be represented by data stored in the database .For example , there is one EMPLOYEE entity type in most organizations , but there may be hundreds (or even thousands ) of instances of this entity type stored in the database. We often use the single term entity rather than entity instance when the meaning is clear from the context of our discussion.

Entity type versus system input, output, or user a common mistake people make when they are learning to draw e-r diagrams, especially if they are already familiar with data process modeling (such as data flow diagramming), is to confuse data entities with other elements of an overall information systems model. A simple rule to avoid such confusion is that a true data entity will have many possible instances, each with a distinguishing characteristic, as well as one or more other descriptive pieces of data.

Consider figure 2-4a, which might be drawn to represent a database needed for a college sorority expense system.(for simplicity in this and some other figures, we show only one name for a relationship.) in this situation, the sorority treasurer manages accounts, receives expense reports, and records expense transactions against each account. However, do we need to keep track of data about the treasurer(the treasurer entity type) and her supervision of accounts(the manages relationship) and receipt of reports(the receives relationship)? The treasurer is the person entering data about accounts and expenses and receiving expense reports. That is, she is a user of the database, because there is only one treasurer, treasurer data do not need to be kept. Further, is the expense report entity necessary? Because an expense report is computed from expense transactions and account balances, it is the result of extracting data from the database and received by the treasurer. Even though there will be multiple instances of expense reports given to the treasurer over time, data needed to compute the report contents each time are already represented by the account and expense entity types.

An other key to understanding why the ERD in figure 2-4a might be in error is the nature of the relationship names, receives and summarizes. These relationship names refer to business activities that transfer or translate date, not to simply the association of one kind of data. The simple e-r diagram in figure 2-4b shows entities and a relationship that would be sufficient to handle the sorority expense system as described here. See problem and exercise 21 for a variation on this situation. STRONG VERSUS WEAK ENTITY TYPES Most of basic entity types to identify in an organization are classified as strong entity types. A strong entity type is one that exists independently of other entity types.（some data modeling software ,in fact, use the term independent entity.)Examples include student, employee, automobile, and course. instances of a strong entity type always have a unique characteristic (called

an identifier)-that is, an attribute or a combination of attributes that uniquely distinguish each occurrence of that entity.

In contrast, a weak entity type is an entity type whose existence depends on

Some other entity. (some data modeling software, in fact, use the term dependent

Entity.) a weak entity type has no business meaning in an E-R diagram without the

Entity on which it depends. The entity type on which the weak entity type depends is

Called the identifying owner (or simply owner for short). A weak entity type does not

Typically have its own identifier. Generally, on an E-R diagram, a weak entity type has An attribute that serves as a partial identifier. During a later design stage (described in Chapter 4 a full identifier will be formed for the weak entity by combining the partial.Identifier with the identifier of its owner or by creating a surrogate identifier attribute.

An example of a weak entity type with an entifying is shown in Figure 2-5 EMPLOYEE is a strong entity type with identifier Employee ID (we note the identifier attribute by underlining it). DEPENDENT is a weak entity type as indicate by the double-lined rectangle .The relationship between a weak entity the identifying relationship (indicated by the double line). The attribute Dependent can be broken into component parts, as we describe later.) We use a double underline be combined with employee id to form a full identifier for dependent. Some additional examples of strong and weak entity pairs are: BOOK-BOOK COPY PRODUCT-SERIAL PRODUCT and COURSE-OFFERING.

NAMING AND DEFINIG ENTITY TYPES in addition to the general guidelines for naming and defining data objects, there are few special guidelines for naming entity types which follow:

An entity type name is a singular noun (such as CUSTOMER , STUDENT , or AUTOMOBILE ) ; an entity is a person , a place , an object , an event , or a concept , and the name is for the entity type , which represents a set of entity instances . It is common to also specify the plural form, because sometimes the E-R diagram is read best by using plurals. For example in Figure 2-1 we would say that a SUPPLIER may supply ITEM Because plurals are not always formed by adding an to the singular noun it is best to document the exact plural form

**(54-55)**