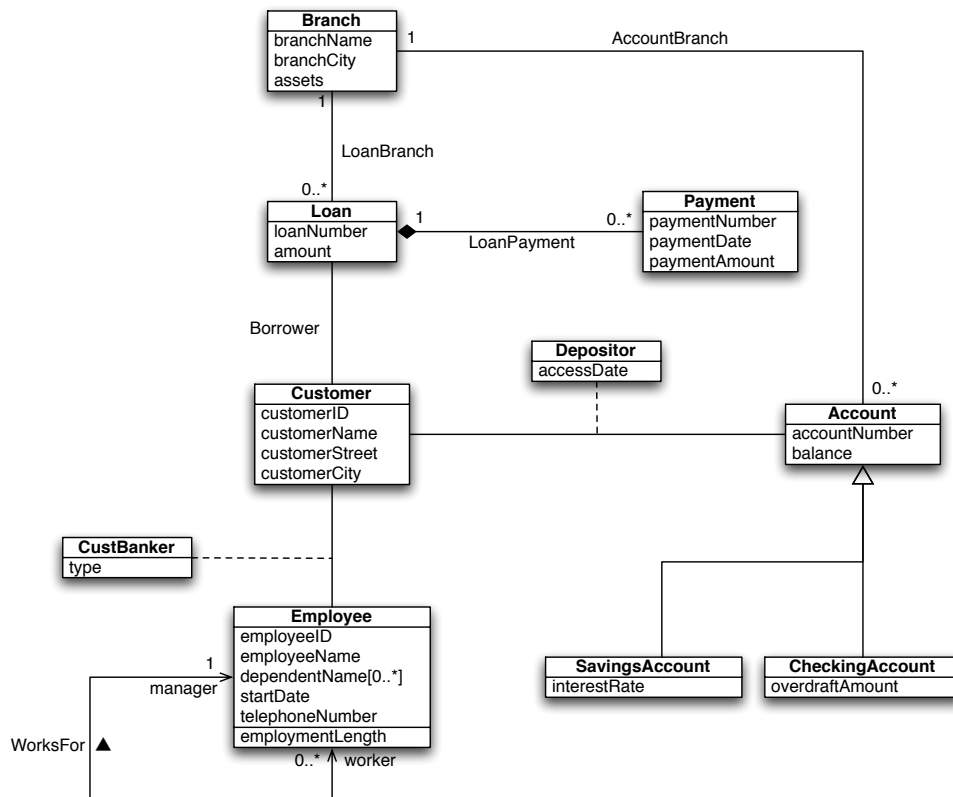


# Structural Modeling Concepts

Concept	Linguistic Role	E-R Term	UML Term
real-world items stored by the system	nouns	entity set   entity	class   object
connections between items	verbs	relationship set   relationship	association   link
properties that describe items	adjectives	attribute	attribute
properties that describe connections	adverbs	descriptive attribute	relationship class   object
distinguishing/unique properties	proper nouns	key	object identifier

- Nouns and verbs have two “levels” of existence: as the *category* to which they belong (*entity set*; *class*) and as a specific occurrence of that category (*entity*; *object*)
- *Generalization/specialization*: entities may indicate that they are specializations or subclasses of other entities
- *Containment*: entities may “hold” other entities through *aggregation* or *composition* relationships
- *Cardinality*: relationships/associations typically indicate how many entities participate in them — *1-to-1*, *1-to-many*, *many-to-1*, *many-to-many*
- *Composite/multivalued attributes*: attributes may be broken down into sub-attributes or may hold multiple values in the same “slot”



Depending on the size of the project and/or its development team, these can happen next:

- Dive into further detail:
  - ◆ Add more information to the data model, such as more specific attribute information (types, default values, constraints), defining methods, etc.
  - ◆ Create the other types of diagrams within UML's scope: component, behavioral diagrams
- On the database front, the conceptual model would need to be implemented in terms of the target database's logical model
  - ◆ When the conceptual model is implemented at runtime in an object-oriented environment (e.g., Java) and is persisted in a relational database, this process goes by the specific term "object-relational (OR) mapping"