Data Flow Diagram

DFD stand for data flow diagram. DFD graphically representing the functions, or processes, which capture, manipulate, store, and distribute data between a system and its environment and between components of a system.

A DFD , also known as a "bubble chart" serves the purpose of clarifying system requirements and identifying major transformation that become program in system design . A DFD consists of a series of bubbles joined by lines . the bubbles represent data transformation and lines represent data flows in system . the DFD is a representation of various processes and the input and output in each process . Graphical description of a system's data and how the process transform the data is known as Data Flow Diagram (DFD).

Why use DFD

Data Flow Diagramming is a means of representing a system at any level of detail with a graphic network of symbols showing data flows, data stores, data processes, and data sources/destination.

Terms used in DFD

- **Process :** A process transforms data values The lowest level processes are pure functions without side effects An entire data flow graphics high level process.
- **Data flows :** A data flow connects the output of an object or process to input of another object or process. It represents the intermediate data value within a computation. It is represented by an arrow and labeled with a description of data, usually its name or type.
- **Data store :** A data store is a passive object with in a data flow diagram that . stores data for later access.
- **External Entity :** A rectangle represents an external entity such as a librarian a library member
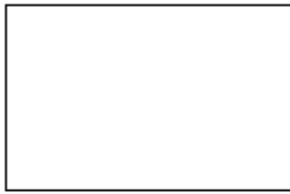
Symbol Used in DFD

Square

Fig: Square DFD

A square defines a source (originator) or destination of system data.

Arrow

Fig: Arrow DFD

An arrow identifies data flow-data in motion. It is a pipeline through which information flows.
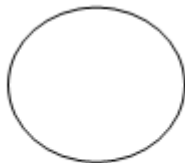
Circle

Fig: Circle DFD

A circle or a bubble represents is a process that transforms incoming data flow into outgoing data flow. Circle basically represents a process.
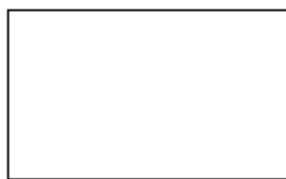
Ractangle

Fig: Open Rectange DFD

An open Rectangle is data store-data at rest, or temporary repository of data. Open rectangle basically denotes data storage.

Naming Conventions in DFD

The name of data stores and destination are written in capital latters . process and data flow name have the first letter of each work capitalize.

Types of DFD

There are two types of DFD Logical DFD and Physical DFD.

Logical DFD

Logical data flow diagram mainly focuses on the system process. It illustrates how data flows in the system. Logical DFD is used in various organizations for the smooth running of system.

Physical DFD

Physical data flow diagram shows how the data flow is actually implemented in the system. Physical DFD is more specific and close to implementation.

Zero Level DFD
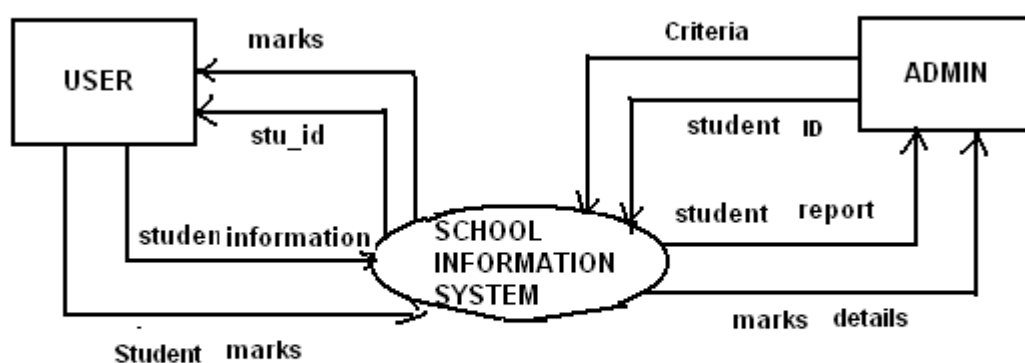
CONTEXT LEVEL OR .O LEVEL DFD
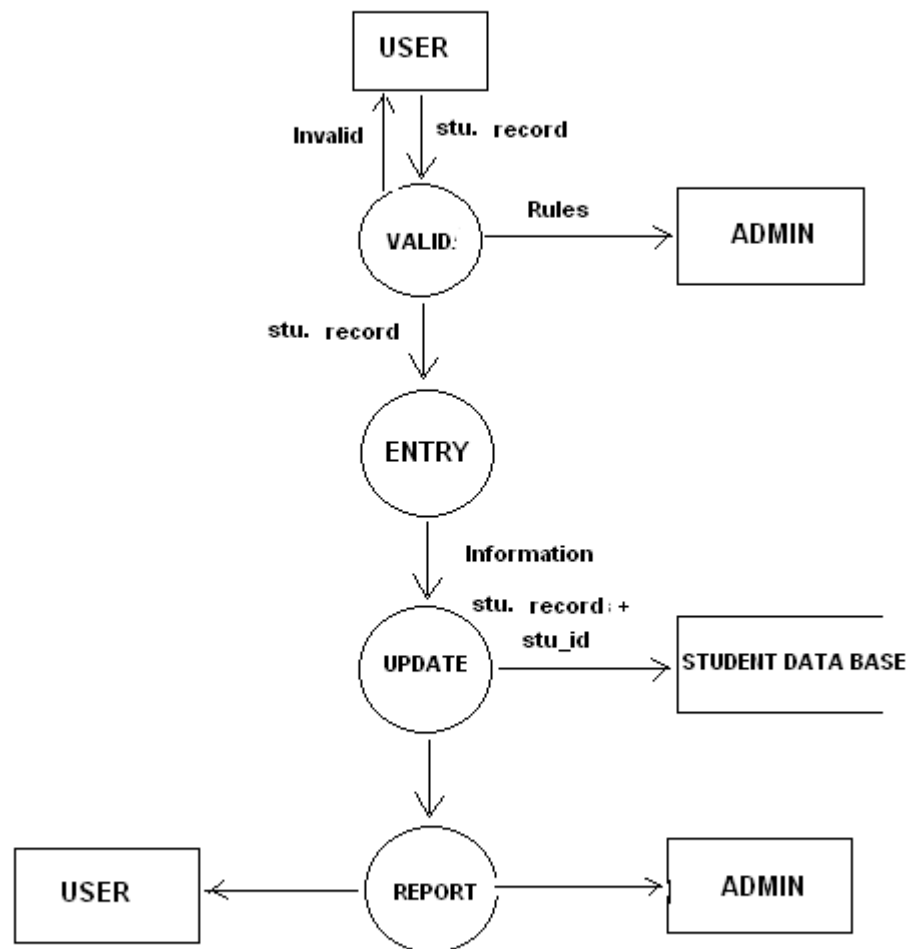
ADD NEW STUDENT RECORDS

Fig: ONE LEVEL DFD

One Level DFD

ER Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties.

A model that represents system data by entity and relationship sets is called E-R (Entity-Relationship) diagram. It is a detailed logical representation of the data for an organization.

The entity-relationship (E-R) diagram is based on a perception of a real world which consists of a set of basic objects.

The ERD is graphical data modeling tool. It is based on a perception of a real worker that consists of a collection of basic objects , called entities , and of relation among these objects. While DFD captures the data and its relationship.

E-R diagram is consists of three main constructs, i.e. Data Entities, Relationships and their Associated Attributes.

Data Entities

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.

Relationship

Relationship: An association of several entities in an entity-relationship diagram is called relationship. There are three types of relationship exist among entities. These are:

- One-to-One
- One-to-Many
- Many-to-Many

Relationship

Attributes: Each entity type has a set of attributes associates with it. An attribute is a property of characteristics of an entity that is of interest to the organization. I use an initial Capital Letters, followed by Lowercase Letters in naming an attribute. If an entity is something about which I want to store data, then I need to identify what specific pieces of data I want to store about each instance of a given entity. I call these pieces as data attributes.

ERD is built up by the following components

- **Rectangle:** Which represent entity sets
- **Ellipses:** Which represent attributes

- **Diamonds:** Which represent relationship among entity sets
- **Lines:** Which like attributes to entity sets customer set to relationship

Attribute(s)

Attributes are the properties which define the entity type. For example, Roll_No, Name, DOB, Age, Address, Mobile_No are the attributes which defines entity type Student. In ER diagram, attribute is represented by an oval.

Key Attribute

The attribute which uniquely identifies each entity in the entity set is called key attribute.For example, Roll_No will be unique for each student. In ER diagram, key attribute is represented by an oval with underlying lines.

Composite Attribute

An attribute composed of many other attribute is called as composite attribute. For example, Address attribute of student Entity type consists of Street, City, State, and Country. In ER diagram, composite attribute is represented by an oval comprising of ovals.

Multivalued Attribute

An attribute consisting more than one value for a given entity. For example, Phone_No (can be more than one for a given student). In ER diagram, multivalued attribute is represented by double oval.

Derived Attribute

An attribute which can be derived from other attributes of the entity type is known as derived attribute. e.g.; Age (can be derived from DOB). In ER diagram, derived attribute is represented by dashed oval.
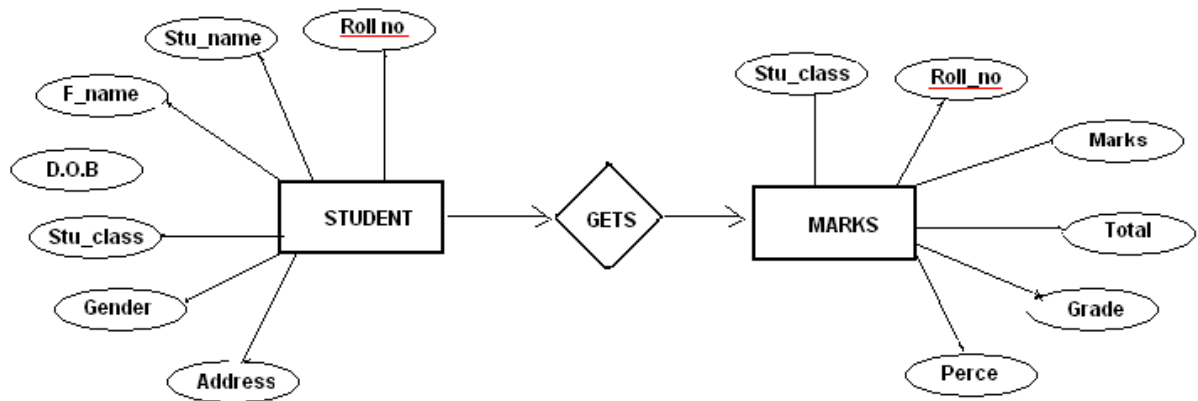
Fig: E R DIGRAM

Common Entity Relationship Diagram Symbols

An ER diagram is a means of visualizing how the information a system produces is related. There are five main components of an ERD:

Entities

Entities, which are represented by rectangles. An entity is an object or concept about which you want to store information.

Week Entities

A weak entity is an entity that must defined by a foreign key relationship with another entity as it cannot be uniquely identified by its own attributes alone.

Action

Actions, which are represented by diamond shapes, show how two entities share information in the database.

Atributes

Attributes, which are represented by ovals. A key attribute is the unique, distinguishing characteristic of the entity. For example, an employee's social security number might be the employee's key attribute. Attribute - ERD SymbolA multivalued attribute can have more than one value. For example, an employee entity can have multiple skill values.

Derived Attributes

A derived attribute is based on another attribute. For example, an employee's monthly salary is based on the employee's annual salary.

Connection Lines

Connecting lines, solid lines that connect attributes to show the relationships of entities in the diagram.
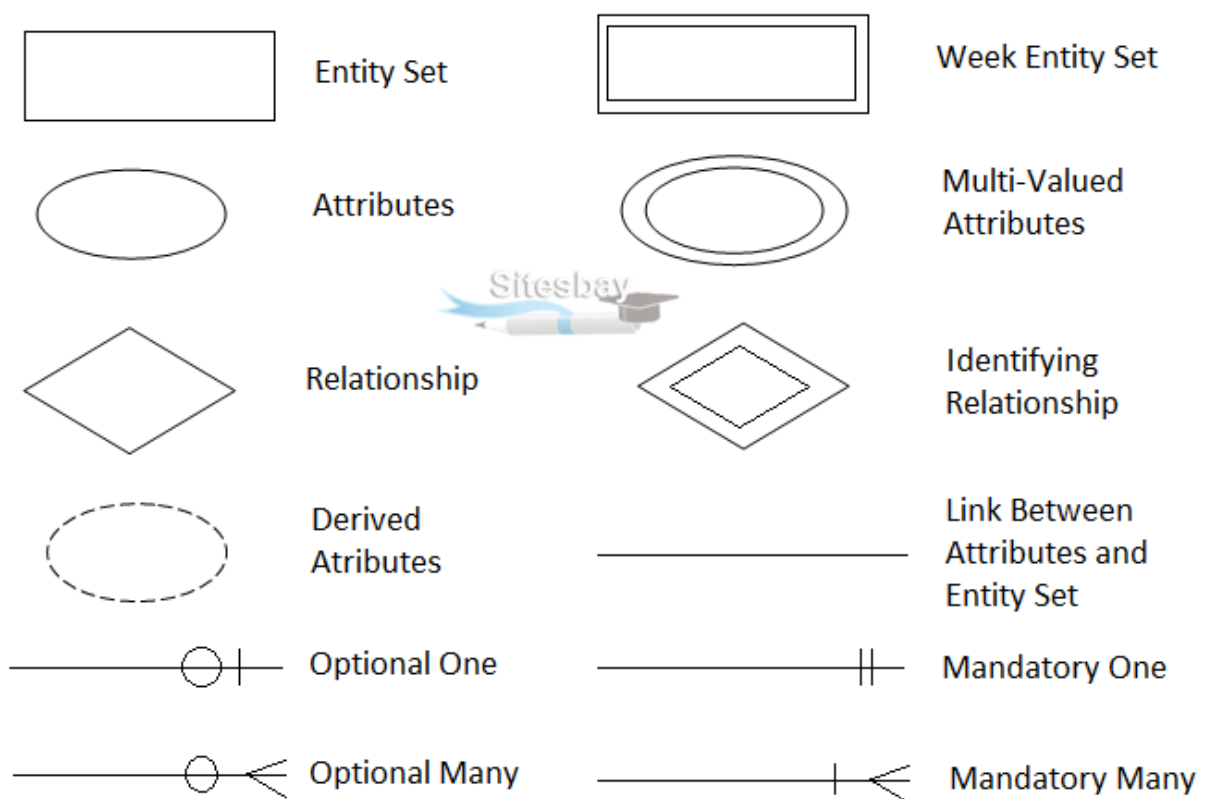

Fig: ER Diagram Symbols

Naming Convention in ER Diagram

In our ER diagrams, we will use the convention that entity type and relationship type names are uppercase letters, attribute names have their initial letter capitalized, and role names are lowercase letters.