More Domain Model Refinement

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ROSE-HULMAN INSTITUTE OF TECHNOLOGY

Today’s Agenda

- Looking Ahead to finishing the term strong
  - Optional Final Exam
  - Design Studios
- More Domain Model Refinement

Final Exam

- 8:00am on Monday, Feb. 22nd
- Exam is *Optional*
  - If you don't take the exam, we'll use your first exam grade as your final exam grade
  - Sign-up for exam by Tuesday of 10th week
    - If you sign-up, you must take the exam
    - Taking the exam can improve or lower your grade

Design Studio: Project Focused

- A chance to get more help on your projects
- Participate in more active learning design sessions without taking more of your time
- Starting Thursday: 20 minutes sessions
  - ~5 minutes: team describes problem and current solution (if any)
  - ~3 minutes: class thinks about questions, alternative approaches
  - ~12 minutes: on-board design with team modeling and instructor advising/facilitating

Suggestions for Design Studio Topics

- Look for problems where there are lots of “which class should be responsible for X” questions

- Challenging design problems you’ve already faced and how you solved them

- Current design problems that you haven't solved yet

- Future extensions that will need to be considered

Design Studio Sign-up

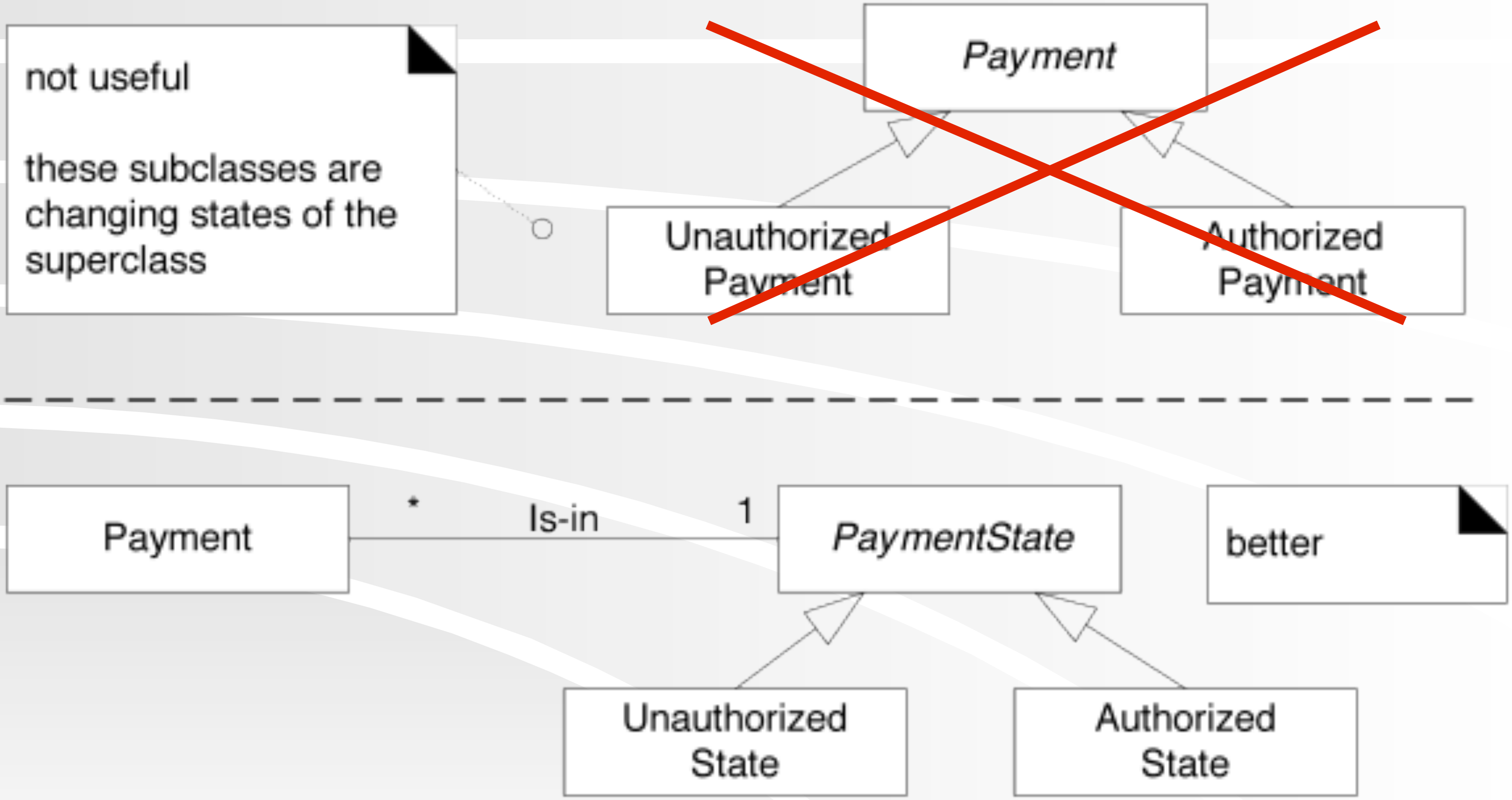
	Monday	Tuesday	Thursday
8th week	Yesterday	Today	T11
9th week	T16	T12	T13
10th week	T15	T14	Course Wrap-up

More on Domain Modeling

Modeling Changing States

- Suppose a concept X has multiple states
  - Draft vs. Sent Email
  - Purchase Request vs. Purchase Order
- Do not model the states as subclasses of X!
- Instead:
  - Define a State hierarchy and associate X with State or,
  - Ignore showing the states in the domain model

State Example



not useful

these subclasses are changing states of the superclass

better

Association Classes: Consider…

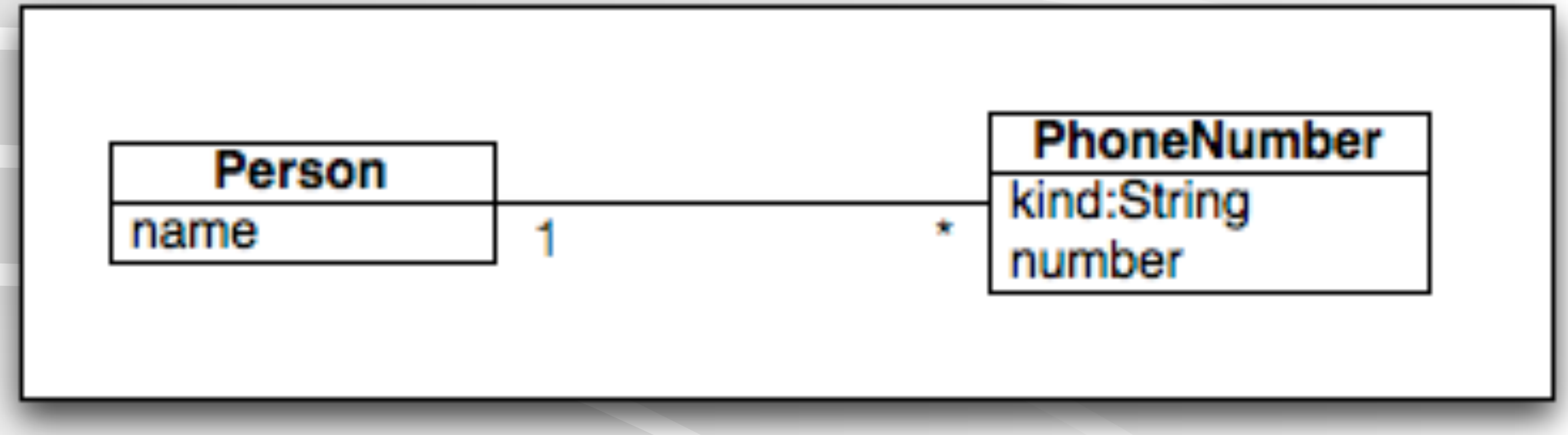
In NextGen POS:

- Authorization Services assign a *merchant ID* to each store
- Payment Authorization Request from store to service must use the *merchant ID*
- A store has a different *merchant ID* for each service

Where should the *merchant ID* appear in the domain model?

Guideline

If a class C can simultaneously have many values for the same attribute A, put A in another class associated with C



Guideline

Association class might be useful in a domain model if:

- The association has a related attribute
- Instances of the association class can only last as long as the association does
- There is a many-to-many association between two concepts and information is needed to distinguish the pairs

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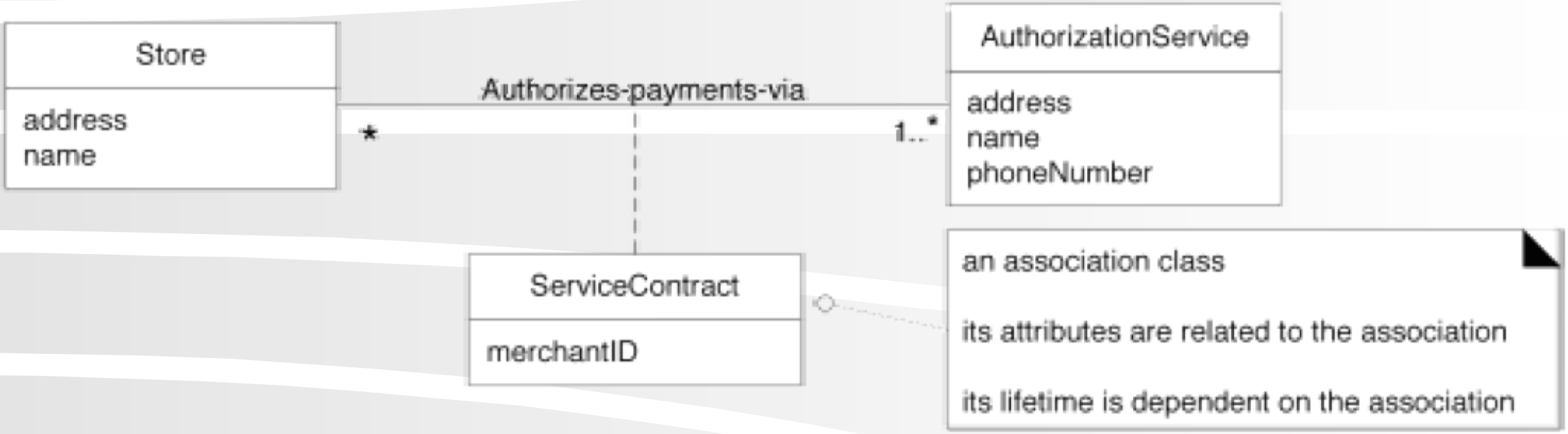
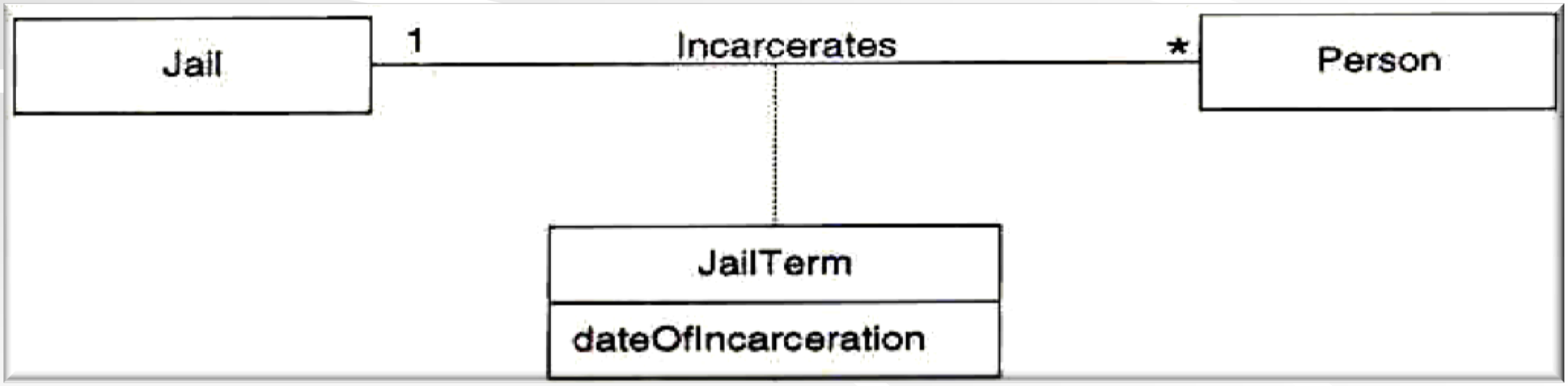
Association Class Examples



an association class

its attributes are related to the association

its lifetime is dependent on the association



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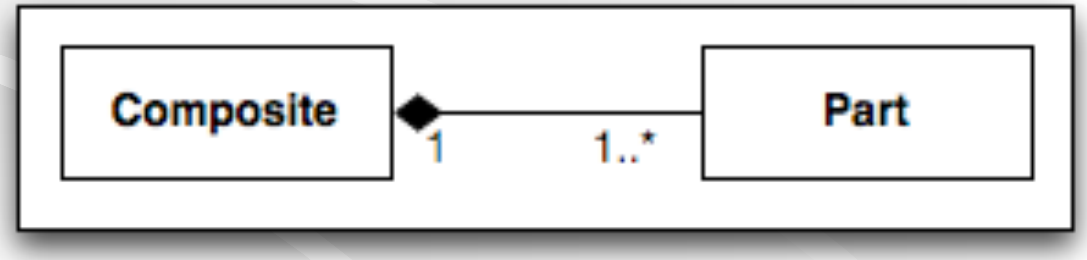
Recall, Composition

A composition relationship implies:

- An instance of the part belongs to only *one* composite instance at a time
- The part must *always belong* to a composite
- The composite is responsible for creating/deleting the parts



Not to be confused with the composite pattern, which is similar. (sigh)

Composition in Domain Models

- Guideline: If in doubt, leave it out.

- But, consider showing composition when:
  - Lifetime of part is bounded within lifetime of composite
  - An obvious whole-part physical assembly exists
  - Composite properties propagate to the parts
  - Composite operations propagate to the parts

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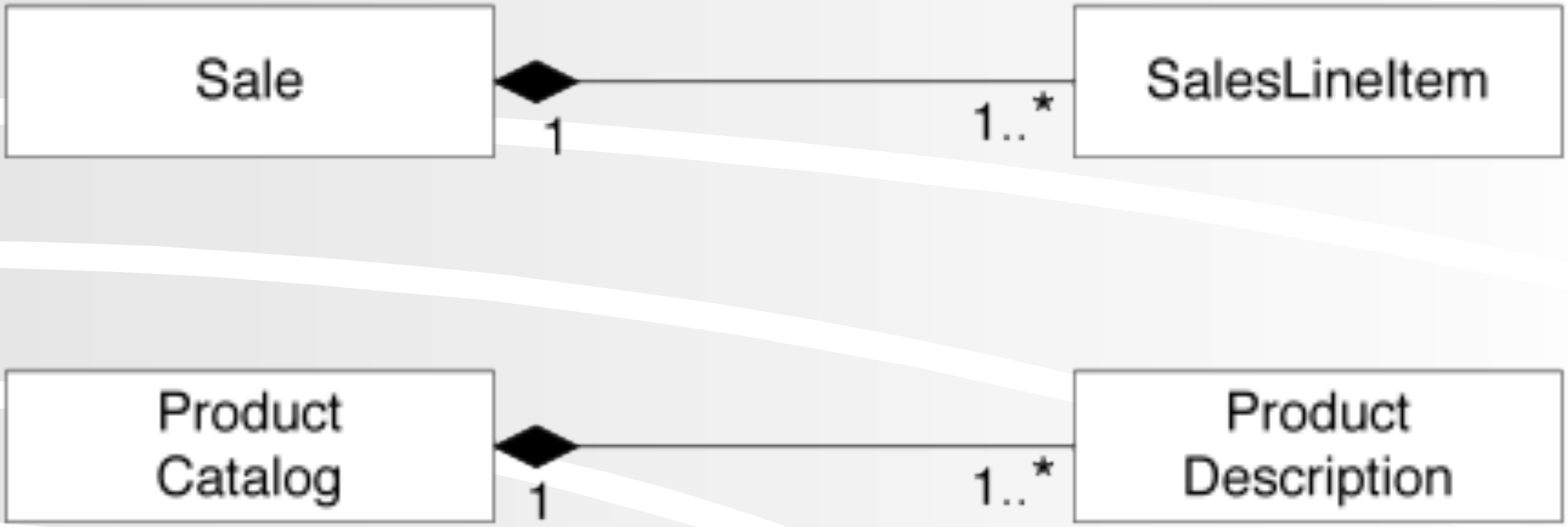
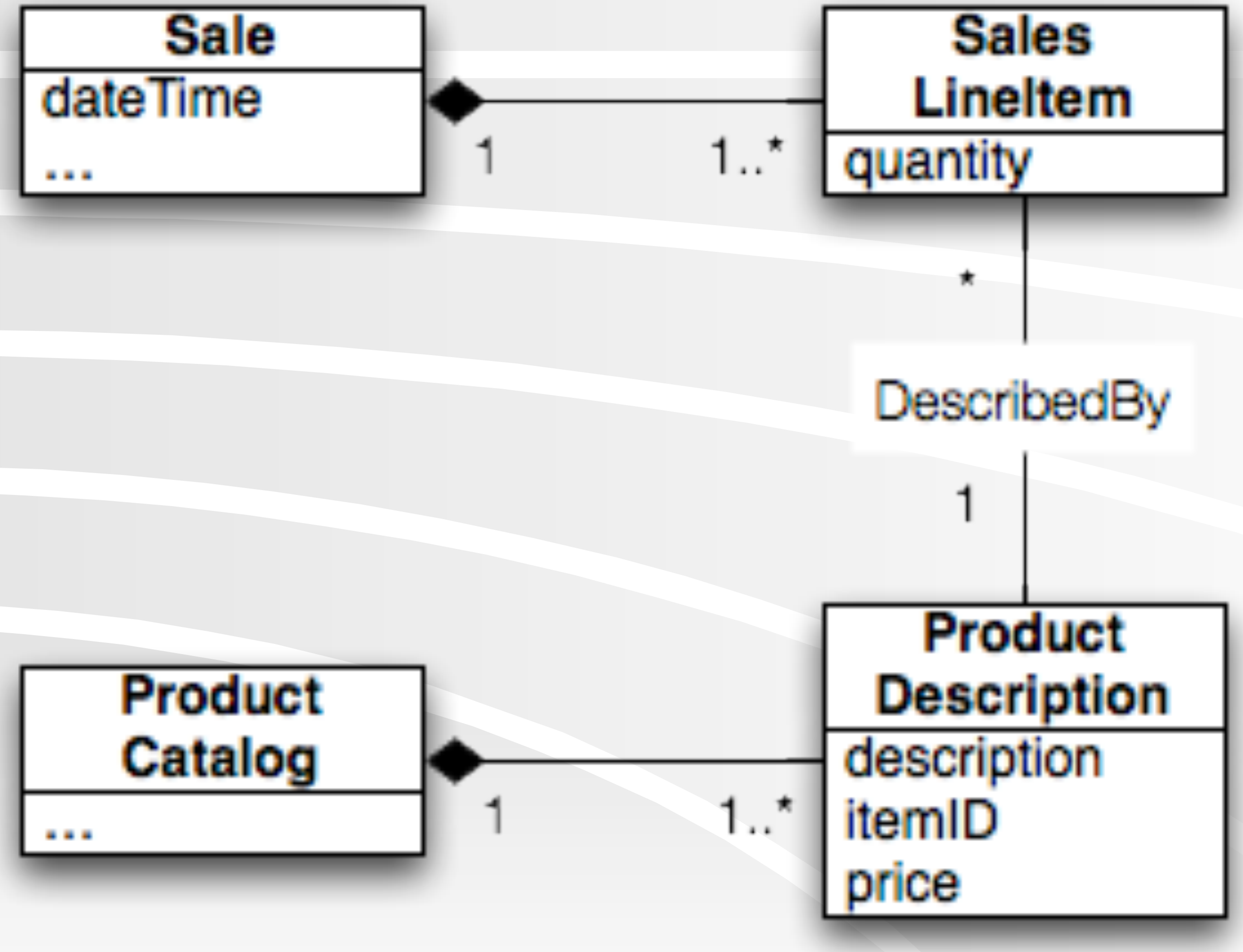
Composition in NextGen Domain Model

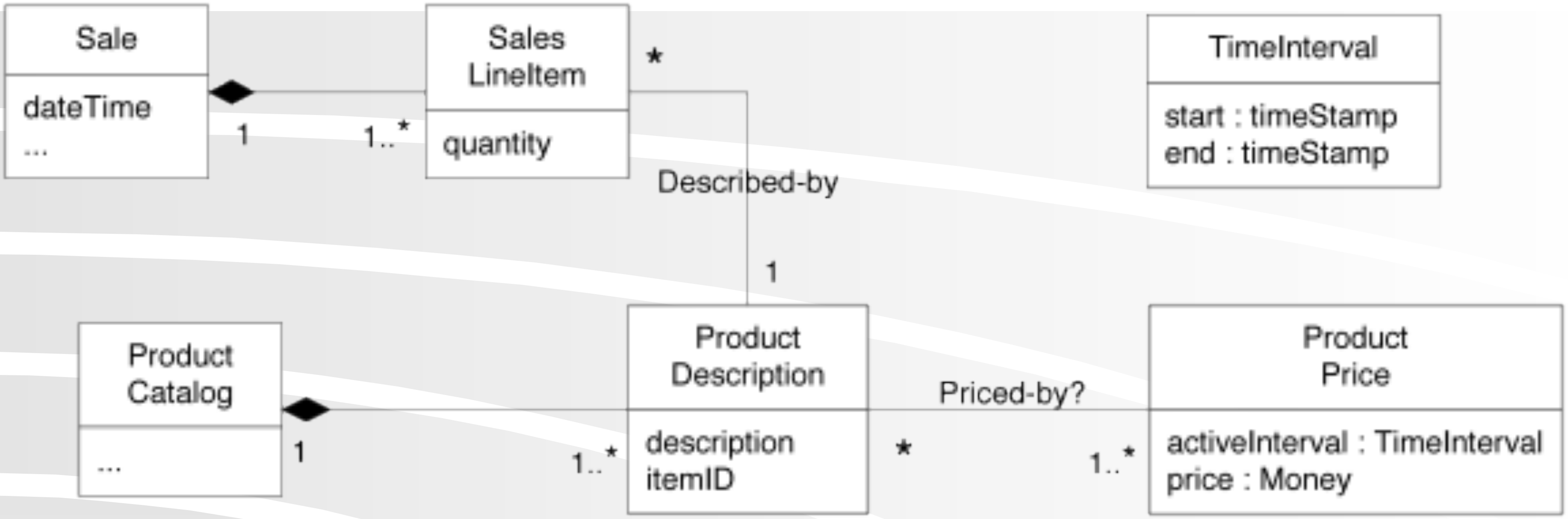


Problem: What happens to old Sales when a product's price changes?



Solutions?

Time Intervals



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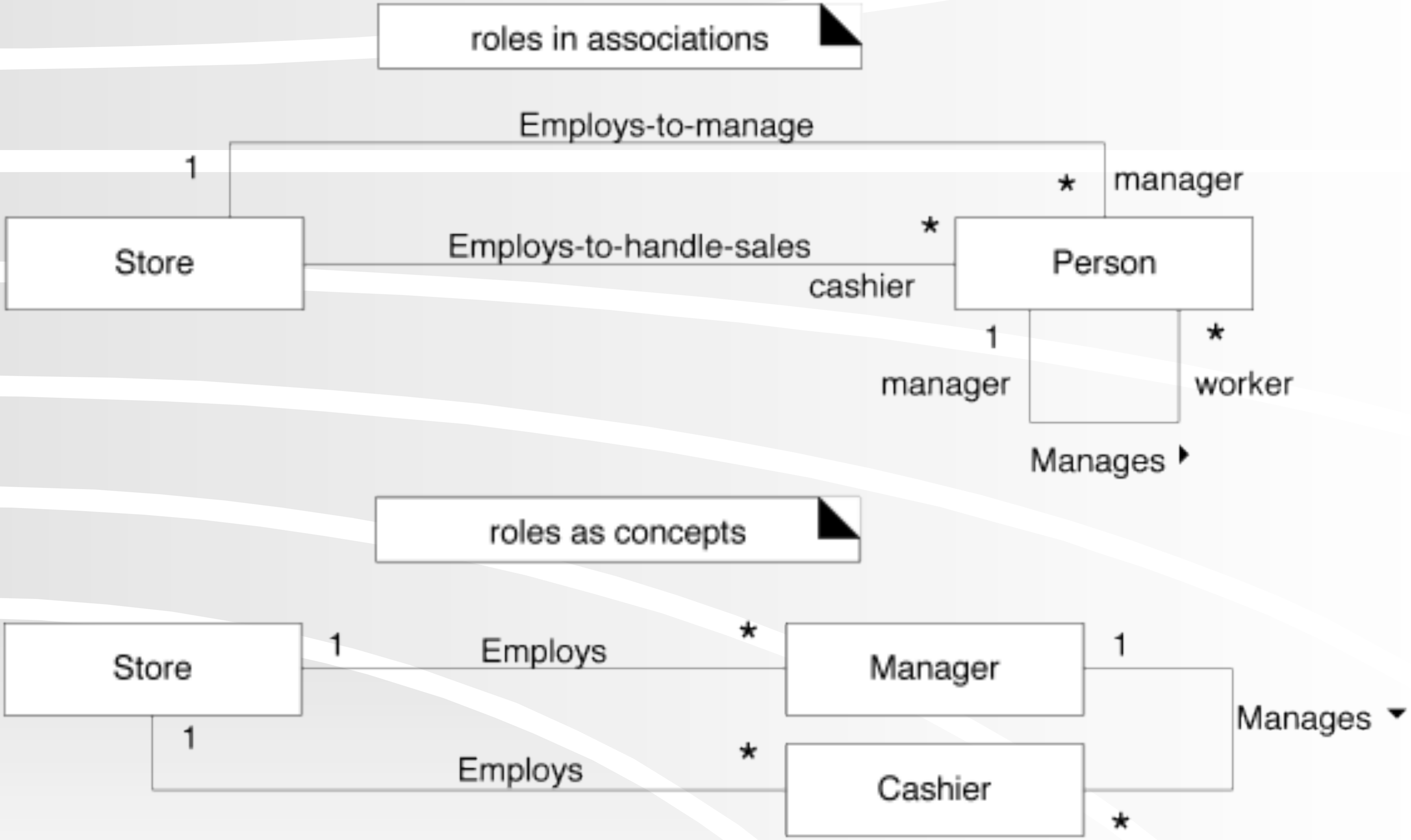
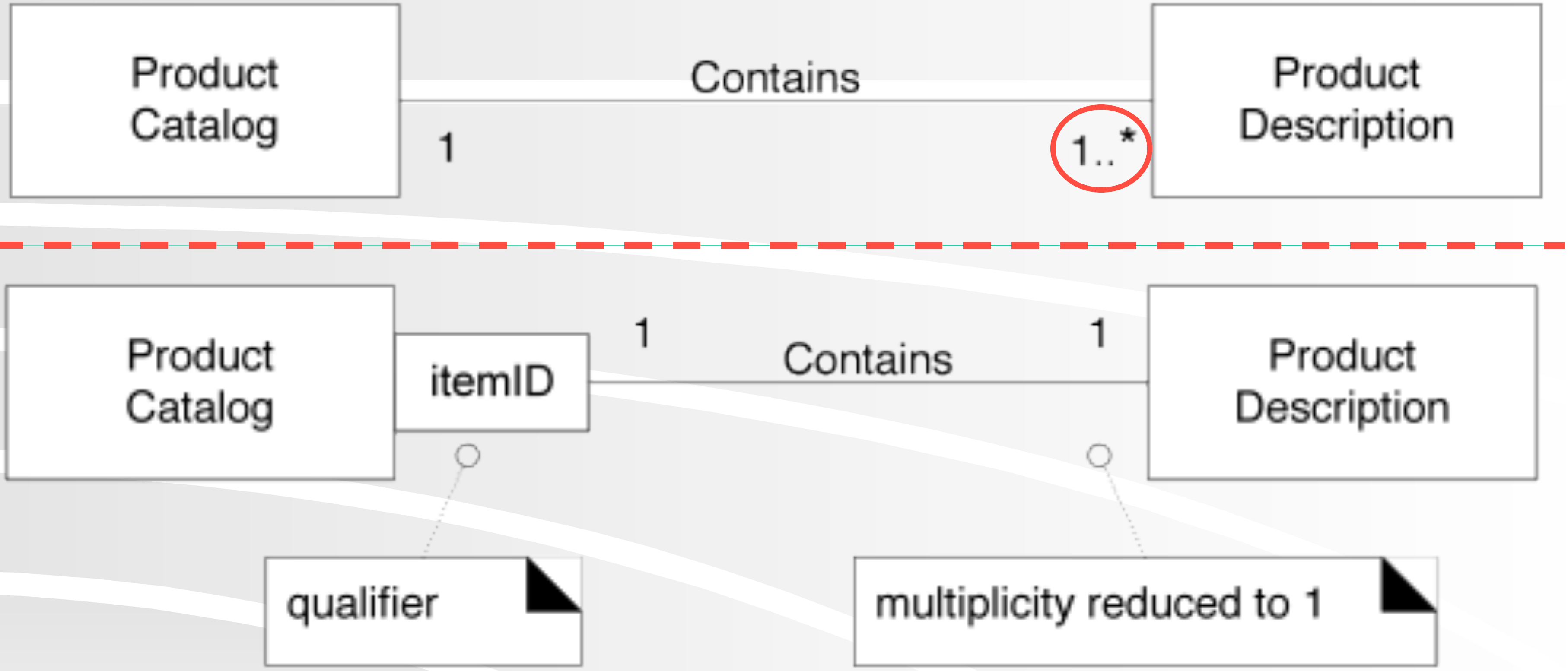
Rolls…

Er, Roles…



Pros and cons?

Qualified Associations



Don't overdo it…

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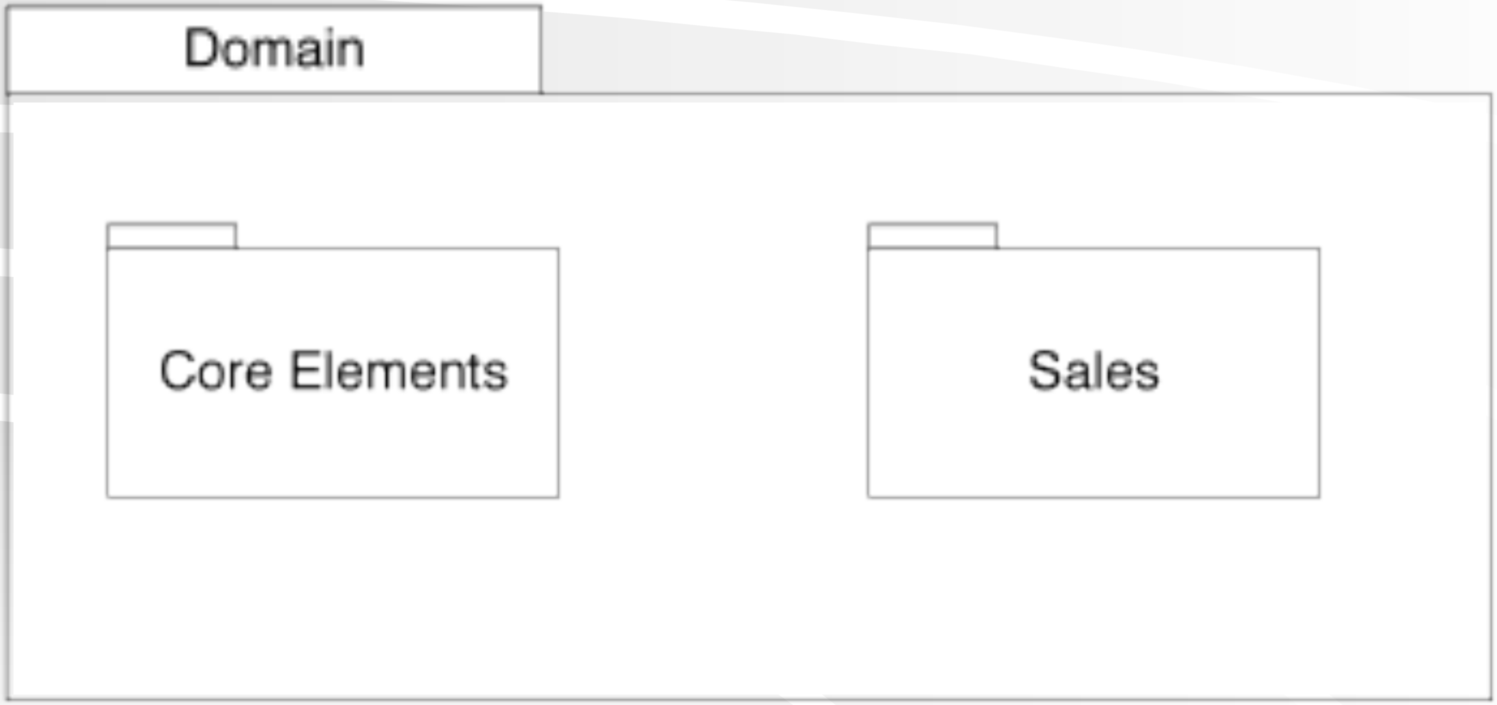
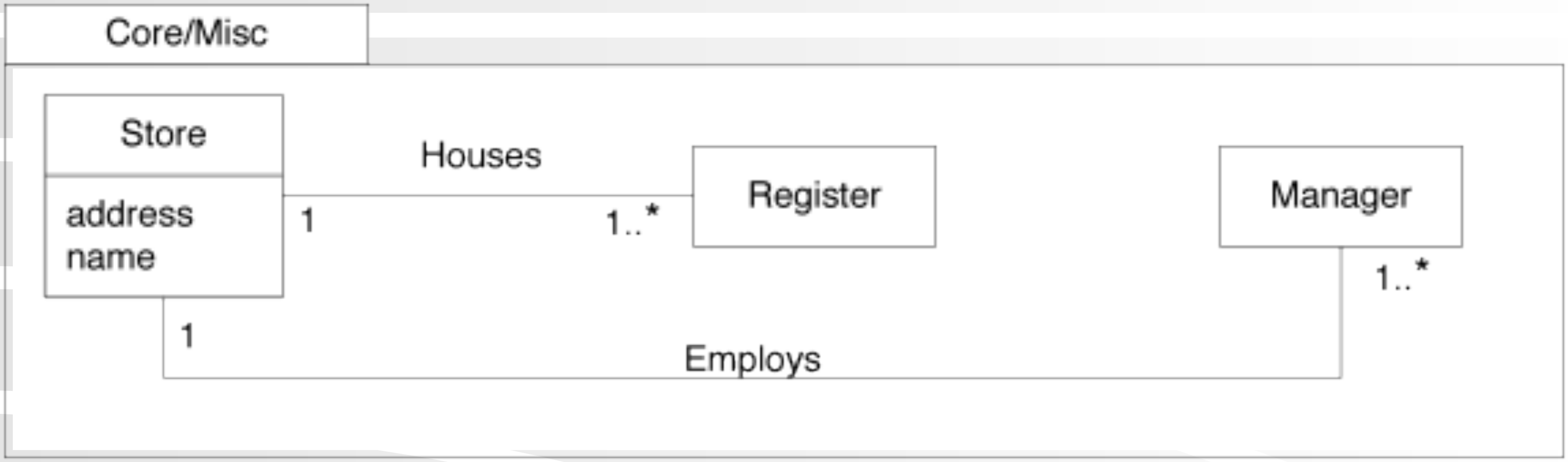
Splitting Domain Model into Packages

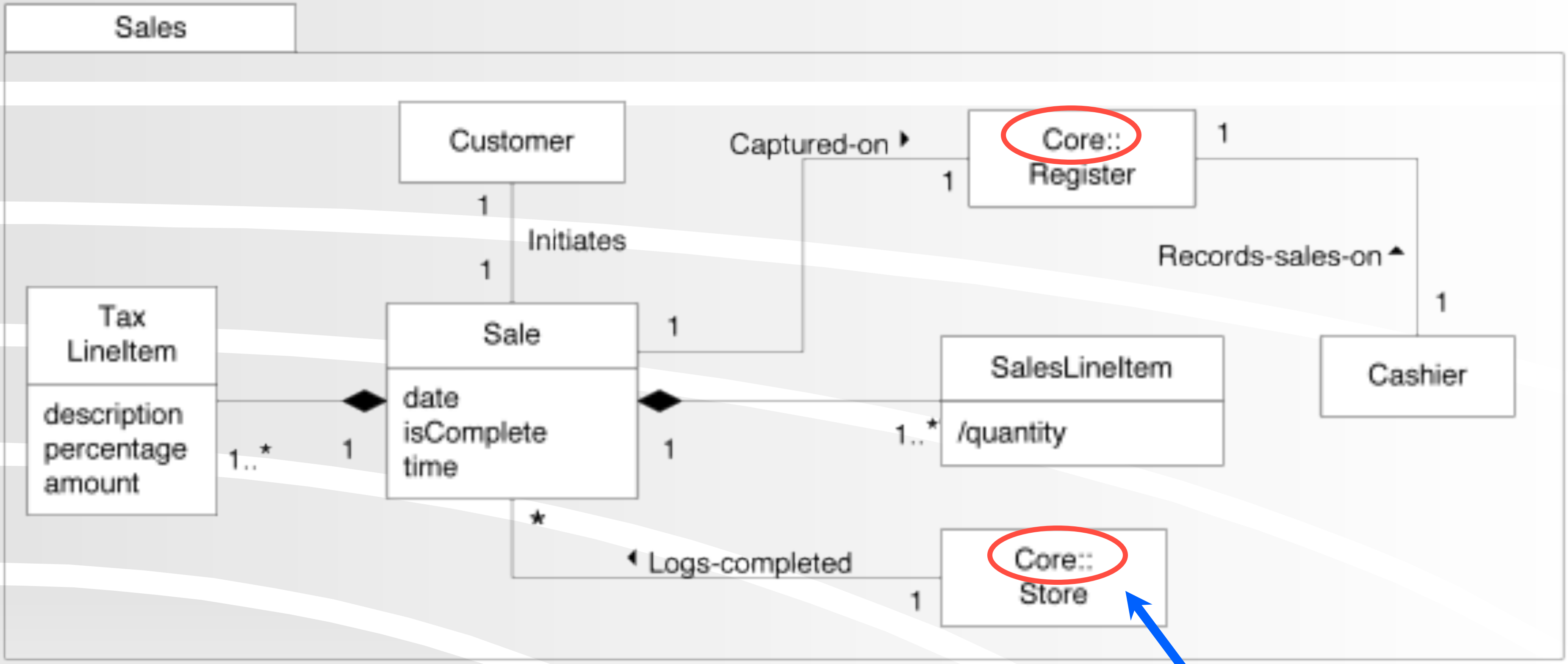
- Supports parallel analysis work
- NextGen POS example:



NextGen POS Core Package



NextGen POS Sales Package with Assocations from Core Package



Store is “owned” by Core package, but also shown here to illustrate associations

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If Domain is big enough to partition into packages, Group conceptual Classes that:

- Are in the same subject area
- Are in the same class hierarchy
- Participate in the same use cases
- Are strongly associated

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Homework and Milestone Reminders

- Read Chapters 32 and 33
- Homework 7– Gang of Four (GoF) Patterns on Video Store Design
  - Due by 5:00pm Tuesday, February 2nd, 2010
- Milestone 5– Iteration 3 Junior Project System with finalized Design Document
  - Due by 11:59pm Friday, February 19th, 2010.