

**A picture is
worth 1024
words**

Chapter 12

Modeling

Modeling useful for:

- Analysis – concepts
- Design – what you intend to build

Context Diagram – Chemical Tracking System

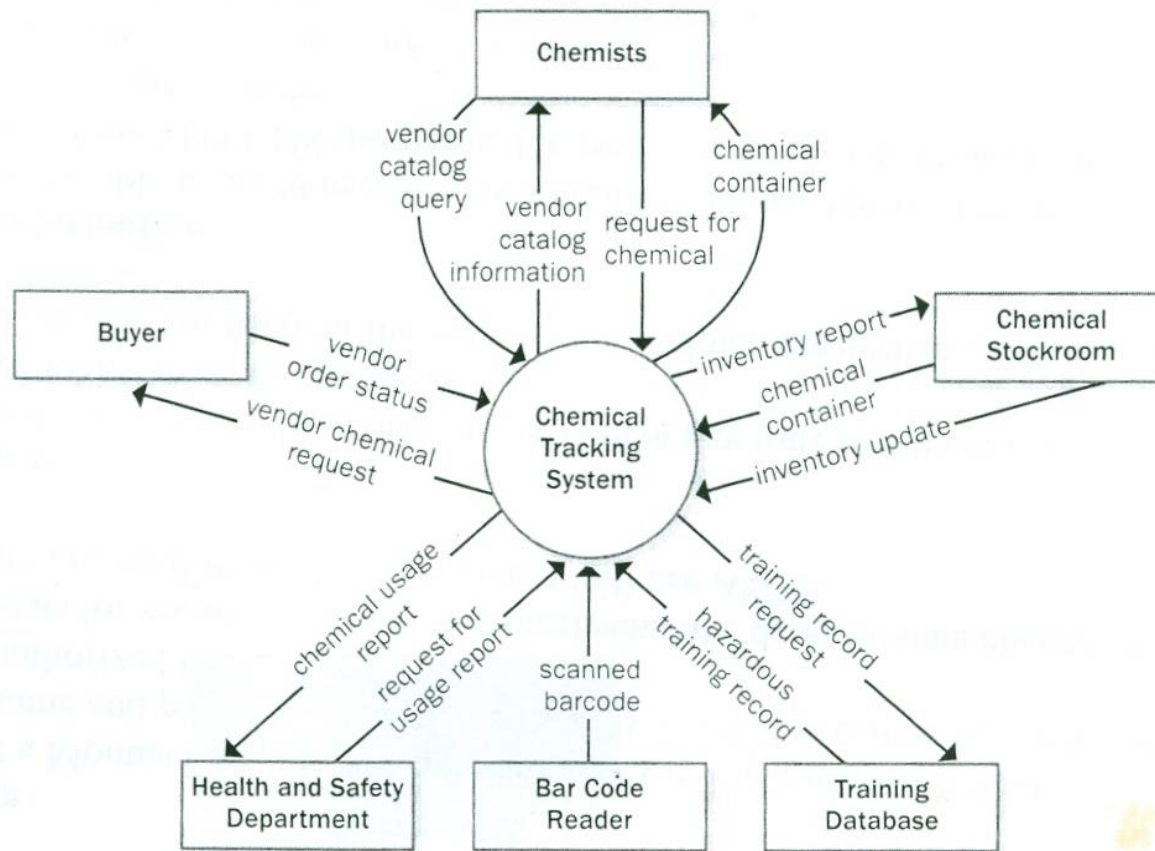


Figure 5-3 Context diagram for the Chemical Tracking System.

Lower Level Data Flow Diagram

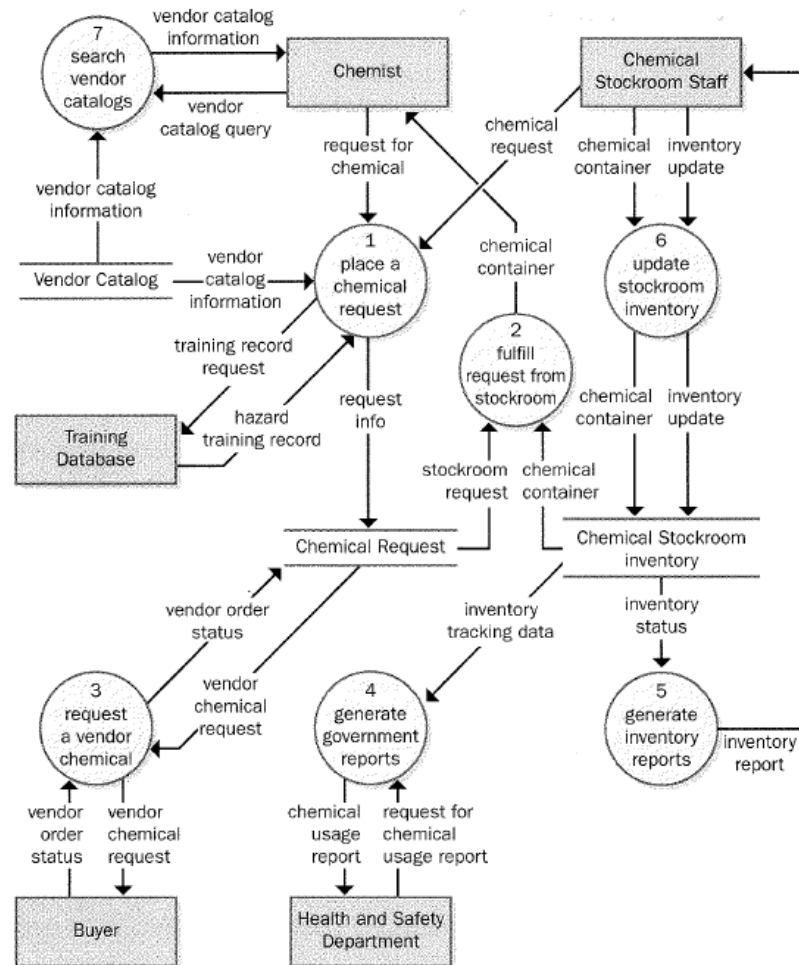


Figure 11-1 Level 0 data flow diagram for the Chemical Tracking System.

Entity-Relationship Diagram (Chen)

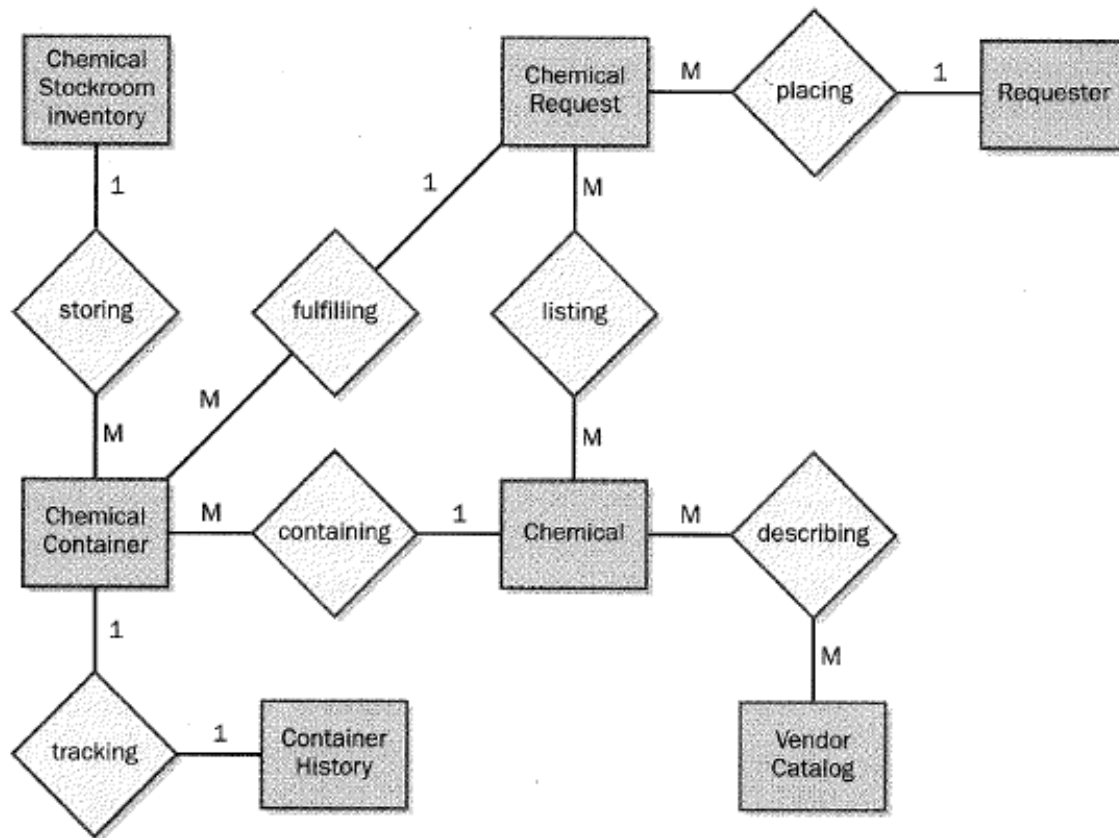
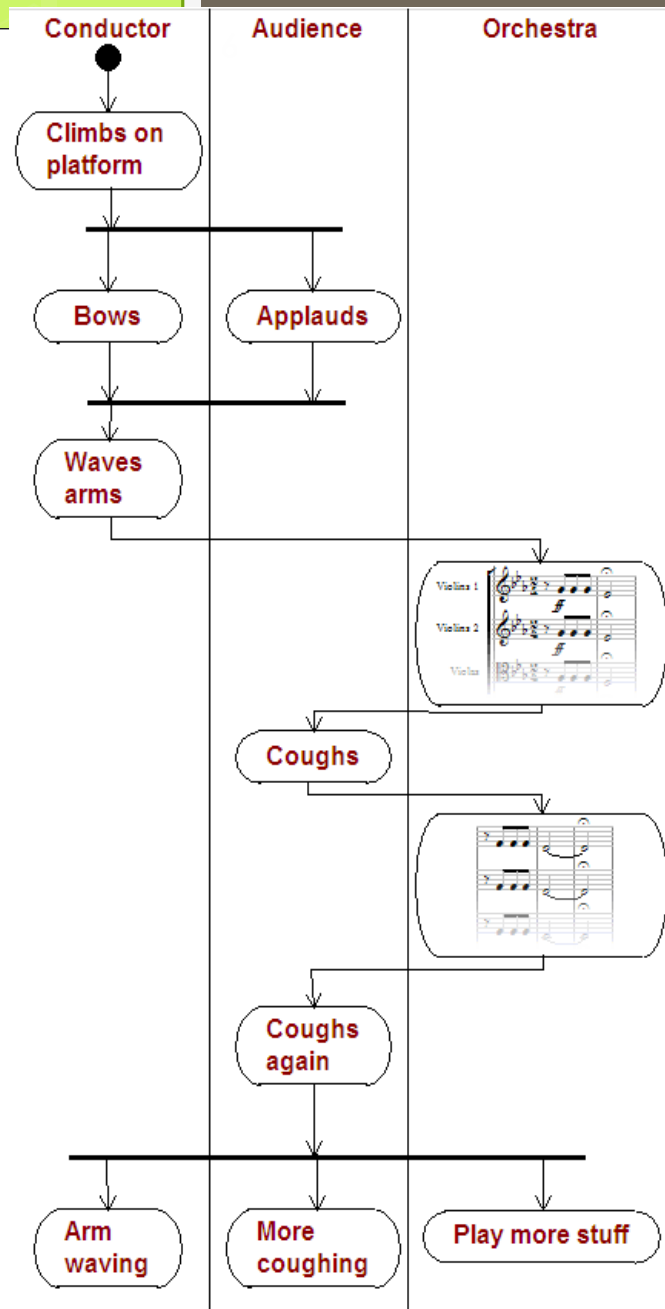


Figure 11-2 Partial entity-relationship diagram for the Chemical Tracking System.

Swimlane Diagram (UML Activity Diagram)



STATE TRANSITION Diagram

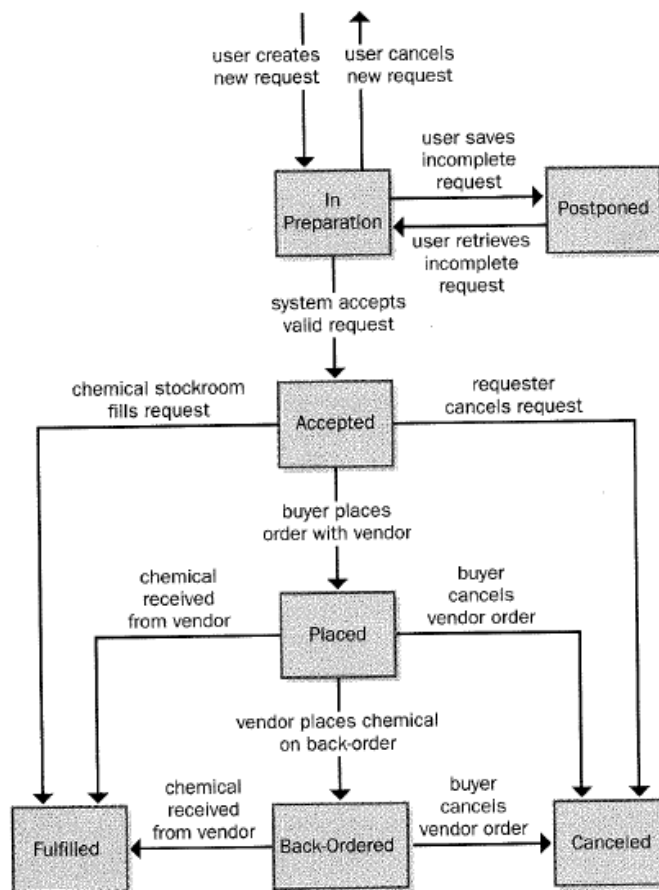


Figure 11-4 State-transition diagram for a chemical request in the Chemical Tracking System.

Dialog Map

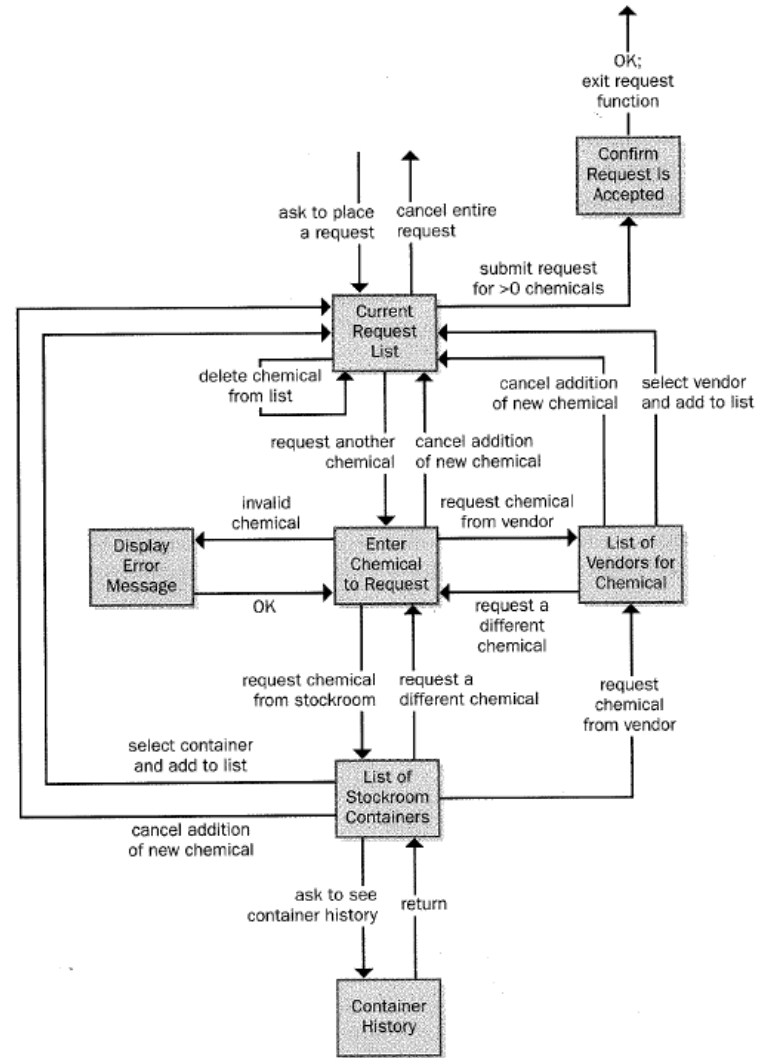


Figure 11-5 Dialog map for the "Request a Chemical" use case from the Chemical Tracking System.

Decision Tree

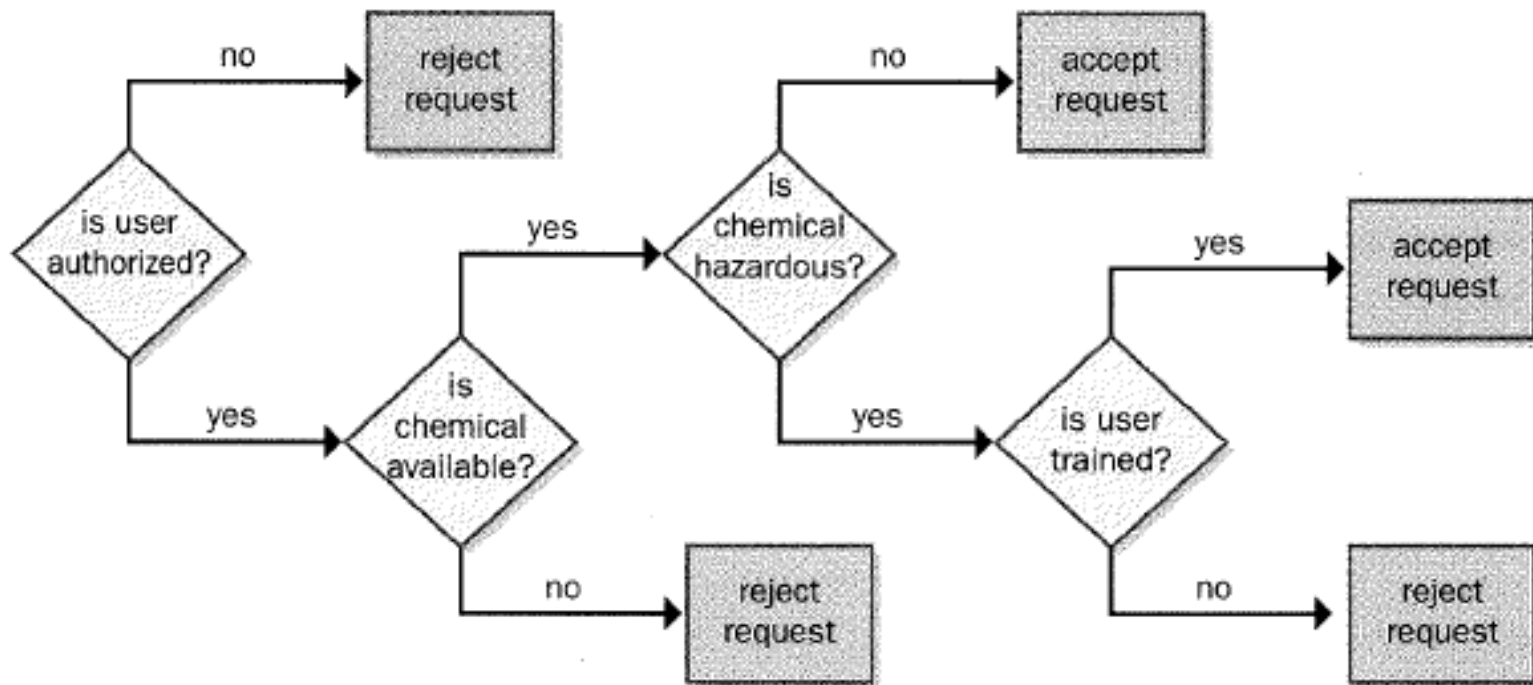


Figure 11-7 Sample decision tree for the Chemical Tracking System.



Decision Table

Requirement Number					
Condition	1	2	3	4	5
User is authorized	F	T	T	T	T
Chemical is available	—	F	T	T	T
Chemical is hazardous	—	—	F	T	T
Requester is trained	—	—	—	F	T
Action					
Accept request			X		X
Reject request	X	X		X	

FIGURE 12-6 Sample decision table for the Chemical Tracking System.

Event Response Table

Event-Response Table: Windshield Wipers

Event	System State	System Response
set wiper control to low speed	wiper off or wiper on high speed or wiper on intermittent	set wiper motor to low speed
set wiper control to high speed	wiper off or wiper on low speed or wiper on intermittent	set wiper motor to high speed
set wiper control set to off	wiper on high speed or wiper on low speed or wiper on intermittent	complete current wipe cycle; turn wiper motor off
set wiper control to intermittent	wiper off	read wipe time interval setting; initialize wipe timer
set wiper control to intermittent	wiper on high speed or wiper on low speed	read wipe time interval setting; complete current wipe cycle; initialize wipe timer
wipe time interval has passed since completing last cycle	wiper on intermittent	perform one low-speed wipe cycle
change intermittent wiper interval	wiper on intermittent	read wipe time interval setting; initialize wipe timer
change intermittent wiper interval	wiper off or wiper on high speed or wiper on low speed	no response
immediate wipe signal received	wiper off	perform one low-speed wipe cycle

UML

Standardized graphical language for visualizing, specifying, constructing, and documenting information about software-intensive systems.

History UML

UML 1.0 (1996) – 9 diagrams

UML 1.1, 1.2, 1.3, ...

UML 2.0 (2005) – 13 diagrams

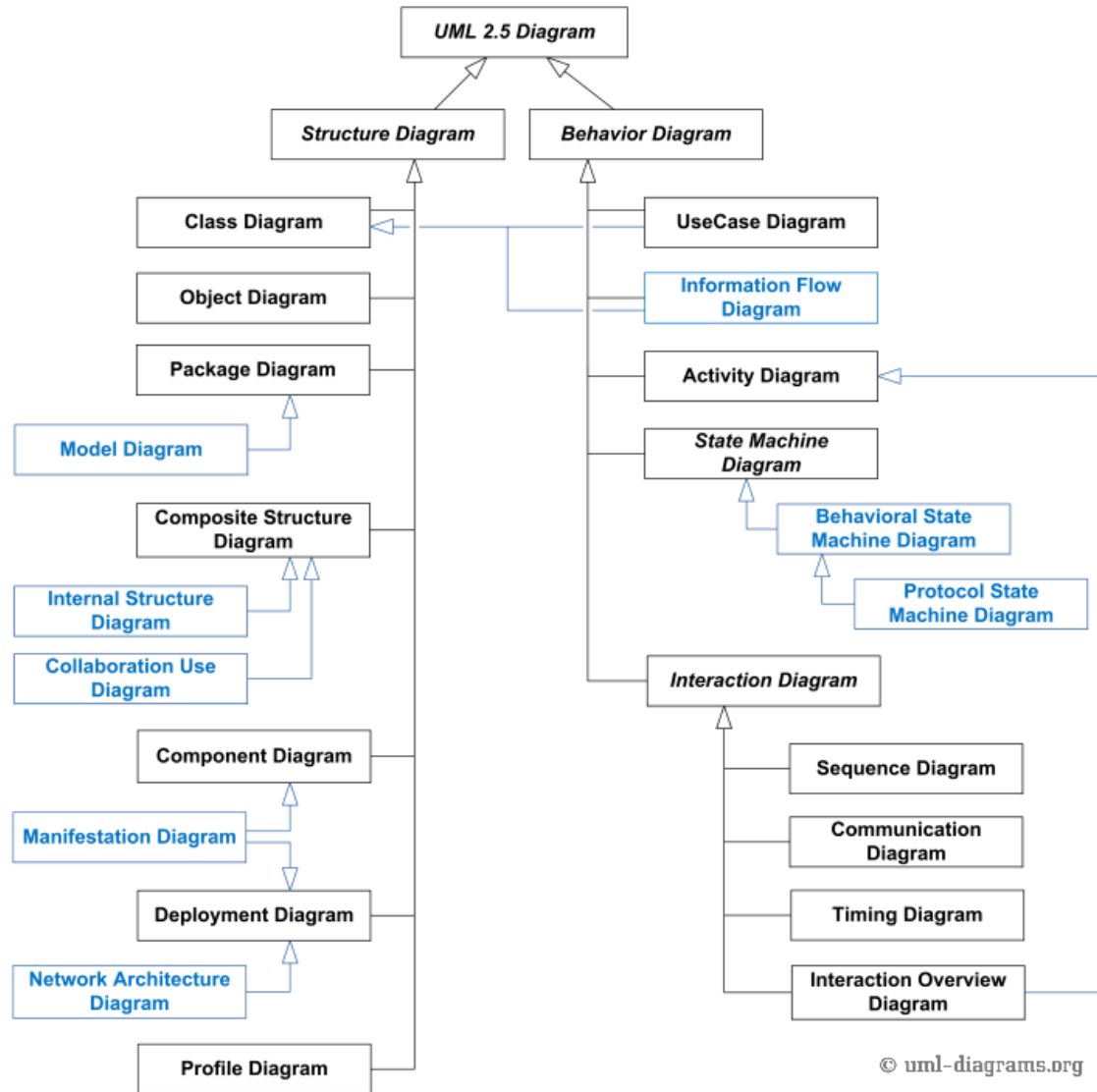
UML 2.5 (2015) – 14 diagrams

Structure versus Behavior

Structure – static structure of the system

Behavior – dynamic behavior, changes to the system over time





UML 2.5 Diagrams Overview.

Note, items in blue are not part of official taxonomy of UML 2.5 diagrams.