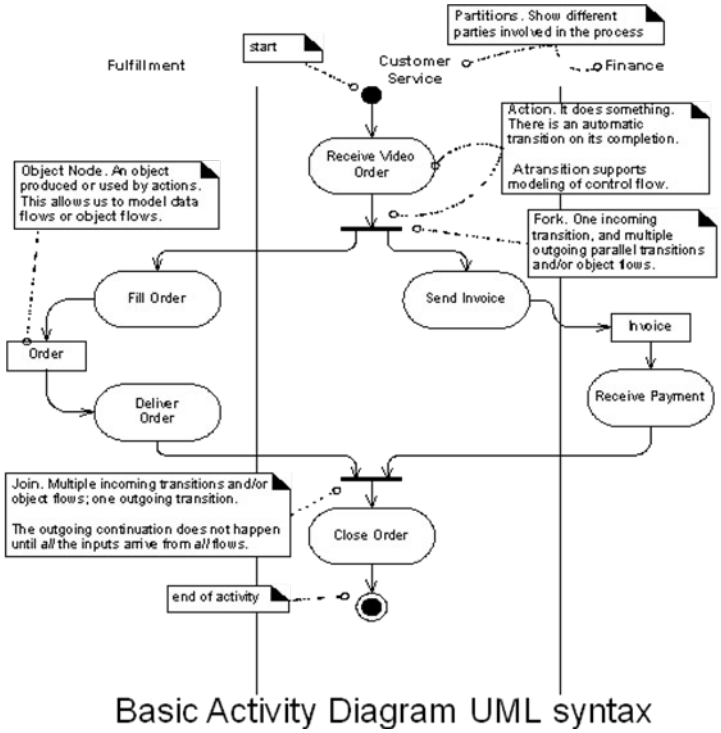
Chapter 27 – Iteration-3

The third iteration takes a border view again, exploring a verity of analysis and design topics, including:

- More GoF design patterns and their application to the design of frameworks; in particular, a persistence framework
- Architectural analysis and documenting
- Process modeling with UML activity diagrams
- Generalization and specialization
- The design of packages

Chapter 28 – UML ACTIVITY DIAGRAMS

- Activity Diagrams are basically modernized flowcharts/Data Flow Diagrams
- Biggest improvement is showing parallel activities
- Easy to understand
- Most underutilized UML model
- Used to model processes, workflows & complex UCs



Basic Activity Diagram UML syntax

Chapter 29 – STATE MACHINE DIAGRAMS

- Models an object's changes in state due to events (e.g., a message that changes it's state)
- Depicts states and transitions between states
- Depicts an object's lifecycle
- Typically used for objects with complex lifecycle

Event

- Significant or noteworthy occurrence

State

- Condition of an object at a moment in time

Transition

- Directed relationship between 2 connected states
- Labeled by an event
- When the event occurs, the object moves to the next state

Common Applications→

[1] Physical devices

[2] Transactions related to Business Objects

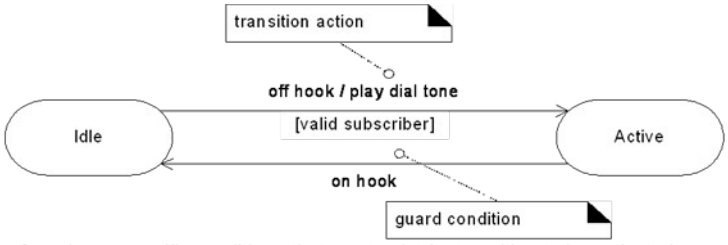
[3] Communication protocols

[4] Screen flow in GUIs

[5] Session management (server-side)

[6] Use Case operations (also handled by activity diagrams)

[7] UI event handling



Guards are specific conditions that must exist for transition to be activated

Chapter 30 – RELATING UCs

Include relationship

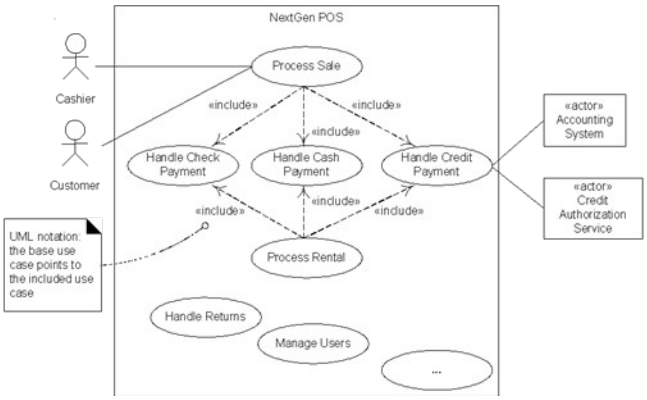
[1] Most common & most important
[2] Use it when you're repeating yourself across UCs
[3] Refactor duplicate UC triplets that occur in multiple UCs into separate UC
[4] Reuse refactored UC by 'including' it in those UCs where it is needed
[5] Similar to refactoring duplicate code into a method and calling the method
[6] Calling UC can hyperlink to included UC

Extend relationship

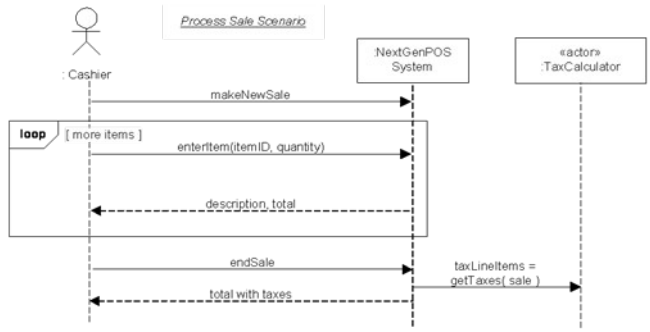
[1] A UC that extends or adds functionality to a base UC

[2] Very similar to inheritance

[3] Base UC does not reference extending UC



Chapter 31 – More SSDs and Contracts

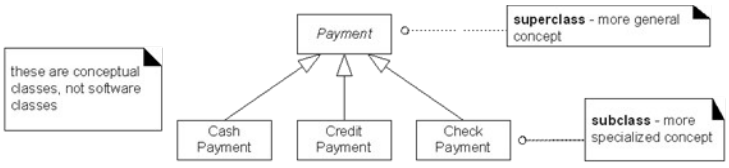


Note collaboration with TaxCalculator system

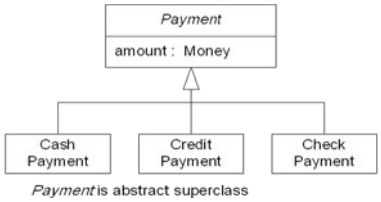
Chapter 32 – Domain Model Refinement

Need to refine domain model based on new reqs.

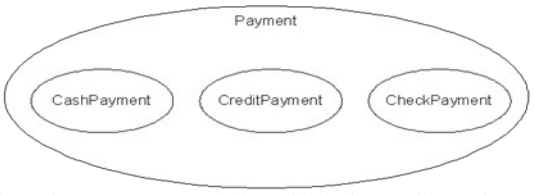
- Use concepts category list to suggest new domain classes
- Can also harvest nouns from revised Process Sale UC



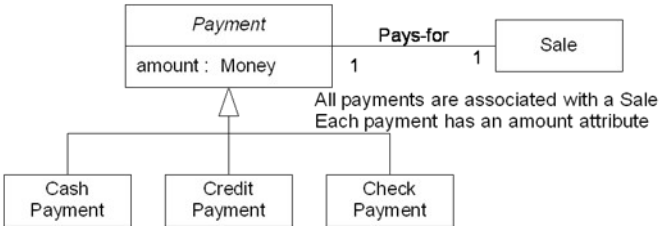
Use of Inheritance to group similar domain concepts



Payment is abstract superclass



Venn diagram representation of inheritance hierarchy



100% Rule→

100% of the superclass's definition should be applicable to each subclass, WRT

- Attributes
- Associations

Subclasses also inherit superclass methods but can override them

Define a subclass when

[1] Complies with the 100% rule

[2] Conforms to the 'is-a' set membership rule

Define a subclass when it has

[1] Additional attributes of interest

[2] Additional associations of interest

[3] Additional methods or overrides inherited methods

Define a superclass when subclasses

[1] Are variation of a single concept

[2] Conform to 100% Rule and 'Is-a'

[3] Have common attributes and/or associations that can be factored out into superclasses

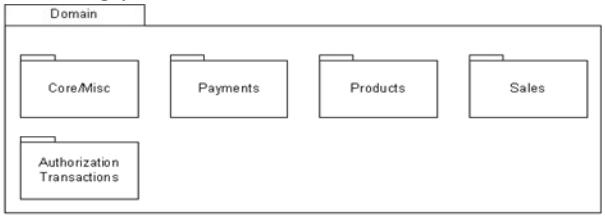
Classes should be in the same package when they …

[1] Are in the same subject area

[2] Are in same class hierarchy

[3] Participate in the same use cases

[4] Are strongly associated



Package diagram for NexGen POS