



**A picture is  
worth 1024  
words**

Chapter 12

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# Modeling

Modeling useful for:

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



# Context Diagram – Chemical Tracking System

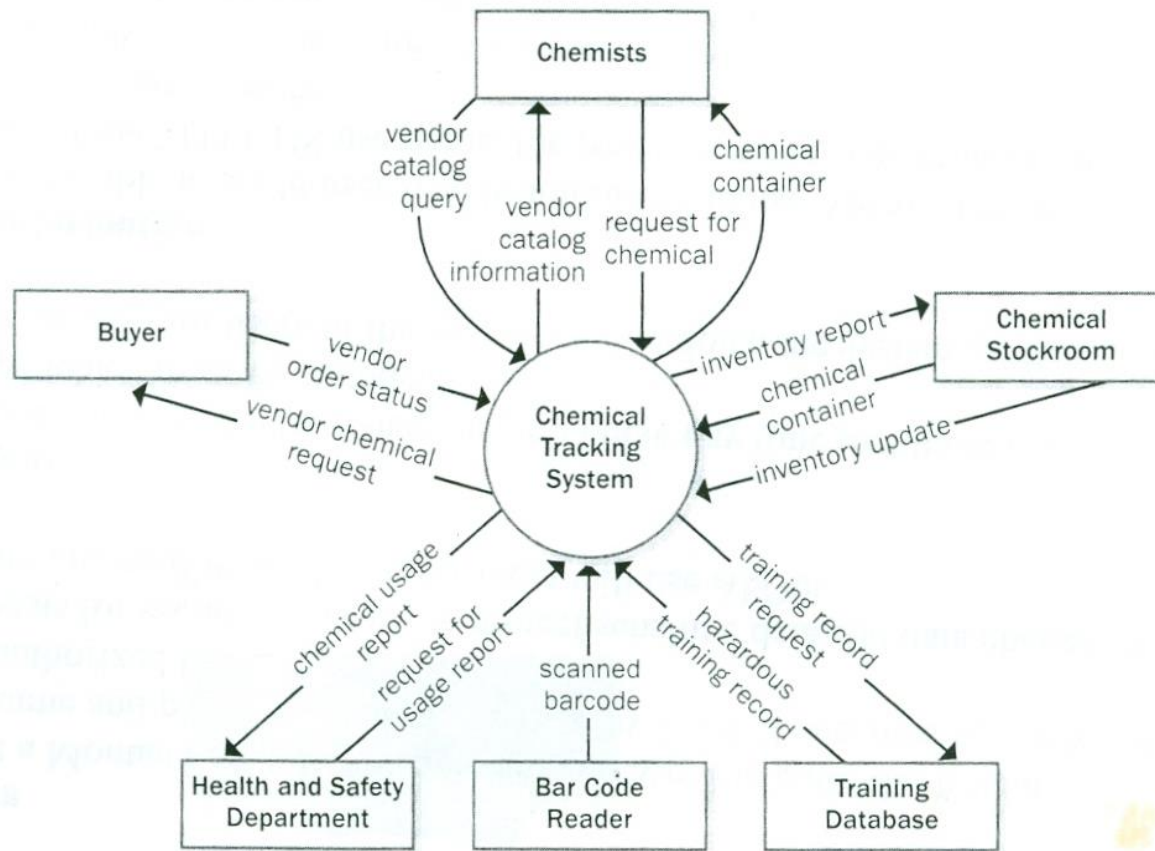


Figure 5-3 Context diagram for the Chemical Tracking System.



# Level 1 Data Flow Diagram

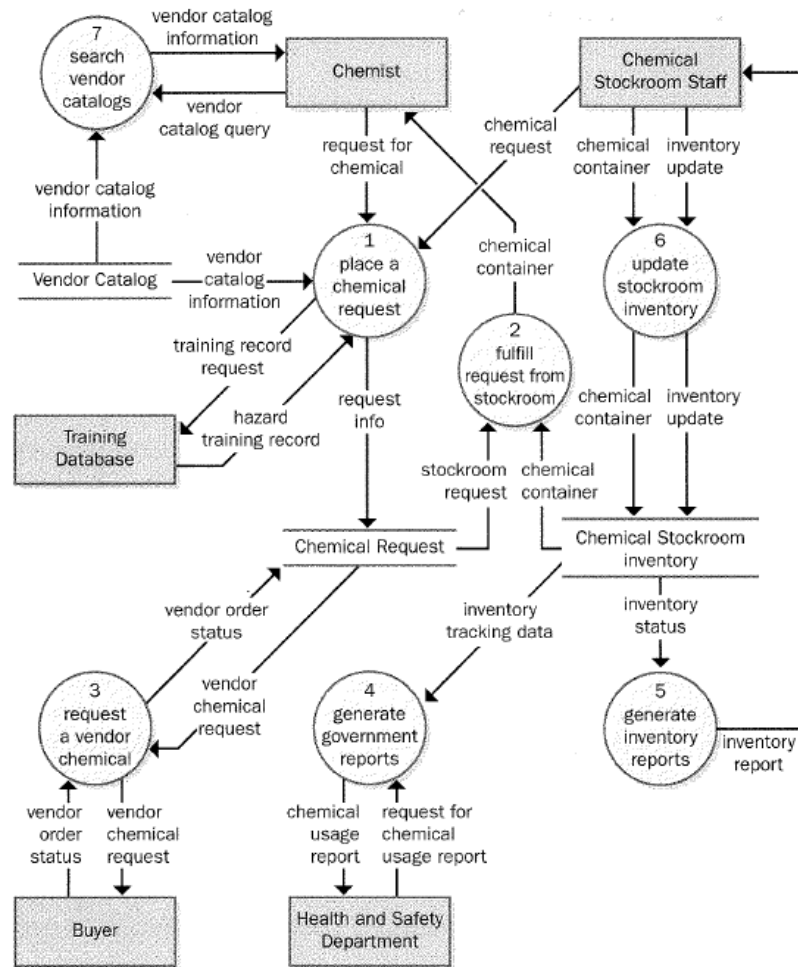
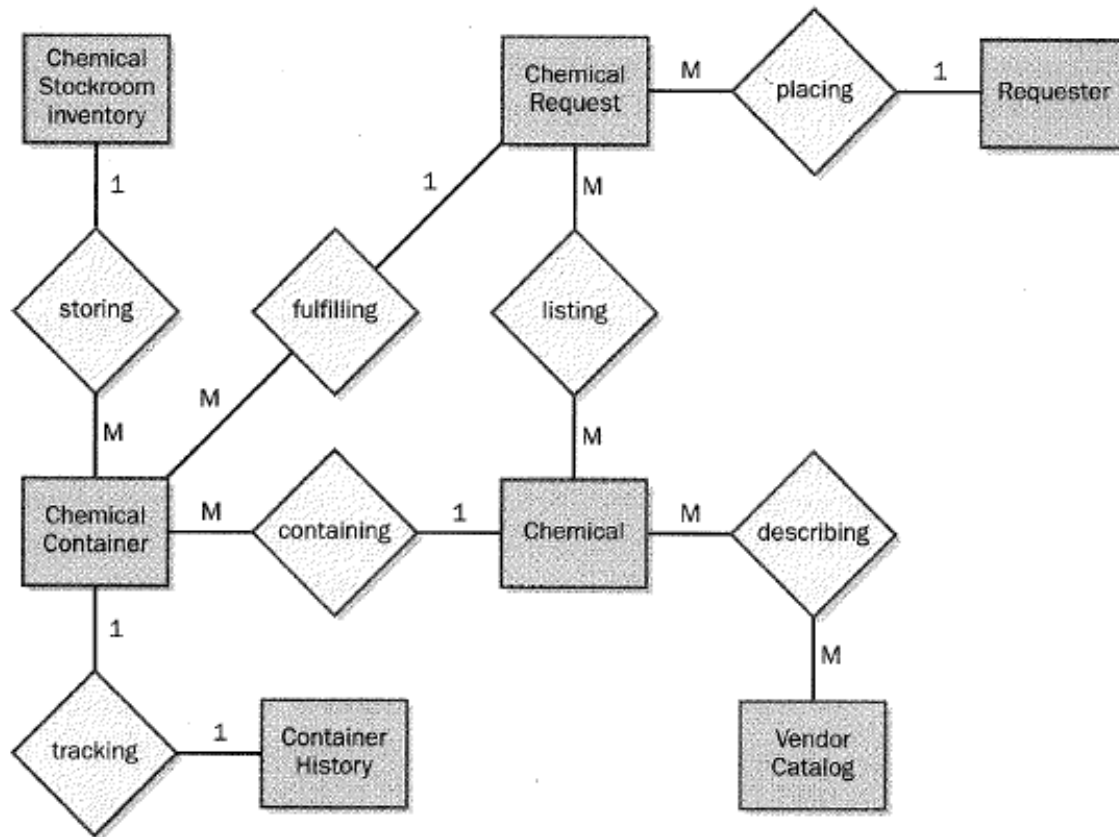


Figure 11-1 Level 0 data flow diagram for the Chemical Tracking System.



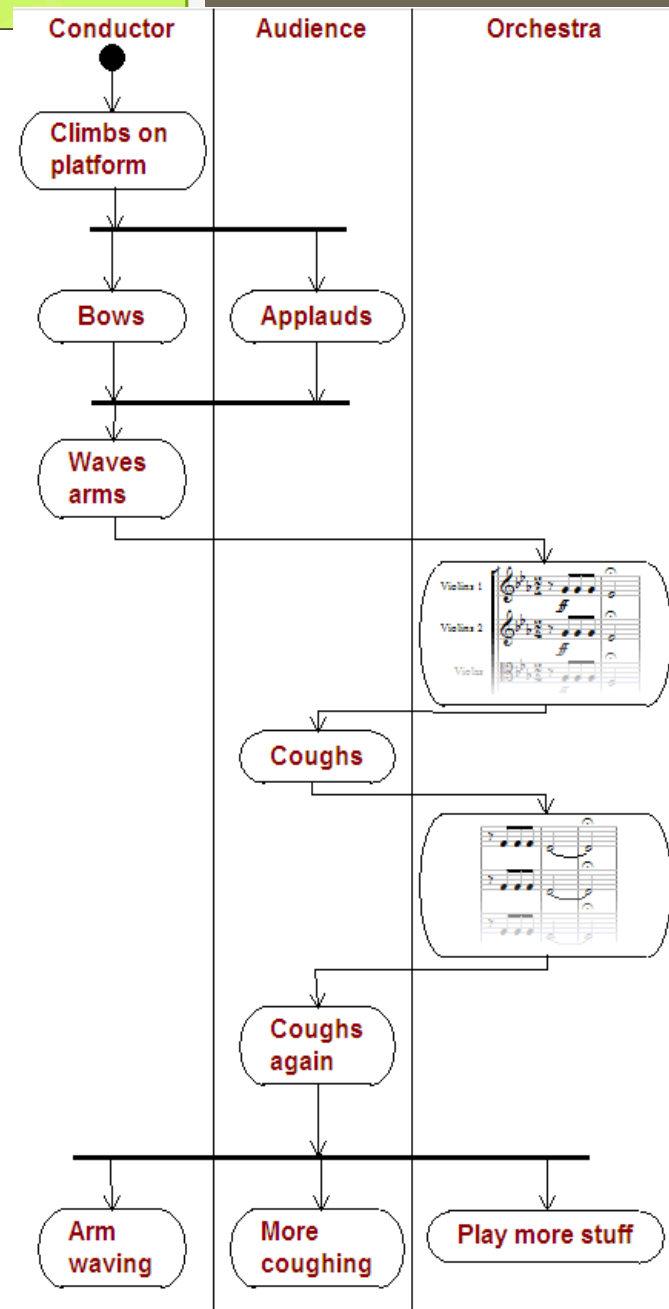
# Entity-Relationship Diagram (Chen)



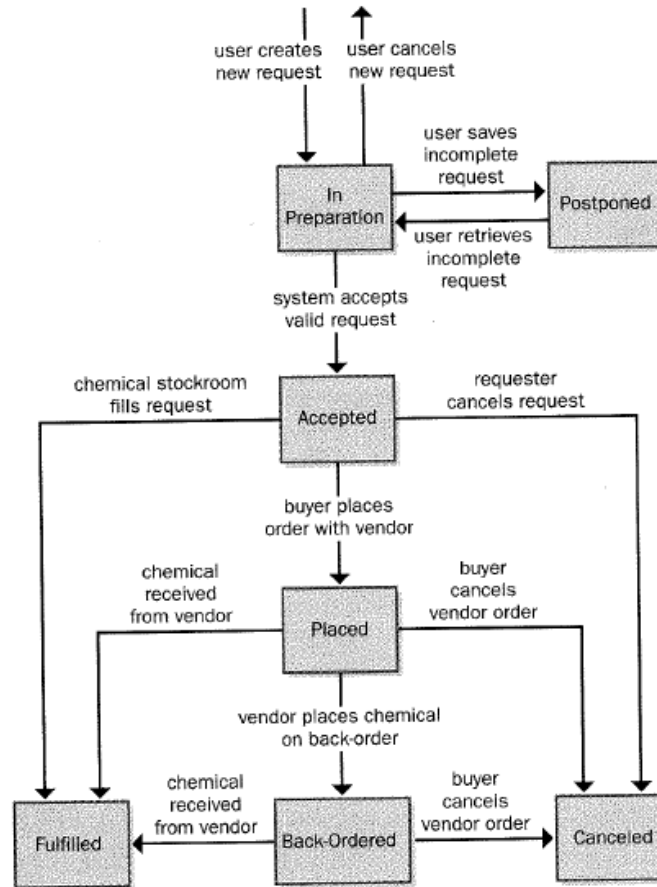
**Figure 11-2** Partial entity-relationship diagram for the Chemical Tracking System.



# 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

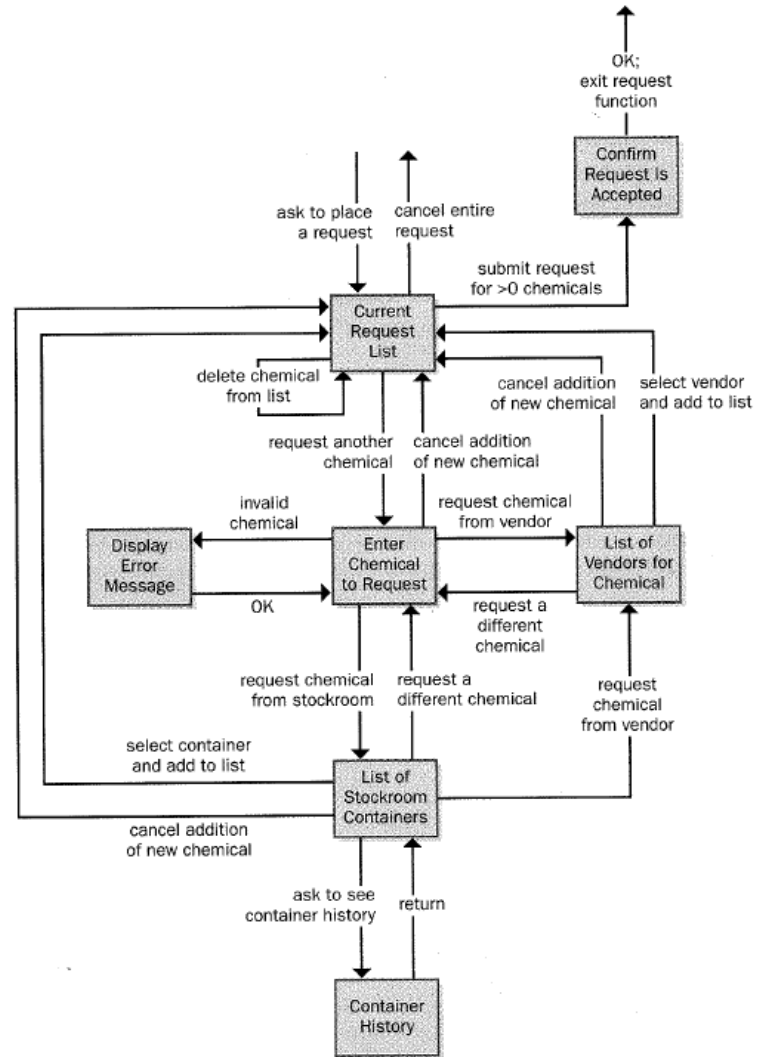
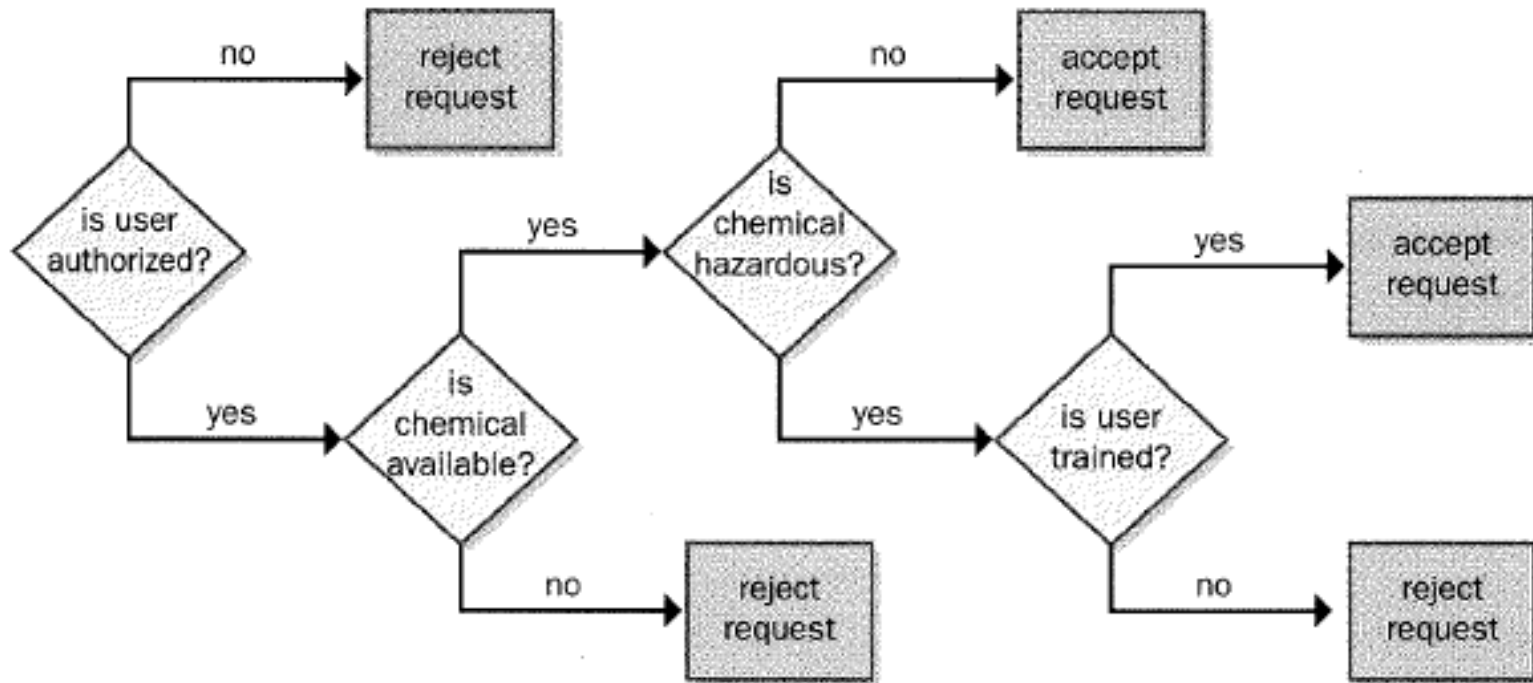


Figure 11-5 Dialog map for the "Request a Chemical" use case from the Chemical Tracking System.





# Decision Tree



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



# 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

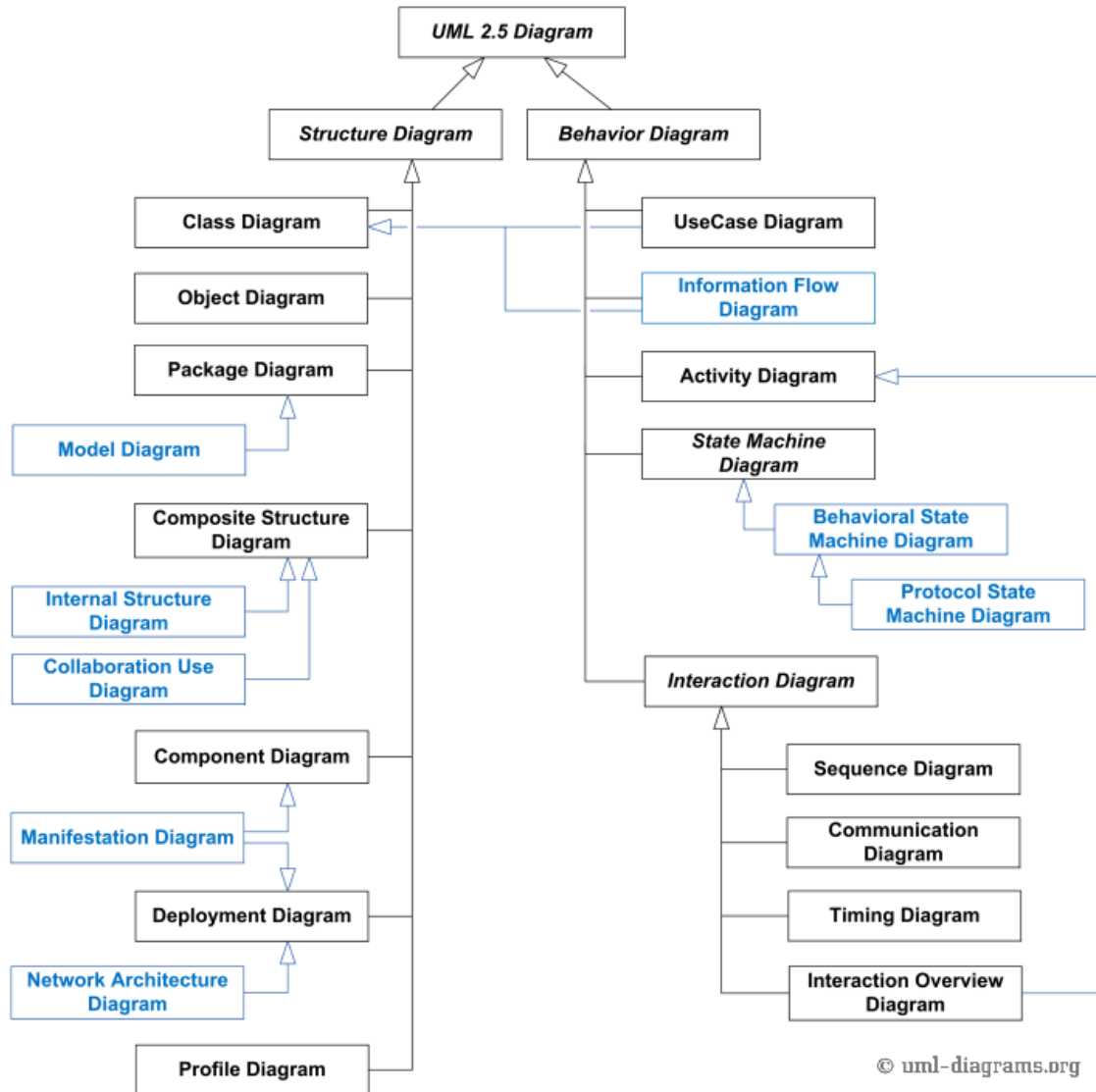


# Structure versus Behavior

Structure – static structure of the system

Behavior – dynamic behavior, changes to the system over time





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