**4.4 USER INTERFACE LAYOUT**

**4.4.1 INPUT DESIGN**

Input design is the process of converting the user-originated inputs to a computer-based format. The design for handling input specifies how data are accepted for computer processing. Input design is a part of overall system design that needs careful attention and if includes specifying the means by which actions are taken.

A system user interacting through a workstation must be able to tell the system whether to accept input produce a report or end processing. The collection of input data is considered to be the most expensive part of the system design.

**4.4.2 OUTPUT DESIGN**

The output design is done so that the result of processing could be committed to the user and to provide a hard copy of these results and evaluations for later consultations. Effective output design will improve the clarity and performance of outputs. Output design phase of the system is concerned with the convergence of information’s to the end user-friendly manner. The output design should be efficient, intelligible so that system relationship with the end user is improved and thereby enhancing the process of decision making.

**4.5 DATABASE DESIGN**

Database design refers to storage areas of necessary data into the database. Database refers to the creation of many tables in order to save large amount of data. The tables may contain the name of the fields, its type. As per the requirements of user we can decide which field to be entered into the table. For a table there may be a primary key which refiner to another table.

**ADVANTAGES OF DBMS**

1. Avoiding data redundancy and inconsistency.
2. Easy retrieval of data
3. Keeps data integrity.
4. Data independency.
5. High security.

**4.5.1 NORMALIZATION**

Normalization is the process of simplifying the relationship between data elements in records. There are four major reasons for normalization.

1. To structure data so that any pertinent relationship between entities can be represented.
2. To permit simple retrieval of data in response to query and report request.
3. To simplify maintenance of data through updates, insertion and deletion.
4. To reduce the need to restructure or reorganize data when new application requirements arise.

**FIRST NORMAL FORM**

First Normal is considered to be part of the formal definition of the relation in the basic relational model. It was defined to disallow multivalve attributes, composite attributes, and their combinations. It states that the domains of an attribute must include only atomic values and that the values of any attributes in a tuple must be a single value from the domain of the attributes.

**SECOND NORMAL FORM**

Second Normal is based on the concept of the fully functional dependency. A functional dependency X->Y is a full functional dependency, if removal of any attribute A from X means that dependency does not hold anymore. A relation schema R is in 2NF if every non-prime attribute A in R is fully functionally dependent on the primary key R.

**THIRD NORAML FORM**

Third Normal form is based on the concept of transitive dependency. A functional dependency X->Y in a relation schema R is a transitive dependency, if there is neither a set of attributes Z that is a candidate key nor a subset of any key of R, and both X->Y and Z->Y hold. A relation schema R is in 3NF if is satisfies 2NF and no non-prime attribute of R is transitively dependent on the primary key.

**TABLES**

A table is a set of data elements (values) that is organized using a model of vertical columns (which are identified by their name) and horizontal rows. A table has a number of columns but can have any number of rows. Each row is identified by the values appearing in a particular column subset which have been identified as a candidate key.

Table is database objects that contain all the data in a database. A table definition is a collection of columns in the same way a database is a collection of tables. Before data can be stored in a database, you must understand how to create, modify, and maintain the tables within your database.

**Database Diagrams**

Database diagrams enable you to create, manage, and view database objects in a graphical format. Before object within the database can be manipulated using database diagram you must understand how to: create a database diagram, add objects to it, work within a database diagram, and save a database diagram.

**4.4.2 E R DIAGRAM**

Entity-Relationship Analysis involves capturing and analysing of maximum possible details on data required for building an information system for an organization. Entity –Relationship (E-R) modelling is concerned with the structure of data rather than with the business rules. Some amount of business rules may also be implied in the E-R model. Structure of data involves details on entities, attributes and relationships. Business rules define such characteristics as the domain values of attributes, unique characteristics of entities, relationships among different entities and validating operations to be performed during data entry.

E-R analysis involves the following:

1. Determining what types of people, places, things and materials interact with the business and about which objects the data must be maintained. These objects form the entities.
2. Determining what unique feature such as the primary key can be used to identify an entity in an entity set.
3. Determining the associations (relationships) among identified objects.

**Name Symbol Meaning**

Rectangle Represents entity set

Oval Represents attributes

Diamond Represents relationships among entity set

Line Links attributes to entity set and entity set

to Relationships