

Data Structure Patterns
Additional Material (not in course textbooks)

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Data Structure Patterns

- Very few data modeling projects require you to start with the proverbial blank slate.
 - Look for similar existing conceptual models.
 - Look for common patterns that have previously worked.
 - Look for useful generic models and patterns.
- However, make sure you **adapt** the pattern model rather than force fitting it.

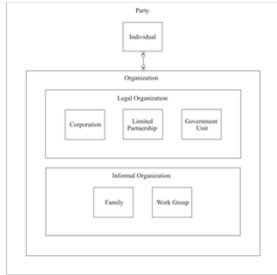
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The Party Model

- A *party* is a person or organization of interest to the database application.
- The party model adds Party as a supertype.
 - This provides the ability to hide the party's implementation details in cases where it doesn't matter.
 - For example, when modeling tasks, we need only a single relationship to assign tasks to parties without regard for whether the party was an individual or organization

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Party Model Data Pattern



- Subtypes need to be tailored the specific organization
- The subtype Individual has a M:N relationship with the subtype Organization.
 - This unusual construct that may be better as a role (covered next).

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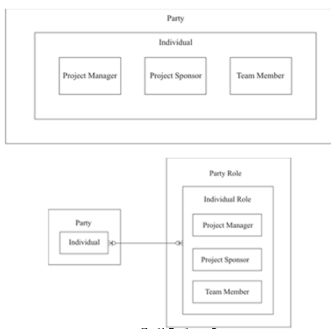
The Role Model

- An alternative to supertypes and subtypes
- Works better than subtypes when:
 - Subtypes overlap (one supertype occurrence can be many subtypes)
 - Subtypes are frequently added and removed
 - A role addition requires only an INSERT to a table (rather than a table CREATE)
 - A role removal requires only a DELETE to a table, or an UPDATE of the effective dates of an existing row for the role.

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Subtype vs. Role Example



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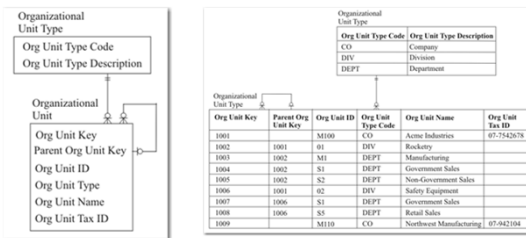
Specialized Hierarchy Weaknesses

- To add another layer, a new table must be created
- If some companies in the database have departments but no divisions, we will have to add a dummy division in their hierarchy to link their departments to the company layer.
- The structure can be confusing to use if parts of the company use different names for the layers.

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Generalized Hierarchy



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Generalized Hierarchy Usability

- Advantages:
 - Can handle any number of layers and any type of organizational unit.
 - Layers do not have to be uniform
- Disadvantages
 - More difficult for concrete thinkers
 - Must use generic identifiers
 - Some designers will generalize for the sake of generalizing
 - Sometimes technically sophisticated solutions are not the smartest choice

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