LECTURE

INFORMATION MODELS AND DATA MODELS

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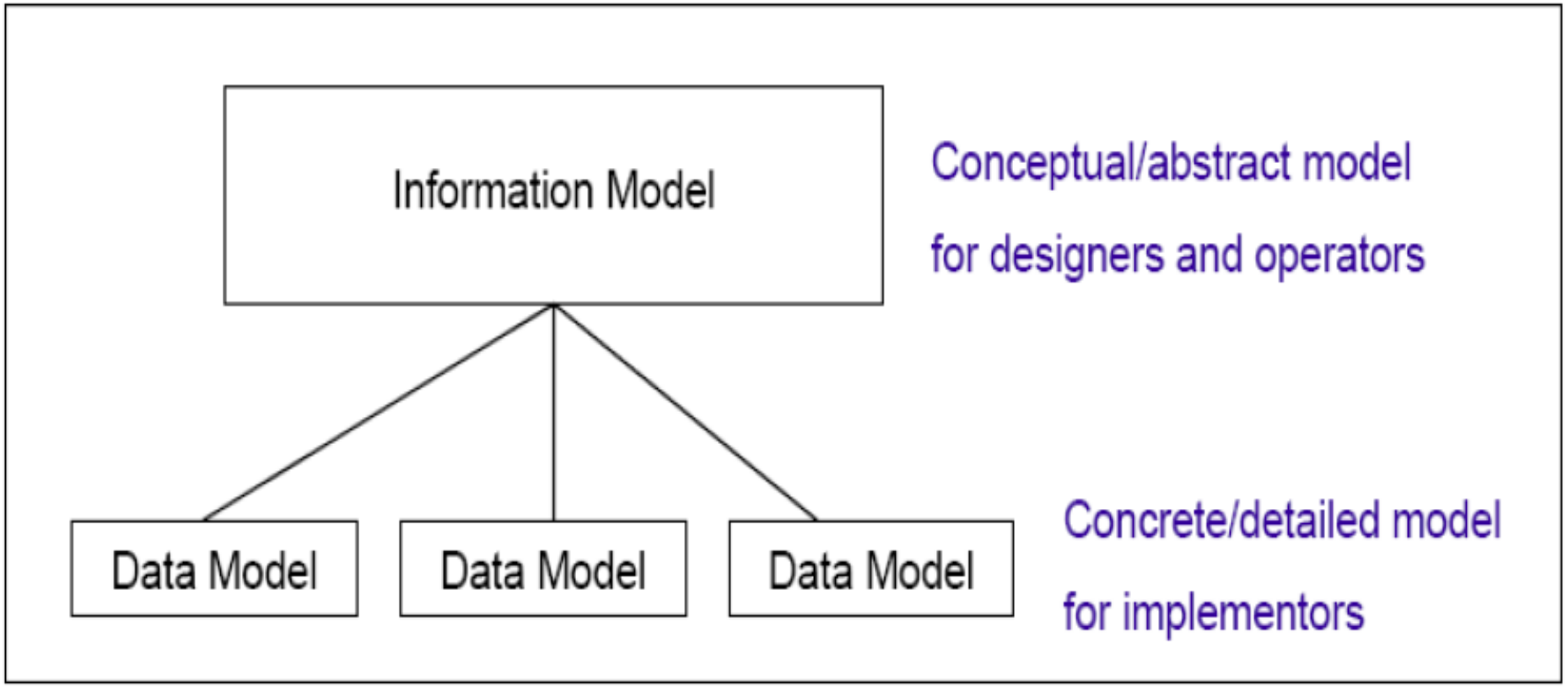
Information and Data Models

Relationship between an Information Model and a Data Model



- An information model is an abstract, formal representation of entities that includes their properties, relationships and the operations that can be performed on them.

- The main purpose of an Information Model is to model managed objects objects at a conceptual level, independent of any specific implementations or protocols used to transport the data.

- Data Models, on the other hand, are defined at a more concrete level and include many details. They are intended for software developers and include protocol specific constructs.

- A data model is the blueprint of any database system.

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WHAT IS DATA MODEL

- A data model is defined as a collection of conceptual tools for describing data, data relationship, data semantics and consistency constraints.

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Information Models

- Network
- Hierarchical
- Relational
- Entity-Relationship
- Extended relational
- Semantic
- Object-oriented
- Object-relational
- Semi-structured

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NETWORK DATABASES

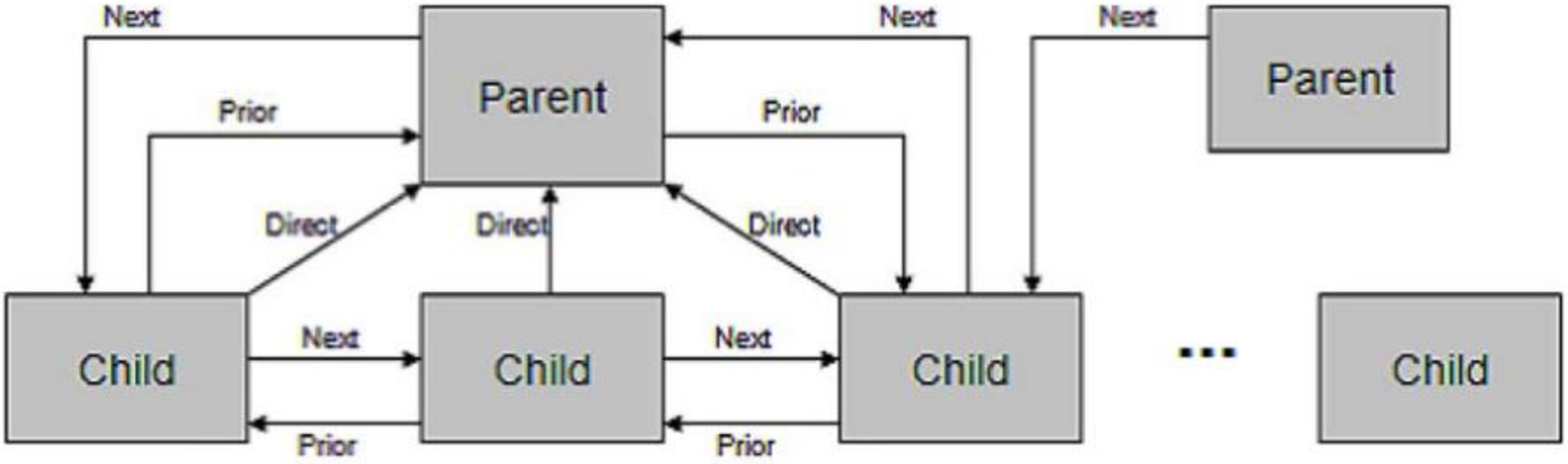
NETWORK DATABASES

- Store data either in a parent record, called the owner, or in a child record called the member.
- Can be referred to as a collection of records which are connected to one another through links.
- Network database can handle many-to-many relationships. Means that owners can have multiple members and members can have multiple owners.

NETWORK DATABASE

- The network model contains many-to-many relationships

Network Model



- In a network model, a child can have more than one parent, and each record type points to each other with next, prior and direct pointers.

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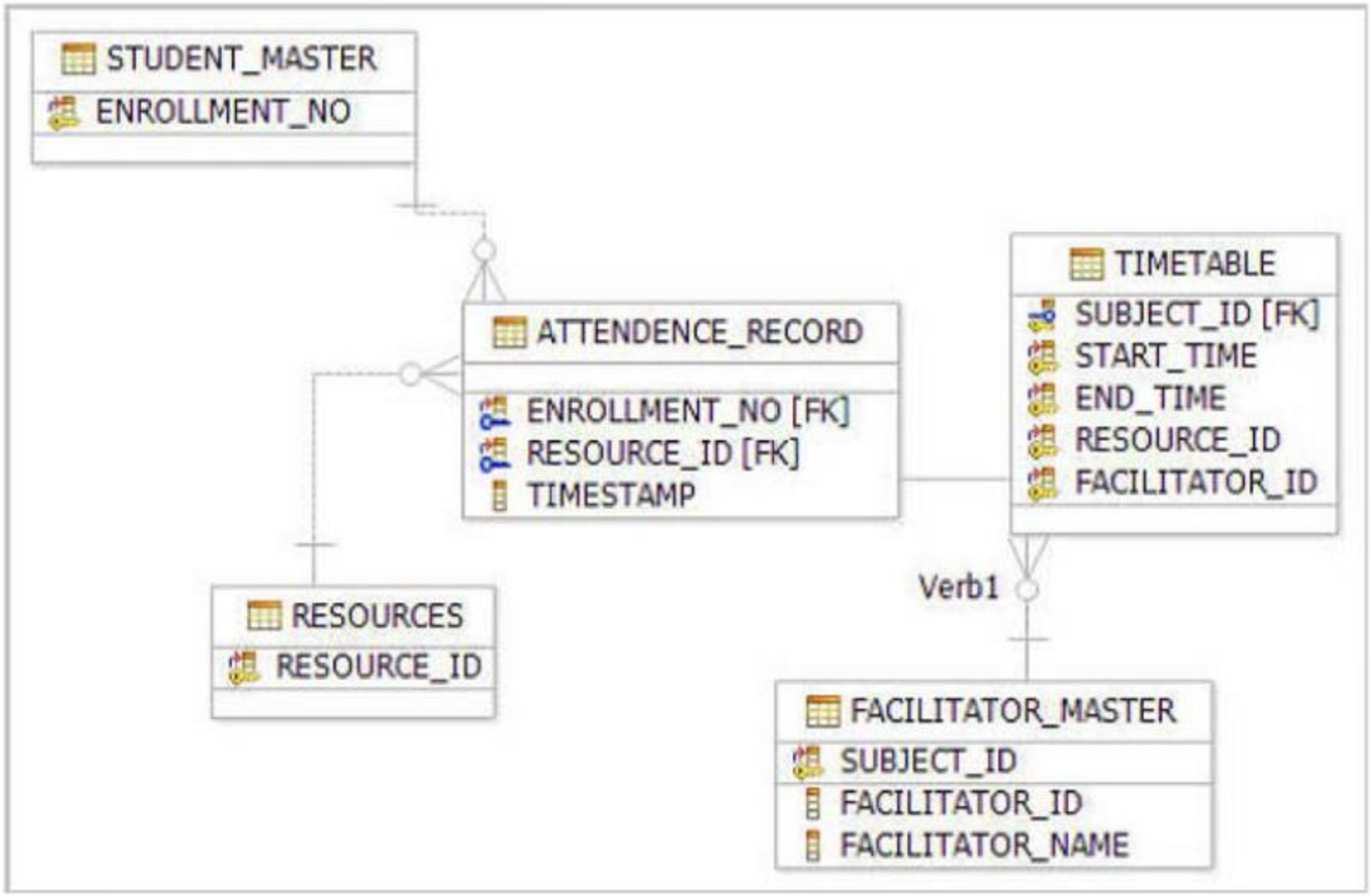
RELATIONAL DATABASE

- In a relational model, data is represented in rows and columns of a table. The rows are called records while the column are called fields.

Relational Model



- The relational data model is simple and elegant. It has a solid mathematic foundation based on sets theory and predicate calculus and is the most used data model for databases today.

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HIERARCHICAL DATABASES

HIERARCHICAL DATABASE

- The hierarchical model makes use of the one-to-one or one-to-many entity relationships. In this type of database, data is grouped into segments resembling a tree structure.

HIERARCHICAL DATABASES

- Are represented by using a hierarchy chart.
- A **SEGMENT** is the smallest unit of information in a hierarchical database. Each segment is composed of fields. The topmost segment in the hierarchy is called the **ROOT or PARENT SEGMENT.**
- Other segments are called **DEPENDENT** or **CHILD SEGMENTS.**

- If a segment has more than one child segment, these segments are called SIBLINGS.

- The relationship is one-to-one if a parent segment has only one child segment; one-to-many if a parent segment has more than one child segment.

- A child segment can only have one parent which imply that many-to-many relationships are not allowed.