavior Diagrams

Timing Diagram (2)

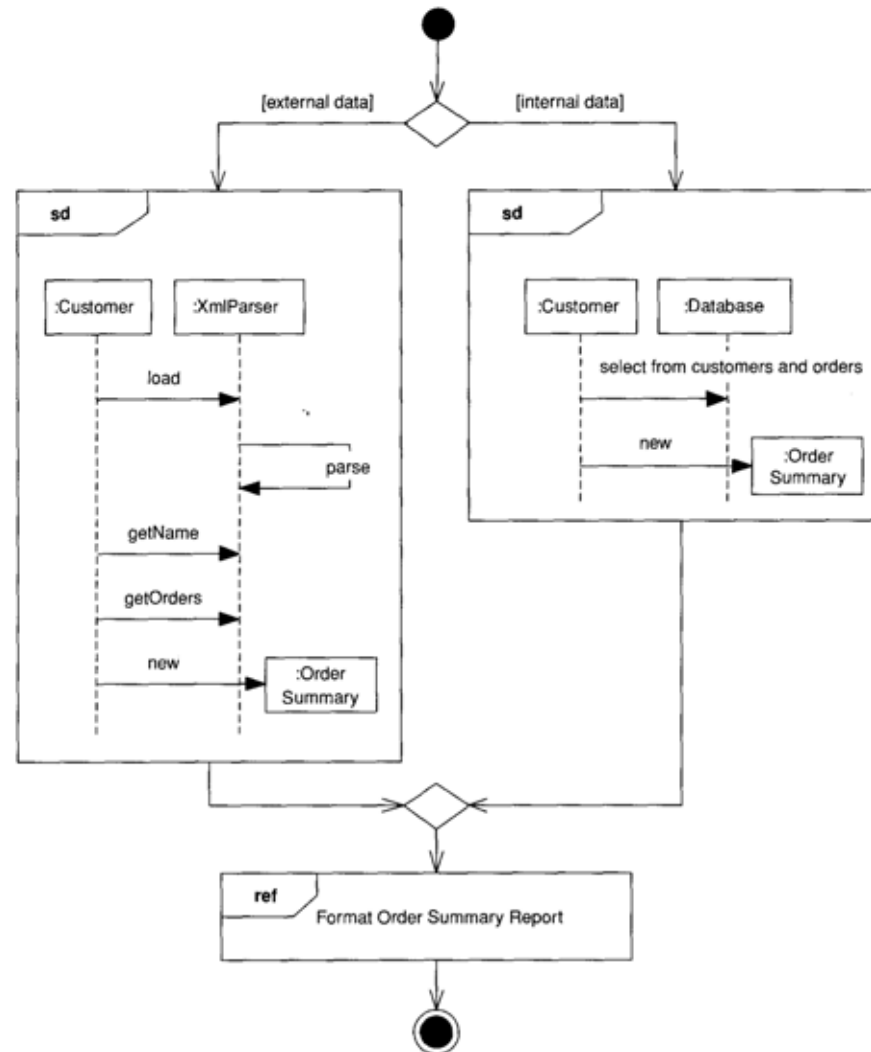


[Fowler 2004]



Behavior Diagrams

Interaction Overview Diagram



[Fowler 2004]



References

- Arlow, J., Neustadt, I., *UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design*, 2nd Ed. Addison-Wesley, 2005.
- Fowler, M., *UML Distilled*, 3rd Ed. Addison-Wesley, 2004.
- Graham, I., *Object-oriented Methods: Principles and Practice*, 3rd Ed. Addison-Wesley, 2001.