Section 1

Comparison of relational and ER model

In case of ER (Entity-relationship) model, before information storage, database structure is defined. Methods and diagram notations for database design are provided by ER model. In case of relational model, mathematical definition is provided. This definition is precise. Here, information is stored in tabular format (relational). Foreign key is used for interrelation purpose. A computational mechanism is provided by relational algebra that is formal. Different operations i.e. aggregation, select, join, project etc. can be performed on database. Every row, in table is related with point, instance or observation. Every column is associated with a feature or an attribute. In a data mining project when relational queries are performed - many temporary views or tables are created. Views are dynamic while tables are static. In case of ER model, they are not considered as entity. If queries are disconnected, then software maintenance, database management and software development become difficult. A relational database is shown as D (T, I). Here, T = {S_1 …. Sn. Integrity constraint is referred as I. A_1, A_2 show column in table. Referential integrity and entity are main constraints. Validity of foreign key and primary key is important. From Entity Integrity perspective, primary key should be there for each relation. In case of referential integrity, form Si (K) → Sj (K) is asserted. Considering recent ER tools, each relationship is having a foreign key. Each entity is related to a table. If there is 1:1 relationship, then it can be merged and there may be formation of one entity. In case of M:N relationship that is many to many, then a linking entity is formed. Both entities are connected. In a normalized database one to many to one relationship exists. For conversion of ER conceptual model in to a model that is Physical, The ER is mapped to relational model (Ordonez, 2014).

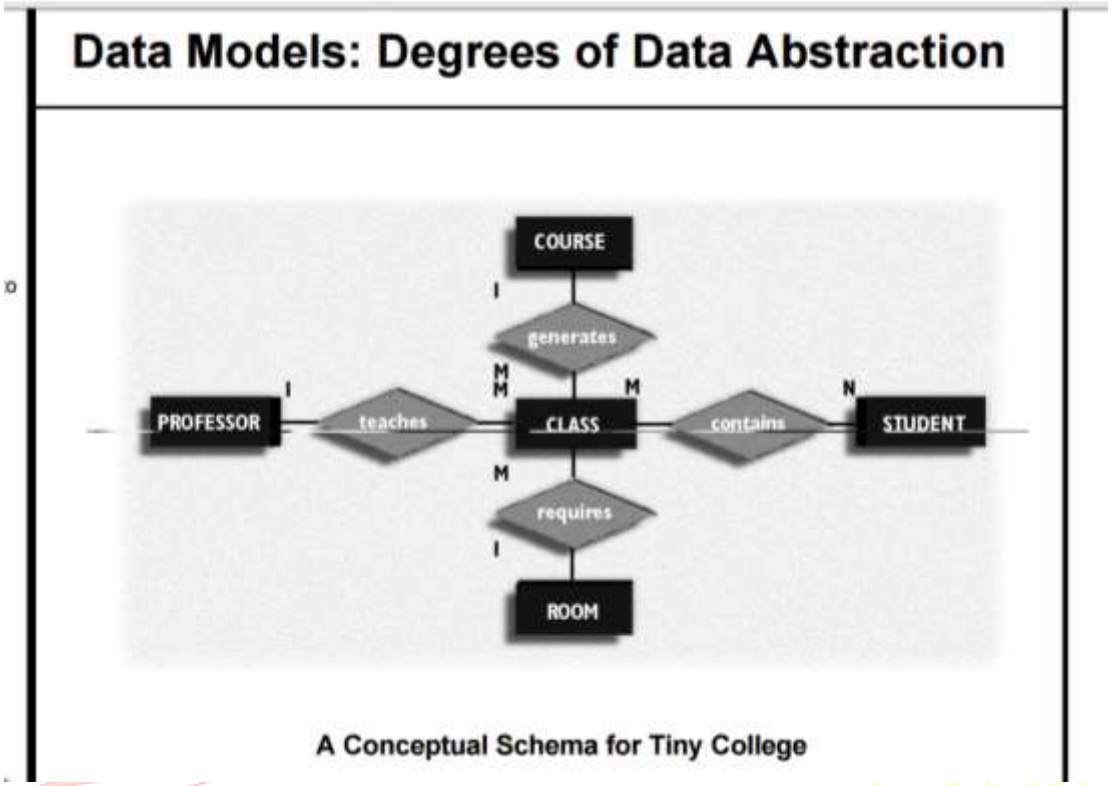
Semantic Data models

There is a need to have better real world understanding. It can be included in database. Database management systems become more sophisticated. Semantic data models help to get structure and meaning of data. This is done using abstraction i.e. association,

inclusion and aggregation. Application's and user's view concerning information are presented and modeled by conceptual design. Specifications concerning information processing or information utilization are supported by Entity relationship. Design of logical data model is converted to physical design. It is done as per the specifications of DBMS and hardware. Each entity is converted into different entity relation during transformation of entity relationship model to relational model.

Level of Abstraction

Abstraction has three levels Architecture i.e. internal, external and conceptual. User's view concerning database is referred as external level abstraction. As per the requirement, different database components are accessed by different users. External model is having external schema, which is its own. Here, data environment is viewed by end user. Internal model is a conceptual model. It is related to specific DBMS i.e. relational, hierarchical and network. It is a software dependent model. For network and hierarchical models, development of internal model is very important. Global view of data is shown by conceptual model. Here, data representation is enterprise wide. Top level managers see this. Entity relationship model is used at a very large scale. It is a conceptual model. Conceptual schema is formed on the basis of this model (Storey, 1993). It is not dependent on hardware or software. So, there is hardware independence as well as software independence.



(Source: http://www.uncg.edu/ism/ism318/e_r.pdf)

Section 2

Artist and Song

There is M-O (many to one) relationship between Artist and Song. It can be assumed that many artists are related with a song. However, in the database, there may be many artist who have not sung a song.

Chair and Department

It is one to one relationship. For example, a Professor chairs one department. There is only one chair in one department. In database, department and chair are related to each other.

Employee and Department

It is one to many relationship. Normally, one employee is related with one department. But in some cases he might be doing work of departments. So, in database, one employee may be related with many departments.

Product and Order

It is many to many relationship. In one order, there may be mention of many products. Similarly, one product may have mentioned in many orders. So, in database, many products may be related to many orders.

Author and Book

This is one to many relationship. One Author may have penned many books. So, in database, one product is related to one or many books.

References

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Storey, V. C. 1993. Understanding Semantic Relationships. VLDB Journal, 2, 455-488 (1993), Fred J. Maryanski, Editor