

Weak Entities

Weak entities require special treatment when creating the relational design. Recall that a weak entity depends for its existence on another entity. If the weak entity is existence dependent but not ID dependent, it can be represented using some techniques. The existence dependency needs to be recorded in the relational design so that no application will create weak entity without its proper parent. Moreover, a processing constraint needs to be implemented so that when the parent is deleted, the weak entity is also deleted. These rules should be described in the relational design.

This situation is slightly different if the weak entity also is ID dependent.

In this [figure](#), LINE-ITEM is an ID-dependent weak entity. It is weak because its logical existence depends on INVOICE, and it is ID dependent because its identifier contains the identifier of INVOICE.

When creating a relation for an ID-dependent entity, we must ensure that both the key of the parent and the key of the entity itself appear in the relation. For example, consider what would happen if we merely establish a relation for LINE-ITEM and did not include the key of INVOICE. Such a relation is shown [here](#).

What is the key of the relation? Because LINE-ITEM is ID dependent, it does not have a complete key, and, in fact, this relation could very well have duplicate rows. The problem is that the relation in figure has no unique identifier. Thus, for an ID-dependent weak entity, it is necessary to add the key of the parent entity to the weak entity's key.

Here we have added InvoiceNumber, the key of INVOICE, to the attributes in LINE-ITEM. The key of LINE-ITEM is the composite {InvoiceNumber, LineNumber}.