

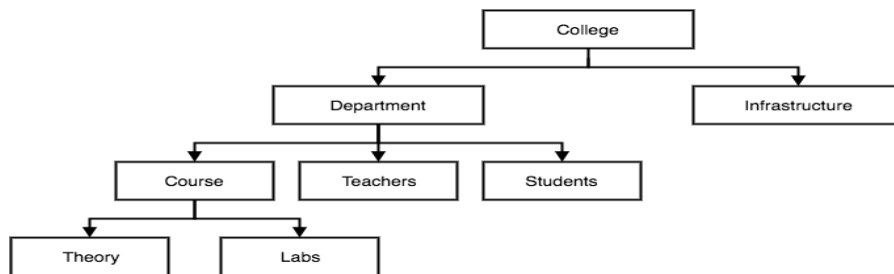
Hierarchical Model

This database model organises data into a tree-like-structure, with a single root, to which all the other data is linked. The hierarchy starts from the **Root** data, and expands like a tree, adding child nodes to the parent nodes.

In this model, a child node will only have a single parent node.

This model efficiently describes many real-world relationships like index of a book, recipes etc.

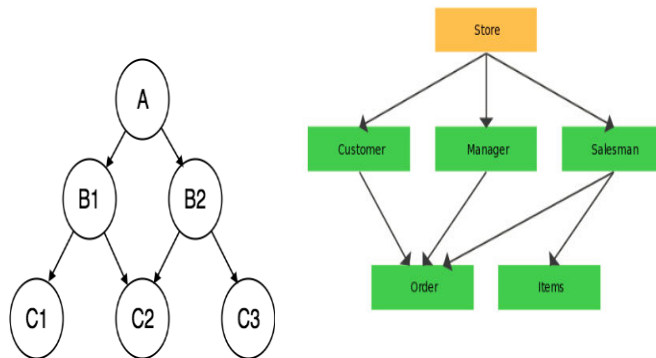
In hierarchical model, data is organised into tree-like structure with one one-to-many relationship between two different types of data, for example, one department can have many courses, many professors and of-course many students.



Network Model

This is an extension of the Hierarchical model. In this model data is organised more like a graph, and are allowed to have more than one parent node.

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. This was the most widely used database model, before Relational Model was introduced.



The Physical Model

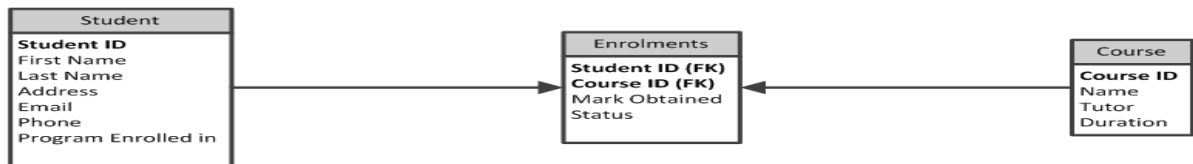
- **Lowest level of abstraction**
 - Describes the way data are saved on storage media such as disks or tapes
- **Software and hardware dependent**
 - Requires database designers to have a detailed knowledge of the hardware and software used to implement database design
- **Physical independence**
 - Can change the physical model without affecting the internal model



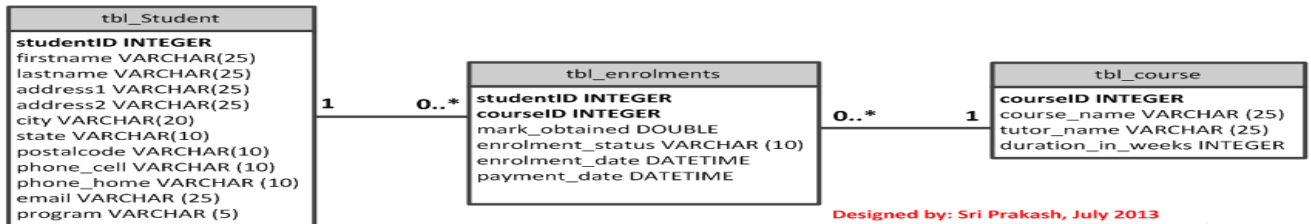
Conceptual Model



Logical Model

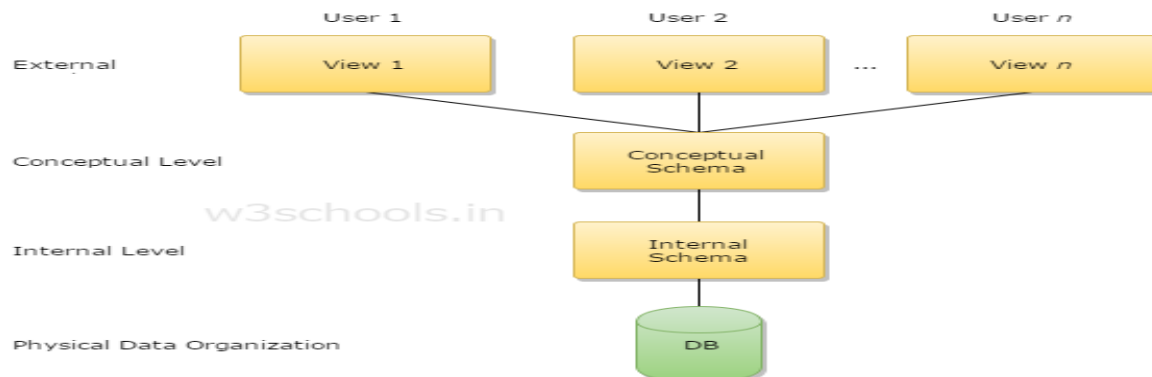


Physical Model



Designed by: Sri Prakash, July 2013
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DBTG (Data Base Task Group) appointed by the Conference on Data Systems and Languages (CODASYL, 1971). The DBTG recognized the need for a two-level approach with a system view called the schema and user views called sub-schemas.



ANSI_SPARC Architecture of the database system



The Three Tier Architecture