



Streamlined Object Modeling Patterns, Rules, And Implementation

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The Pattern Players

People	Actor
	Role
Places	Place & OuterPlace
Things	Item & Specific Item
	Assembly & Part
	Container & Content
	Group & Member
Events	Transaction
	Composite Transaction & Line Item
	Follow-up Transaction



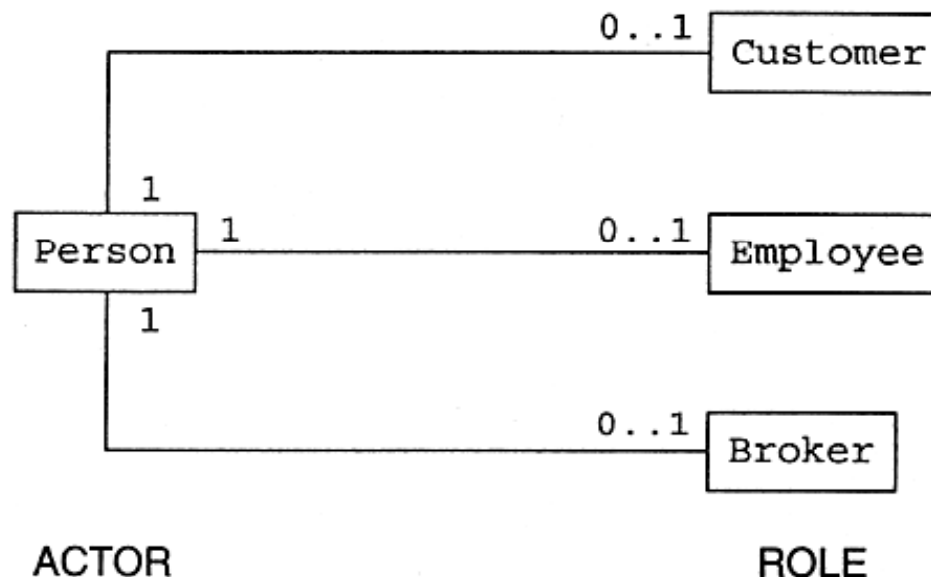


Actor - Role

- An actor can know about multiple roles, but can take on only one of each kind. The actor is responsible for knowing information-properties, services, and collaborations-that is relevant across all contexts.

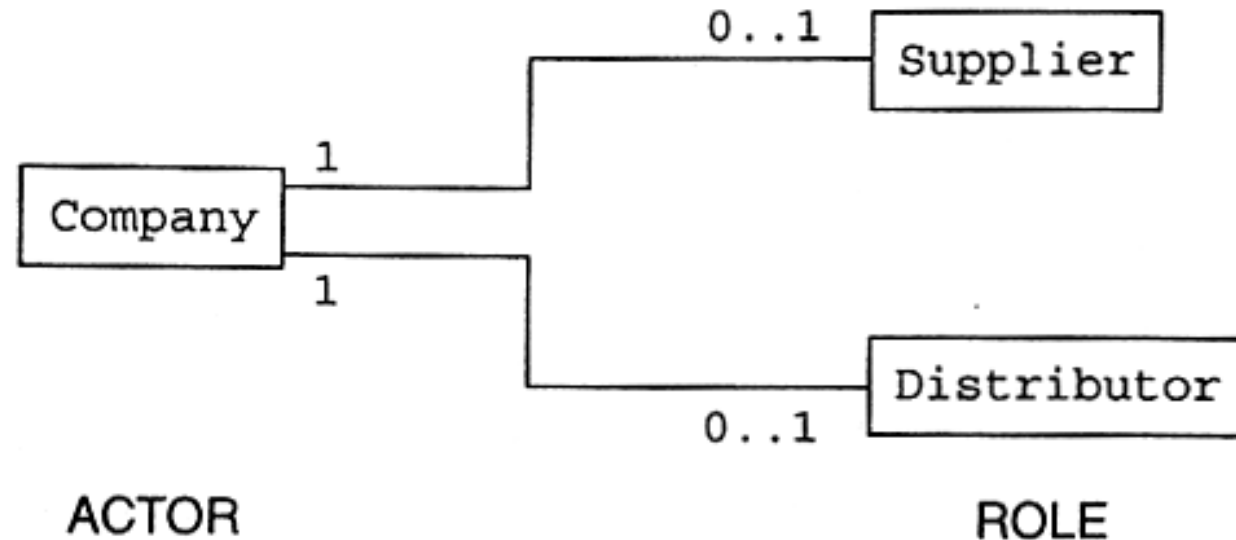
Actor - Role

- EXAMPLE - An e-commerce startup tracks people who are customers, employees, and brokers. A person (actor) can play multiple roles, but can only take on at most one customer role, one employee role, and one broker role.



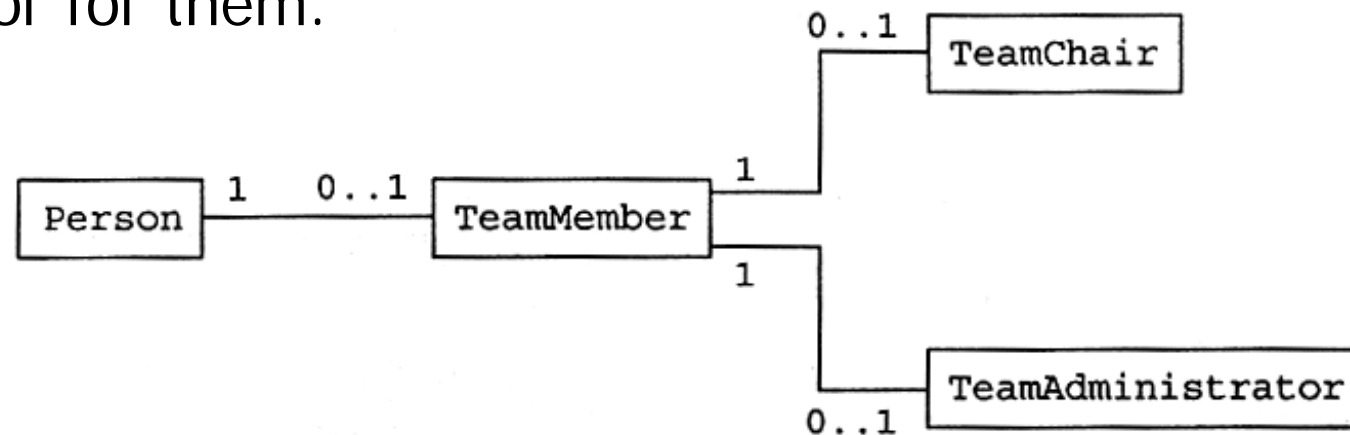
Role Responsibilities

- EXAMPLE-In a supply-chain application, a company can be both a supplier of goods and services and a distributor that buys from suppliers



Role serves double duty as an actor for another role?

- EXAMPLE - A project team collaborates online. Within the team there are specialized roles: administrators and team chairs. Since these additional roles are on top of team membership, the team member role becomes the actor for them.



ACTOR

ROLE

ACTOR

ROLE



Outer Place - Place

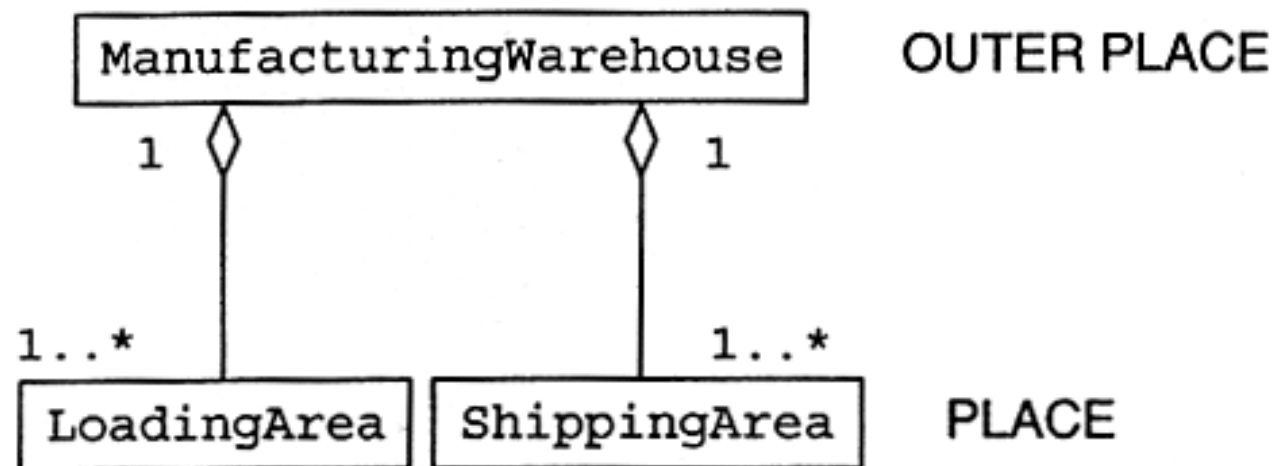


Outer Place - Place

- The outer place - place pattern models locations where interactions between people and things happen. This pattern models a location for interactions with two types of objects - one describing the event location (place), and an optional second object (outer place) when the location is hierarchical.

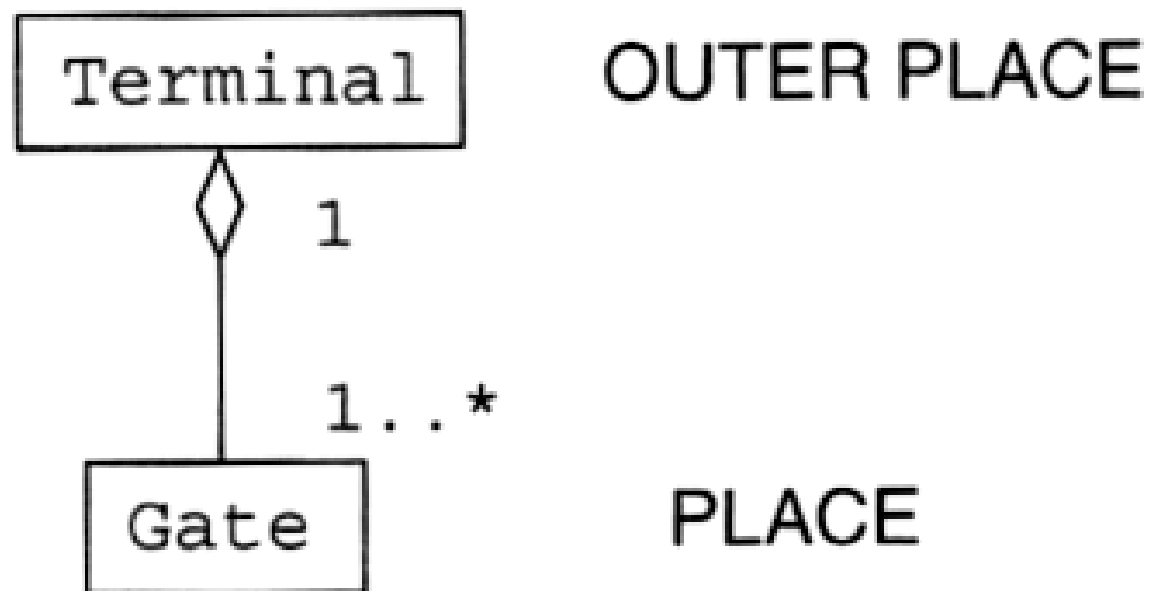
Outer Place Responsibilities

- An outer place knows at least one place, and serves as the container of its places.
- EXAMPLE - A manufacturing warehouse receives deliveries in its loading areas and dispenses shipments from its shipping areas.



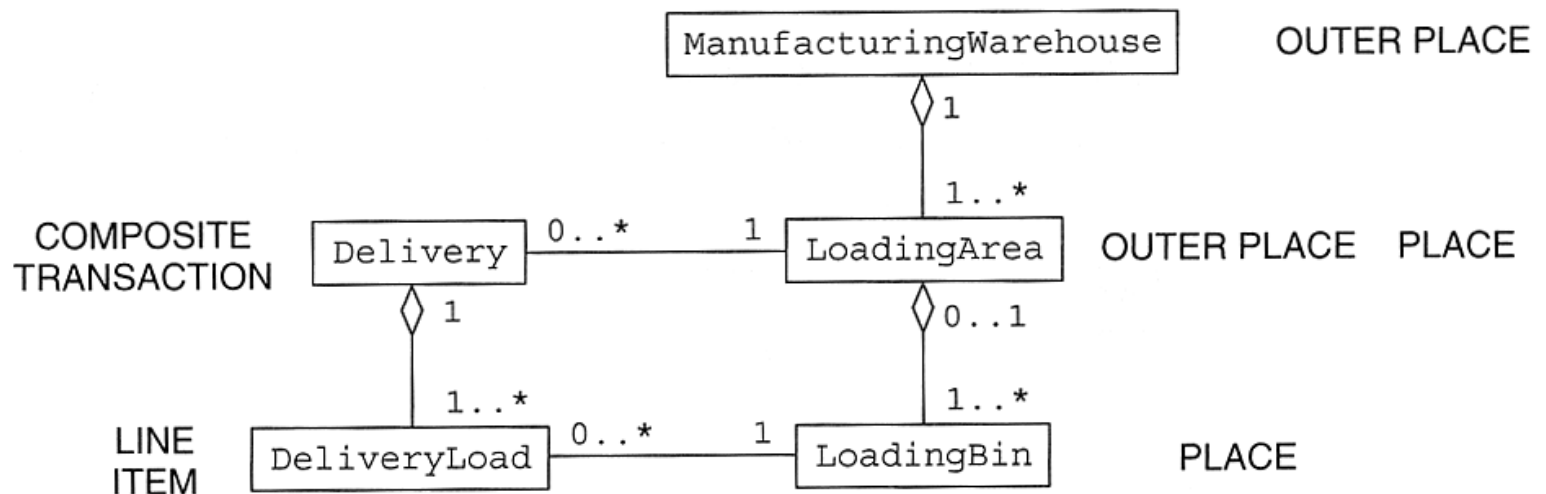
Place Responsibilities

- EXAMPLE-An airplane flight arrives at and departs from a specific gate within a terminal



A place serves double duty by acting as an outerplace

- EXAMPLE - Within a manufacturing warehouse, each loading area contains loading bins; deliveries happen at loading areas, and each delivery is subdivided into loads that are placed into loading bins.





Item – Specific Item



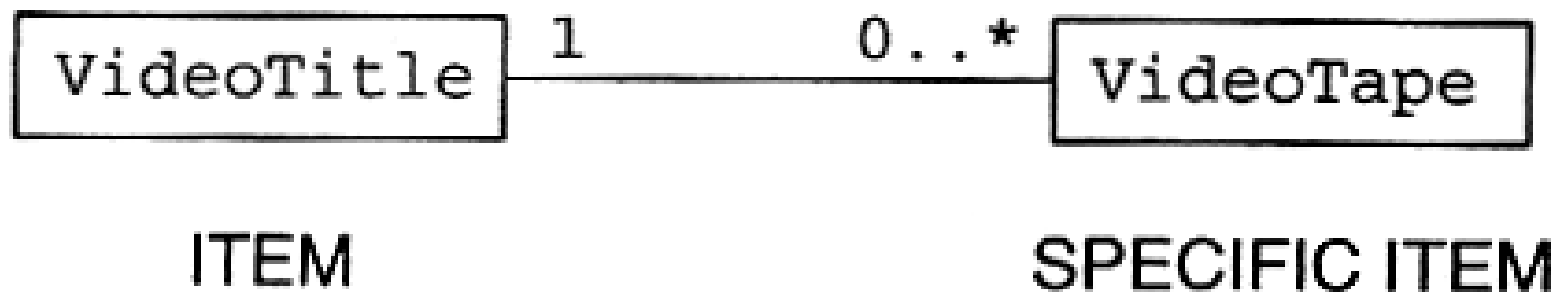
Item – Specific Item

- The item describes the information that is common across all variations.
- The specific item describes the information that makes each variation distinctive. Also, the specific item participates in events.



Item Responsibilities

- EXAMPLE-Everyone's favorite example is the video store. A video title, for example, Big Sinking Ship, describes a set of videotapes available for renting. The video title has information about the movie and about how the movie is classified within the video store.



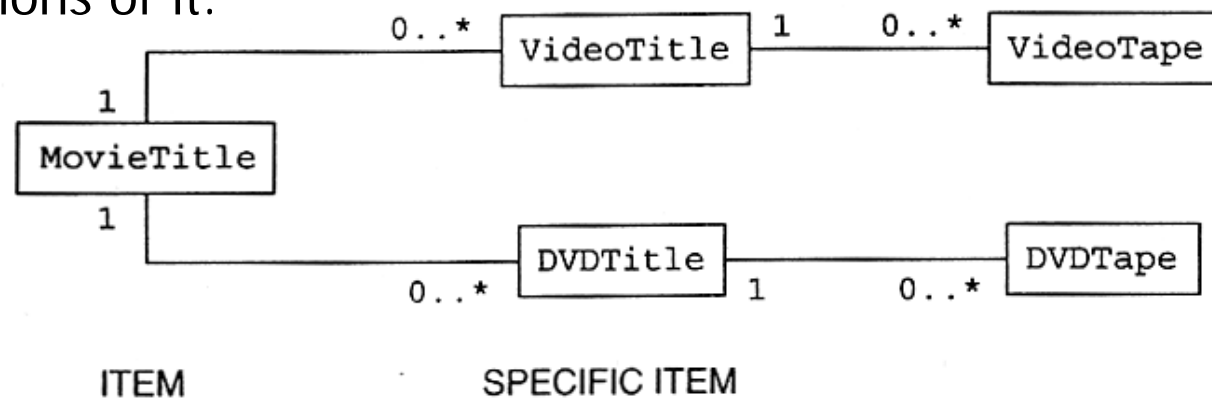


Specific Item Responsibilities

- EXAMPLE - In the video store example, each videotape has its own unique tracking number to distinguish it from other videotapes of the same title, and each videotape has its own history of rentals and returns.

Items perform double duty by acting as specific things.

- EXAMPLE - In a video store with both DVDs and videotapes for rent, different descriptions for the same movie are required because DVDs have additional options such as subtitles and dual formats not available on videotapes. DVDs are modeled with their own DVD titles, and videotapes with their own video titles. The DVD title and video title are described by a movie title description, which has the characteristics common to all media versions of it.





Assembly - Part

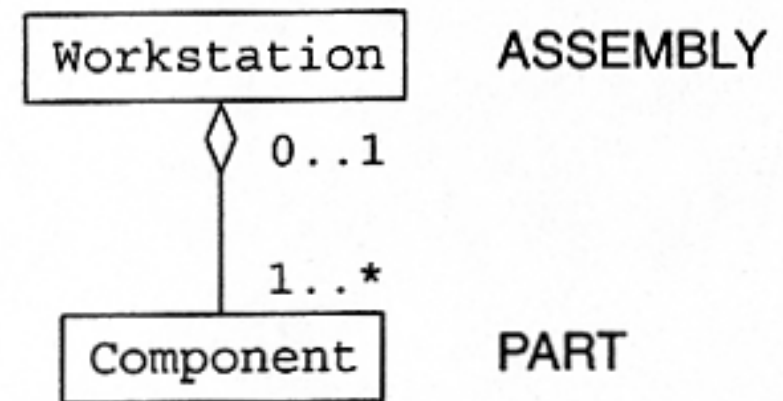


Assembly - Part

- The assembly - part pattern is one of the patterns for modeling things with complex structures. It is used to model a thing that is constructed from other things. This pattern differs from the other complex structures, container and group, because it cannot exist without at least one part.

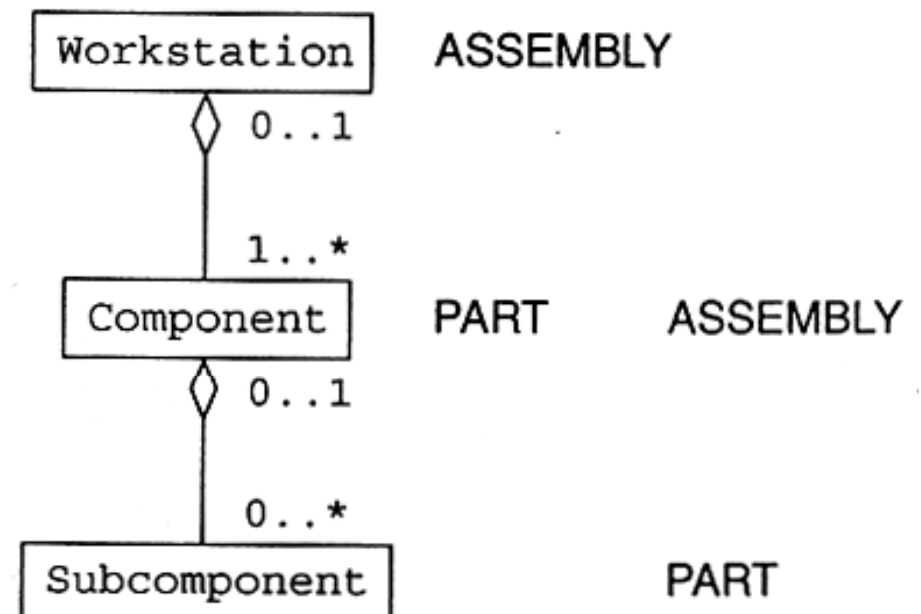
Assembly Responsibilities

- An assembly collaborates with one or more parts, and its parts determine many of its properties.
- EXAMPLE - A computer workstation is assembled from computer components. The price, weight, and availability of the workstation are partly determined from the characteristics of its parts.



As with places, assemblies can be nested into multiple layers

- EXAMPLE-Some of the components in the computer workstation assembly are constructed out of smaller subcomponents; for example, the video card component is an assembly of a circuit board, graphics processors, memory, and so on.





Container - Content

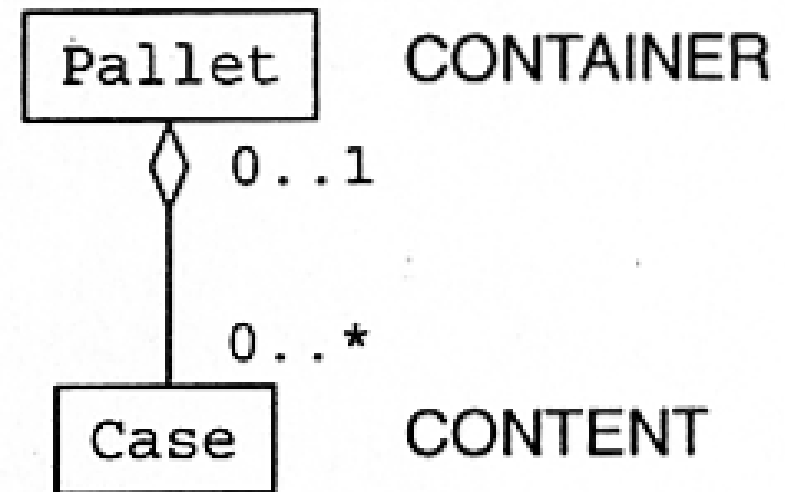


Container - Content

- Use the container - content pattern when a thing is a receptacle or storage place for other things.

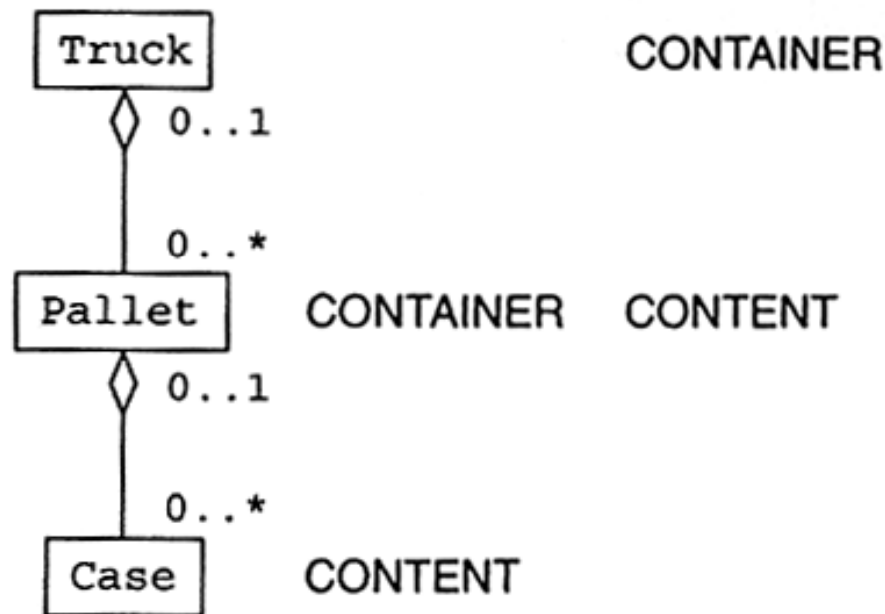
Container Responsibilities

- A container holds zero or more content objects. Notice that unlike an assembly, a container can be empty.
- EXAMPLE - In a distribution center for a manufacturing plant, cases of product are stored in pallets that are then loaded onto delivery trucks.



Containment can be hierarchical

- EXAMPLE - A pallet of cases is placed within a truck.





Group - Member

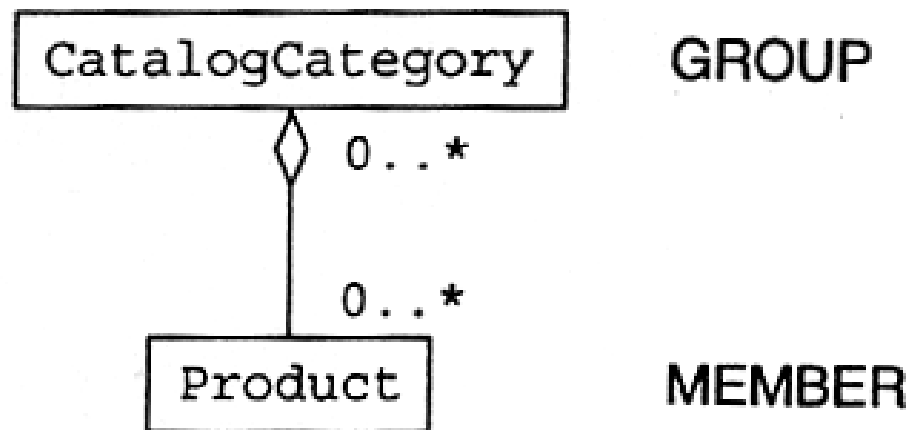


Group - Member

- It is frequently used to model collections and classifications of things, and it can also be used for collections of people and places.

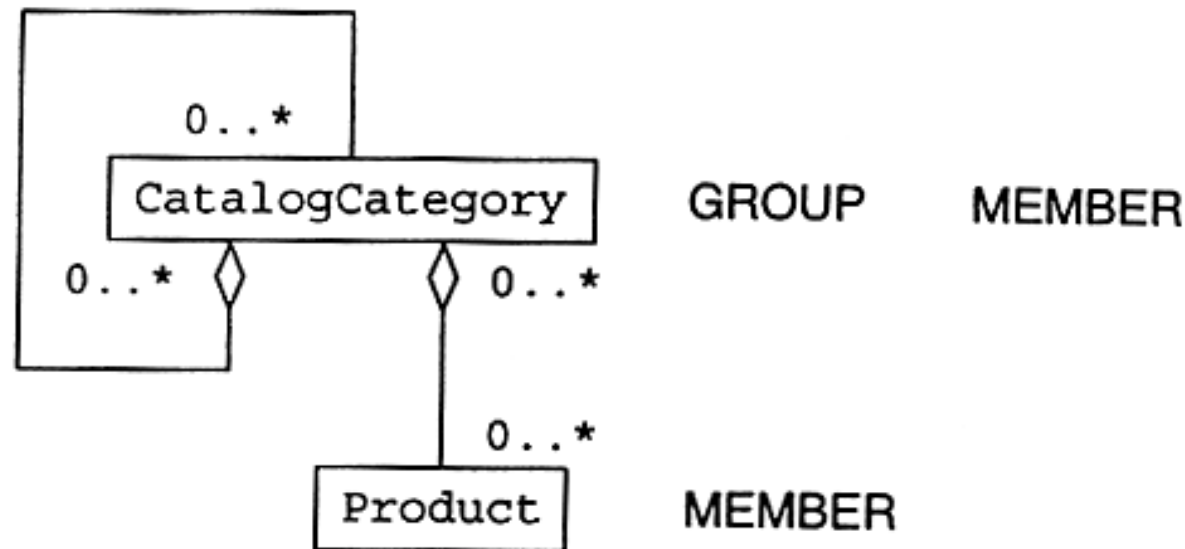
Group Responsibilities

- A group knows about zero or more members.
- EXAMPLE - A product catalog puts products into categories, such as sportswear, home and garden, etc.



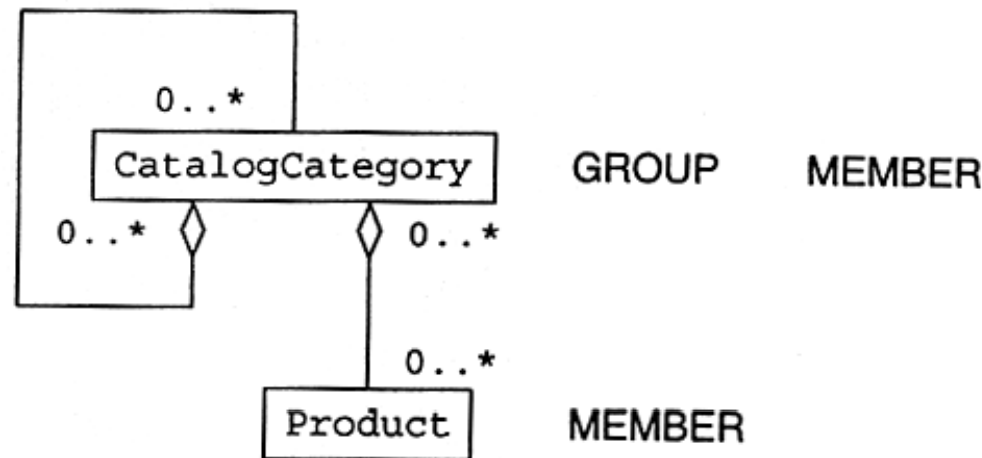
Member Responsibilities

- A member **knows about zero or more groups**. This means that unlike parts and content objects, **members can belong to more than one group**.
- EXAMPLE - In the product catalog example, products can belong to multiple catalog categories.



A group serves double duty as a member

- EXAMPLE - Product catalog categories can be subdivided into smaller categories; for instance, the home and garden category may contain the kitchen and bathroom categories.





Transaction - Role

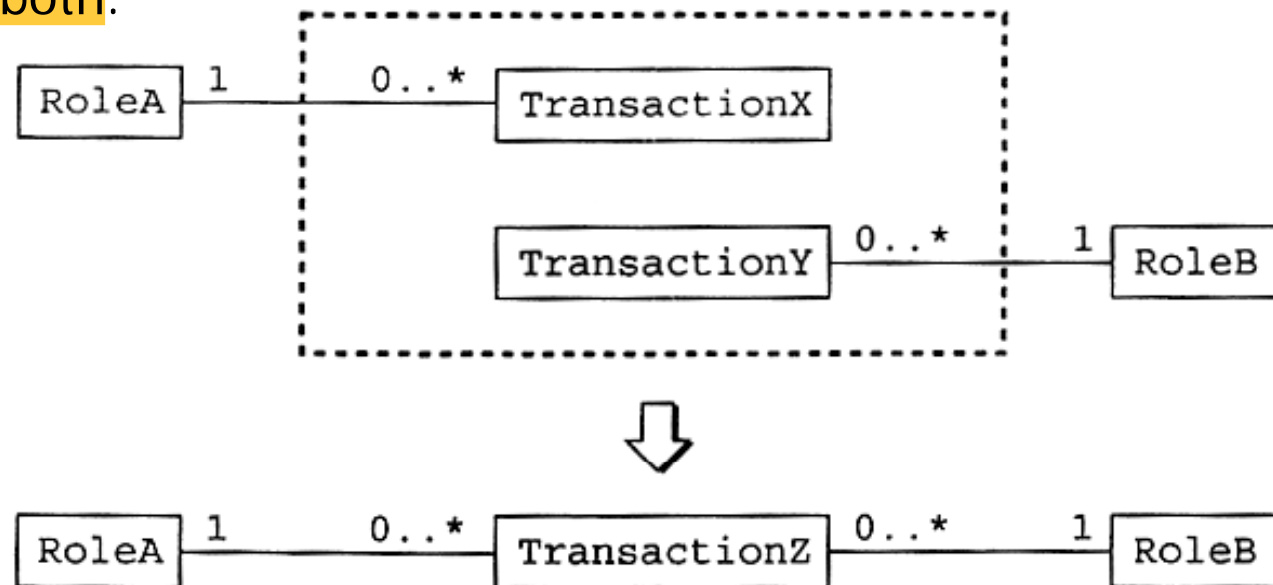


Transaction - Role

- The transaction - role pattern models an entity interacting with things at places.
- The role pattern player is used instead of actor because the role describes an entity's participation within a context, and an interaction always occurs within a context.

Transaction Responsibilities

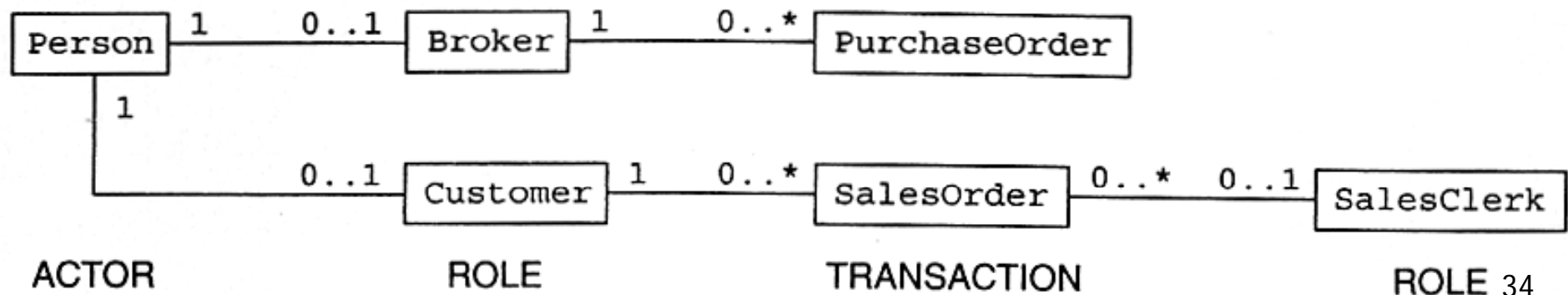
- A transaction knows one role, which represents the real-world doer of the event modeled by the interaction.
- Occasionally, events coincide with two or more real-world doers engaged in a mutual interaction. If the event details for each doer are the same and simultaneous, then one transaction will work for both.



Transaction Responsibilities

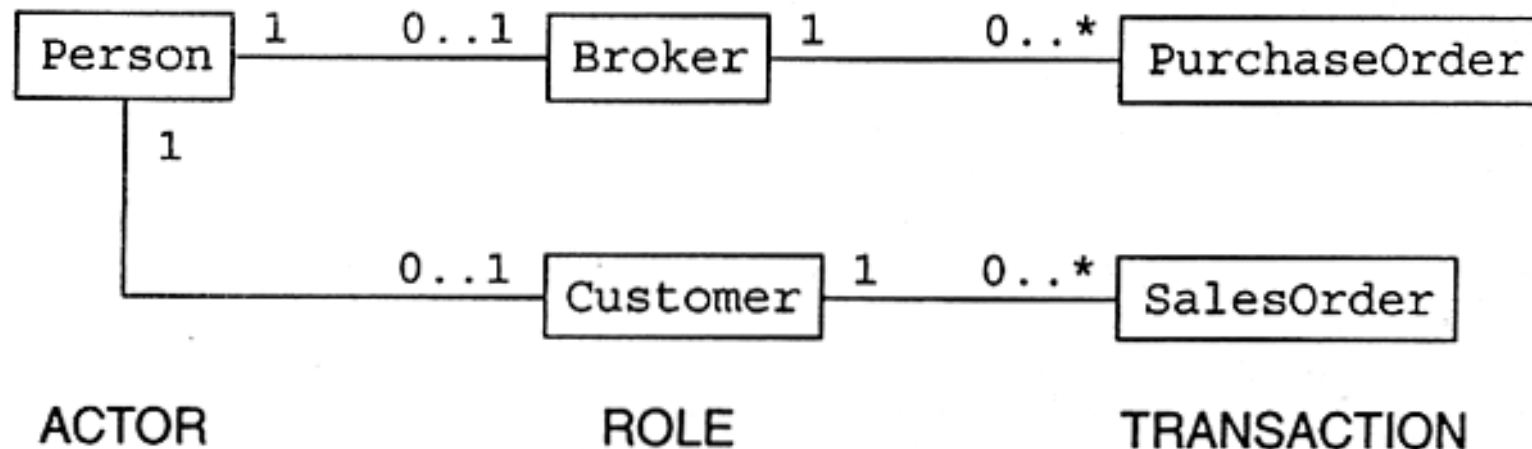
In general, a transaction can know about multiple roles, but can take on only one of each kind. Each role represents one of the real-world doers of the event modeled by the transaction. The transaction records details to pinpoint the event in time.

- EXAMPLE - In the office supplies example, a sales order placed over the telephone includes the participation of the sales rep taking the order.



Role Responsibilities

- EXAMPLE - An office supplies system takes orders from people participating as customers and brokers. Brokers create purchase orders for businesses; their methods of payment and price lists differ from those of customers. Customers have customer identifiers and create sales orders.





Transaction - Place

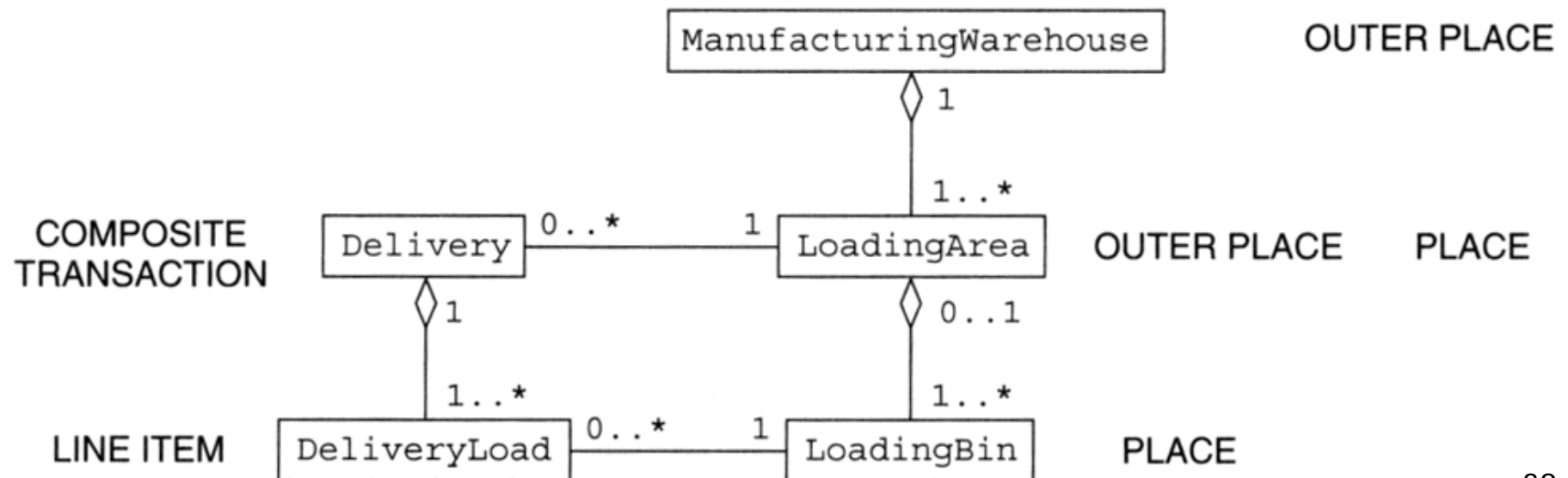


Transaction Responsibilities

- A transaction knows about one place. When a time-interval transaction occurs in more than one place, then it is best to model that event as a composite transaction containing multiple single transactions, each at a different location. In these cases, the single transactions are acting like line items within the composite transaction

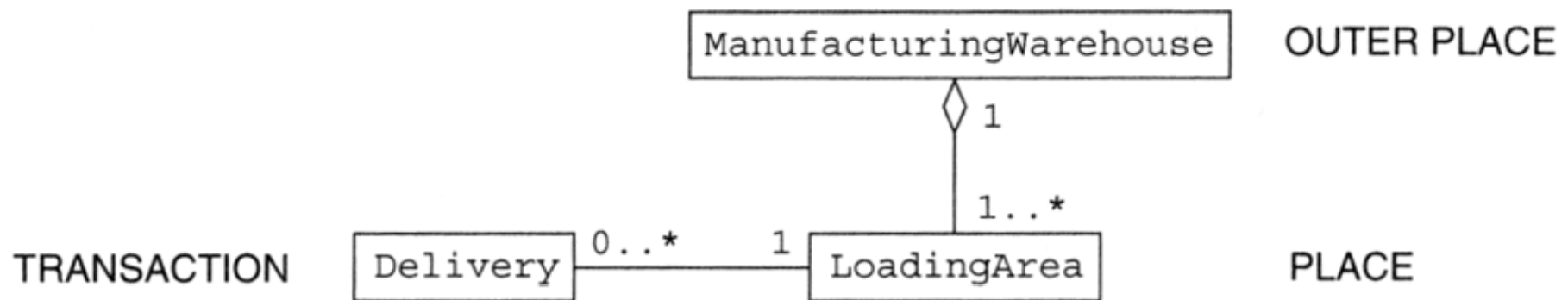
Transaction Responsibilities

- EXAMPLE-A delivery at a loading area is actually a composite transaction consisting of many delivery loads that are deposited into individual loading bins. The loading bins are constrained to be in the same loading area where the delivery is located.



Place Responsibilities

- EXAMPLE - In a manufacturing warehouse, deliveries arrive to one loading area. To track deliveries, loading areas must be uniquely identified.





Transaction - Specific Item

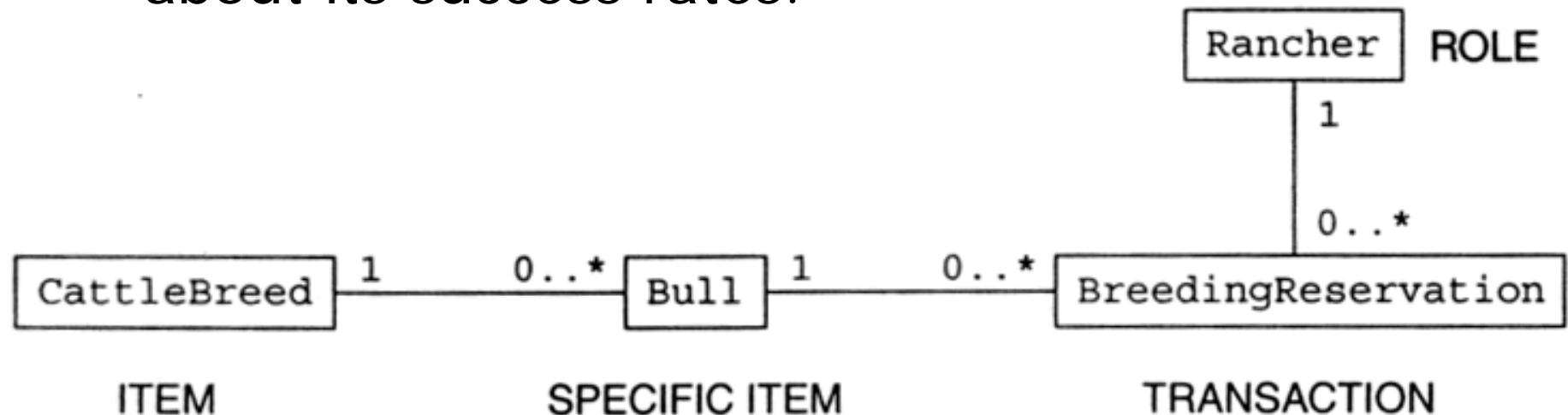


Transaction - Specific Item

- Models the involvement of a thing in an interaction. Here the thing is involved as the subject of the interaction, not the doer of the interaction, and only one thing is involved. The specific item pattern player is used instead of the item pattern player because an event requires a thing with distinguishing details, whereas an item is a common description for a set of things.

Transaction Responsibilities

- EXAMPLE - In the online cattle breeding site, ranchers can browse the history of breeding events for a given bull and see individual event statistics as well as historical statistics about its success rates.

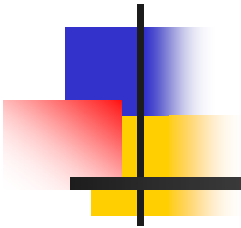


Specific Item Responsibilities

- EXAMPLE - An online cattle breeding site allows ranchers to search for and reserve bulls for breeding services with their cows. A bull object belonging to a cattle breed that contains the general characteristics of the breed represents each bull on the site.



Composite Transaction - Line Item



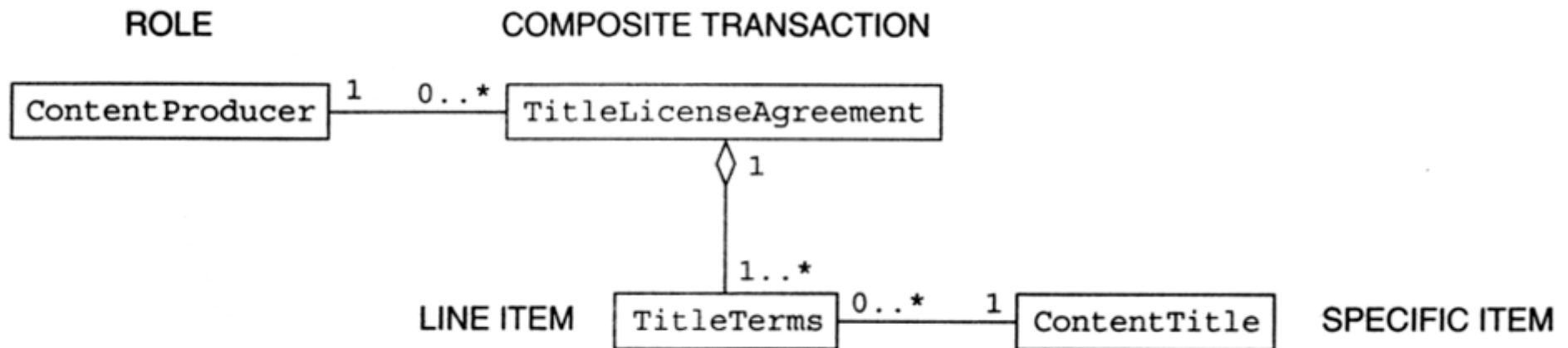


Composite Transaction - Line Item

- Use the composite transaction - line item pattern to describe an interaction of people with multiple things at a given location.

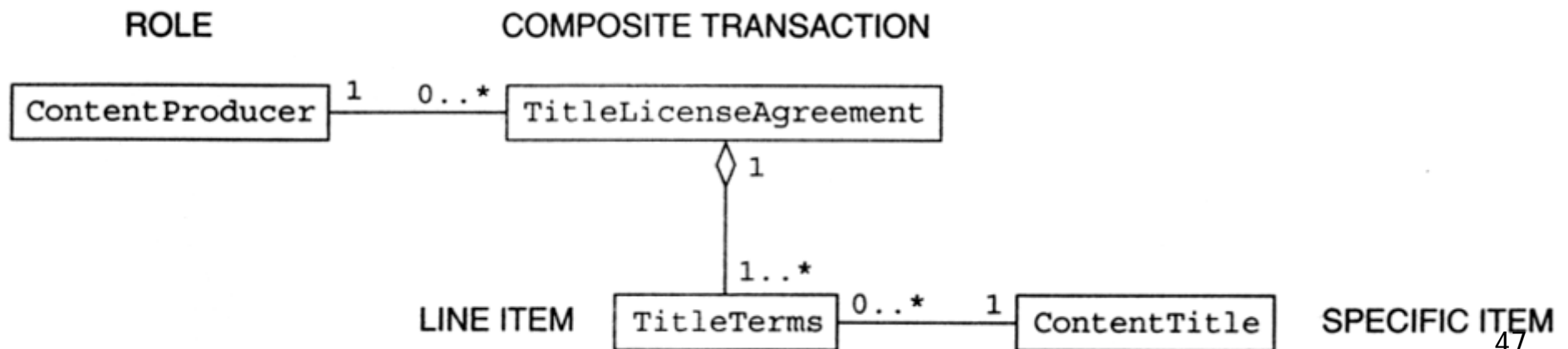
Composite Transaction Responsibilities

- EXAMPLE - An online entertainment site contracts with content (usually video) producers for the rights to show portions of the producer's content titles on the site. The license agreement contains title terms for each content title covered.



Line Item Responsibilities

- EXAMPLE - In the online entertainment example, each title terms object includes the number of minutes of content that can be extracted from the content title for viewing on the site, the payment terms for viewing the title, and the commission rates for the title when the content showing results in any e-commerce revenues.





Specific Item - Line Item

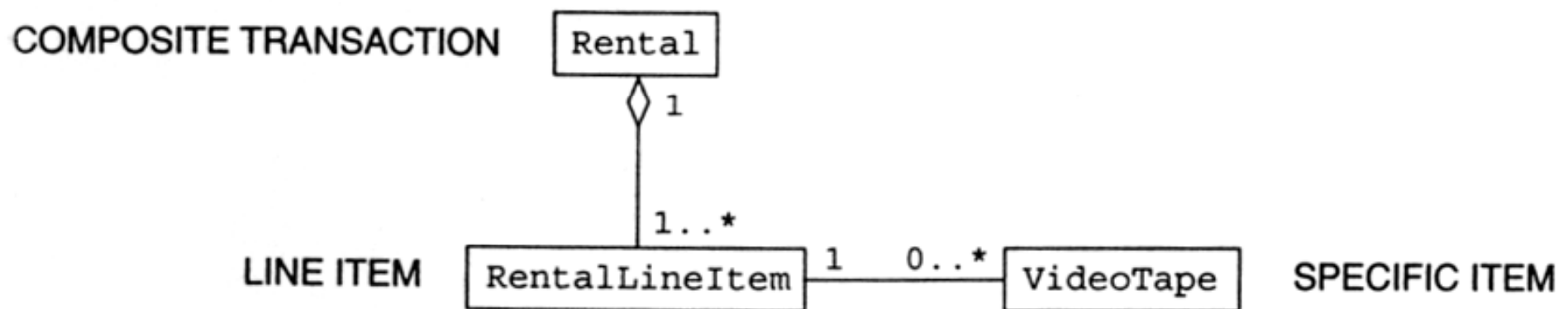


Specific Item - Line Item

- Use the specific item - line item pattern to describe one thing's interaction in an event involving many things.

Specific Item Responsibilities

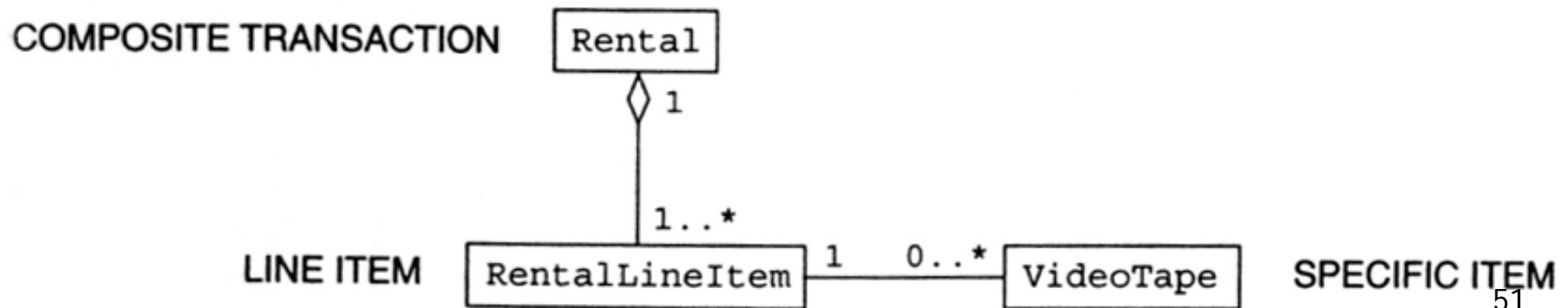
- A specific item can be involved in zero to many line items. The collection of line items a specific item knows about is part of its history of interactions.
- EXAMPLE - In a video store customers can rent multiple videotapes in a single rental transaction.



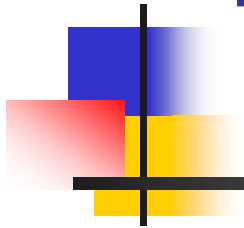
Line Item Responsibilities

A line item knows exactly one specific item. The line item captures details about the specific item's interaction with a composite transaction.

- EXAMPLE - In the video store example, when a videotape is rented, its due date and actual return date are recorded in a rental line item. The rental line item can also be used to record the state of a videotape when it is returned.



Transaction - Follow-up Transaction



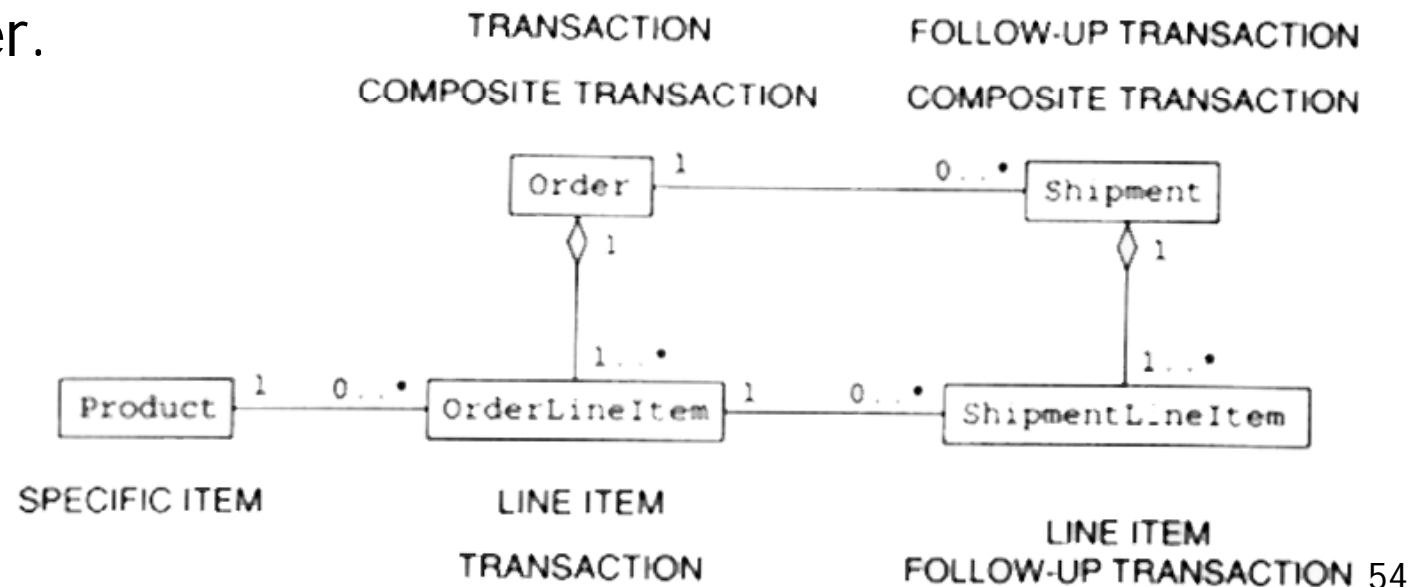


Transaction - Follow-up Transaction

- Use the transaction - follow-up transaction pattern to model interactions that follow from earlier interactions.

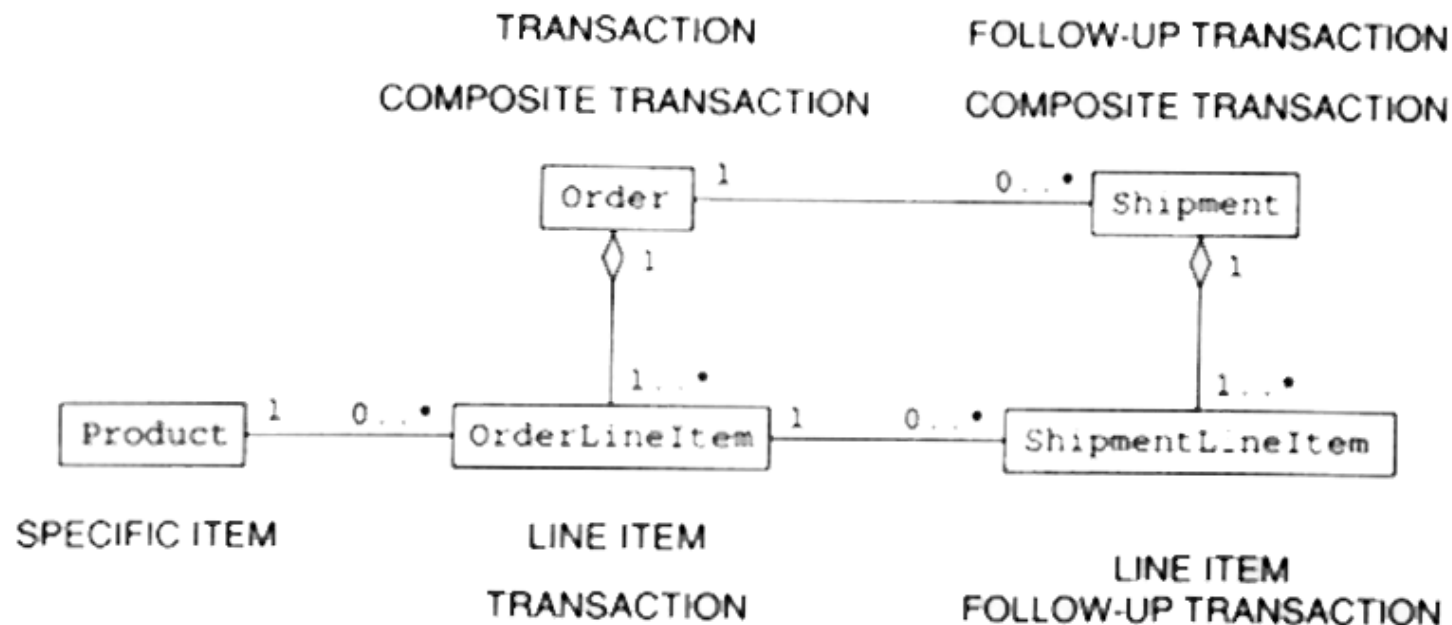
Transaction Responsibilities

- EXAMPLE - An e-commerce site allows a product (an SKU) to be ordered and shipped. Depending on the availabilities of the products ordered and if there are multiple ship-to addresses, multiple shipments may be required to deliver the entire order to the customer.



Follow-up Transaction Responsibilities

- EXAMPLE - For each line item of product ordered from the e-commerce site, there are some follow-up shipment line items to track how many of the product were sent in each follow-up shipment.



A Sequential Chain Of Events

- A follow - up transaction can act as a transaction for a subsequent follow-up transaction.
- EXAMPLE - All or part of a shipment can be returned.

