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DATABASE MANAGEMENT SYSTEM

CLASS: UG
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Presentation on
DATABASE MANAGEMENT SYSTEM

BASIC CONCEPTS OF DATABASE

* A database is a collection of related information stored in a organized manner so that it is available to many users for different purposes. The content of a database is obtained by combining data from all the different sources in an organization. So that data are available to all users and redundant data can be eliminated.

* An organization must have accurate and reliable data for effective decision making. To this end, the organization maintains records the various facets of its operations by building appropriate models of the diverse classes of objects of interest. These models capture the essential properties of the objects and record relationships among them. Such related data is called a **Database**. A **Database System** is an integrated collection of related files, along with details of the interpretation of the data contained therein.

General objectives in establishing a Database

* Eliminate redundant data as much as possible.
* Integrate existing data files.
* Share data among all users.
* Incorporate changes easily and quickly.
* Simplify the use of data files.
* Maintenance of Data Security
* Lower the cost of storing and retrieving data.
* Improve accuracy and consistency.
* Provide data security from unauthorized use.
* Exercise central control over standards.

Advantages of Database

* File Consolidation
* Program and file independence
* Access Versatility
* Data Security
* Program Development
* Program Maintenance
* Special Information

What is DBMS?

* The management of data in a database system is done by means of a general purpose software package called DBMS.
* The primary goal of the DBMS is to provide an environment that is both convenient and efficient to use in retrieving and storing database information.

* A Database Management System is a software system that allows access to data contained in a database. The objective of the DBMS is to provide a convenient and effective method of defining, storing, and retrieving the information contained in the database. The DBMS interfaces with application programs, so that data contained in the database can be used by multiple applications and users.

DBMS - facilities/capabilities

* Creating of a file, addition, Deletion, modification of data and of entire files.
* Retrieving data collectively/selectively.
* The data can be sorted/indexed.
* Various reports can be produced.
* It can perform desired calculations.
* To maintain data integrity and database use.

Commercially available DBMS Software are

* ORACLE
* SYBASE
* INGRESS
* Microsoft ACCESS
* FoxBASE
* FoxPro
* Dbase

ENTITY-RELATIONSHIP MODEL

* Although it has some means of describing the physical database model, It is basically useful in the design of logical database model.
* It is used to organize data as a relation, normalizing relations and finally obtaining a relational database model.

E-R MODEL BASICS

- Entities : An entity is a person, place, thing, or event of interest to the organization and about which data are captured, stored or processed. For example, an Employee is an entity. An **entity type** or **entity set** is a group of similar objects of concern to an organization for which it maintains data.
- Attributes : Which specify properties of entities and relationships.
- Relationship :Which connect entities and represent meaningful dependencies between them. In general we can say that an employee works in some department.

Definitions Related to Relational Model

* The data is perceived by the user as relations (and nothing but relations); and
* The operators are at the user's disposal, for data retrieval - the operators that generate new relations from old, include at least SELECT, PROJECT, UNION and JOIN

RELATIONAL DATA INTEGRITY

- Primary key : The PK is the kind of key that is chosen by the database designer as the principal means of identifying entities within an entity set.
- Foreign key : If a non-key attribute in one relation appears as the primary key (or part of the primary key) in another relation, it is called foreign key

DBMS FACILITIES

* Data Definition Language : It includes all the entity sets and their attributes as well as the relationships among the entity sets. It also includes any constraints that have to be maintained, including the constraints on the value that can be assigned to different attributes in the same or different records. Example : Create Table,Index,View

* Data Manipulation Language : It enables users to access or manipulate data from the database, insertion of new data into the database, and deletion or modification of existing data. The first of these data manipulation operation is called a QUERY. Examples : Select, Insert, Update, Delete

PROPERTIES OF NORMALIZED RELATIONS

* No data value should be duplicated in different rows unnecessarily.
* A value must be specified for every attribute in a row.
* Each relation should be self-contained.
* When a row is added to a relation, other relations in the database should not be affected.
* A value of an attribute in a tuple may be changed independent of other tuples in the relation and other relations.

TABLE : ORDER_DETAILS

ORD_NO	ORD_DT	IT_CODE	QTY	PRICE
1456	26/02/2021	3687	52	50
1456	26/02/2021	4627	38	60
1456	26/02/2021	3214	20	17
1886	27/02/2021	4629	45	20
1886	27/02/2021	4627	30	60
1788	28/02/2021	4627	40	60

NORMALIZED FORM OF RELATION

THANK YOU

Any Questions?