Weak entities

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Defining weak entity

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DEFINITION

WEAK ENTITY

If the existence of an entity depends on the existence of another entity, we say the entity is a weak entity.

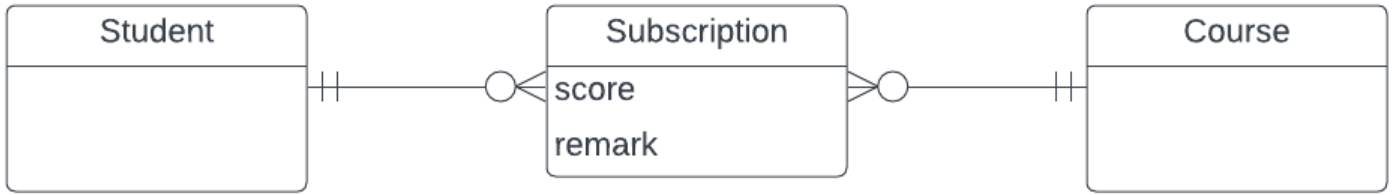
Peter Pin-Shan Chen. 1976.

RECAP

ATTRIBUTE OF A RELATIONSHIP

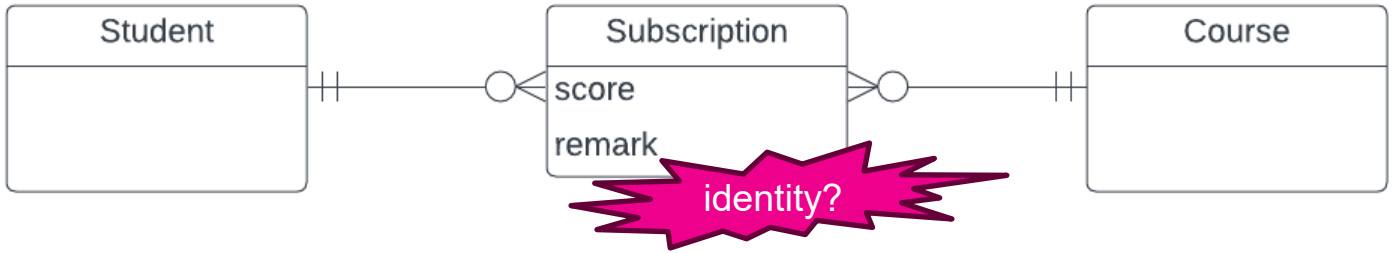
RECAP

FROM RELATIONSHIP TO ENTITY TYPE



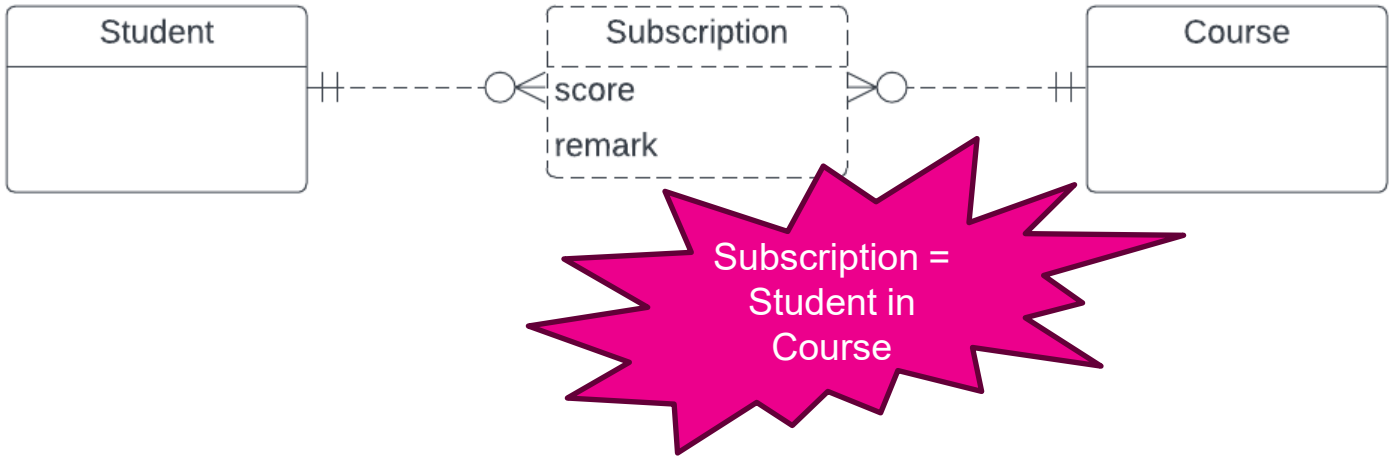
WEAK ENTITY IDENTITY

FROM RELATIONSHIP TO ENTITY TYPE



WEAK ENTITY IDENTITY

FROM RELATIONSHIP TO ENTITY TYPE



IDENTITY

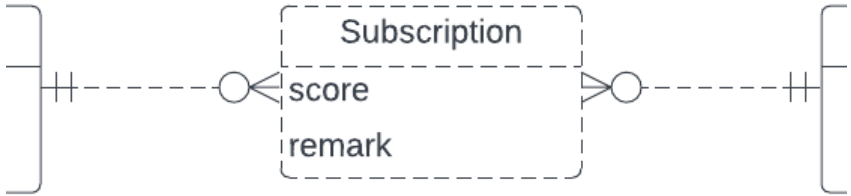
WEAK ENTITY IDENTITY

An entity that **cannot be uniquely identified by its own attributes** and relies on the relationship with one or more other (strong) entities is called a weak entity and needs at least one (strong) entity to be uniquely identifiable.

The **identity** of a weak entity is composed of **the identities of the related strong entities.**

WEAK ENTITY TYPE NOTATION

WEAK RELATIONSHIP NOTATION



ERD weak entity and relationship constraints

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CARDINALITY

WEAK ENTITY CONSTRAINTS

A weak entity has always at least one **many to one *weak* relationship** with a *strong* entity. The **weak entity has full participation** in the relationship. The strong entity can be full or partial participation.

A weak entity *must* be related to *one or more* strong entities.

ERD weak entity and partial identity

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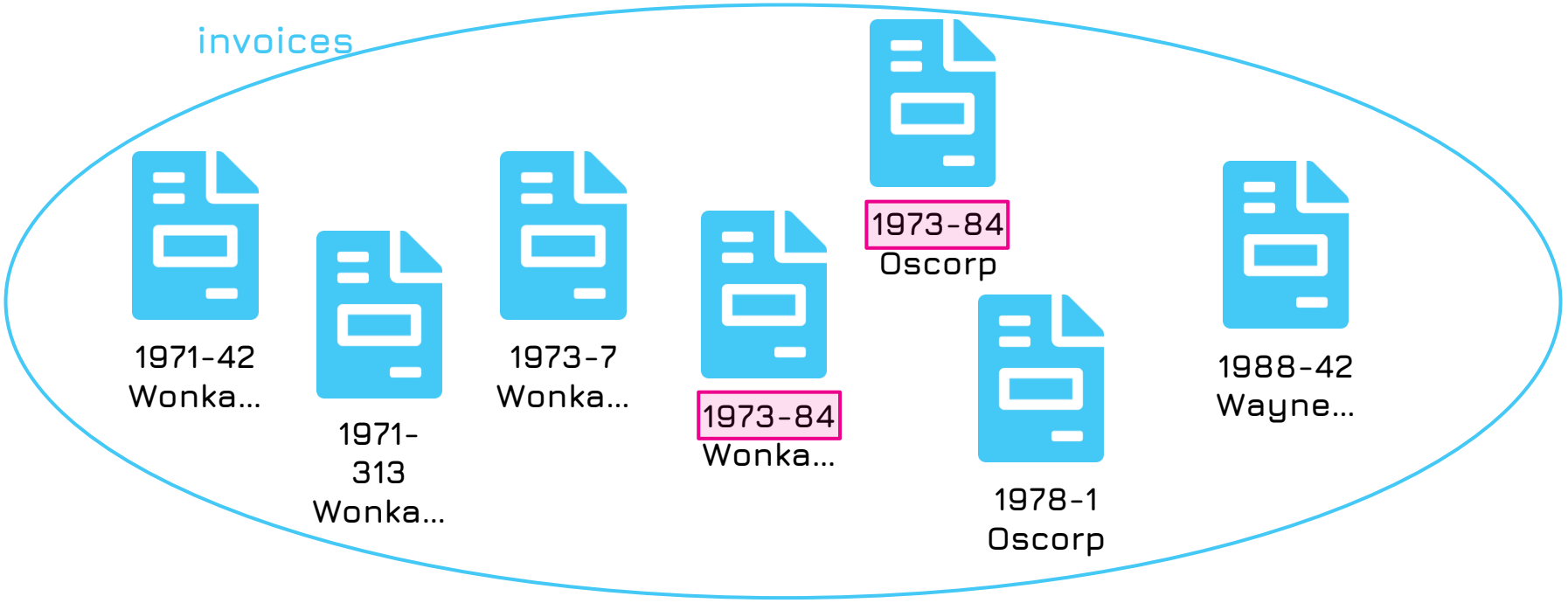


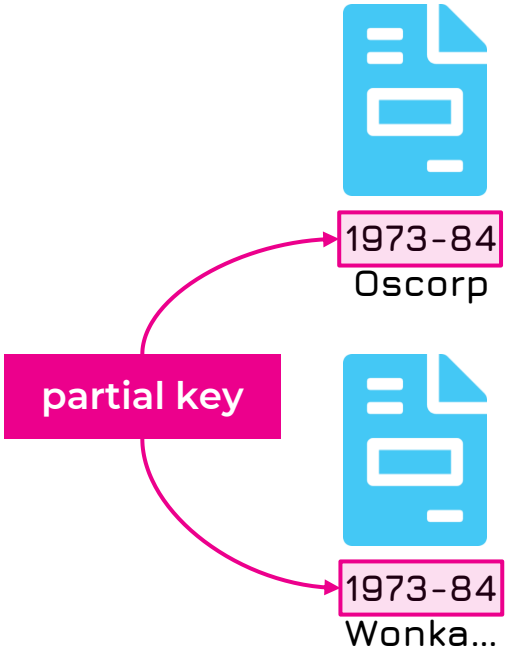
invoice number and its related company
uniquely identify the entities in the invoice set

but it depends on the universe of discourse (here Smart Accountants Company)

WEAK ENTITY IDENTITY

PARTIAL KEY

A partial key, also known as discriminator, is the set of attributes which can **uniquely identify weak entities** that are **related to the same owner entity**.



WEAK ENTITY IDENTITY

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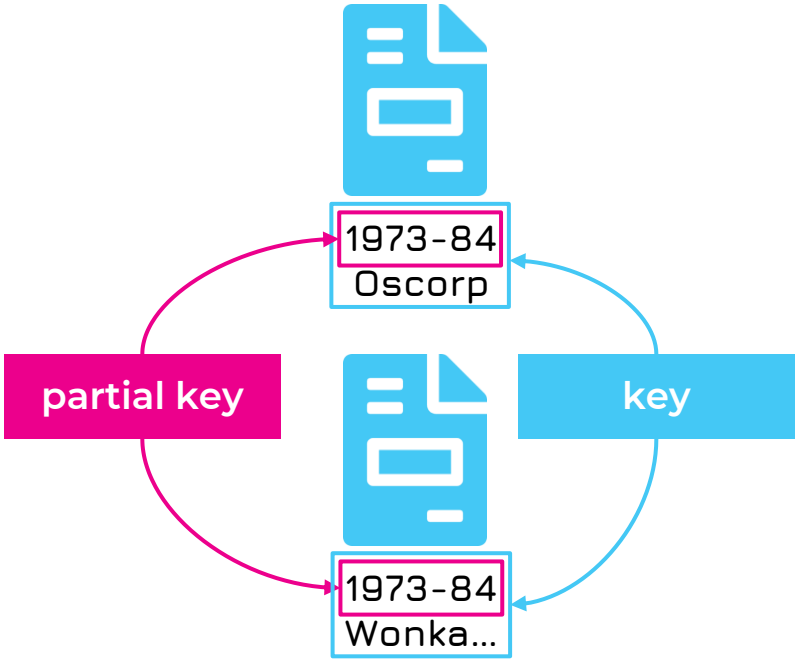


RECAP IDENTITY

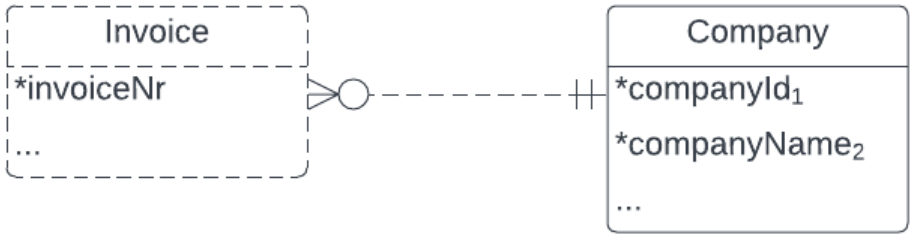
WEAK ENTITY IDENTITY

An entity that **cannot be uniquely identified by its own attributes** and relies on the relationship with one or more other (strong) entities is called a weak entity and needs another (strong) entity to be uniquely identifiable.

The **identity** of a weak entity is composed of **the identities of the related strong entities and possibly its own partial key.**

PARTIAL KEY NOTATION

WEAK RELATIONSHIP AND PARTIAL KEY



Weak versus strong relationships

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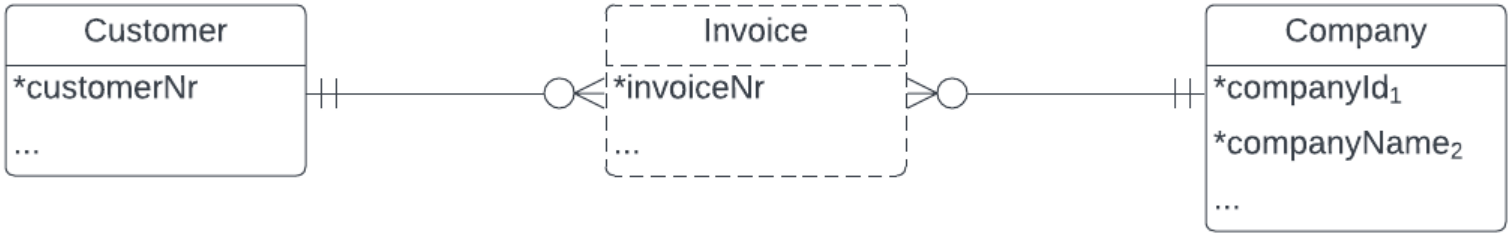
what's the use of a...

WEAK RELATIONSHIP



with which strong entity is invoice related?

what's the use of a...

WEAK RELATIONSHIP

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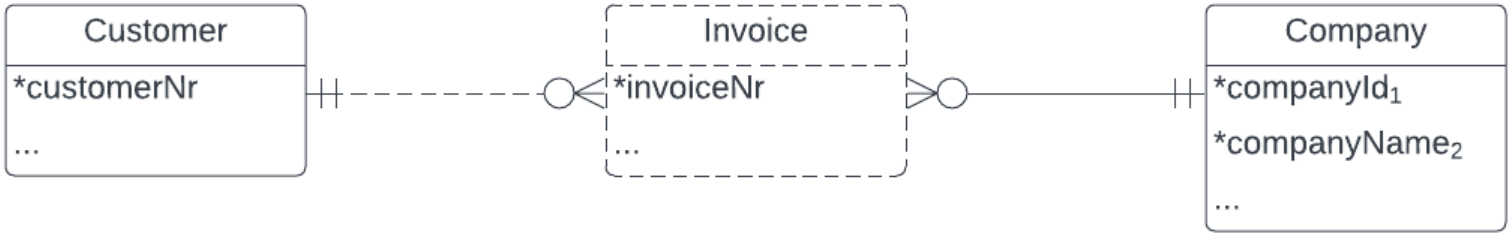
what's the use of a...

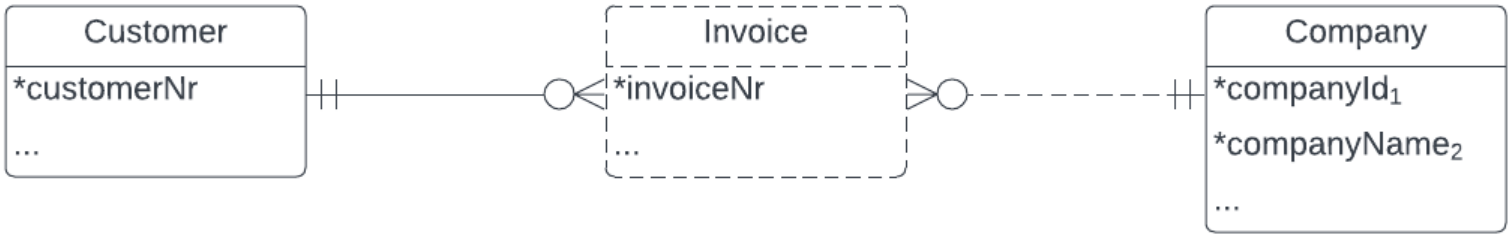
WEAK RELATIONSHIP



Invoice identity (uniqueness) is **not** dependent on the related customer

what's the use of a...

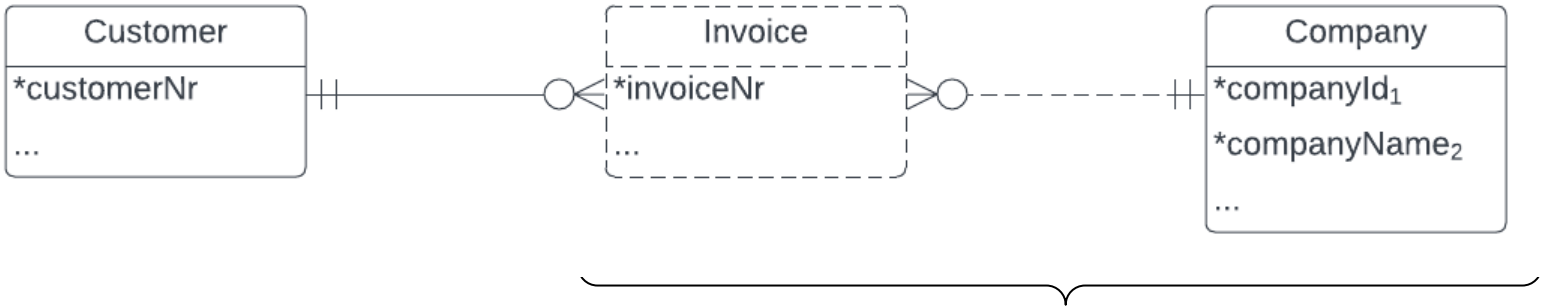
WEAK RELATIONSHIP



invoice identity (uniqueness) **is** dependent on the related company

what's the use of a...

WEAK RELATIONSHIP



(invoiceNr, companyId) is the key of invoice

A weak entity can have a strong relationship with a strong entity. However, strong relationships indicate that the related strong entity is not part of the key of the weak entity. Only (the key of) weakly related entities are part of the key of the related weak entity.

Weak entities

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