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Information and Database

Database

"Refers to a structured collection of electronically stored data which is controlled, accessed through computers based on predefined relationships between predefined types of data items related to a specific business situation or problem"

"Is an organized collection of records/information that is made-up of related records."

Database Management System : *A DBMS is an integrated set of programs used to define, update and control databases.*

File : *Is a set of related records that contains the same fields in the same order and same format.*

Record : *Record is a set of fields, each of which is related to the same thing, person or event.*

Field : *A field is a group of characters that have a predefined meaning.*

Key : *A key is field that uniquely identifies which person, thing or event the record describes.*

Types of Data

- Pre-defined data Items
- Text
- Images
- Audio
- Video

Data Modeling : *The process of defining what data is used or produced in an information system and how that data is organized.*

Entities :*The specific things, database collects data about.*

Entity type :*The kind of things, data is collected about*

Relationship :*The way specific entities of one type might related to specific entities of the other type*

Entity Relation Diagram :*Technique for identifying the entity types in a situation and diagramming the relationship between those entity types.*

Type of Relationships :

- *One-to-One relationship*
- *One to Many relationship*
- *Many to Many relations*

Types of Databases

- Relational Databses
- Multi-Dimensional Databases
- Data Warehouse
- Geographical Information systems
- Text and Image databases
- Hyper Databases and Web
  - Web page
  - HTML
  - URL
- Indexes and Search Engines

Roles of DBMS

- <u>Controlling and Organizing data to increase its value</u>
  - Efficient way to organize data
  - Improves data Accuracy
  - Discouraging Data Redundancy
  - Flexibility
  - Supports Data Security (controlled access / recovery procedures)
- Making Programming more efficient
  - Provides consistent and centralized defining methods

Range of DBMS Functions

- Defining the database
  - Data Definition
  - Data Dictionary
- Methods of Accessing data in a Computer Systems
  - Sequential Access
  - Direct Access
  - Indexed Sequential Access (ISAM)
- Processing transactions
- Controlling Distributed Databases
- Backup and Recovery
- Supporting Database Administration

Evaluating Data as a Source (Usefulness)

- **Information Quality :**
  - Accuracy
  - Precision
  - Completeness
  - Age
  - Timeliness
  - Source
- **Information Accessibility:**
  - Availability
  - Admissibility
- **Information Presentation :**
  - Level of Summarization
  - Format
- **Information Security :**
  - Access Restriction
  - Encryption

Models as Component of IS

- **Mental Models**
- **Mathematical Model**
- **What-if Questions**
- **Virtual Reality :The Ultimate interactive Model**