# Conceptual Design for Relational Databases

# -

# Most common errors
# …to avoid

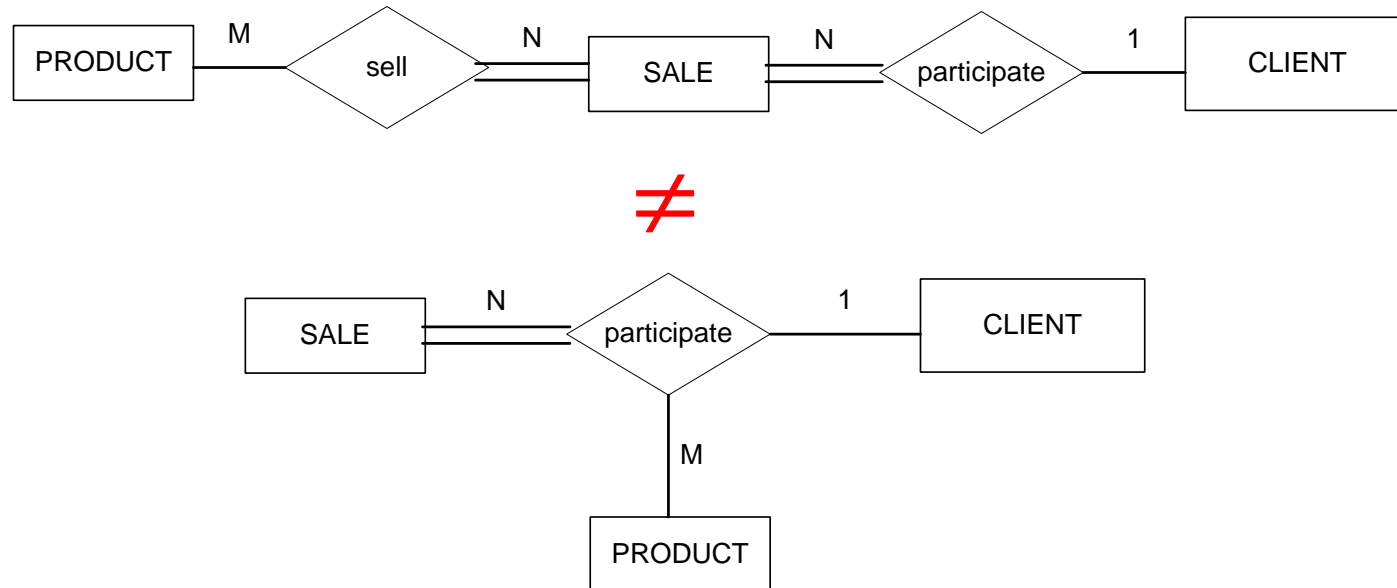**Rui Oliveira © rui.oliveira@ipleiria.pt**

# Error #1 – foreign keys

**ERROR**: *represent foreign keys in ER diagrams*
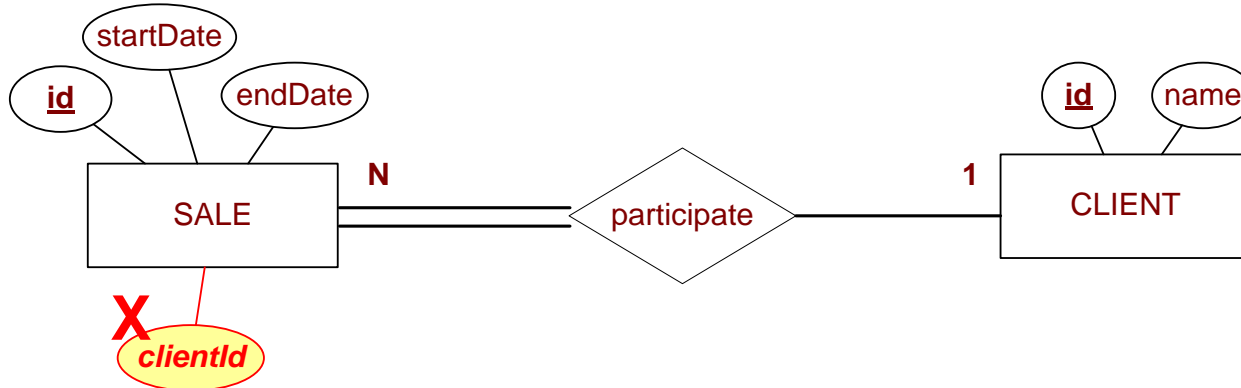


**The concept of foreign key does not exist in ER diagrams, only on relational tables**

# Error #2 – randomly replacing relationships

**ERROR**: *replace binary relationships with ternary (or above) relationships... randomly*

PRODUCT —M— ⟨ sell ⟩ —N— SALE —N— ⟨ participate ⟩ —1— CLIENT

≠

SALE —N— ⟨ participate ⟩ —1— CLIENT

⟨ participate ⟩ —M— PRODUCT

**A ternary relationship is DIFERENT from two individual binary relationships**

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# Error #3 – unnamed relationships

**ERROR**: *define relationships without an adequate verb*
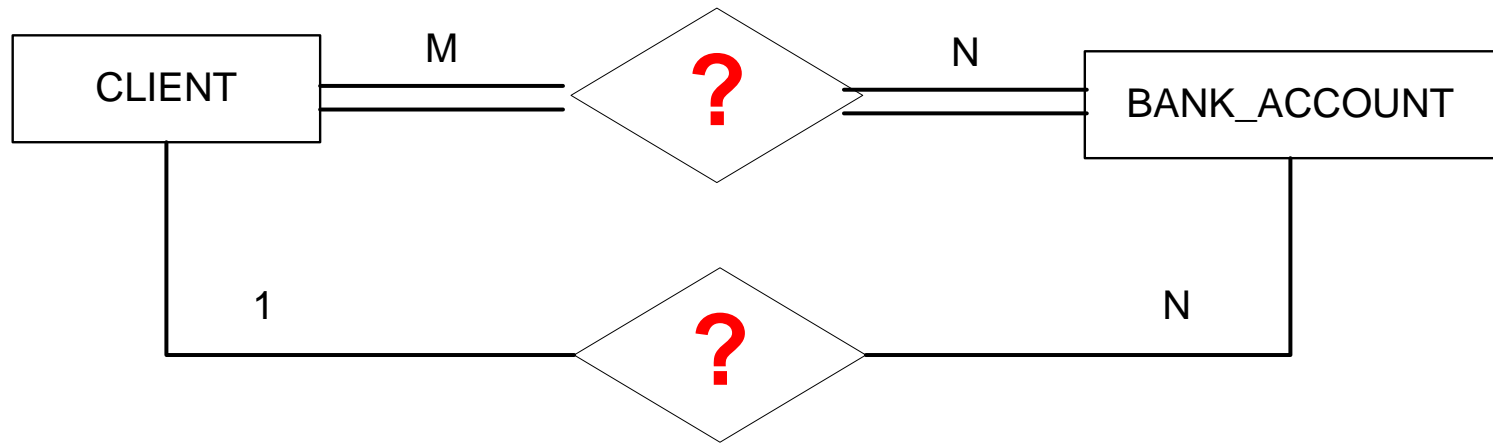


? = close?  open?  deactivate?

**Always name relationships using verbs in their base form**

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# Error #4 – plural naming

ERROR: *name attributes and entities using plural noums*

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**Relationship and attributes require a noun in its singular form**
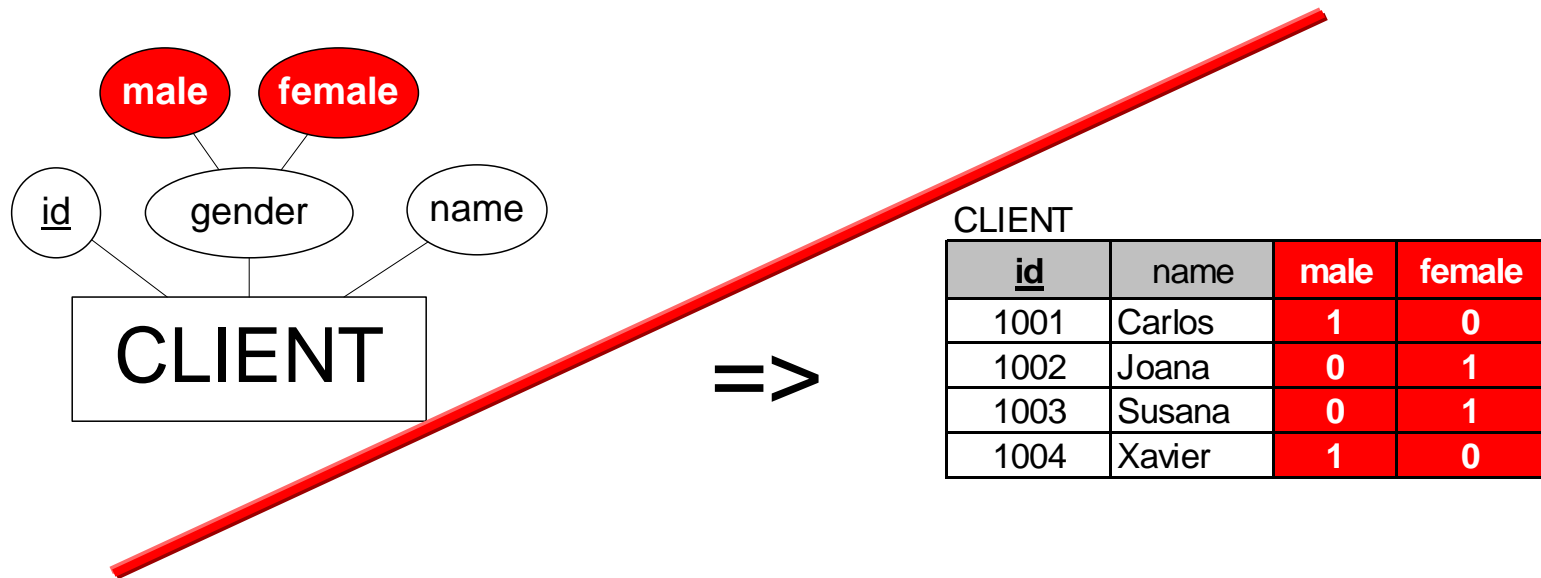
# Error #5 – incorrect representation of concepts

ERROR: *represent entities with elipses*

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*<no comments...>*

# Error #6 – domain representation
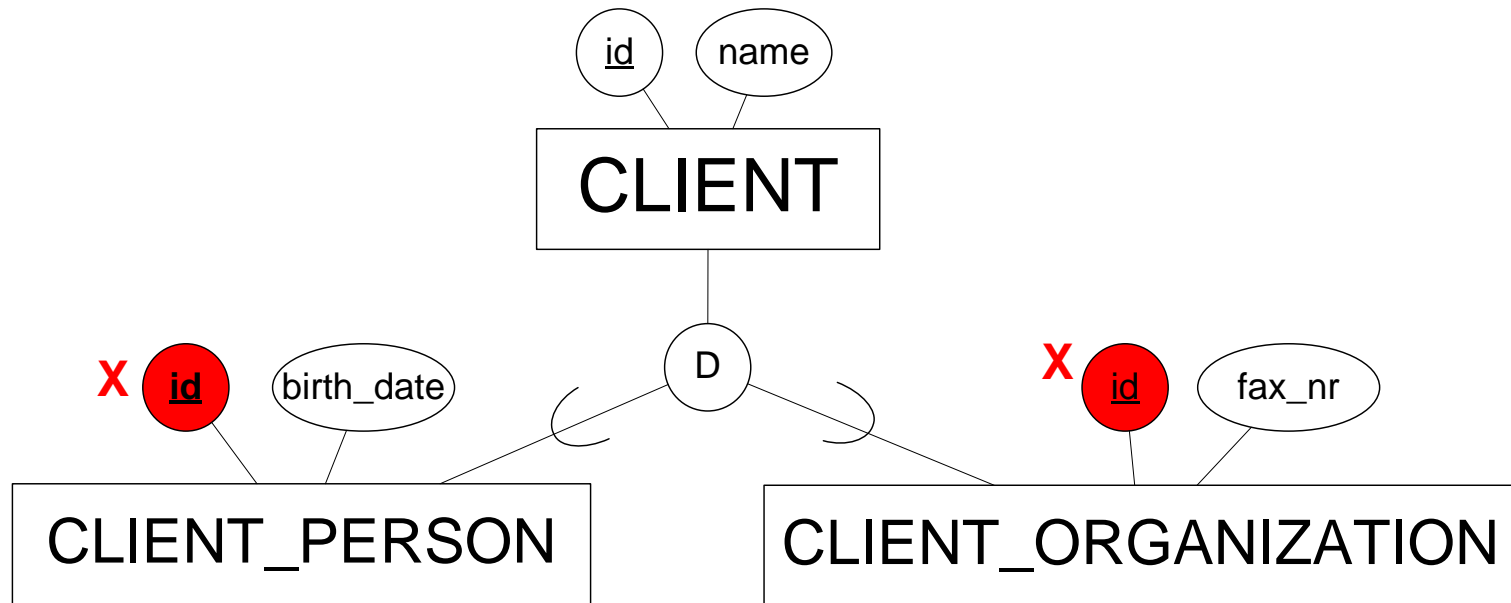
**male**  **female**

id    gender    name

CLIENT

=>

CLIENT

| id | name | male | female |
|----|------|------|--------|
| 1001 | Carlos | 1 | 0 |
| 1002 | Joana | 0 | 1 |
| 1003 | Susana | 0 | 1 |
| 1004 | Xavier | 1 | 0 |

**Represent a composite attribute to specify the parts in which it must be decomposed (for storage or querying purposes)**

# Error #7 – wrong inheritance design
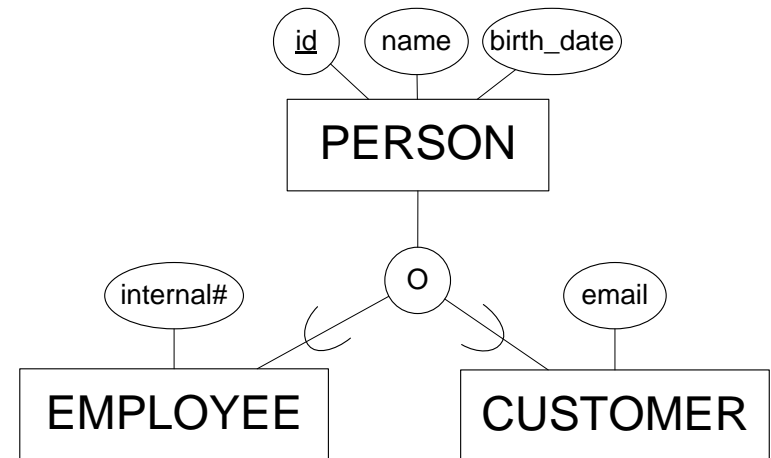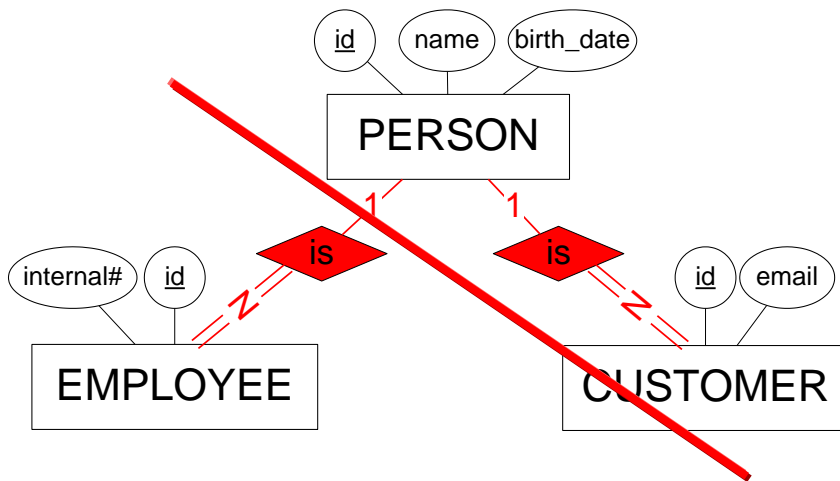
**ERROR**: *PKs in sub entities*



**Every subentity always inherits the super entity's attributes**
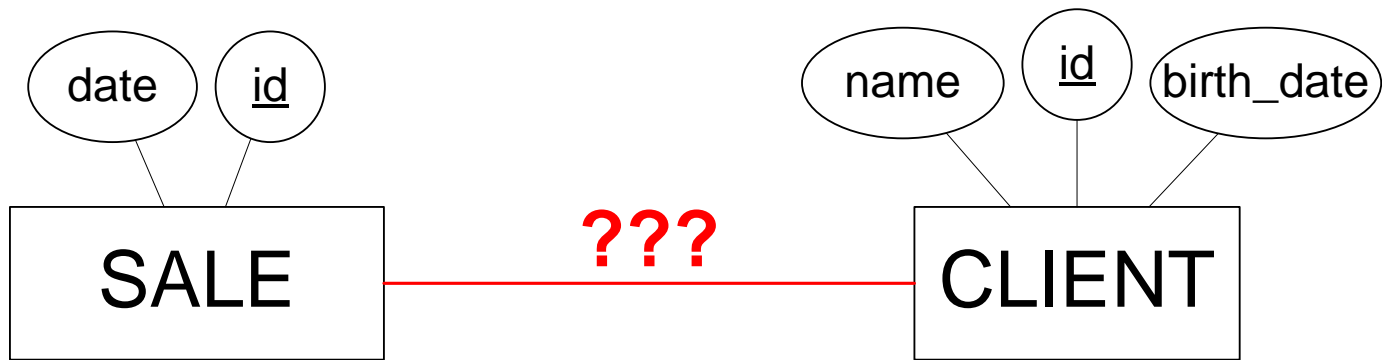
# Error #8 – representing sets and subsets

ERROR: *represent sets and subsets with relationships instead of hierarchies*



SUBSETS are represented using hierarchies, not as independent entities
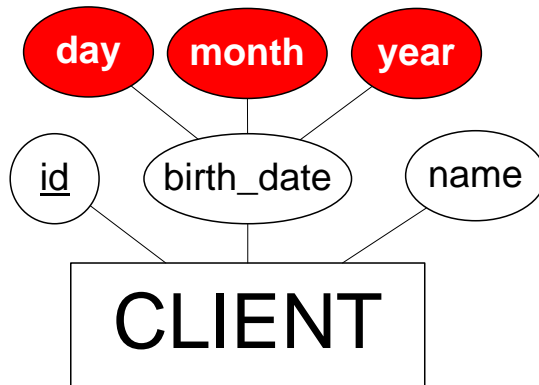
# Error #9 – missing relationships

ERROR: *connect entities directly*



**Relationships and hierarchies are
the ONLY method for relating entities**

# Error #10 – decomposing dates

**ERROR**: *separate dates into their subvalues (if that is not what you need)*
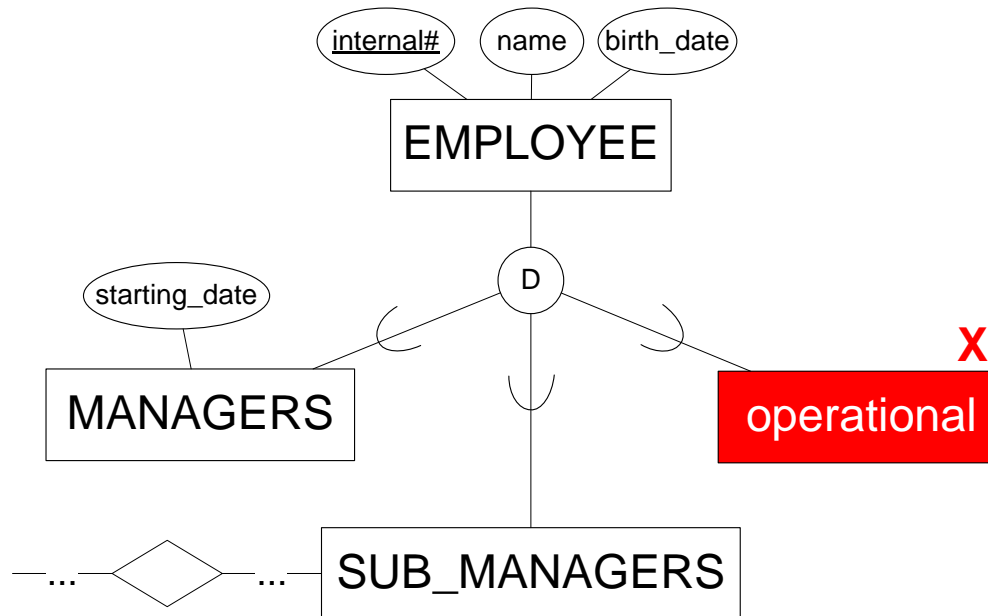


=>

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| id | name | day | month | year |
|------|--------|-----|-------|------|
| 1001 | Carlos | 1 | 10 | 2000 |
| 1002 | Joana | 17 | 9 | 1998 |
| 1003 | Susana | 18 | 1 | 2000 |
| 1004 | Xavier | 5 | 3 | 1999 |

*(is this what you need?)*

**Dates are complex values: they naturally aggregate several concepts. Leave dates alone!?**

# Error #11 – alone sub entities

**Represent a sub entity ONLY when it has relationships with other entities *OR* when it has attributes of its own.**

# Error #12 – lack of practice

**ERROR**: *to neglect the importance of practice*

*«We are what we repeatedly do. Excellence, then, is not an act but a habit. »*

Aristotle

**Practice will hopefully lead you towards the *error*.
The *error* will often lead you to understanding.
If you make no mistakes, you will learn nothing.**

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*(to be continued)*