Introduction to Data Models

What is a data model ?

efficient

① Storage

② computation

↑ Fast

complex DS

customer

Abstraction

Data Modeling

Abstraction

Data Modelling

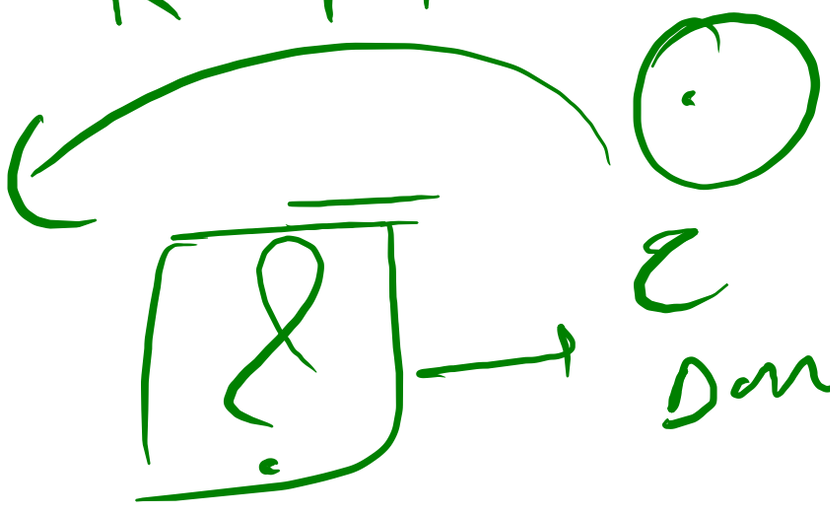
↳ collection of concepts n notations for describing data

↳ Relationships b/w data

↳ Data semantics

DBMS

Read/update / create

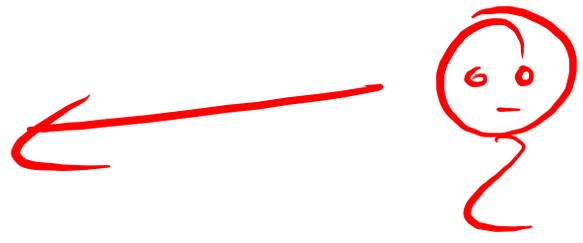


E

Done by Data Modelling

High Level Conceptual Data Models

(DBMS)

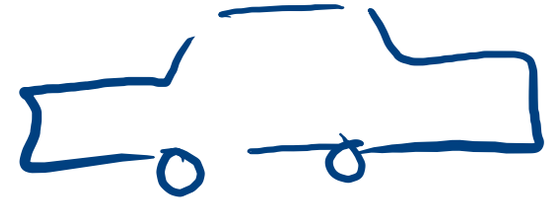


Entity Relationship Model

Entity

name
age
gender

non living



color
sound
Myear

entities

ER Model } Relationships }

Company }

Department

id | name | description

Employees

id | name | DOJ | salary

Relationship

improvement!!!

Relationship }

Record based logical data models

① Easy to understand

② Representation is more like how data can be stored in computer

Hierarchical Model

Parent child | Tree like Model

Represent data in tree like structure

Vehicle

Engine

Structure

Left door

Right door

① Each child can have only 1 parent

② Each parent can have 0 or more childs

Network Model

Complex Graph

① Each child can have multiple parents

② Each parent can have multiple children

University

Students

Degrees

Subjects → Multiple parents

Relational Model

Data
① Tables
② Relationships b/w tables

University

Students

id | name | doj | ...

Professors

id | name | doj | ...

Courses

id | name | description

Physical Data Model

How data is stored physically in computer memory

↓

Data tasks

- Attribute → Name
- → type

ordered / arranged in the computer Memory

retrieved from computer Memory

Student table

id : Integer

name : String

Age : Integer

Address : String / varchar

Department table

id : Integer

name : varchar

location : varchar

↑ Relationship