



# **DATABASE MANAGEMENT SYSTEM CASE STUDY**

**MC 302**

## **TOPIC - Network Model**

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# Database Models

A Database model defines the logical design and structure of a database and defines how data will be stored, accessed, and updated in a database management system. While the **Relational Model** is the most widely used database model, there are other models too:

- Hierarchical Model
- Network Model
- Entity-relationship Model
- Relational Model

## Network Model

The network model is the extension of the hierarchical structure because it allows many-to-many relationships to be managed in a tree-like structure that allows multiple parents. A network database looks more like a cobweb or interconnected network of records.

There are two fundamental concepts of a network model –

- Records contain fields that need hierarchical organization.
- Sets are used to define one-to-many relationships between records that contain one owner, many members.

In network databases, children are called members, and parents are called occupiers. The difference between each child or member can have more than one parent. The Approval of the network data model similar to the esteem of the hierarchical data model. Some data were more naturally modeled with more than one parent per child. The network model authorized the modeling of many-to-many relationships in data.

The hierarchical model is a subset of the network model. However, instead of using a single-parent tree hierarchy, the network model uses set theory to provide a tree-like hierarchy with the exception that child tables were allowed to have more than one parent. It supports many-to-many relationships. In this database model data is more related as more relationships are established in this database model. Also, as the data is more related,

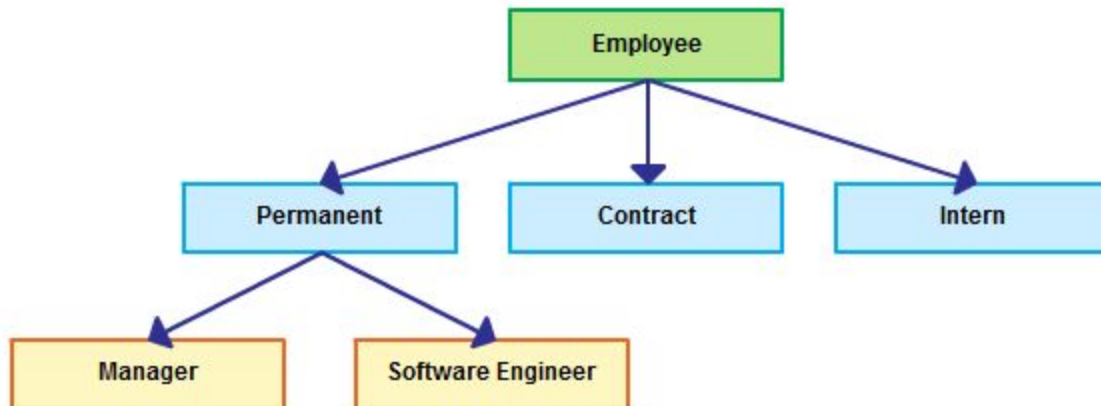
hence accessing the data is also easier and fast. This database model was used to map many-to-many data relationships.

A set is designed with the help of circular linked lists where one record type, the owner of the set also called as a parent, appears once in each circle, and a second record type, also known as the subordinate or child, may appear multiple times in each circle.

A hierarchy is established between any two record types where one type (A) is the owner of another type (B). At the same time, another set can be developed where the latter set (B) is the owner of the former set (A). In this model, ownership is defined by the direction, thus all the sets comprise a general directed graph. Access to records is developed by the indexing structure of circular linked lists.

Network Database: A network database is mainly used on large digital computers. It more connections can be made between different types of data, network databases are considered more efficient. It contains limitations must be considered when we have to use this kind of database.

### Example of Network Database Model



A collection of records is represented by a node, and a set structure helps to establish a relationship in a network helps to. This development helps to relate a pair of nodes together by using one node as an owner and the other node as a member. A one-to-many relationship is managed by set structure, which means that a record in the owner node can be related to one or more records in the member node, but a single record in the member node is related to only one record in the owner node.

## **ADVANTAGES OF NETWORK MODEL**

The major advantages of the network model are-

1. Conceptual simplicity - Just like the hierarchical model, the network model is also conceptually simple and easy to design.
2. Capability to handle more relationship types - The network model can handle the one to many and many to many relationships which are a real help in modeling real-life situations.
3. Ease of data access - The data access is easier and flexible than the hierarchical model.
4. Data integrity - The network model does not allow a member to exist without an owner.
5. Data independence- The network model is better than the hierarchical model in isolating the programs from the complex physical storage details.
6. Database standards

## **DISADVANTAGE OF NETWORK MODEL**

1. System complexity- All the records are maintained using pointers and hence the whole database structure becomes very complex.
2. Operational Anomalies- The insertion, deletion, and updating operations of any record require a large number of pointers adjustments.
3. The absence of structural independence - structural changes to the database is very difficult.