Database Design Project (Phase 1)

Draw an EER diagram to accurately represent this set of requirement. This will be your Conceptual Design. Clearly specify any assumption that you are making. You can use any tools (software) to draw the EER diagram. You don't need to describe the value constraints of the attributions in the EER diagram.

Ans:

The EER diagram is included in the zip file as a PDF.

Assumptions:

1. Partial key for Issues Weak entity. We assume Volumes/Issue together form partial key.
2. An issue can only belong to one magazine.
3. Publishers have a unique name and website. We assume that name and website can both be independent keys, as a website will always have a unique address.
4. Each material in the library can either be a magazine or a book, but cannot be both in a library. Also there may be other kinds of material in a library, except books and magazine.
5. There are 2 types of readers. And there cannot be any other type of reader, except the one shown in the diagram. All readers must be either faculty or student.
6. Copy_id is a partial key for Copy Weak entity type. Copy is modeled as a weak entity type because copy is dependent on material.
7. One reader may borrow 0 copies minimum and a maximum of 1copy.
8. Record will be generated for each copy borrowed by a reader and the copy. i.e. Record has min 1, max 1 to borrows relationship
9. Reader can participate or cannot participate in the "borrows" relationship, i.e. reader may or may not borrow the materials. The maximum number of reader s who borrow the materials is not fixed. Any number of readers can borrow the materials.
10. It is not necessary for a record to have fine.
11. We assume that it is not necessary for a publisher to have published a book or a magazine. Also, a single magazine may have only one publisher, no more.
12. It is not necessary for a material to be reserved by a faculty. But if it is reserved, then it can only be reserved by one faculty. A faculty may or may not reserve a material. And a maximum of N faculties can reserve a material.

a) Can you think 2 more rules (other than the one explicitly described above) that are likely to be used in the system?

Ans:

Two more rules to be considered could be:

a. When a Faculty reserves a Material, then a Reserves_Record should be generated, which should store the details regarding the fine and the checkout time of the Material. A reservation_status should also be generated to say if the record is expired, cancelled etc.
b. We could consider the modelling of other types of materials in the library too, such as CD's and DVDs. A CD or a DVD be related to the books (i.e. a CD or a DVD of a book) and could be considered an individual entity in itself, as a subclass of material.
c. Another rule could be, if the Book present, is actually a physical copy or an E-book. If it is an E-book, then its URL and Reservation_status (telling if the E-book is downloadable, paid, in which format etc.) should be recorded.

b) Is the ability to model super-class/subclass relationships likely to be important in such environment? Why or why not?

Ans:

The superclass-subclass relationship proves to be very important while modelling an EER diagram. This can be seen from the modelling of the Material as Books and Magazines. This helps to keep the diagram easy to read and prevent redundancy.

Also, dividing the Readers into Faculty and Students helps separate out the relationships in which only the Faculty will participate, and the ones in which only the students will take part, alongside keeping the superclass-subclass notion of inheriting the properties of the superclass. This provides better understanding of the mini-world being considered.

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