

Software Architecture

Exercise – ERM versus OOD

BSc



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Exercise Opening

Overview

In this example, we consider the address management of a company, in which data of individual persons are stored.

A *person* can assume the following roles: *customer*, *supplier* and *employee*.

All persons share the same attributes: *name*, *first name*, *address* (i.e. street and number), *postal code* and *city*.

Depending on the role of a person, additional attributes are stored. For example, *customers* have an *annual turnover* (cumulative for the current year), *suppliers* have a *quality rating* from previous deliveries, and *employees* work for a *department* and have an *annual salary*.

Exercise Agenda



■ ERM versus OOD

ERM versus OOD

Entity Types

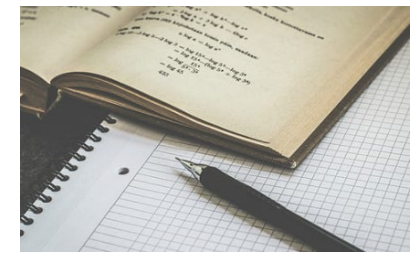
The above description gives us a first impression of entities (i.e., entity types) and these entity types' attributes.

ERM versus OOD

Entity Types

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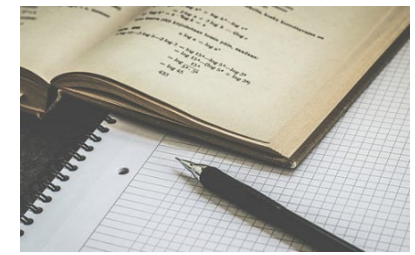
Entity (Entity Type)	Attribute(s)
Person	Name FirstName Address PostalCode City
Customer (role)	AnnualTurnover
Supplier (role)	QualityRating
Employee (role)	Department AnnualSalary



ERM versus OOD

RDBMS Representation

How are these entity types represented in a relational database in the development view?



ERM versus OOD

OOD Representation

How are these entity types represented in an object oriented design in the development view?

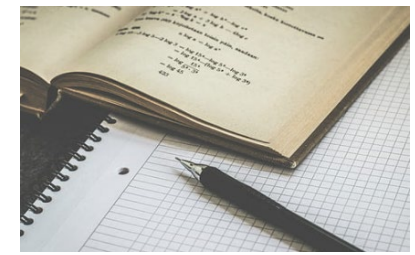
ERM versus OOD

Approach Differences

In the Logical View, differences between the two approaches become evident, especially with regard to when is-a relationships are established with concrete data.

The following scenario makes the differences visible:

1. customer Luis Müller, Bergweg 9, 8015 Eximplikon has an annual turnover of 284'295.
2. supplier Katja Maier, Hauptstrasse 525, 4711 Strasswil has a quality rating of 5.
3. employee Jonas Huber, Seitenstrasse 98, 2113 Waldbach works in the accounting department for an annual salary of 87'654.
4. Luis Müller, already known as a customer, is additionally employed in the shipping department with an annual salary of annual salary of 78,323.



ERM versus OOD

Approach Differences

How are these entities represented in a relational database in the logical view?

Person

PId	Name	FirstName	Address	PostalCode	City

Customer

PId	AnnualTurnover

Supplier

PId	QualityRating

Employee

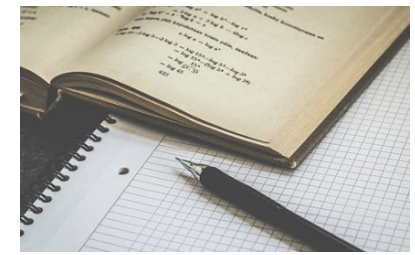
PId	Department	AnnualSalary



ERM versus OOD

Approach Differences

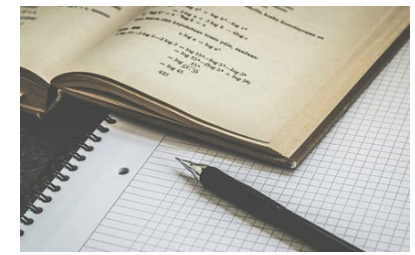
Now, how are the above entities represented in an object oriented design in the logical view?



ERM versus OOD

Approach Differences

Compare the two designs (i.e., ERM and OOD). What are the differences regarding to the associations of people with roles?



ERM versus OOD

Approach Differences

What does an object-oriented design look like that offers similar flexibility in the logical view as the relational database design above?

Development view

Logical view

Questions

