

INFORMATION TECHNOLOGY (ICITSS)

COURSE MATERIAL MODULE – II



Board of Studies

The Institute of Chartered Accountants of India, New Delhi

The objective of this compilation of background material is to provide uniform reference material to the students undergoing Information Technology under ICITSS. All attempts have been made to make the discussion simple and comprehensive.

Students may note that this is intended to help them acquire knowledge and skill in the subject and gain hands on experience. This is also expected to serve as a source of reference book in their future education and training. In case students have any suggestions to make for further improvement of the material contained herein, they may write to Board of Studies, A-29, Sector-62, and NOIDA.

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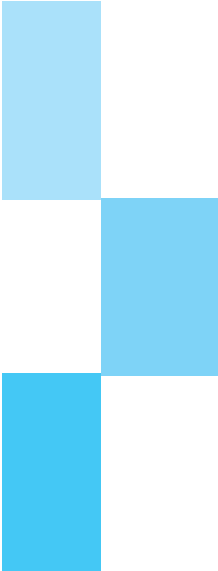
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Section - D

MS Access-2010



INTRODUCTION TO MICROSOFT ACCESS, 2010

LEARNING OBJECTIVES

- What is MS-Access?
- What are databases used for?
- Component of databases.
- Opening file in Access.

1.1 INTRODUCTION TO MICROSOFT ACCESS 2010

Microsoft Access 2010 for Windows is a Database Management System or DBMS, which helps us manage data stored in a computer database. In this chapter, the readers will be given exposure to the basics of Access and the various data types used in Access. A database is a tool for collecting and organizing information. Databases can store information about people, products, orders or anything else. A computerized database is a container of objects. One database can contain more than one table. For example, an inventory tracking system that uses three tables is not three databases, but one database that contains three tables.

An **Access** database stores its tables in a single file, along with other objects, such as forms, reports, macros and modules. Databases created in the **Access 2010** format have the file extension **.accdb** and databases created in earlier Access formats have the file extension **.mdb**.

Using **Access**, we can do the following:

- Add new data to a database, such as a new item in an inventory,
- Edit existing data in the database, such as changing the current location of an item,
- Delete information, perhaps if an item is sold or discarded,
- Organize and view the data in different ways,
- Share the data with others via reports, e-mail messages, an intranet or the Internet.

Microsoft Access 2010 can be started in Windows 95 or later versions of windows operating system in the following way:

- (i) Click on the **Start** button on the **Windows Taskbar** and then choose **Program >> Microsoft Access 2010**.
- (ii) After a short delay, the **Microsoft Access 2010** main window displays a dialogue box offering the user a choice of creating a new database or opening one of the existing databases as shown

in Fig. 1.1.1. The lower panel contains the names of the databases that have been opened recently.

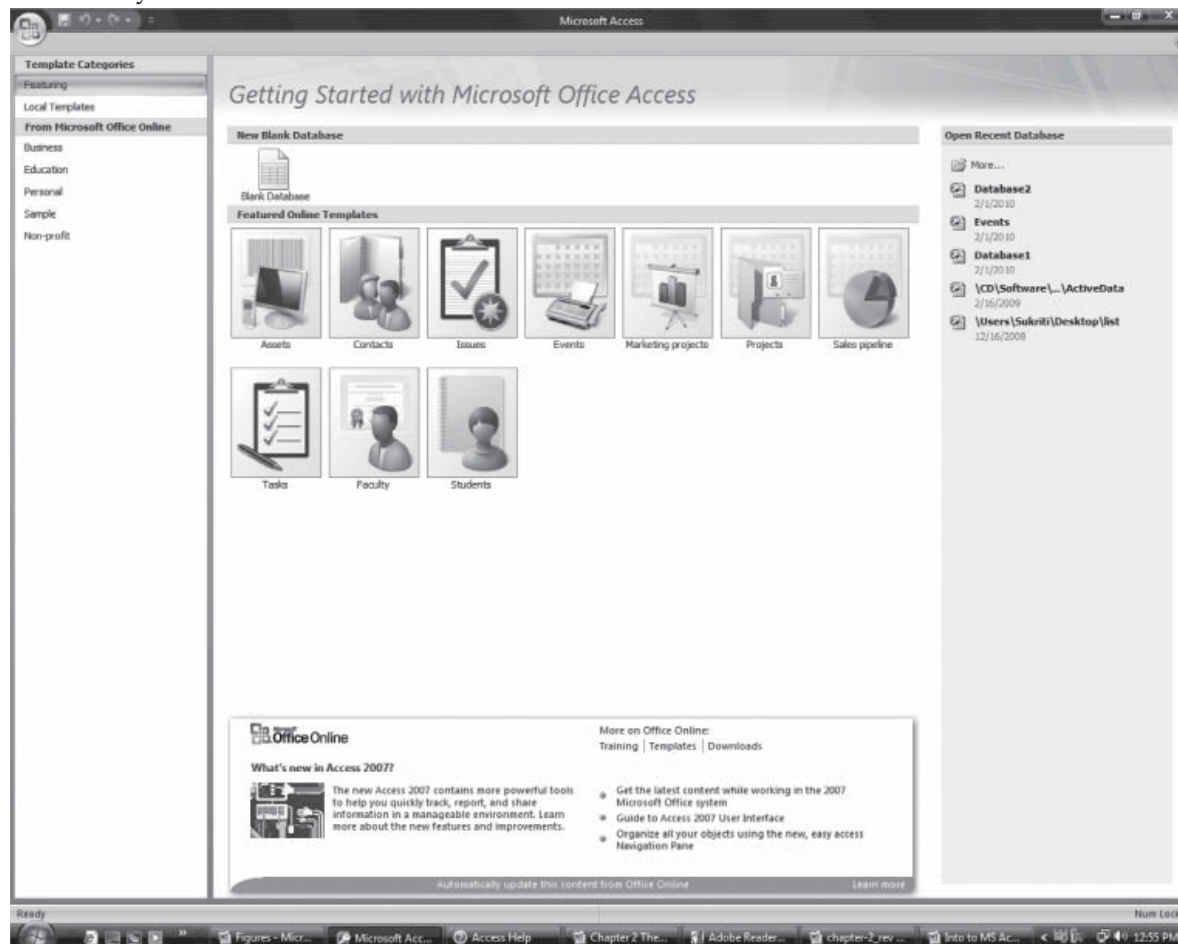


Fig. 1.1.1: Start-up MS Access 2010 Screen

1.1.1 The parts of an Access database

The following sections are short descriptions of the parts of a typical **Access** database.

1. Tables
2. Forms
3. Reports
4. Queries
5. Macros
6. Modules

1.1.2 Tables

A **database table** is similar in appearance to a spreadsheet, in that data is stored in rows and columns.



As a result, it is usually quite easy to import a spreadsheet into a database table. The main difference between storing data in a spreadsheet and storing it in a database is in how the data is organized.

To get the most flexibility out of a database, the data needs to be organized into tables so that redundancies don't occur. For example, if we're storing information about employees, each employee should only need to be entered once in a table that is set up just to hold employee data. Data about products will be stored in its own table and data about branch offices will be stored in another table. This process is called **Normalization**.

Each row in a table is referred to as a **Record**. Records are where the individual pieces of information are stored. Each record consists of one or more fields. Fields correspond to the columns in the table.

1.1.3 Forms

Forms are sometimes referred to as "Data Entry Screens", which are the interfaces we use to work with our data and they often contain command buttons that perform various commands. We can create a database without using forms by simply editing our data in the table datasheets. However, most database users prefer to use forms for viewing, entering and editing data in the tables.

Forms provide an easy-to-use format for working with the data and we can also add functional elements, such as command buttons, to them. We can program the buttons to determine which data appears on the form, open other forms or reports or perform a variety of other tasks. For example, we might have a form named "Customer Form" in which we work with customer data. The customer form might have a button which opens an order form where we can enter a new order for that customer.

Forms also allow us to control how other users interact with the data in the database. For example, we can create a form that shows only certain fields and allows only certain operations to be performed. This helps protect data and to ensure that the data is entered properly.

1.1.4 Reports

Reports are what we use to summarize and present data in the tables. A report usually answers a specific question, such as "How much money did we receive from each customer this year?" or "What cities are our customers located in?" Each report can be formatted to present the information in the most readable way possible.

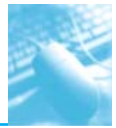
A report can be run at any time and will always reflect the current data in the database. Reports are generally formatted to be printed out, but they can also be viewed on the screen, exported to another program or sent as e-mail message.

1.1.5 Queries

Queries are the real workhorses in a database and can perform many different functions. Their most common function is to retrieve specific data from the tables. The data we want to see is usually spread across several tables and queries allow us to view it in a single datasheet. Also, since we usually don't want to see all the records at once, queries let us add criteria to "filter" the data down to just the records we want. Queries often serve as the record source for forms and reports.

1.1.6 Macros

Macros in Access can be thought of as a simplified programming language which we can use to add functionality to our database. For example, we can attach a macro to a command button on a form so that the macro runs whenever the button is clicked. Macros contain actions that perform



tasks, such as opening a report, running a query or closing the database. Most database operations that we do manually can be automated by using macros, so they can be great time-saving devices.

1.1.7 Modules

A **module** is a collection of declarations, statements and procedures that are stored together as a unit. A module can be either a class module or a standard module. Class modules are attached to forms or reports and usually contain procedures that are specific to the form or report they're attached to. Standard modules contain general procedures that aren't associated with any other object. Standard modules are listed under Modules in the Navigation Pane, whereas class modules are not.

1.2 CREATING DATABASES

The primary step involved in creating any application is to set up a database file. There are various methods of creating a database. The user could either start with creating a database from the scratch or create a database using the database wizard having predefined objects.

1.2.1 Create a Database using a Template

Access provides us wide variety of templates that can be used to speed up the database creation process. A template is a ready-to-use database containing all the tables, queries, forms and reports needed to perform a specific task. For example, there are templates that we can use to track issues, manage contacts or keep a record of expenses. Some templates contain a few sample records to help demonstrate their use. Template databases can be used as they are or we can customize them to better fit our needs.

If one of these templates fits our needs, using it is usually the fastest way to get a database started. However, if we have data in another program that we want to import into Access, it is better to create a database without using a template. Templates have a data structure already defined and it might require a lot of work to adapt our existing data to the template's structure. The steps to be followed are:

- (i) If we have a database open, click File and then  click **Close Database**  to display the **Getting Started with MS Office Access** page.
- (ii) Several featured templates are displayed in the middle of the **Getting Started with MS-Office Access** page and more become available when we click the links in the **Sample Templates** pane as shown in Fig. 1.2.1.

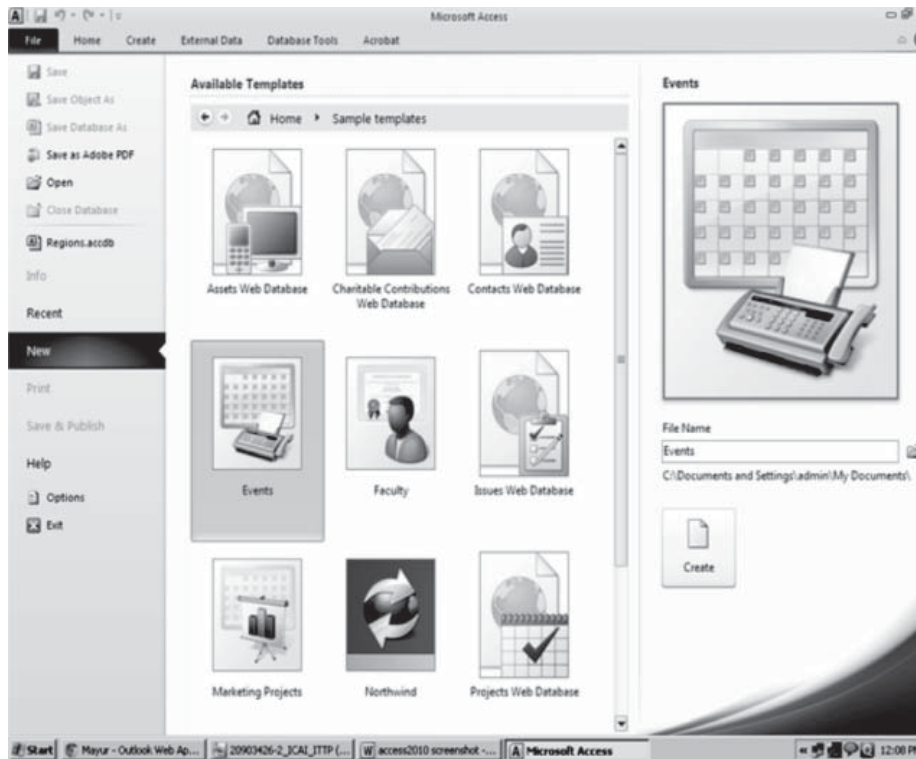


Fig. 1.2.1: MS Access showing Local Template Categories

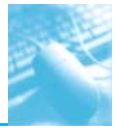
- (iii) Click the template we want to use. For example - Let us choose **Event** Template.
- (iv) Access suggests a file name for our database in the File Name box - we can change the file name, if we want. To save the database in a different folder from the one displayed below the file name box, click **Browse** to the folder in which we want to save it and then click **OK**.
- (v) Click **Create** (or Download for an Office Online template). **Access** creates or downloads the database and then opens it. A form is displayed in which we can begin entering data. If our template contains sample data, we can delete each record by clicking the record selector (the shaded box or bar just to the left of the record) and then click **Home >> Records >> Delete**.
- (vi) To begin entering data, click in the first empty cell on the form and begin typing. Use the **Navigation Pane** to browse for other forms we might want to use.

1.2.2 Create a Database without using a Template

If we are not interested in using a template, we can create a database by building our own tables, forms, reports and other database objects. In most cases, this usually involves one or both of the following :

Entering, pasting or importing data into the table that is created when we create a new database and then repeating the process with new tables that we create by using the Table command on the **Create** tab.

Importing data from other sources and creating new tables in the process.



1) Create a blank database

- (i) On the **Getting Started with MS Office Access** page, under **New Blank Database**, click **Blank Database**, as shown in Fig. 1.2.2.

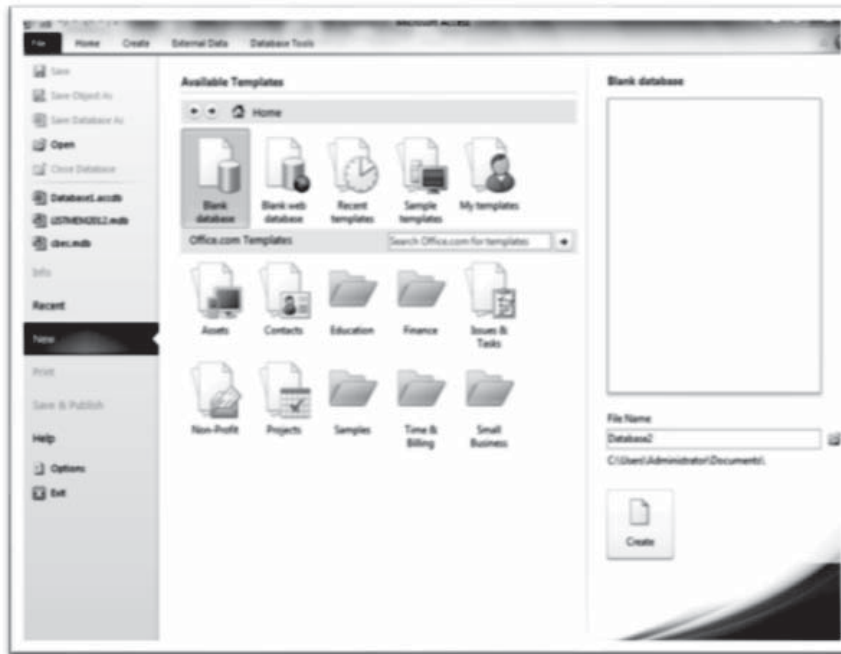


Fig. 1.2.2: Creating and Naming the Blank Database

- (ii) In the **Blank Database** pane, type a file name in the **File Name** box. If we do not supply a file name extension, **Access** adds it for us. To change the location of the file from the default, click **Browse** for a location to put for our database, (next to the File name box), browse to the new location and then click **OK**.
- (iii) Click **Create**, Access creates the database with an empty table named Table1 and then opens Table1 in **Datasheet** view. The cursor is paces in the first empty cell in the Click to Add column.
- (iv) Begin typing to add data or data can be pasted from another source.

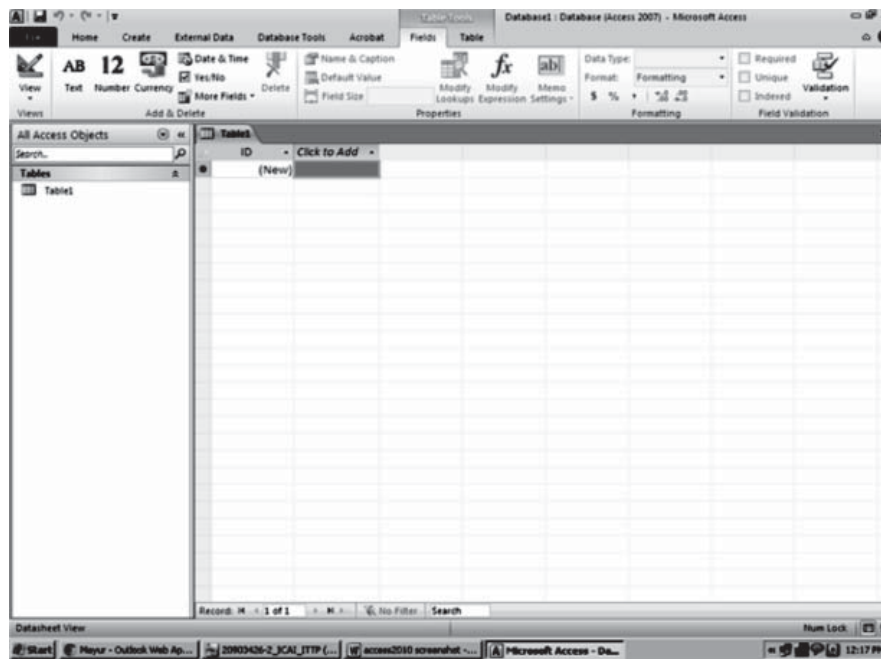


Fig. 1.2.3: Datasheet View

Entering information in Datasheet view (as shown in Fig. 1.2.3) is designed to be very similar to working in a **Microsoft Office Excel 2010** worksheet. The table structure is created while we enter data - any time we add a new column to the table, a new field is defined. Access automatically sets each field's data type, based on the data we enter.

If we do not want to enter information in Table1 at this time, click **Close** . If any changes are made in the table, **Access** prompts us to save changes to the table. Click **Yes** to save the changes, click **No** to discard them or click **Cancel** to leave the table open.

LEARNING OBJECTIVES

- To understand the concept of table.
- To introduce table and field properties.
- To know all data types.
- To work with database design and creation of a table.
- To save, delete, rename and open a table.
- To introduce the concept of SharePoint List.
- Form and its importance.
- General types of forms.
- General steps in creating a form.
- Creating a form using form view.
- Creating a form using Form Wizard.
- Form controls, its types and properties.
- Inserting controls on a form.

2.1 INTRODUCTION TO TABLES

When we create a database, we store our data in tables - subject-based lists of rows and columns. For instance, we might create a **Contacts** table to store a list of names, addresses and telephone numbers or a **Products** table to store information about products. We should always start the design of a database by first creating its tables - even before we create any other database objects.

2.1.1 WHAT IS A TABLE?

A **Table** is a database object used to contain data about a particular subject, such as employees or products. Each record in a table contains information about one item, such as a particular employee. A record is made up of fields, such as name, address and telephone number. A record is also commonly called a **Row** and a field is referred as a **Column**.



Customer Id	Company Name	First Name	Last Name
1	A	John	Bedecs
2	B	Joe	Axen
3	A	Anny	Smith
4	C	Harry	Potter

Fig. 2.1.1 : An example of a 'Customers' Table

In Fig. 2.1.1, point 1 indicates Record or Row whereas point 2 indicates Field or Column. A database can contain many tables, each storing information about a different subject. Each table can contain many fields of different types, including text, numbers, dates and pictures.

The following list shows some common examples of tables we might create.

- A Customers table that lists our company's customers and their addresses,
- A Catalogue of products sold, including prices and pictures for each item,
- A Tasks table that tracks tasks and due dates,
- An Inventory of equipment or stock on hand.

We should plan and design our database carefully to ensure its correctness and to avoid having to make too many changes later.

(1) Table and Field Properties

Tables and fields have properties that one can set to control their characteristics or behaviour.

- Table property :** In an **Access database**, table properties are attributes of a table that affect the appearance or behaviour of the table as a whole. A table opens in **Design view** and its properties are set in the table's property sheet. For example, one can set a table's **Default View** property to specify how the table is displayed by default.
- Field property :** A field property defines one of the field's characteristics or an aspect of the field's behaviour and applies to a particular field in a table through Datasheet view. One can also set any field property in **Design view** by using the **Field Properties** pane.

Datasheet View : In **Datasheet** view, we can enter data immediately and let Access build the table structure behind the scenes. Field names are assigned numerically (Field1, Field2 and so on...) and Access automatically sets each field's data type, based on the data we enter. In this, we can edit fields, add and delete data and search for data.



(2) Data Types

Every field has to be assigned a data type which indicates the kind of data that the field stores, such as large amounts of text or attached files. A data type is a field property, but it differs from other field properties as follows :

- We set a field's data type in the table design grid, not in the **Field Properties** pane.
- A field's data type determines what other properties the field has.

The **Data Type** property can be set only in the upper portion of table **Design view**. The data types and their explanation is highlighted in Table 2.1.1.

Setting	Type of Data	Size
Text	(Default) Text or combinations of text and numbers, as well as numbers that don't require calculations, such as phone numbers.	Up to 255 characters or the length set by the FieldSize property, whichever is less.
Memo	Lengthy text or combinations of text and numbers.	Upto 63,999 characters.
Number	Numeric data used in mathematical calculations.	1, 2, 4 or 8 bytes.
Date/Time	Date and time values for the years 100 - 9999.	8 bytes.
Currency	Currency values and numeric data used in mathematical calculations involving data with one to four decimal places. Accurate to 15 digits on the left side of the decimal separator and to 4 digits on the right side.	8 bytes.
AutoNumber	A unique sequential (incremented by 1) number or random number assigned whenever a new record is added to a table. AutoNumber fields can't be updated.	4 bytes (16 bytes if the FieldSize property is set to Replication ID).
Yes/No	Yes and No values and fields that contain only one of two values (Yes/No, True/False or On/Off).	1 bit.
OLE Object	An object (such as a Microsoft Excel spreadsheet, a Microsoft Word document, graphics, sounds or other binary data) linked to an embedded in a Microsoft Access table.	Up to 1 gigabyte (limited by available disk space)



Setting	Type of Data	Size
Hyperlink	Text or combinations of text and numbers stored as text and used as a hyperlink address. A hyperlink address can have up to three parts: text to display – the text that appears in a field or control. address – the path to a file (UNC path) or page (URL) subaddress – a location within the file/page.	Each part of the three parts of a Hyperlink data type can contain up to 2048 characters.
Attachment	screentip – the text displayed as a tooltip. Any supported type of file.	To attach images, spreadsheet files, documents, charts and other types of supported files to the records in the database and to view and edit attached files.
Lookup Wizard	Creates a field that allows the user to choose	The same size as the primary key field used to perform the lookup, typically 4 bytes.

Table 2.1.1 : Data types and their explanation

Calculated Field: Result of calculation. The calculation must refer to other fields in the same table. You would use the expression builder to create the calculation.

(3) Table Relationships

Although each table stores data about a different subject, tables in a database usually store data about subjects that are related to each other. For example, a database might contain the following:

- A Customers table that lists our company's customers and their addresses.
- A Products table that lists the products that we sell, including prices and pictures for each item.
- An Orders table that tracks customer orders.

Because we store data about different subjects in separate tables, we need some way to tie the data together so that we can easily combine related data from those separate tables. To connect the data stored in different tables, relationships are created. A relationship is a logical connection between two tables that specifies fields that the tables have in common.

Keys: Fields that are part of a table relationship are called keys. A key usually consists of one field, but may consist of more than one field. There are two kinds of keys :

- (i) **Primary key :** A table can have only one primary key which consists of one or more fields that



uniquely identify each record that is stored in the table. Often, there is a unique identification number, such as an ID number or a code, that serves as a primary key.

- (ii) **Foreign key** : A foreign key contains values that correspond to values in the primary key of another table. A table can also have one or more foreign keys. For example, we might have an Orders table in which each order has a customer ID number that corresponds to a record in a Customers table. The customer ID field is a foreign key of the Orders table.

The correspondence of values between key fields forms the basis of a table relationship. We use a table relationship to combine data from related tables. For example, suppose that **Employee** and **Salary** are two database tables. In each **Employee** and **Salary** table, each record is identified by the primary key field, Employee_Id.

Benefits of using relationships

Keeping data separated in related tables produces the following benefits:

- **Consistency** : Because each item of data is recorded only once, in one table, there is less opportunity for ambiguity or inconsistency. For example, we store a customer's name only once in a table about customers, rather than storing it repeatedly (and potentially inconsistently) in a table that contains order data.
- **Efficiency** : Recording data in only one place implies less disk space. Moreover, smaller tables tend to provide data more quickly than larger tables. If separate tables for separate subjects are not used, null values (means the absence of data) and redundancy can waste space and impede performance.
- **Comprehensibility** : The design of a database is easier to understand if the subjects are properly separated into tables.

(4) Introduction to Navigation Pane

When a new or existing database is opened in **Office Access 2010**, the objects in our database - the tables, forms, reports, queries, macros and so on - appear in the **Navigation Pane**. Our tables reside in a group called **Tables**, forms in a group called **Forms** and so on. The Fig. 2.1.2 shows the groups in the **Object Type** category.

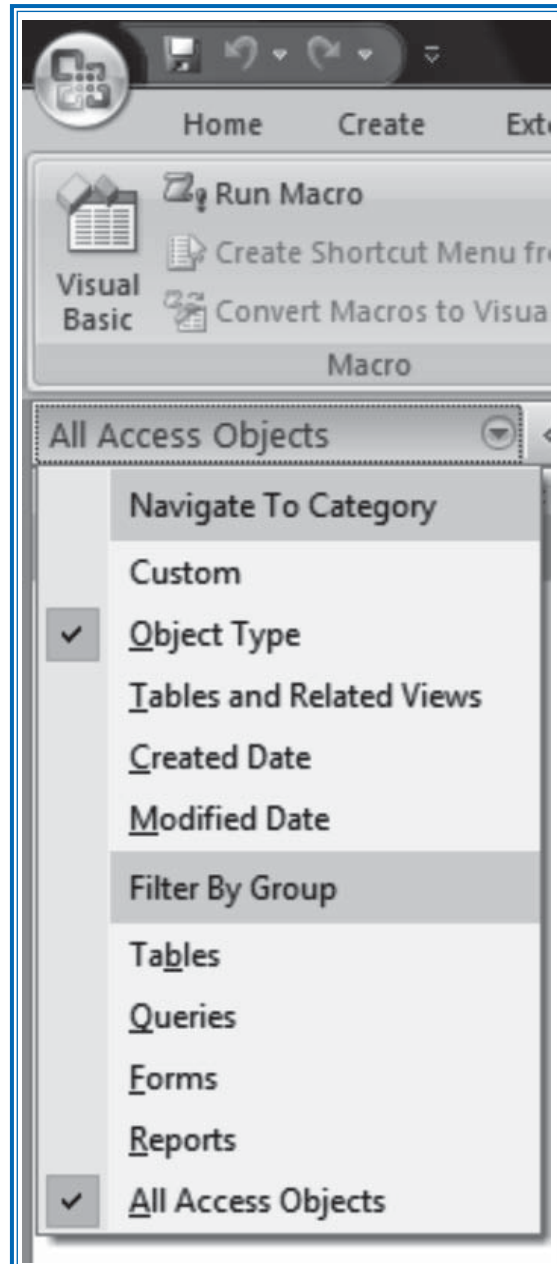


Fig. 2.1.2 : Navigation Pane



The **Navigation Pane** appears by default when a database in **Office Access 2010**. For example, if a data is to be entered into a new table row, the task can be performed from the **Navigation Pane**.

Prevent the Navigation Pane from appearing by default

- (i) Click the **File**  and then click **Access Options**. The **Access Options** dialog box appears.
- (ii) Click **Current Database** and, under **Navigation**, select or clear the **Display Navigation Pane** check box. By default, this option is selected. Fig. 2.1.3 depicts the same.

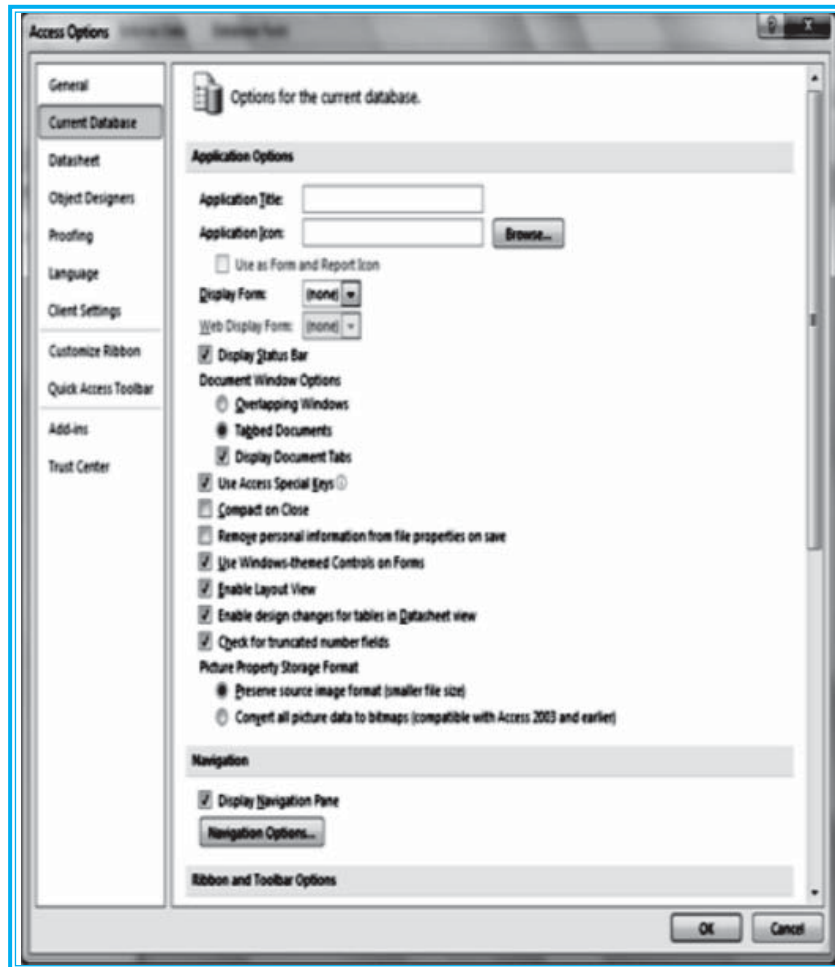


Fig. 2.1.3 : Access Option Dialog Box under Option 'Current Database'

Set global options for the Navigation Pane

Several global options in the **Navigation Pane** can be set or changed according to the user's requirements. The following Table 2.1.2 lists the options and describes how to use them.



Option	Purpose
Show Hidden Objects	Display hidden objects as semi-transparent disabled icons. Clear this option when we want to hide objects completely.
Show System Objects	Display system objects, such as system tables.
Single Click Open	Open objects with a single mouse click.
Double Click Open	Open objects with a double mouse click.

Table 2.1.2 : Options in Navigation Pane

To do so, left click the menu at the top of the **Navigation Pane** and then click **Navigation Options** as shown in Fig. 2.1.4.

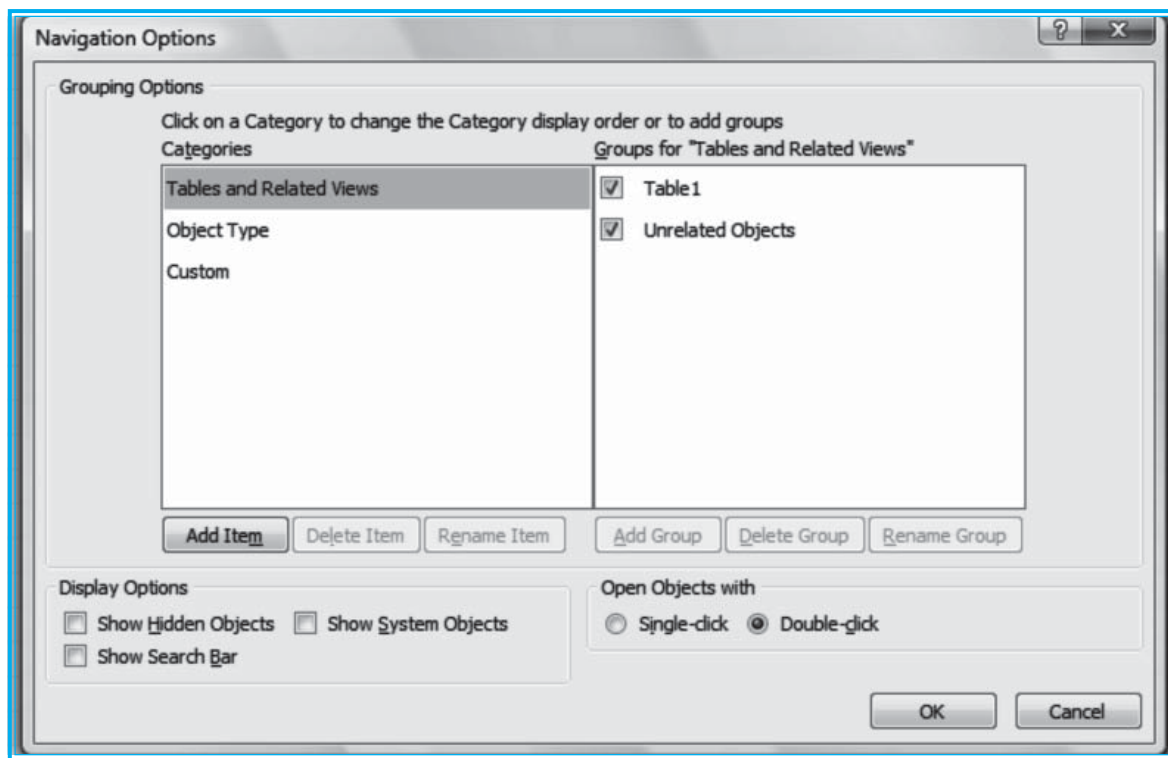


Fig. 2.1.4 : Navigation Options Dialog Box

(5) Database Design

A properly designed database provides us with the access to up-to-date, accurate information. Certain principles that guide the database design are as follows :

- (i) The first principle is that duplicate information (redundant information) is bad, as it wastes space and increases the likelihood of error and inconsistencies.
- (ii) The second principle is that the correctness and completeness of information is important. If our database contains incorrect information, any reports that pull information from the database will also contain incorrect information.



A good database design is, therefore, one that

- divides the information into subject-based tables to reduce redundant data,
- provides **Access** with the information it requires to join the information in the tables together as needed,
- helps support and ensure the accuracy and integrity of the information,
- accommodates the data processing and reporting needs.

The design process consists of the following steps :

- (i) Determine the purpose of the database.
- (ii) Find and organize the information required.
- (iii) Divide the information into tables.
- (iv) Turn information items into columns.
- (v) Specify primary keys.
- (vi) Set up the table relationships.
- (vii) Refine the design.
- (viii) Apply the normalization rules.

2.2 CREATE A NEW TABLE

A simple database, such as a Contact list, might use only a single table, whereas many databases, however, may use several tables. When a new database is to be created, a new file on the computer is to be created that acts as a container for all of the objects in our database, including our tables.

We can create a table by creating a new database, by inserting a table into an existing database or by importing or linking to a table from another data source - such as a Microsoft Office Excel 2007 Workbook, a Microsoft Office Word 2007 document, a text file or another database. When we create a new blank database, a new empty table is automatically inserted for us. We can then enter data to start defining our fields.

2.2.1 Create a new Table in a new Database

- (i) Click the **File**  and then click **New**.
- (ii) In the **File**  **Name** box, type a file name. To change the location, click the folder icon to **Browse**.
- (iii) Click **Create**.

The new database is opened and a new table named **Table1** is created and opened in **Datasheet view**.

2.2.2 Create a new table in an existing Database

- (i) Click the **File**  and then click **Open**.
- (ii) In the **Open** dialog box, select and open the database.

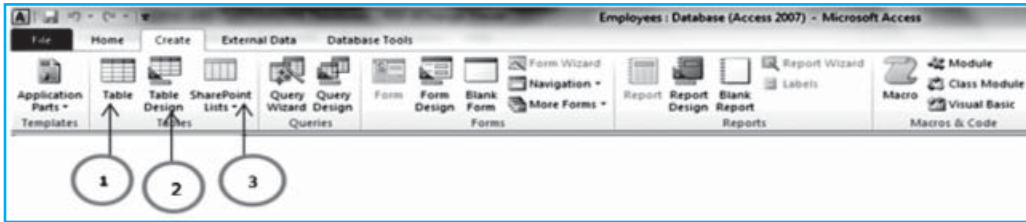


Fig. 2.2.1 : Tables Group

- (iii) On the **Create** tab, in the **Tables** group, click **Table**. (as depicted in point 1, Fig. 2.2.1). A new table gets inserted in the database and the table is opened in **Table tools** as shown in Fig. 2.2.2.

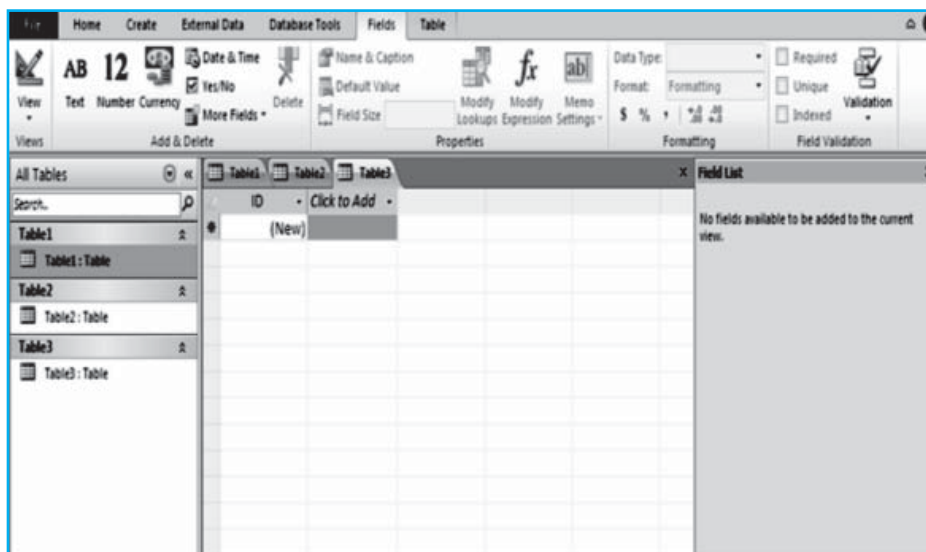


Fig. 2.2.2 : Datasheet view of the Table

2.2.3 Create a table based on a Table Template

To create a **Contacts**, **Tasks**, **Issues**, **Events** or **Assets** table, start with the **Table Templates** that come with **Office Access 2010**. The steps to be followed are as follows :

- (i) Click the **File**  and then click **Open**.
- (ii) In the **Open** dialog box, select and open the database.
- (iii) On the **Create** tab, in the **Templates** group, click **Application parts** and then from **Quick start** select one of the available templates from the list (Point no. 2, Fig. 2.2.1). A new table is inserted, based on the table template (shown in Fig. 2.2.3) we choose.



Fig. 2.2.3 : Table Templates

2.3 IMPORT OR LINK TO CREATE A TABLE

We can create a table by importing or linking to information stored elsewhere. For instance, we can import or link to information in an Excel worksheet, SharePoint list, an XML file, another Access database, a Microsoft Office Outlook 2010 folder and a number of other sources.

- When we import any information, we create a copy of the information in a new table in the current database.
- Conversely, when we link to the information, we create a linked table in the current database that represents a live link to the existing information that is stored elsewhere. Thus, when we change data in the linked table, we change it in the original source too. When information is changed in the original source by using another program, that change is visible in the linked table.

In some cases, we cannot make changes to our data source through a linked table, most notably when the data source is an Excel worksheet.

Note : SharePoint is a web site that can be displayed in a browser such as Internet Explorer and includes an interface for displaying lists and libraries in a secure database. **SharePoint** also contains various web-parts that can display sorted or filtered information in various ways or can display some kind of custom functionality. **SharePoint** can be used for something as simple as a list of contacts or for something as complex as a project management dashboard for a new store opening.

2.3.1 Create a new table by importing or linking to External Data

- (i) To use an existing database, on the **File**  menu, click **Open**.
- (ii) In the **Open** dialog box, select and open the database.
- (iii) To create a new database, on the **File**  menu, click **New**.
 - In the **File**  **Name** text box, type a file name. To change the location, click the folder icon.
 - Click **Create**.
 - The new database is opened and a new table named **Table1** is created and opened in **Datasheet view**.
- (iv) On the **External Data** tab, in the **Import** group, click one of the available data sources as shown in Fig. 2.3.1.

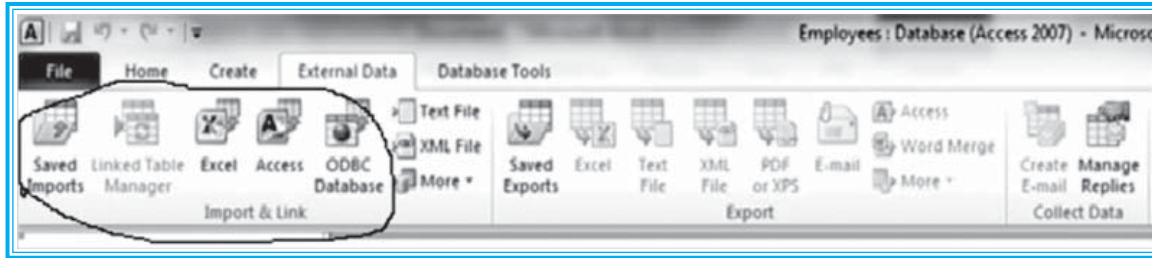


Fig. 2.3.1 : Import Group in External Data Tab

- (v) Follow the instructions in the dialog boxes. **Access** creates the new table and displays it in the **Navigation Pane**.

One can also import or link to a **SharePoint** list by using a command on the **Create** tab.

2.3.2 Create a Table based on a Share Point list

We can create a table in our database that imports from or links to a **SharePoint** list. The list can pre-exist which we can import or link to or we can create a new custom list or a new list based on a predefined template. The predefined templates in **Office Access 2010** include **Contacts**, **Tasks**, **Issues** and **Events** as shown in Fig. 2.3.2.

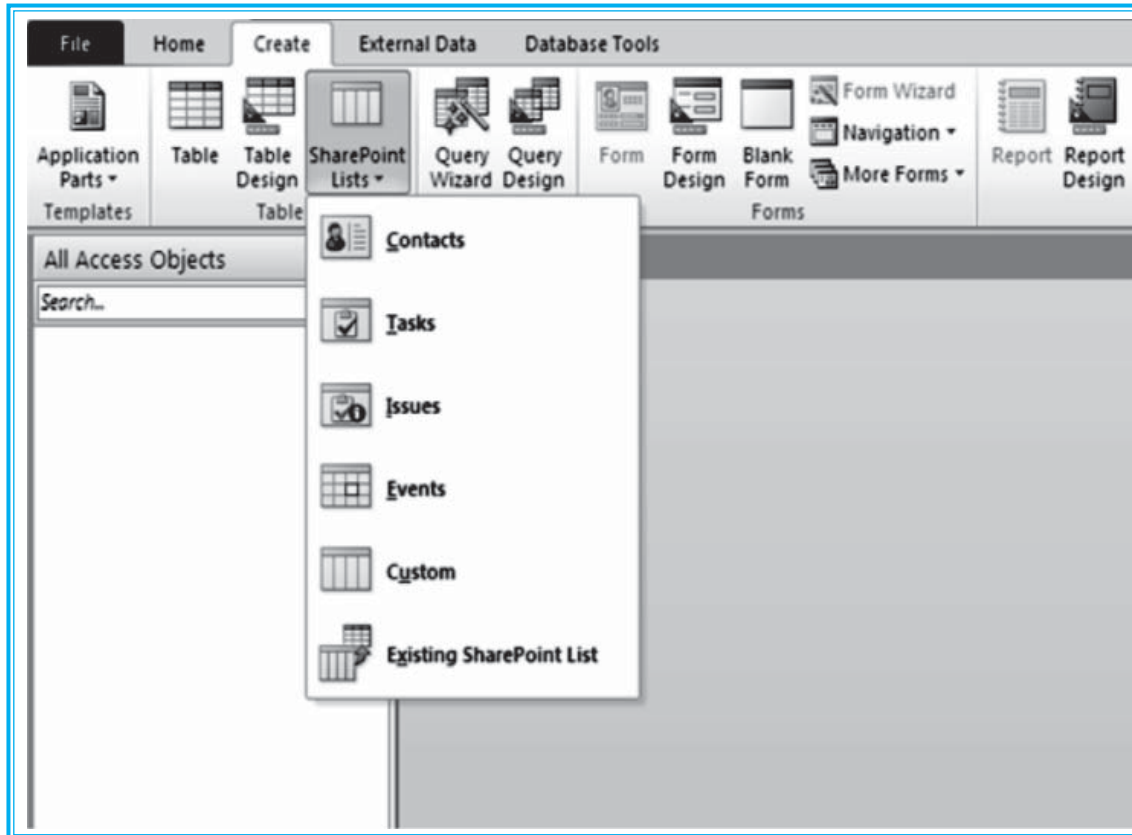


Fig. 2.3.2 : Options in SharePoint Lists



First, open the database in which we want to create the table.

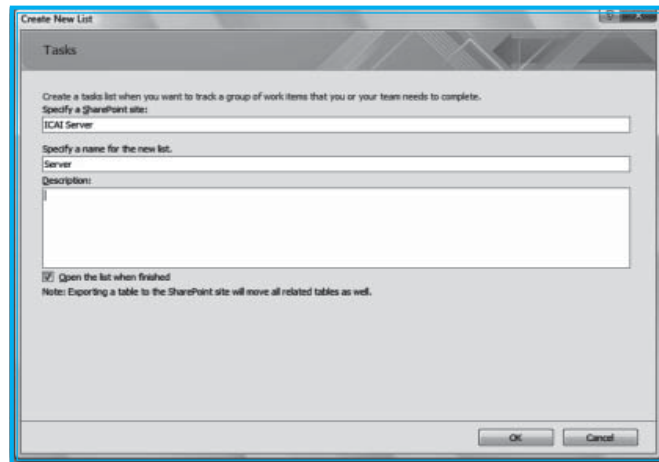
- (i) Click the **File**  and then click **Open**.
- (ii) In the **Open** dialog box, select and open the database.
- (iii) On the **Create** tab, in the **Tables** group, click **SharePoint Lists**. (point 3, Fig 3.2.1)

The Fig. 2.3.2 gets opened showing predefined templates in **Office Access 2010 - Contacts, Tasks, Issues and Events**.

(iv) Then, do one of the following:

1) Create the list based on a template

- (i) Click either **Contacts, Tasks, Issues** or **Events**. Fig. 2.3.3 shows the selection of option **Tasks** from the group of **SharePoint List**.
- (ii) In the **Create New List** dialog box, type the **URL** for the **SharePoint** site where we want the list to reside. Also, enter the name of the new **SharePoint** list and its description. If we want the linked table to open after it is created, select the **Open the list when finished** check box (it is selected by default). Otherwise, clear the check box.



(iii) Click **OK**.

2) Create a new custom list

- (i) Click **Custom** in Fig. 2.3.2. The **Custom** Dialog Box shown in Fig. 2.3.4 gets opened.
- (ii) In the **Create New List** dialog box, type the URL for the **SharePoint** (point 1, Fig. 2.3.4) site where we want the list to reside. Also, type the name of the new **SharePoint list** (point 2, Fig. 2.3.4) and its description.
- (iii) If we want the linked table to open after it is created, select the **Open the list when finished** check box (it is selected by default). Otherwise, clear the check box.
- (iv) Click **OK**.

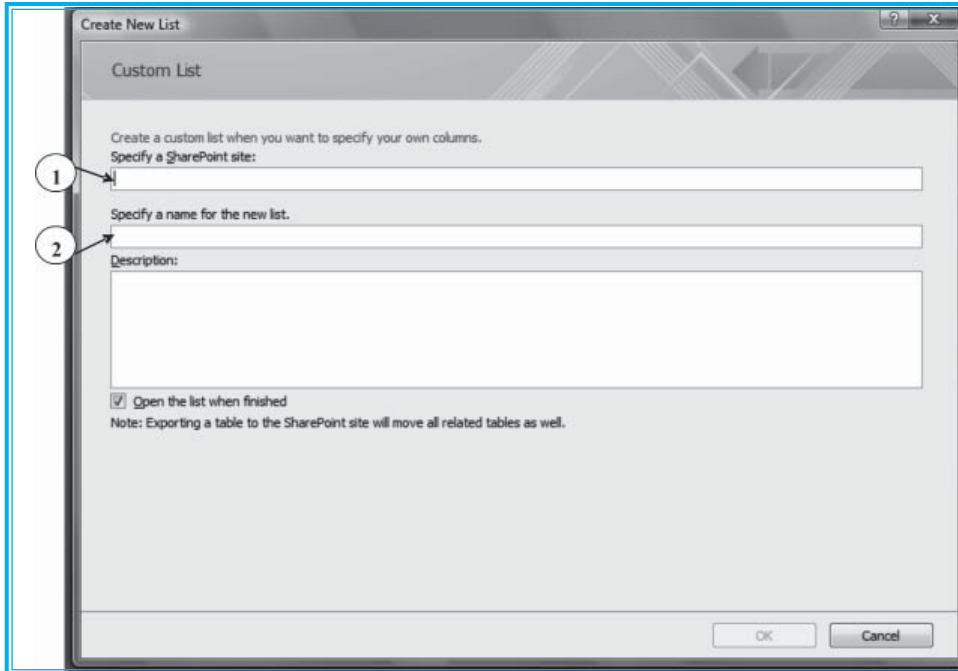


Fig. 2.3.4 : 'Custom' option Dialog Box from SharePoint List

3) Import the data from an existing list

- (i) Click **Existing SharePoint List** in Fig. 2.3.2.
- (ii) In the **Get External Data** dialog box, type the **URL** for the **SharePoint** site that contains the list as depicted in Fig. 2.3.5.
- (iii) Click **Import the source data into a new table in the current database** (point 1, Fig. 2.3.5).
- (iv) Click **Next** and select a check box next to any **SharePoint lists** we want to import.
- (v) Click **OK**.

4) Link to an existing list

- (i) Click **Existing SharePoint List**. The dialog Box shown in Fig. 2.3.5 gets opened.
- (ii) In the **Get External Data** dialog box, type the **URL** for the **SharePoint** site that contains the list.
- (iii) Click **Link to the data source by creating a linked table** (point 2, Fig. 2.3.5).
- (iv) Click **Next**.
- (v) Select a check box next to any **SharePoint lists** to which we want to link.
- (vi) Click **OK**.

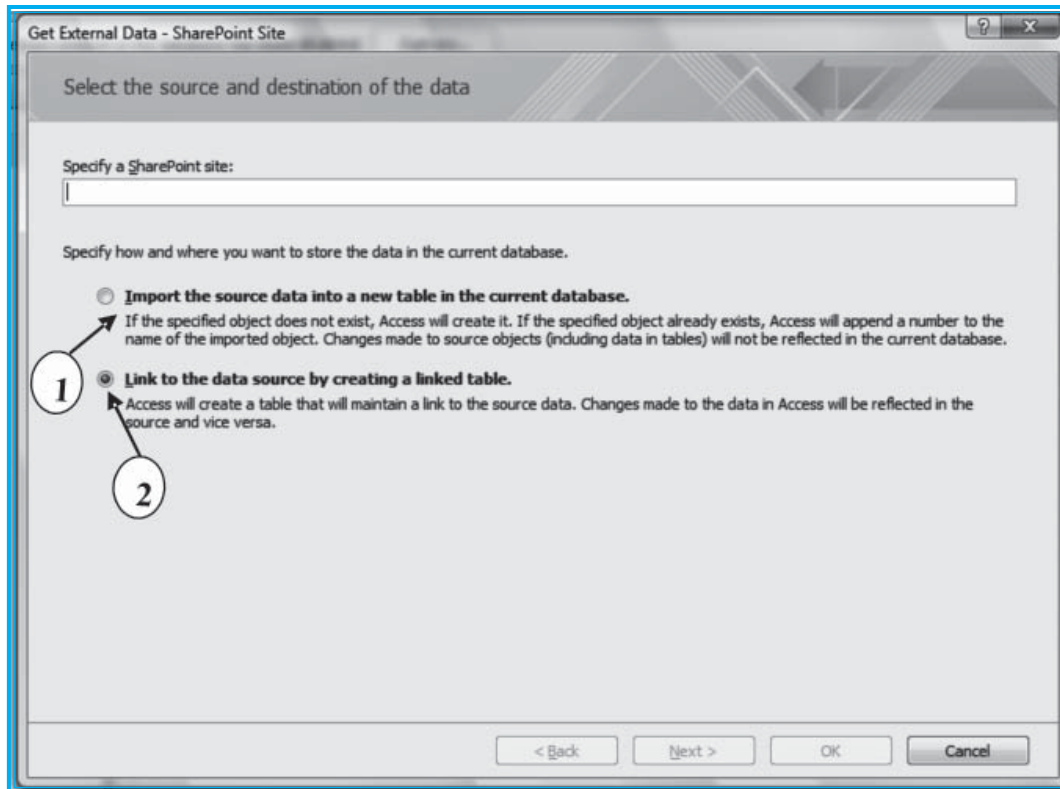


Fig. 2.3.5 : Existing SharePoint List Dialog Box

2.4 ADD FIELDS TO A TABLE IN DATASHEET VIEW

We store the information items we want to track in fields (also called columns). For example, in a **Employee_Details** table, we might create fields for EmpCode, LastName, FirstName, Telephone_Number and Address, among others.

A field defines certain characteristics and are to be selected carefully. For example, every field has a Name that uniquely identifies the field within a table. A field also has a data type that's chosen to match the information to be stored. The data type determines the values that can be stored and the operations that can be performed, as well as how much storage space to set aside for each value. Every field also has an associated group of settings called **properties** that define the appearance or behaviour characteristics of the field. For example, the **Format property** defines a field's display layout - that is, how it should appear when displayed.

When we create a new table, the table opens in **Datasheet view**. We can immediately add a field by typing some information in the **Add New Field** column as shown in Fig. 2.4.1, point 1.

Emp_ID	Emp_FirstName	Emp_LastName	Emp_Gender	Click to Add
001	Joe	Wiley	M	
002	Smith	Sin	M	
003	Parley	John	F	
004	Park	Ray	M	
*				

Fig. 2.4.1 : 'Add New Field' Column Header

2.4.1 Add a new field to an existing table

- (i) Click the **File** button and then click **Open**.
- (ii) In **Open** dialog box, select and open the database.
- (iii) In the **Navigation Pane**, double-click one of the available tables to open it.
- (iv) Type the data in the cell below the **Click to Add** column header.

2.4.2 Add a new field to a new table

- (i) Click the **File** button and then click **Open**.
- (ii) In **Open** dialog box, select and open the database.
- (iii) On the **Create** tab, in the **Tables** group, click **Table** (shown in point 1, Fig. 2.2.1).

Access inserts a new table in the database and opens it in **Datasheet** view. Type the data in the cell below the **Click to Add** column header. When we enter data in the new column, **Office Access 2010** uses the information we type to recognize the appropriate data type for the field. For example, if a date is inserted in a column, such as 1/1/2010, **Office Access 2010** recognizes it as a date and sets the data type for the field to Date/Time. If **Access** doesn't have enough information from what we enter to guess the data type, the data type is set to **Text**. The Table 2.4.1 shows how automatic data type detection works in **Datasheet** view.

If we type	Office Access 2010 creates a data type with a field of
Mary	Text
45,000.98	Number, Double
45000	Number, Long Integer
1/12/2009 or 1st December 2009	Date/Time

Table 2.4.1: Default data type by MS Access 2010

2.4.3 Explicitly set the Data Type/Format

If we want to explicitly set the data type and format for a field, overriding the choice that **Office Access 2010** makes, we can do so by using the commands in the **Data Type & Formatting** group on the **Datasheet** tab as shown in Fig. 2.4.2.

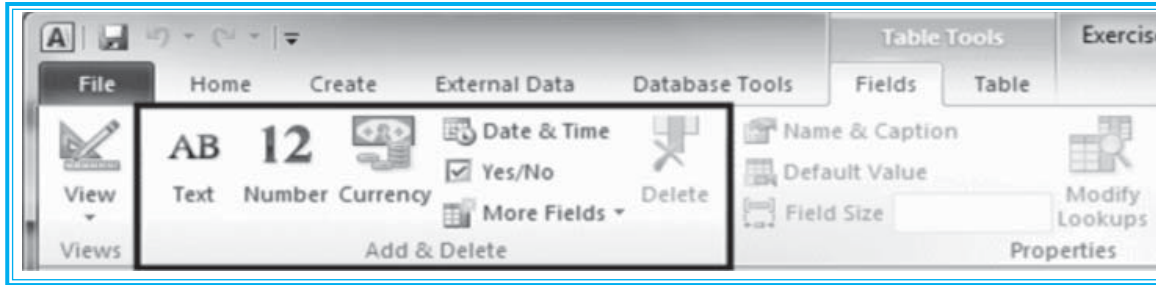


Fig. 2.4.2 : Data Type & Formatting Option in Datasheet View

Do the following steps:

- (i) On the **Field** tab, in the **Add & Delete** group, click **Data Type**.
- (ii) Choose the **data type/format** of our choice.

When we add a field by typing information into the cell below the **Click to Add** header, **Office Access 2010** automatically assigns a name to the field. These names start with **Field1** for the first field, **Field2** for the second field and so on. It is a good practice to use more descriptive field names. One can rename the field by right-clicking its header and then clicking **Rename Column** on the shortcut menu.

Field names can consist of up to 64 characters (letters or numbers), including spaces. We should try to give fields descriptive names so that we can easily identify them when we view or edit records.

2.4.4 Add fields by using field templates

A **Field Template** is a predefined set of characteristics and properties that describes a field. The field template definition includes a field name, a data type, a setting for the field's format property and a number of other field properties that, when taken together, form a model that serves as the basis for creating a new field.

One can use the **Field Templates** task pane to choose from a list of predefined fields than to manually create a field. **Office Access 2010** comes with a set of built-in field templates that can save our considerable time when we create fields. To create a new field using a field template, we display the **Field Templates** pane and then drag and drop one or more templates to the table that is opened in **Datasheet view**.

- (i) Open up the table in a **Datasheet view**.
- (ii) On the **Field** tab, in the **Add & Delete** group, click **More Fields** as shown in point 1, Fig. 2.4.3.

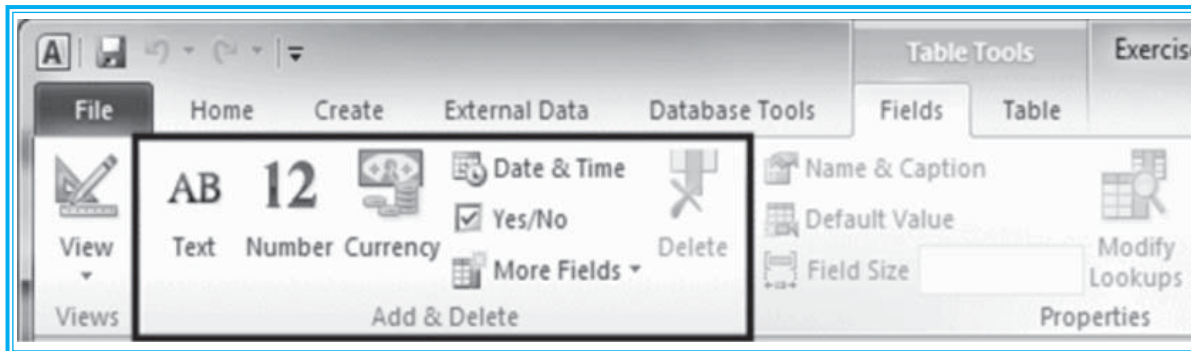
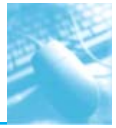


Fig. 2.4.3 : Fields & Columns Option in Datasheet View



- (iii) Select one or more fields in the **Field Templates** pane and drag them to the table. The fields appear in the datasheet as shown in Fig. 2.4.4.

Field templates are models, which provide a basis from which we can create a new field. In addition to creating a new field from a field template, we can also create a new field from an existing field in another table.

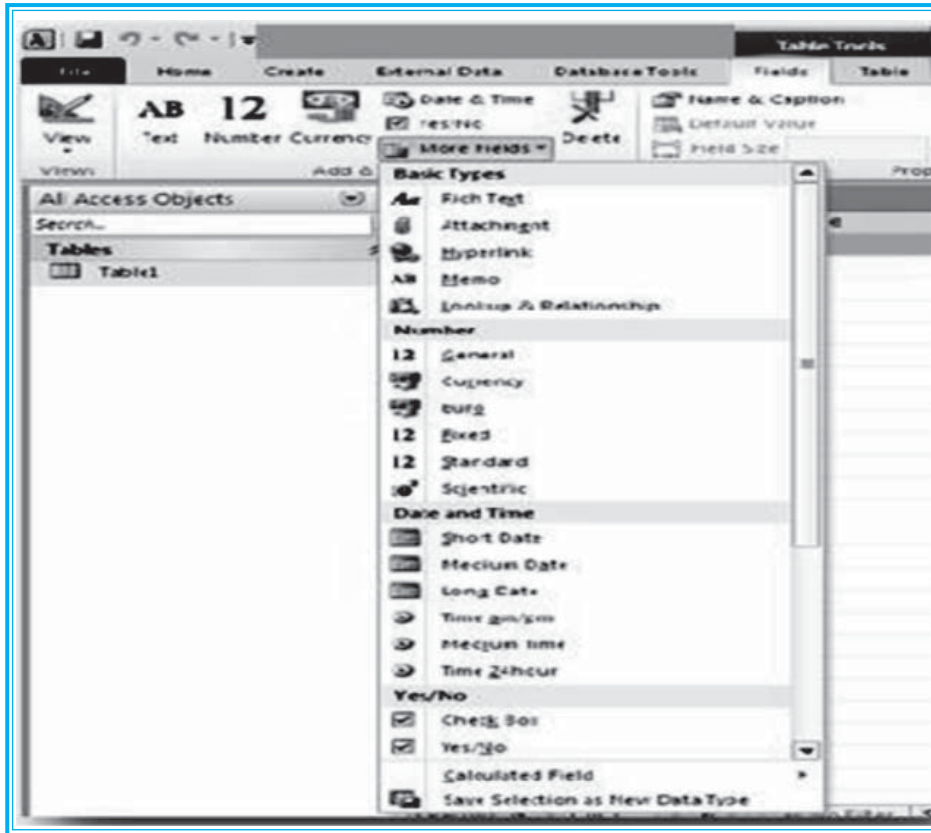


Fig. 2.4.4 : Field Template in Datasheet View

2.4.5 Add a field from an existing table

If a database contains multiple tables, we can add a field from another table. In a relational database, we store information in separate subject-based tables and then define relationships to bring the information together as needed. **Office Access 2010** allows user to create a new field by adding it from another related table or by adding it from another table for which no relationship is created. We add the field by using the **FieldList**, which shows us fields available in other tables in our database.

1) Open and add a field from the Field List pane

- (i) Click the **File** button and then click **Open**.
- (ii) In the **Open** dialog box, select and open the database.
- (iii) In the **Navigation Pane**, double-click the table in which we want to add an existing field. The table opens in **Datasheet view**.



- (iv) On the **Datasheet** tab, in the **Fields & Columns** group, click **Add Existing Fields**, as shown in point 2, Fig. 2.4.3. The **Field List** pane appears as depicted in Fig. 2.4.5.

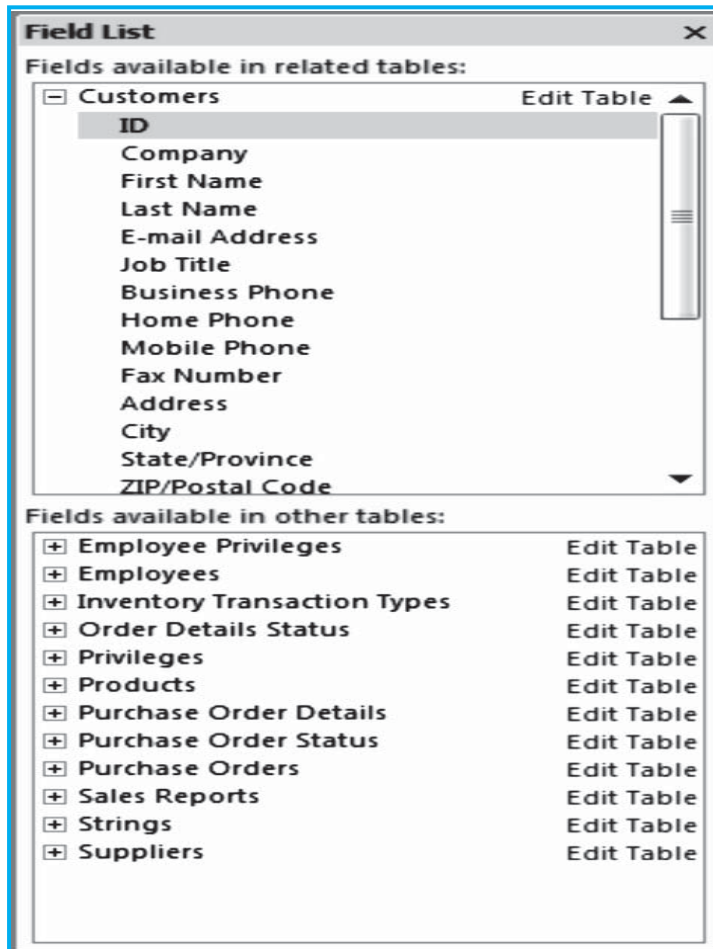


Fig. 2.4.5 : FieldList Pane

The **Field List** pane lists all of the other tables in our database, grouped into categories.

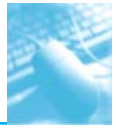
- (v) Click the plus sign (+) next to a table to display the list of fields in that table and drag the field we want from the Field List pane to the table in Datasheet view. The Lookup Wizard starts. Follow the instruction to complete the wizard.

2.5 SAVE A TABLE

Once a table's fields are added and its design is set, one should save it. When a new table is to be saved for the first time, a name is to be given to it that describes the information it contains. We can use up to 64 characters (letters or numbers), including spaces, for example, a table name may be Customers, Parts Inventory, Products and so on.

To save a table, do any of the following :

- (i) Click the **File**  and then click **Save**.



- (ii) Right-click the table's document tab and then click **Save** on the shortcut menu.
- (iii) Click **Save** on the **Quick Access Toolbar**.

If we are saving the table for the first time, type a name for the table and then click **OK**.

2.6 SET THE PRIMARY KEY

The primary key of a table consists of one or more fields that uniquely identify each row we store in the table. The primary key is never empty or null - there is always a value and it rarely (ideally never) changes. **Access** uses primary key fields to quickly bring together data from multiple tables. We should always specify a primary key for a table. **Access** automatically creates an index for the primary key, which helps speed up queries and other operations and ensures that every record has a value in the primary key field and that it is always unique. For example, we might have an **Employee** table where each employee has a unique employee_ID, which can be made as a primary key of the table.

When we create a new table in **Datasheet view**, **Access** automatically creates a primary key for us and assigns it a field name of ID and the **AutoNumber** data type. The field is hidden in **Datasheet view**, but we can see it if we switch to **Design view**.

2.6.1 Switch to Design View

To switch to **Design View**, do any of the following:

- (i) Right click the document tab and then click **Design View**.
- (ii) Right-click the table name in the **Navigation Pane** and then click **Design View**.
- (iii) Click **Design View** in the **Access** status bar.

To change or remove the primary key or to set the primary key for a table that doesn't already have one, we must use **Design view**.

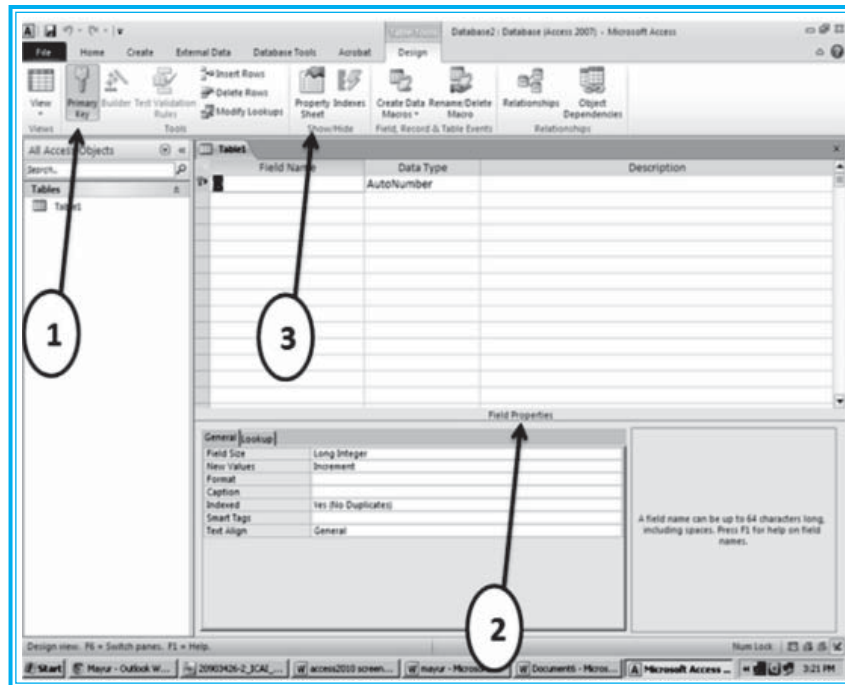


Fig. 2.6.1 : Design View

1) Set or change the primary key

When a new table is created without setting a primary key, Access prompts the user to create one. If we choose **Yes**, **Access** creates an **ID** field that uses the **AutoNumber** data type to provide a unique value for each record. If the table already includes a **AutoNumber** field, **Access** uses it as the primary key. Do the following:

- Open the table in **Design view**.
- Select the field or fields we want to use as the primary key. To select one field, click the row selector for the field we want. To select more than one field, hold down the **CTRL** key and then click the row selector for each field.
- On **Design** tab in **Tools** group, click **Primary Key** as shown in Fig. 2.6.1, point 1. A key indicator is added to the left of the field or fields that we specify as the primary key.

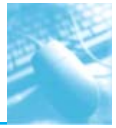
2) Remove the primary key

- Open the table in **Design view**.
- Click the row selector for the current **primary key**. If the primary key consists of a single field, click the **row selector** for that field. If the primary key consists of multiple fields, click the **row selector** for any field in the primary key.
- On the **Design** tab, in the **Tools** group, click **Primary Key**. (point 1, Fig. 2.6.1).

The key indicator is removed from the field or fields we previously specified as the primary key.

2.7 SET FIELD PROPERTIES

One can control the appearance of information, prevent incorrect entries, specify default values, speed up searching and sorting and control other appearance or behavior characteristics by setting



field properties. For example, we can format numbers to make them easier to read or we can define a validation rule that must be satisfied for information to be entered in a field.

The data type of the field determines the properties we can set. For example, the **Format**, **InputMask** and **Caption** properties affect how our information appears in table and query datasheets. In addition, any controls on new forms and reports that are based on the fields in the table inherit these same property settings by default.

1) Set a field property for a table in Datasheet view

- (i) Open the table in **Datasheet view**.
- (ii) Click in the field for which we want to set the property.
- (iii) On the **Field** tab, in the **Field Validation** group, select one of the following commands in Fig. 2.7.1:
 - **Unique** - Sets the **Indexed** property.
 - **Is Required** - Toggles the setting of the Required property. If it was set to **Yes**, it is set to **No**. If it was set to **No**, it is set to **Yes**.

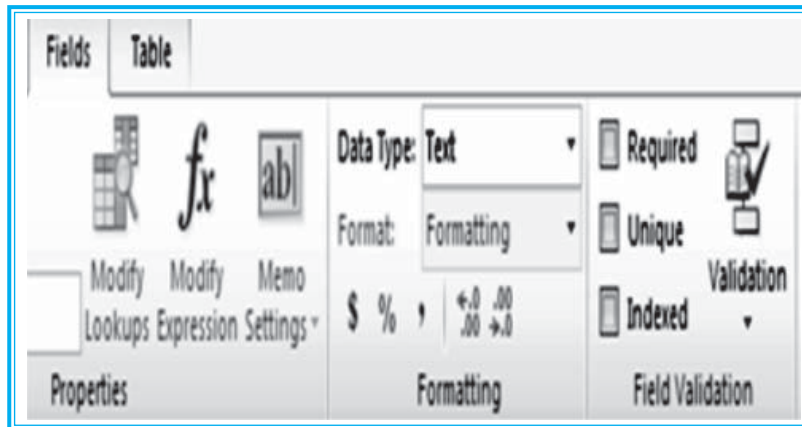


Fig. 2.7.1 : Datasheet View

We can set only a few of the available field properties in **Datasheet view**. To set additional field properties, we must open the table in **Design view**. To have access to and set the complete list of field properties, we must use **Design view**.

2) Set a field property for a Table in Design view

- (i) Open the table in **Design view**.
- (ii) In the upper portion of the table **Design grid**, click the field for which we want to set properties (or move to the field by using the arrow keys).
- (iii) **Access** displays the properties for this field in the lower portion of the table **Design grid**. The data type of the field determines the properties we can set.
- (iv) In the lower portion of the window, under **Field Properties**, (point 2, Fig. 2.6.1) click the box for the field property we want to set. Alternatively, we can press **F6** and then move to the property by using the arrow keys.



- (v) Type a setting for the property or, if an arrow appears at the right side of the property box, click the arrow to choose from a list of settings for the property. The following Table 2.7.1 lists the available field properties.

Use this Field Property	To
Field Size	Set the maximum size for data stored as a Text , Number or AutoNumber data type.
New Values	Set whether an AutoNumber field is incremented or assigned a random value.
Format	Customize the way the field appears when displayed or printed.
Caption	Set the text displayed by default in labels for forms, reports and queries.
Indexed	Speed up access to data in this field by creating and using an index.
Smart Tags	Attach a smart tag to this field.
Text Align	Specify the default alignment of text within a control.

Table 2.7.1: Field Property

To save the changes made, do any of the following:

- (i) Click **Save** on the **Quick Access Toolbar**.
- (ii) Right-click the table's document tab and then click **Save** on the shortcut menu.
- (ii) Click the **File**  and then click **Save**.

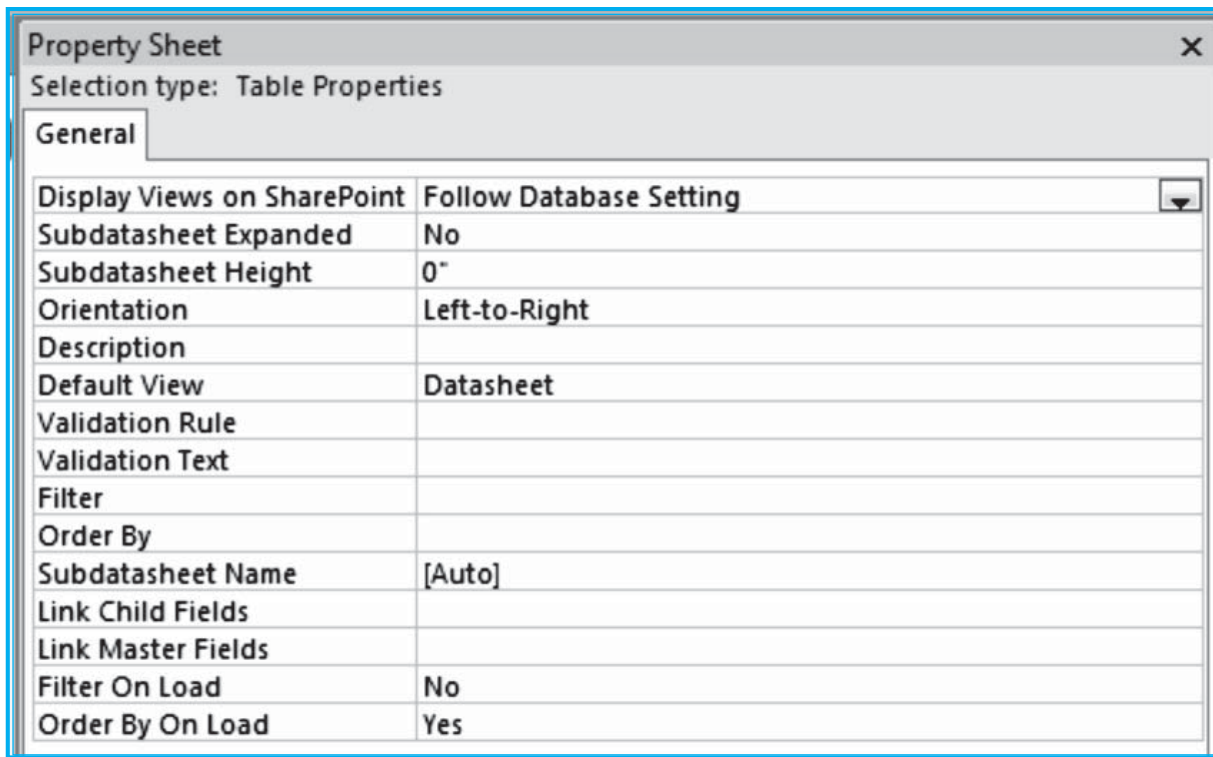
The following table provides additional information about the **FieldSize**, **Format** and **New Values** field properties.

2.8 SET TABLE PROPERTIES

In addition to field properties, we can set properties that apply to an entire table and to entire records. We set these properties in the table's property sheet.

1) Set a Table property

- (i) Open the table in **Design view**.
- (ii) On the **Design** tab, in the **Tools** group, click **Property Sheet** (point 3, Fig. 2.6.1). The table's property sheet is displayed.
- (iii) Click the box for the property we want to set and type a setting for it as shown in Fig. 2.8.1.



The screenshot shows the 'Property Sheet' dialog box with the 'Table Properties' selection type. The 'General' tab is active, displaying a list of properties and their current values. The properties include 'Display Views on SharePoint' (set to 'Follow Database Setting'), 'Subdatasheet Expanded' (No), 'Subdatasheet Height' (0"), 'Orientation' (Left-to-Right), 'Description' (empty), 'Default View' (Datasheet), 'Validation Rule' (empty), 'Validation Text' (empty), 'Filter' (empty), 'Order By' (empty), 'Subdatasheet Name' ([Auto]), 'Link Child Fields' (empty), 'Link Master Fields' (empty), 'Filter On Load' (No), and 'Order By On Load' (Yes).

Property Sheet	
Selection type: Table Properties	
General	
Display Views on SharePoint	Follow Database Setting
Subdatasheet Expanded	No
Subdatasheet Height	0"
Orientation	Left-to-Right
Description	
Default View	Datasheet
Validation Rule	
Validation Text	
Filter	
Order By	
Subdatasheet Name	[Auto]
Link Child Fields	
Link Master Fields	
Filter On Load	No
Order By On Load	Yes

Fig. 2.8.1: Property Sheet

The following Table 2.8.2 lists the available table properties.

Use this Table Property	To
Display Views On Share Point	Specify whether forms and reports associated with this table should be available on the View menu in Windows Share Point Services if the database is published to a SharePoint site.
Subdatasheet Expanded	Set whether to expand all subdatasheets when we open the table.
Subdatasheet Height	Specify whether to expand to show all available subdatasheet rows (the default) when opened or set the height of the subdatasheet window to show when opened.
Orientation	Set the view orientation, according to whether our language is read left-to-right or right-to-left.
Description	Provide a description of the table.
Default View	Set Datasheet , Pivot Table or PivotChart as the default view when we open the table.
Validation Rule	Supply an expression that must be true whenever we add a record or change a record.
Validation Text	Enter text that appears when a record violates the Validation Rule expression.



Filter	Define criteria to display only matching rows in Datasheet view .
OrderBy	Select one or more fields to specify the default sort order of rows in Datasheet view .
SubdatasheetName	Specify whether a subdatasheet should appear in Datasheet view and if so, which table or query should supply the rows in the subdatasheet.
LinkChildFields	List the fields in the table or query used for the subdatasheet that match this table's primary key field(s).
LinkMasterFields	List the primary key field(s) in this table that match the child fields for the subdatasheet.
FilterOnLoad	Automatically apply the filter criteria in the Filter property (by setting to Yes) when the table is opened in Datasheet view .
OrderByOnLoad	Automatically apply the sort criteria in the OrderBy property (by setting to Yes) when the table is opened in Datasheet view .

Table 2.8.2 : Table Properties in /Access

To save the changes made, do any of the following:

- (i) Click **Save** on the **Quick Access Toolbar**.
- (ii) Right-click the table's document tab and then click **Save** on the shortcut menu.
- (iii) Click the **File**  and then click **Save**.

2.9 DELETING A TABLE

If we have a table we don't need anymore, we can remove it from our database. Because we cannot delete a table if it is opened, we must first close it. To remove a table from our database, do any of the following:

- (i) In the **Navigation Pane**, right click the table and click **Delete**.
- (ii) In the **Navigation Pane**, click the table to select it. Then, on the **Ribbon**, click **Home**. In the **Records** group, click **Delete**.
- (iii) In the **Navigation Pane**, click the table to select it and press **Delete**.

2.10 RENAMING A TABLE

If for some reason, the name of the table is to be changed, it can be done by right-clicking the table in the **Navigation Pane** and clicking **Rename**.

Sources:

- [1] <http://cisnet.baruch.cuny.edu/holowczak/classes/2200/access/accessall.html>
- [2] Microsoft Office Access Help



2.11 CREATING FORMS

This topic deals with forms, their importance, general types of forms available under **MS-Access** and how to create simple form using form wizard and form design view. It also put focus on the various controls, their types and properties which could be used while designing a form using form design view. The chapter also explores the topic on how to insert controls in a form.

2.11.1 Introduction

Although **Access** provides a convenient spreadsheet-style datasheet view for entering data, it is not an ideal tool for safe and secured data entry. In such situation Microsoft Access 2010 offers a facility called forms through which the user can enter data to their respective databases. A form provides the user with a better interface to work with. Microsoft Access 2010 form offers many new options for creating a form which make form creation much easier. Generally forms can be created using the form wizard or by opting for form design view where the user needs to create the form manually. The form should be created in such a way that it reflects its user friendliness and the user should feel at ease while using it.

2.11.2 Definition

A form is a database object that the user can use to enter, edit, display data from a table or a query. The user can use the forms to control access of data in a database.

2.11.3 Form and Its Types

As mentioned above, the user can create a form in **MS-Access** in either of the following two ways:-

- Choose the **Form Wizard** provided by **Microsoft Access**. Opting for form wizard make the form creation an easy task. But the form thus created is very simple with little options.
- Create form from scratch using **Form Design** view. Opting for form design view provides the user with more controls to customize and design the form in a complex yet effective way.

The general types of forms that MS-Access offers are as follows:-

2.11.3.1 Simple Form

This is the simplest and most common type of form available in **MS-Access**. It lets the user create a form that lets him / her to enter information for one record at a time.

2.11.3.2 Split Form

This form lets the user see the datasheet in the upper section and a form in the lower section for entering information about the record selected in the datasheet.

2.11.3.3 Multiple Items

This form lets the user to see multiple records in a datasheet, with one record per row.

2.11.3.4 Blank Form

This form lets the user start with a blank form and then add fields and other controls manually.

2.11.3.5 PivotChart

PivotChart lets the user create a PivotChart form.

2.11.3.6 Form Wizard

Form wizard lets the user create a form instantly using step by step instructions.



2.11.3.7 Datasheet

Datasheet lets the user see a form in a datasheet view. The user can see the data in a row and column format in which the user can provide limit on which fields are displayed and editable.

2.11.3.8 Modal Dialog

Modal Dialog lets the user create a dialog box which may be used by a user to host or carry other controls. A dialog box is characterized as modal if the user must close it before continuing with another task on the same application.

2.11.3.9 PivotTable

In **MS-Access 2010** the user instead of creating PivotTable forms, can open an existing form in PivotTable view and build the layout of the view or use the PivotTable wizard to help you design the PivotTable view for a new form.

2.11.3.10 Form Design

Form Design lets the user create a blank form and displays it in design view.

2.11.4 General Steps to create a form

The general steps to create a form in **MS-Access** are as follows:-

- Choose the table or query for creating the form.
- Specify the type of form by selecting from **Forms** option under **Create** menu tab.
- The user may need to provide necessary details for successful creation of form.
- For activities adding records, editing records, etc., the user may switch to form view. And for customization of form, the user may go to design view.
- After the creation, the newly created form should be saved under a meaningful and valid name.

2.11.5 Create a Form using Form Wizard

Form wizard may be used by a user to automatically create a simple form. Although, the form wizard provides less control in creating a form but the user has the option to customize using form design view.

Source:

Database : Northwind 2010

Table : Customers

Steps:-

1. On the **Create** tab, in the **Forms** group, click **More Forms** and choose **Form Wizard** as shown in Fig. 2.11.1.



Fig. 2.11.1: Form Wizard (i)

2. Now, specify the table or query for which the user wants to create the form as shown in Fig. 2.11.2.

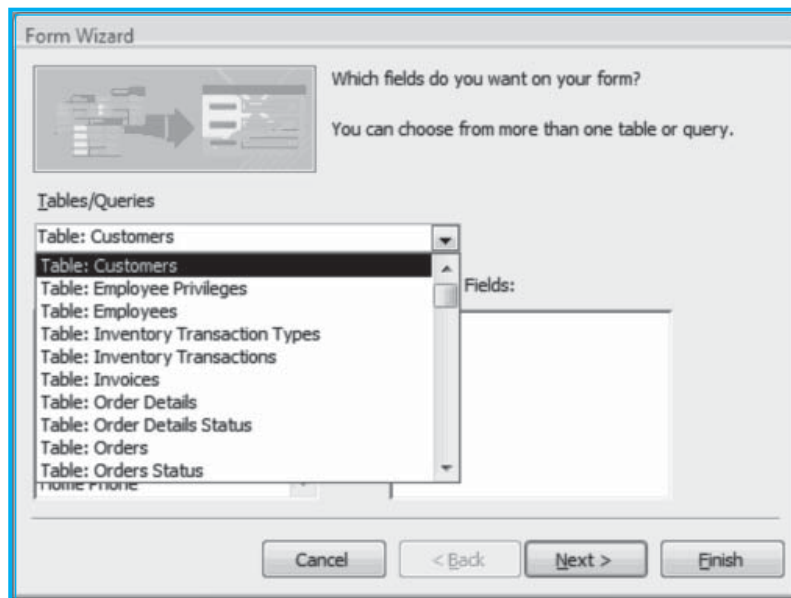
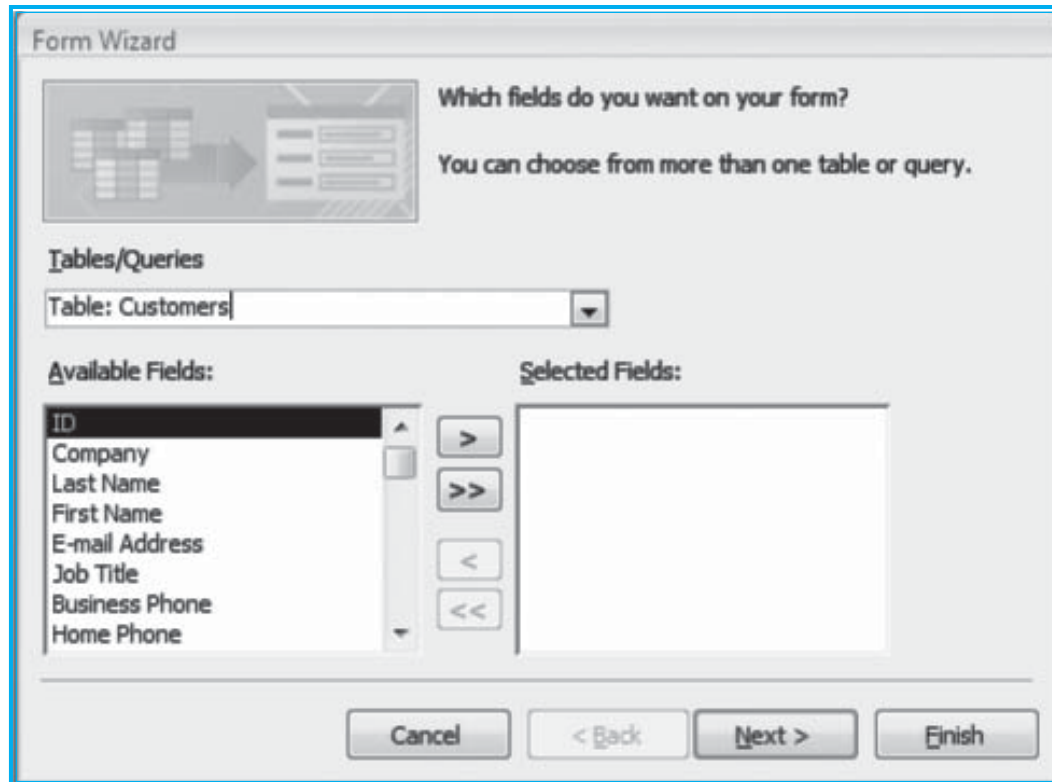


Fig. 2.11.2: Form Wizard (ii)

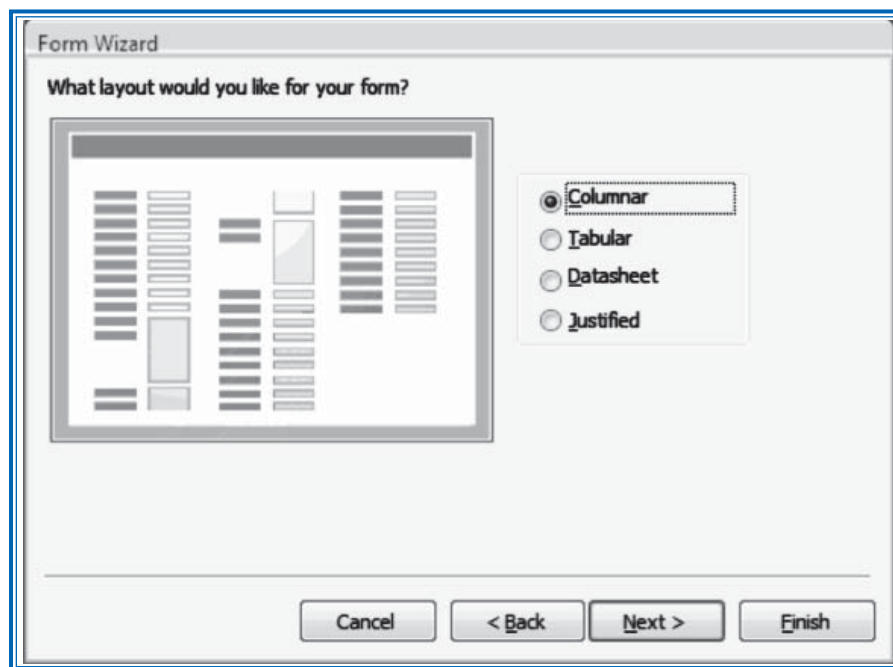
After choosing the table or query, the user will see a screen similar to Fig. 2.11.3 as shown below:-



The 'Form Wizard' dialog box is shown at step (iii). It asks 'Which fields do you want on your form?' and 'You can choose from more than one table or query.' Below this, there is a 'Tables/Queries' list with 'Table: Customers' selected. To the right, there are two lists: 'Available Fields' and 'Selected Fields'. The 'Available Fields' list contains: ID, Company, Last Name, First Name, E-mail Address, Job Title, Business Phone, and Home Phone. The 'Selected Fields' list is currently empty. Between the two lists are four buttons: '>', '>>', '<', and '<<'. At the bottom of the dialog are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.

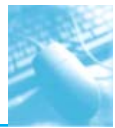
Fig. 2.11.3: Form Wizard (iii)

After selecting the desired field(s) from the table or query, the following screen will appear as shown in Fig. 2.11.4.



The 'Form Wizard' dialog box is shown at step (iv). It asks 'What layout would you like for your form?'. On the left, there is a preview of a form layout. On the right, there are four radio buttons for layout options: 'Columnar' (selected), 'Tabular', 'Datasheet', and 'Justified'. At the bottom of the dialog are four buttons: 'Cancel', '< Back', 'Next >', and 'Finish'.

Fig. 2.11.4: Form Wizard (iv)



Here, the user needs to specify the form layouts which are as follows:-

Columnar: By default, the form layout is Columnar as shown in Fig. 2.11.4.

Tabular: As shown in Fig. 2.11.5.

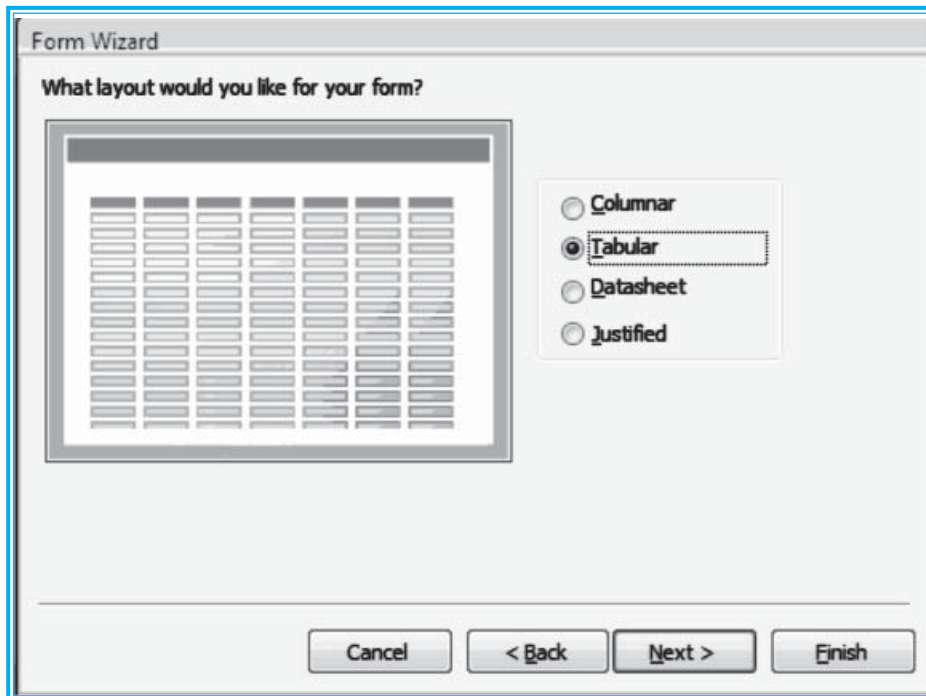


Fig. 2.11.5: Form Wizard (v)

Datasheet: As shown in Fig. 2.11.6.

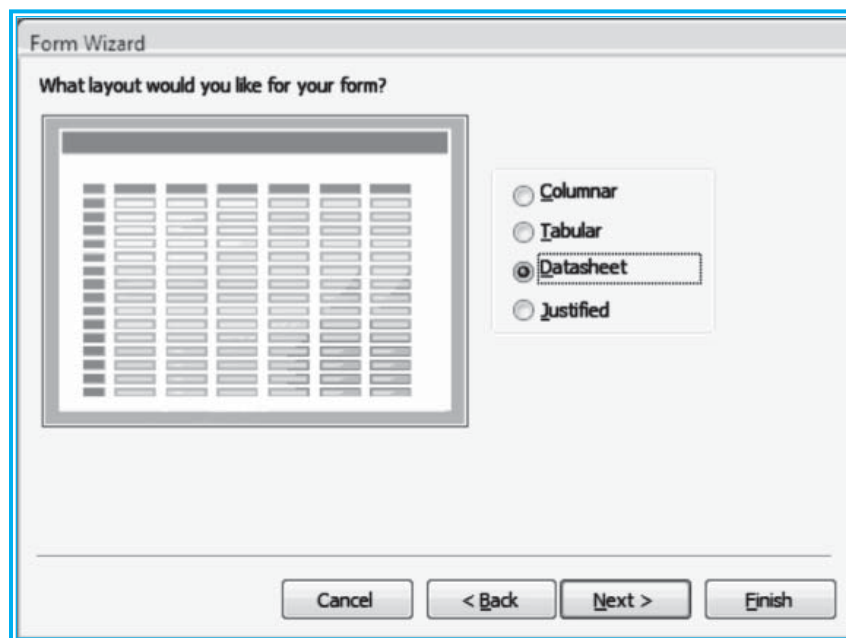


Fig. 2.11.6: Form Wizard (vi)



Justified: As shown in Fig. 2.11.7.

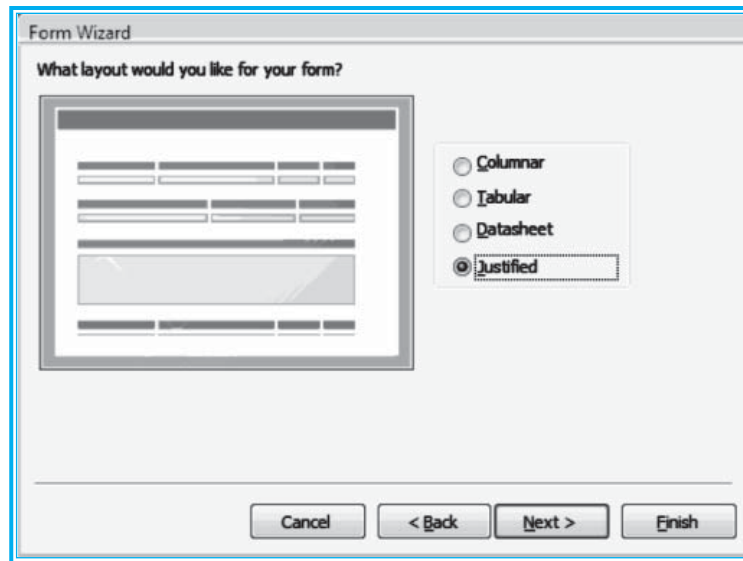


Fig. 2.11.7: Form Wizard (vii)

4. The user may then specify the title of the form and may further specify whether they want to open the newly created form in form view to carry out form related activities like addition of records, editing existing records, etc or to modify the form in form design view for further customization as shown in Fig. 2.11.8.

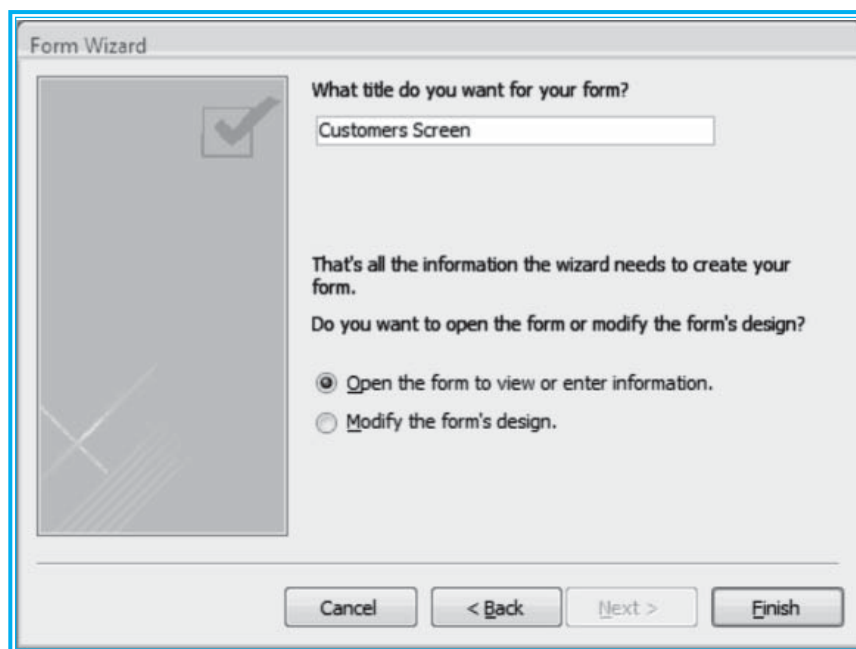


Fig. 2.11.8 : Form Wizard (viii)



After making the choice, the user can click **Finish** to see a screen similar to the Fig. 2.11.9.

Fig. 2.11.9 : Resultant Screen

2.12 CREATE FORM USING FORM VIEW

The user may use the form view available under **Forms** Group of **Create** tab as shown in Fig. 2.12.1.



Fig. 2.12.1: 'Form' option

Source:

Database : Northwind 2010

Table : Customers



Steps:-

1. Select the desired table or query for the form to be created.
2. Click the **Form** view option available under **Forms** group of **Create** tab as shown in Fig. 2.12.1.
3. The user will be shown a screen similar to Fig. 2.12.2.

Fig. 2.12.2: Form Design Screen

4. The user may further go to design view to customize the form as per the requirements.
Now, before proceeding with the creation of form through design view, the user needs to understand the various form controls that are available to them for placing in the form as per the field types.

2.13 CONTROLS

Control is an object on a form such as labels, text boxes, buttons etc.

The various form controls available under **Control** group, as shown in Table 2.13.1, are as follows:-

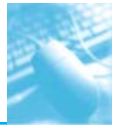
Logo		Lets the user to insert a picture into the form.
Title		Lets the user specify a title of the form.
Insert Page Number		Lets the user insert page number.
Date & Time		Insert current date and time.



Text Box		Displays and allows users to edit data.
Label		Displays static text that typically doesn't change.
Button		Also called a command button. Calls macros or runs VBA code when clicked.
Combo Box		A drop-down list of values.
List Box		A list of values that is always displayed on the form or report.
Subform / Subreport		Displays another form or report within the main form or report.
Line		A graphical line of variable thickness and color, which is used for separation.
Rectangle		A rectangle can be any color or size or can be filled in or blank; the rectangle is used for emphasis.
Bound Object Frame		This frame holds an OLE object or embedded picture that is tied to a table field.
Option Group		Holds multiple option buttons, check boxes or toggle buttons.
Check Box		A two-state control, shown as a square that contains a check mark if it's on and an empty square if it's off.
Option Button		Also called a radio button, this button is displayed as a circle with a dot when the option is on.
Toggle Button		This is a two-state button-up or down-which usually uses pictures or icons instead of text to display different states.
Tab Control		Displays multiple pages in a file folder type interface.
Insert Page		Adds a "page" on the form or report. Additional controls are added to the page and multiple pages may exist on the same form.
Insert Chart		This chart displays data in a graphical format.



Unbound Object Frame		This frame holds an OLE object or embedded picture that is not tied to a table field and can include graphs, pictures, sound files and video.
Image		Displays a bitmap picture with very little overhead.
Insert or Remove Page Break		This is usually used for reports and indicates a physical page break.
Insert Hyperlink		This control creates a link to Web page, a picture, an e-mail address or a program.
Attachment		This control manages attachments for the Attachment data type.
Line Thickness		This control is used to specify the line thickness.
Line Type		This control is used to specify the line type.
Line Color		This control is used to specify the line color.
Special Effect		This control is used to specify special effect for a control on a form like flat, raised etc.
Set Control Defaults		This control doesn't add a control to a form. Instead, it determines whether a wizard is automatically activated when you add certain controls. Note: The Option Group, Combo Box, List Box, Subform / Subreport, Bound and Unbound Object Frame and Command Button controls all have wizards that Access starts when the user add a new control.
Select All		This control is used to select all the control present on a form.
Select		This control is used to select a particular control present on a form.
Control Wizard		
Insert ActiveX Control		This control is used to insert ActiveX controls like RealPlayer G2 Controls, Windows Media Player, Yahoo! Toolbar etc.



2.13.1 Types of Controls

These are the three basic categories of controls available under MS-Access, which are as follows:-

Bound Controls: Bound controls are those controls which are bound to a table field. When the user enters a value into a bound control, Access automatically updates the table field in the current record. Most of the controls that let the user enter information can be bound. These include **OLE (Object Linking and Embedding)** fields. Controls can be bound to most data types, including text, dates, numbers, Yes / No, pictures and memo fields.

Unbound Controls: Unbound controls are those controls which retain the entered value, but they don't update any table fields. The user can use these controls for text label display, for controls such as lines and rectangles or for holding unbound OLE objects (such as bitmap pictures or logo) that aren't stored in a table but on the form itself. Unbound controls are also known as variables or memory variables.

Calculated Controls: Calculated controls are those controls which are based on expressions, such as functions or calculations. Calculated controls are also unbound because they don't update table fields. An example of a calculated control is $\text{=[Quantity]} \times \text{[Price]}$. This control calculates the total of two table fields for display on a form but is not bound to any table field.

There are two ways to add a control in a form which is as follows:

- User may click a button in the Design ribbon's Controls group and draw a new unbound control on the form.
- User may drag a field from the Field List to add a bound control to the form.

A bound control is one that is linked to a table field, while an unbound control is one that is not bound to a table field. A control bound to a table places the data directly into the table by using the form.

2.13.2 Properties

Properties are named attributes of controls, fields or database objects that are used to modify the characteristics of a control, field or object. Examples of these attributes are the size, color, appearance or name of an object. Properties are used extensively in forms and reports to change the characteristics of controls. Each control on the form has properties. The form itself also has properties. A property can also modify the behavior of a control, determining, for example, whether the control is read-only or editable and visible or not visible.

Properties are displayed in a property sheet also called property window. Whenever a user clicks any control present on the form, the property sheet shows the related properties of that control. The users can then change or modify the associated properties of that control from the property sheet. The property sheet groups the types of property of an associated control and presents them to the user under specific tabs which are as follows:-

Format: These properties determine how a label or value looks: font, size, color, special effects, borders and scroll bars.

Data: These properties affect how a value is displayed and the data source it is bound to: control source, input masks, validation, default value and other data type properties.

Event: Event properties are named events, such as clicking a mouse button, adding a record, pressing a key for which you can define a response (in the form of a call to a macro or a VBA procedure) and so on.

Other: Other properties show additional characteristics of the control, such as the name of the control or the description that displays in the status bar.

All: It lets the user see all the properties for a control.



2.14 INSERTING CONTROLS ON A FORM

2.14.1 Insert Logo

1. Click **Logo** option under **Header/Footer** group. The user will be prompted to specify image or picture as shown in Fig. 2.14.1.

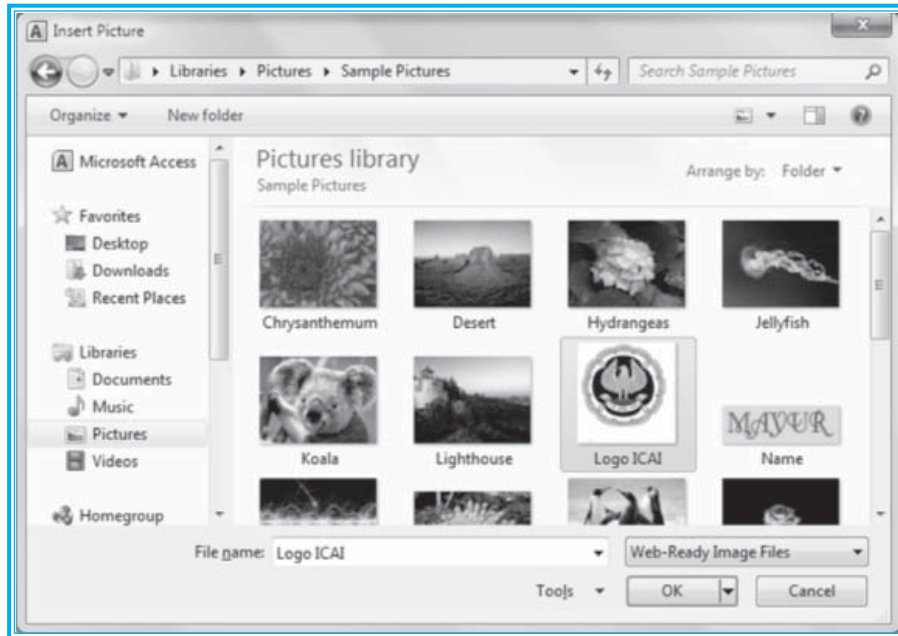


Fig. 2.14.1: Insert Logo (i)

2. After choosing an image or picture, the user will be required to click **Open**.
3. When the user will click **Open**, picture will be inserted in the **Form Header** section as shown in Fig. 2.14.2.

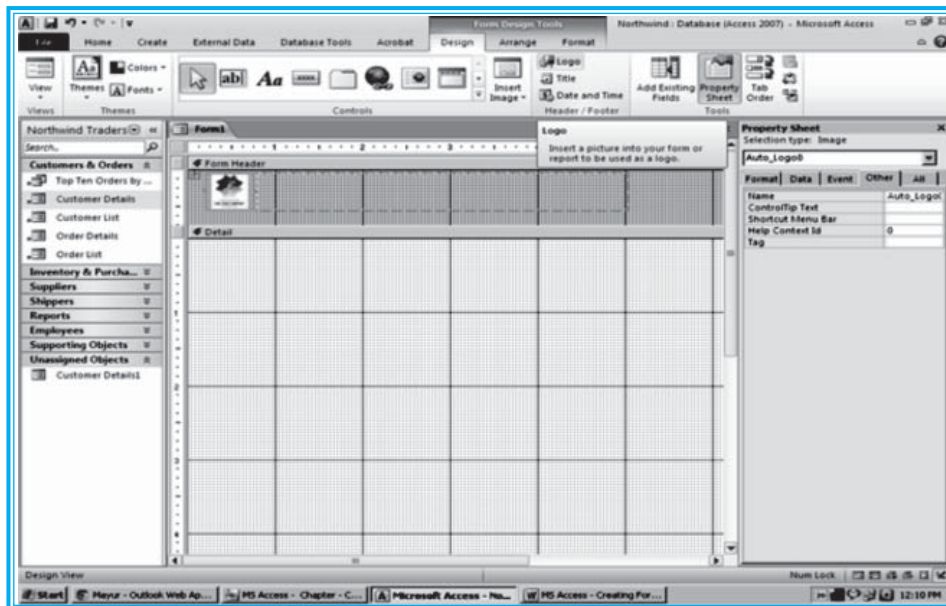


Fig. 2.14.2: Insert Logo (ii)



Note: The user may move the image or picture used as a logo from Form Header section to Detail section, as per requirement.

2.14.2 Insert Title

1. Click **Title** option under **Header / Footer** group. The user will be prompted to specify a title on the **Form Header** section as shown in Fig. 2.14.3.

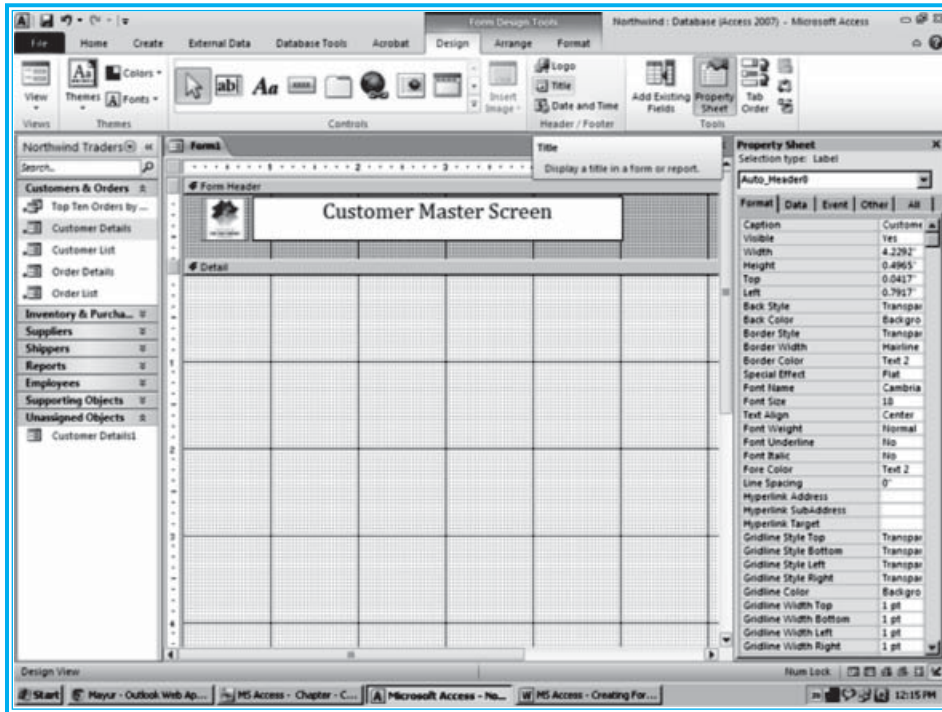


Fig. 2.14.3: Insert Title

2.14.3 Insert Date & Time

1. Click **Insert Date & Time** option under **Header / Footer** group. The user will be prompted to specify some additional information as shown in Fig. 2.14.4.



Fig. 2.14.4: Insert 'Date & Time'

2. After providing additional information as per requirement, the user will be shown a screen similar to Fig. 2.14.5 (A) in form design view. The output will be shown in form view as shown in Fig. 2.14.5 (B).

Fig. 2.14.5 (A): Form Header (i)

Fig. 2.14.5 (B): Form Header (ii)



2.14.4 Insert Label

1. Click **Label** option under **Controls** group.
2. Draw a **Label** in **Detail** section as shown in Fig. 2.14.6 (A) (**Form Design View**) and Fig. 2.14.6 (B) (**Form View**):

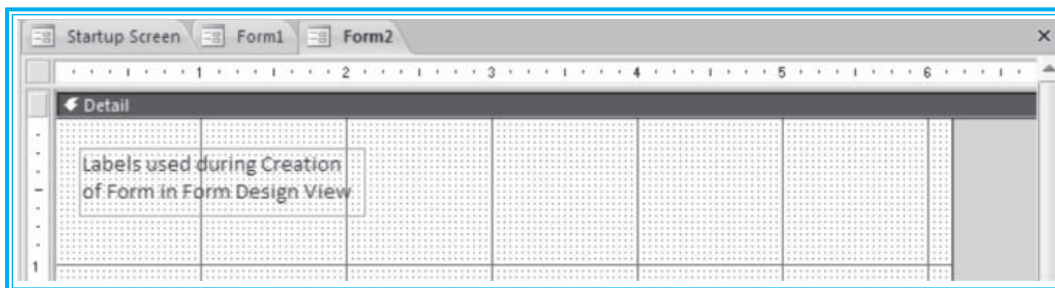


Fig. 2.14.6 (A): Insert Label (i)

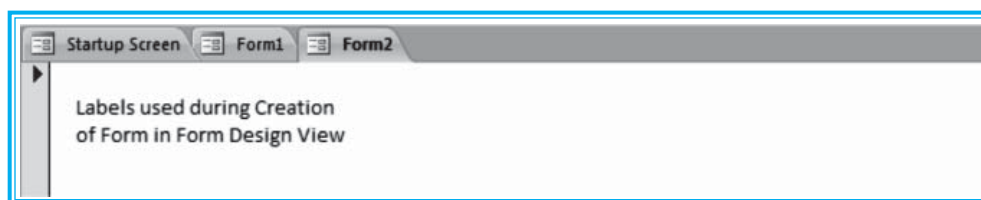


Fig. 2.14.6 (B): Insert Label (ii)

2.14.5 Insert Text Box

To add unbound Text Box

1. Click **Text Box** option under **Controls** group.
2. Draw a text box in **Detail** section as shown in Fig. 2.14.7.

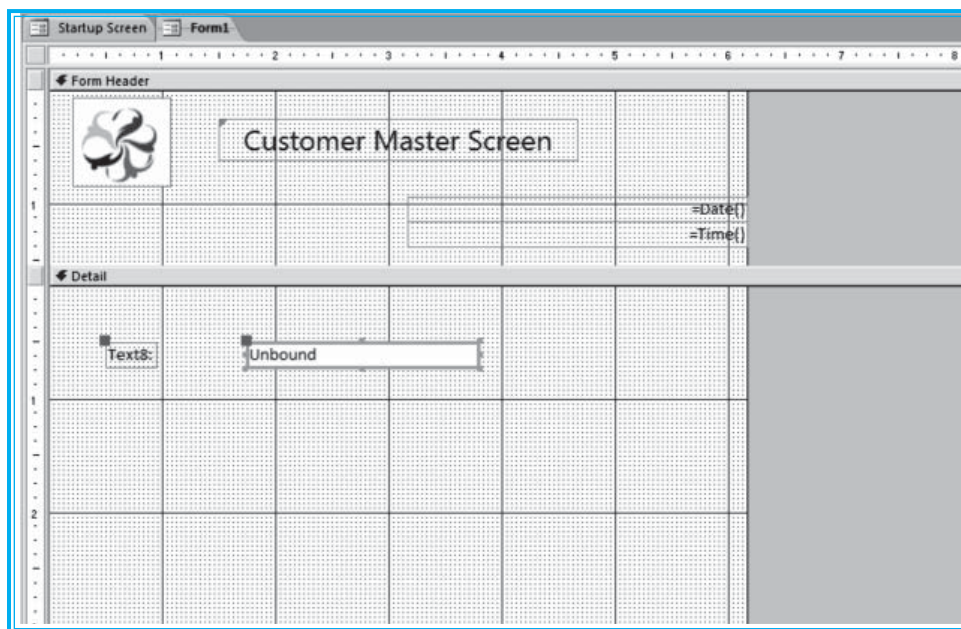


Fig. 2.14.7: Insert Text Box (i)



To add bound Text Box

1. Click **Add Existing Fields** option under **Tools** group as shown in Fig. 2.14.8.



Fig. 2.14.8: Add Existing Fields

2. After clicking **Add Existing Fields** option, a screen similar to Fig. 2.14.9 will be shown to the user:-

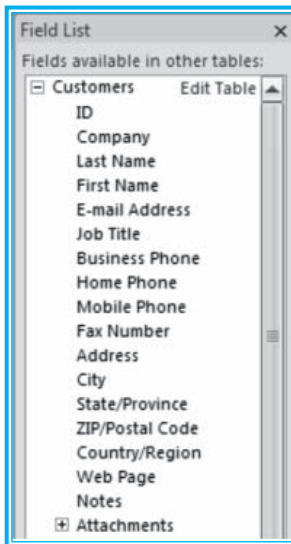


Fig. 2.14.9: Field List Dialog Box

3. The user may drag and drop the required fields in the detail section from the Field List dialog box showing Fig. 2.14.9. The user will be shown in Fig. 2.14.10 (A) (Form Design View) and Fig. 2.14.10 (B) (Form View):

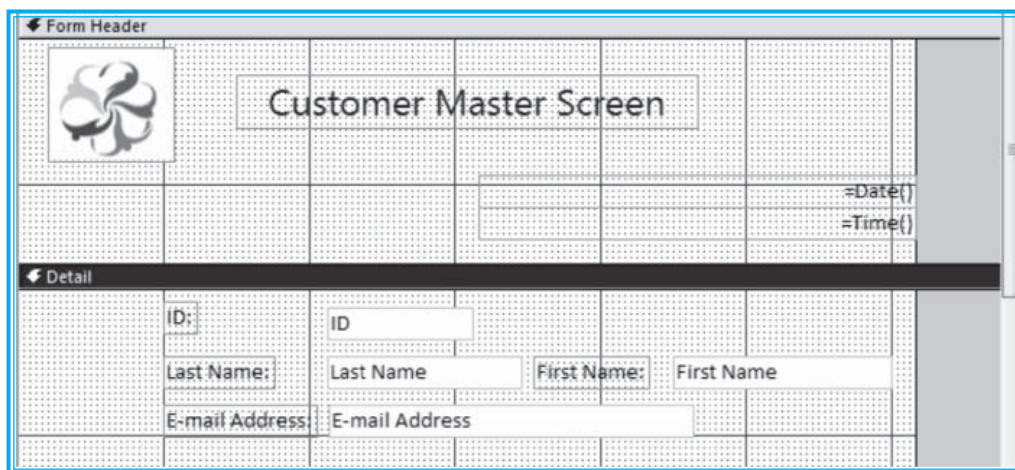


Fig. 2.14.10 (A): Form Design View of Text Box

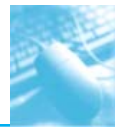


Fig. 2.14.10 (B): Form view of Text Box

2.14.6 Insert Button

Insert Unbound Button

1. Click **Button** option under **Controls** group.
2. Draw a button in the **Details** section as shown in Fig. 2.14.11.

Fig. 2.14.11: Insert Button

3. Provide a meaningful name to the newly created Button as shown in Fig. 2.14.12 (A) (Form Design View) and Fig. 2.14.12 (B) (Form View):

Fig. 2.14.12 (A): Naming a Button

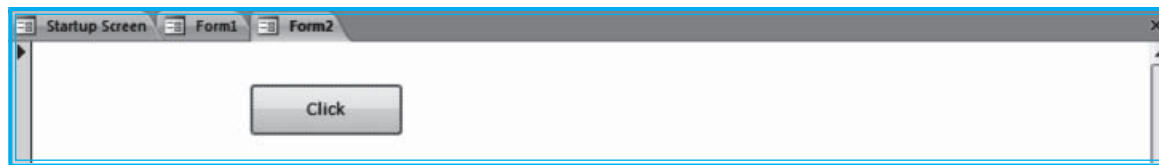


Fig. 2.14.12 (B): Form view of Button

Events Associated with a Button

The user may attach an event procedure on an activity associated with the button as follow:-

- On Click
- On Got Focus
- On Lost Focus
- On Dbl (Double)Click
- On Mouse Down
- On Mouse Up
- On Mouse Move
- On Key Down
- On Key Up
- On Key Press
- On Enter
- On Exit

As stated in the above sections, events are procedures which get triggered on an associated activity of a control.

Insert bound Button

1. Before clicking the **Button** option under **Controls** groups, the user must ensure that the **Use Control Wizard** option under **Controls** group is activated. Use Control Wizard is a toggle button, once clicking it will activate it and another time clicking will deactivate it.
2. Click the **Button** option under **Controls** groups.
3. Draw the **Button** in the **Details** section of the form. The user will see a screen similar to Fig. 2.14.13.

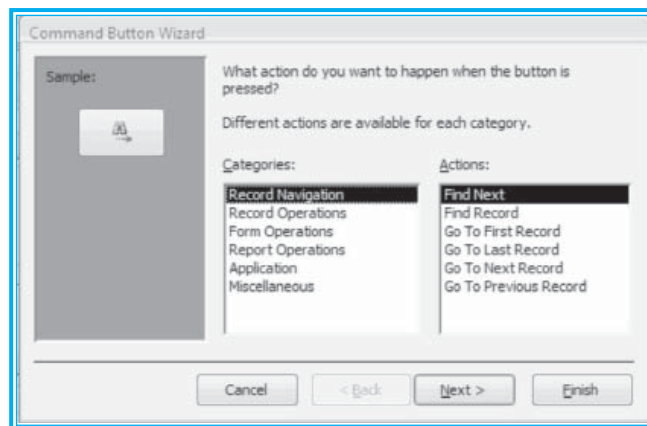


Fig. 2.14.13: Command Button Wizard (i)



4. The user needs to specify the Category and associated Action related with the newly created Button. Following table lists all the categories and associated actions to be found under **Command Button Wizard**:-

Categories	Actions
Record Navigation	Find Next Find Record Go to First Record Go to Last Record Go to Next Record Go to Previous Record
Record Operations	Add New Record Delete Record Duplicate Record Print Record Save Record Undo Record
Form Operations	Apply Form Filter Close Form Open Form Print a Form Print Current Form Refresh Form Data
Report Operations	Mail Report Open Report Preview Report Print Report Send Report to File
Application	Quit Application
Miscellaneous	Auto Dialer Print Table Run Macro Run Query

Table 2.14.1: Command Button Categories & Actions

5. After specifying the category and associated action related with the newly created Button, the user will be shown the following Fig. 2.14.14.

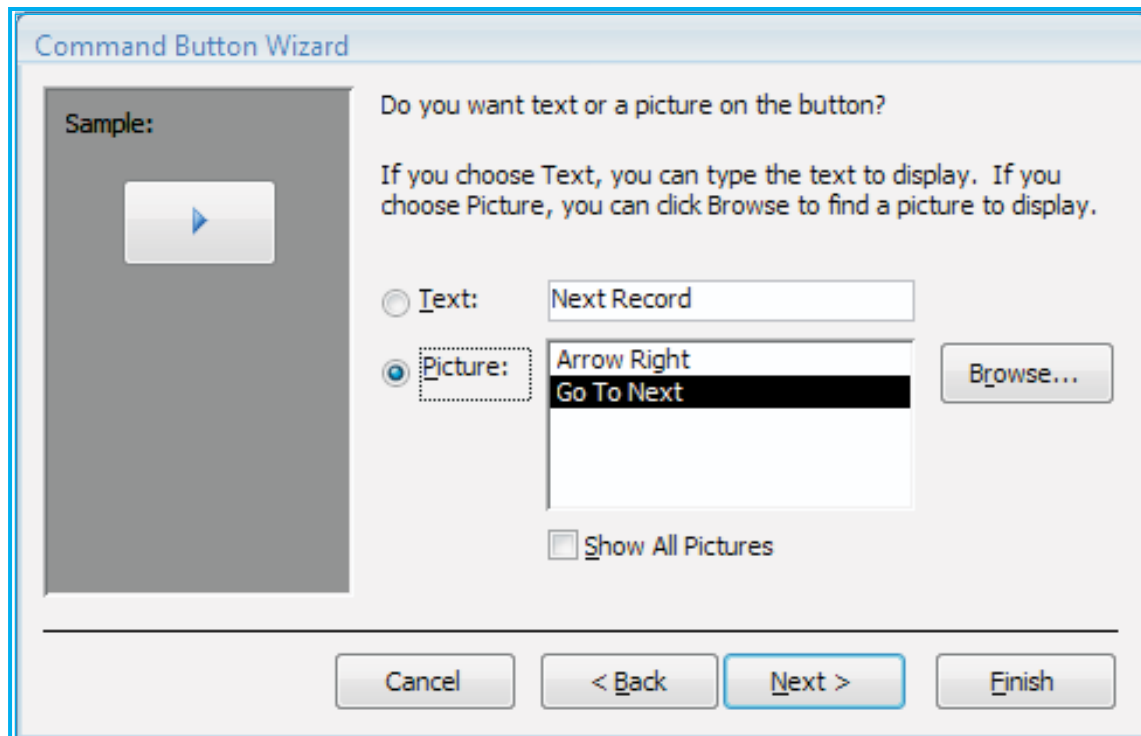


Fig. 2.14.14: Command Button Wizard (ii)

6. The user may specify to use text or a picture on the button as per the requirements. Further, the user will be shown the following Fig. 2.14.14.

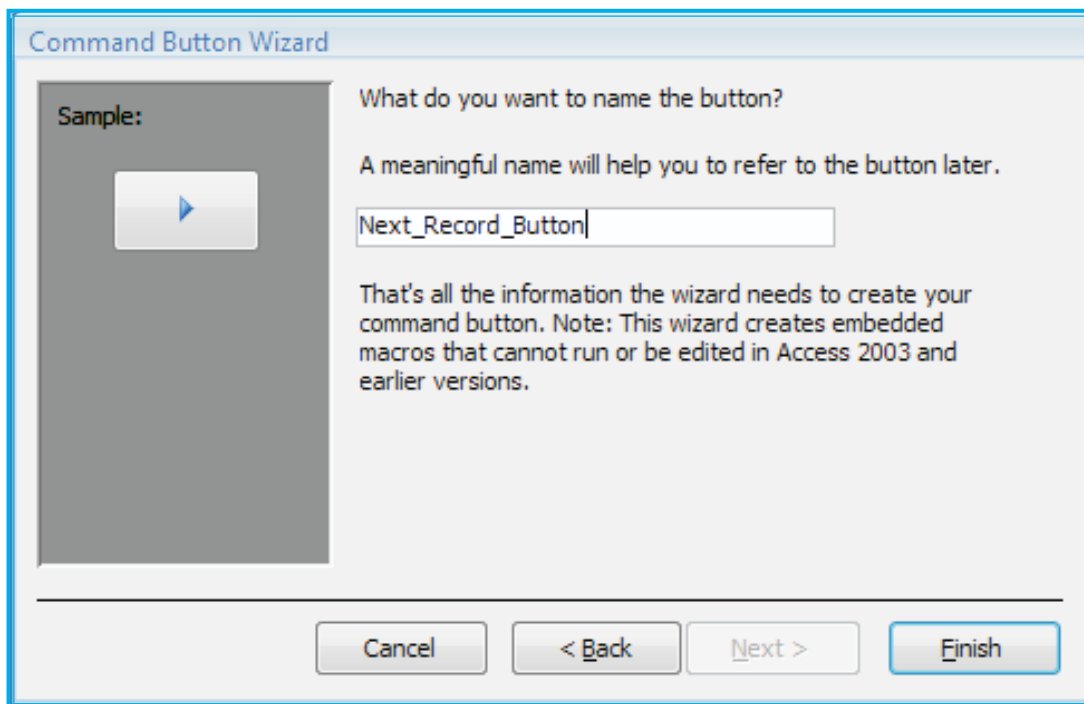
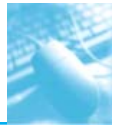


Fig. 2.14.15: Command Button Wizard (iii)



7. The user needs to give a meaningful name to the Button which could be user in future to refer to the button control as shown in Fig. 2.14.15.
8. Click **Finish** to close the wizard.

2.14.7 Insert Combo Box

1. Click the **Combo Box** option under **Controls** group.
2. Draw the **Combo Box** in the **Details** section of the form. The user will see a screen similar to Fig. 2.14.16.

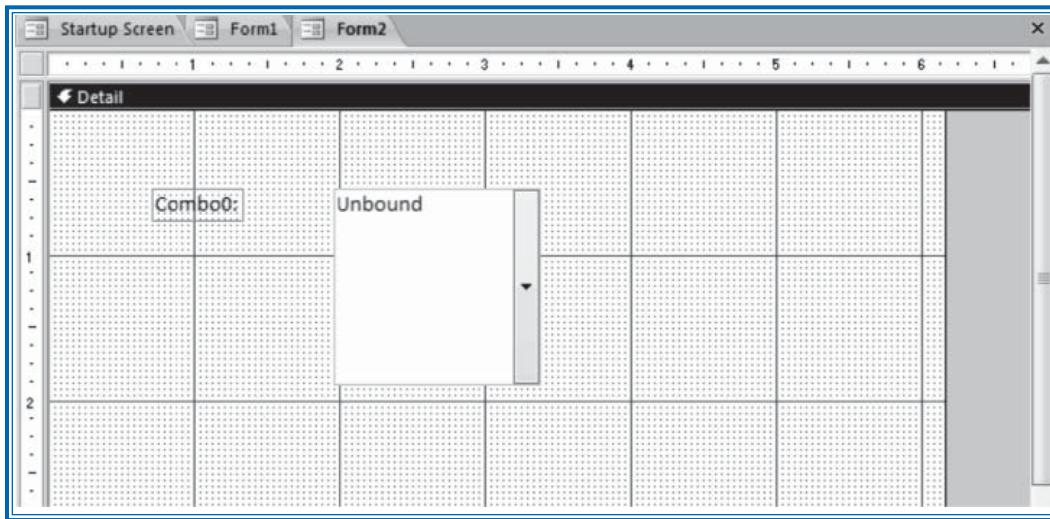


Fig. 2.14.16: Insert Combo Box (i)

3. Select the concerned **Combo Box** control and click the **Property Sheet** option under **Tools** group.
4. On the **Property Sheet**, Click the **Data Tab**.
5. As shown in Fig. 2.14.17, under Row Source Type of Property Sheet, select Value List to supply user defined values to the Combo Box control. Alternatively, the user may also select Table / Query or Field List to associate the Combo Box control with desired table and field.

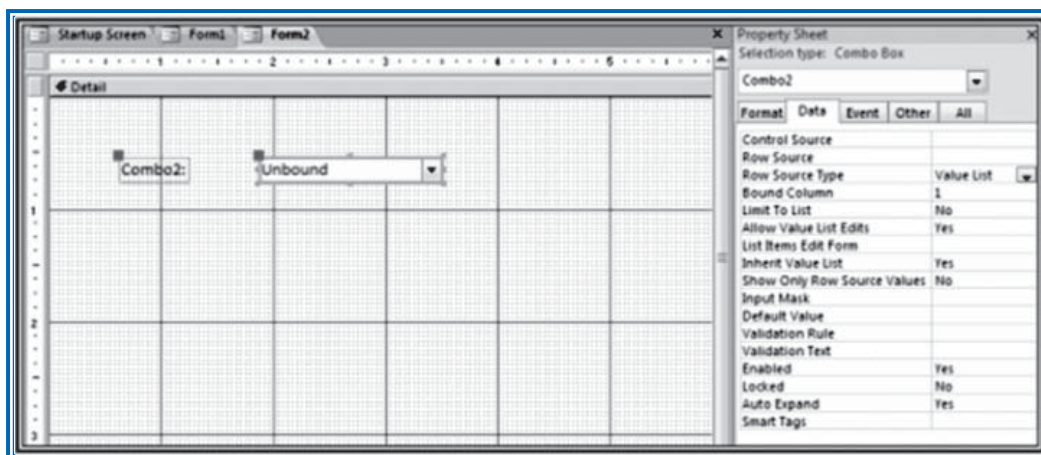


Fig. 2.14.17: Insert Combo Box (ii)



6. Selecting Row Source will show the user a screen similar to Fig. 2.14.18.

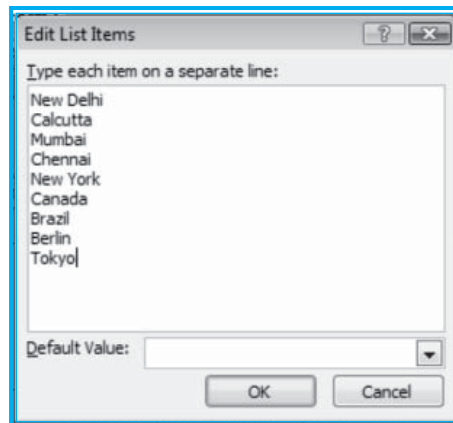


Fig. 2.14.18: Insert Combo Box (iii)

7. The user needs to type in the items that the user wishes to include in the **Combo Box** control as shown in Fig 2.14.18.
8. Click **OK** and see the output in **Form View** as shown in Fig. 2.14.19:

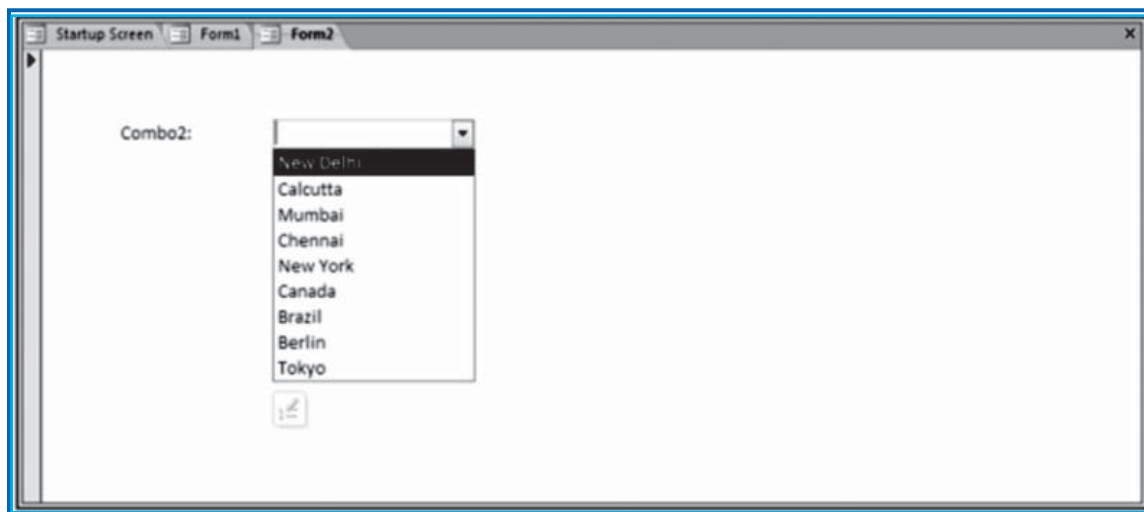


Fig. 2.14.19: Insert Combo Box (iv)

2.14.8 Insert List Box

1. Click the **List Box** option under **Controls** group.
2. Draw the **List Box** in the **Details** section of the form. The user will see a screen similar to Fig. 2.14.20.

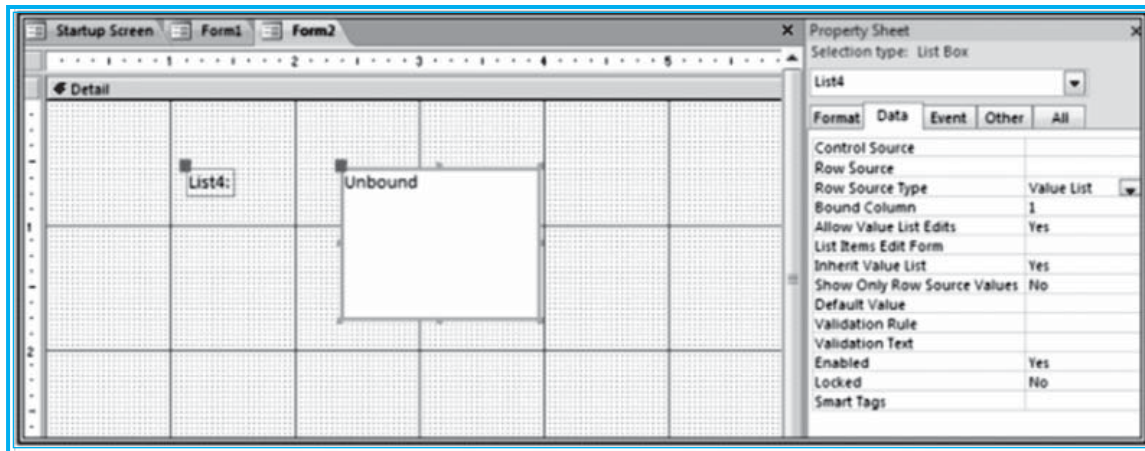


Fig. 2.14.20: Insert List Box (i)

3. Select the concerned **List Box** control and click the **Property Sheet** option under **Tools** group.
4. On the **Property Sheet**, Click the **Data** Tab.
5. As shown in Fig. 2.14.20, under Row Source Type of Property Sheet, select Value List to supply user defined values to the List Box control. Alternatively, the user may also select Table / Query or Field List to associate the List Box control with desired table and field.
6. Selecting Row Source will show the user a screen similar to Fig. 2.14.21:

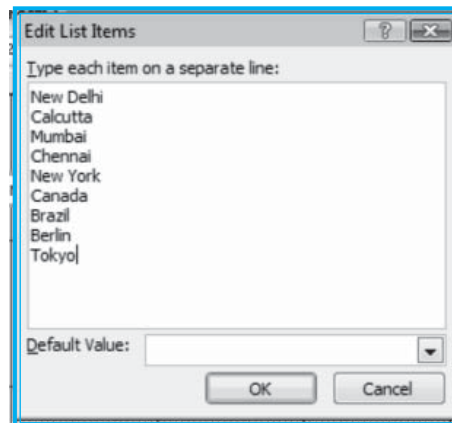


Fig. 2.14.21: Insert List Box (ii)

7. The user needs to type in the items that the user wishes to include in the List Box control as shown in Fig. 2.14.21.
8. Click **OK** and see the output in **Form** View as shown in Fig. 2.14.22:

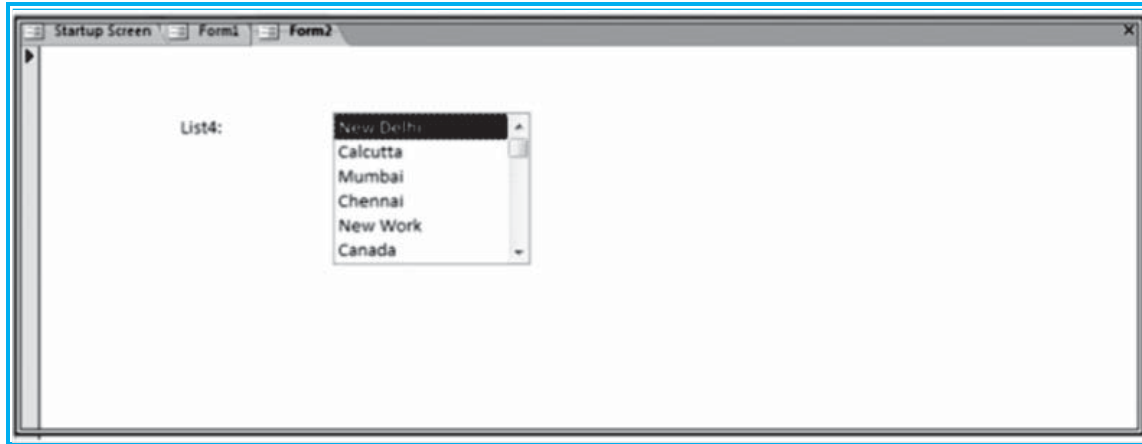


Fig. 2.14.22: Insert List Box (iii)

2.14.9 Insert Check Box, Option Button and Toggle Button

Bound Controls:

1. Create a table name Membership_Statistics with the structure as shown in Fig. 2.14.23:

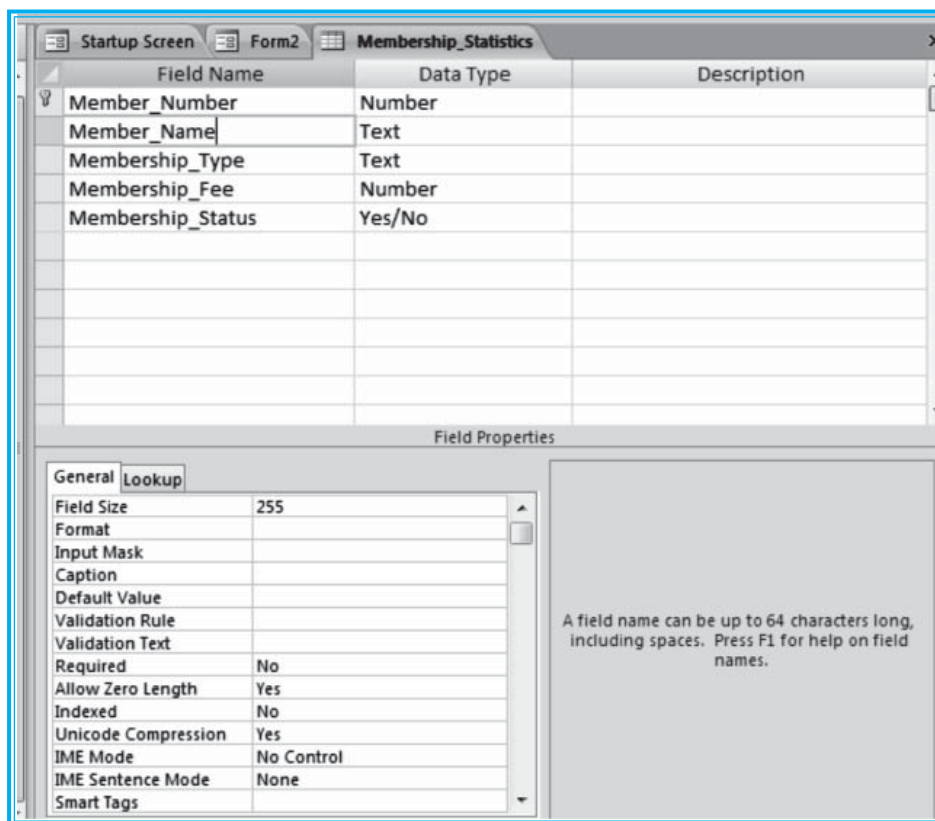


Fig. 2.14.23: Insert Bound Controls (i)



2. Add the following data as shown in Fig. 2.14.24:

Member_Number	Member_Name	Membership_Type	Membership_Fee	Membership_Status	Click to Add
101	Mayur Kumar	Life Member	7000	☒	
102	Vikas Shinde	Annual	2500	☒	
103	Anoj Das	Life Member	7000	☐	
104	Ankur Khairwal	Semi Annual	1600	☒	

Fig. 2.14.24: Insert Bound Controls (ii)

3. Save and close the table.
4. Open a form in **design view** and click the field list pane as shown in Fig. 2.14.25:

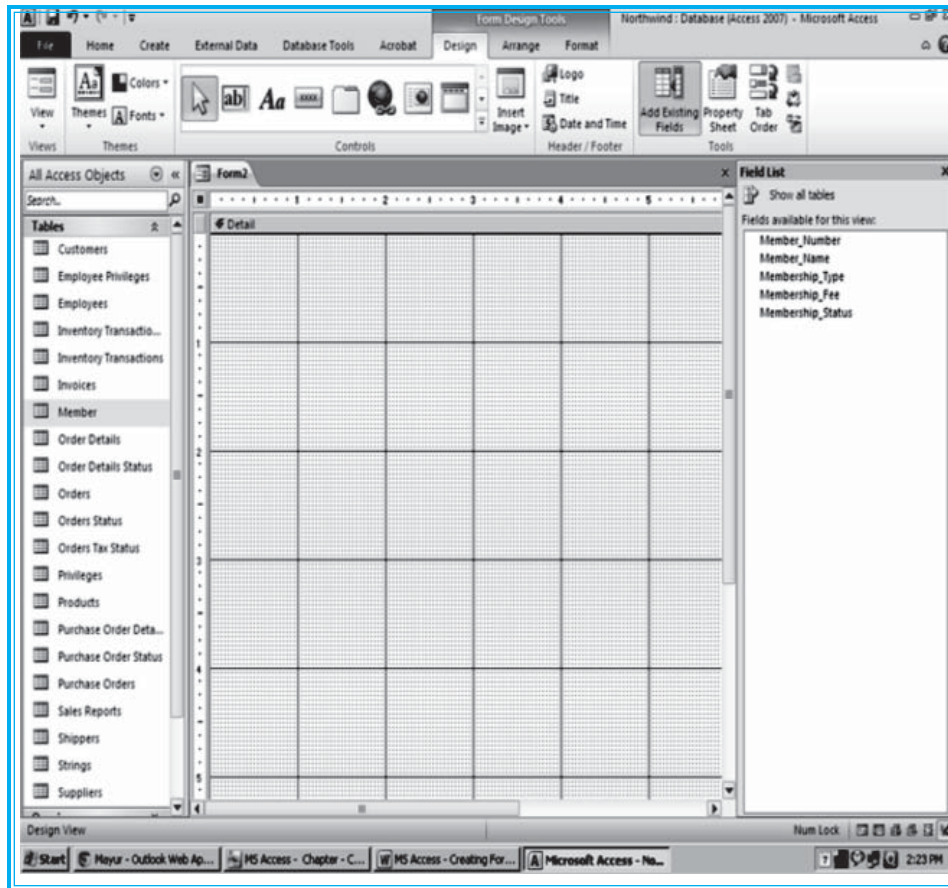


Fig. 2.14.25: Insert Bound Controls (iii)

5. Add the fields from field list pane one by one. The user will see a screen similar to Fig. 2.14.26:

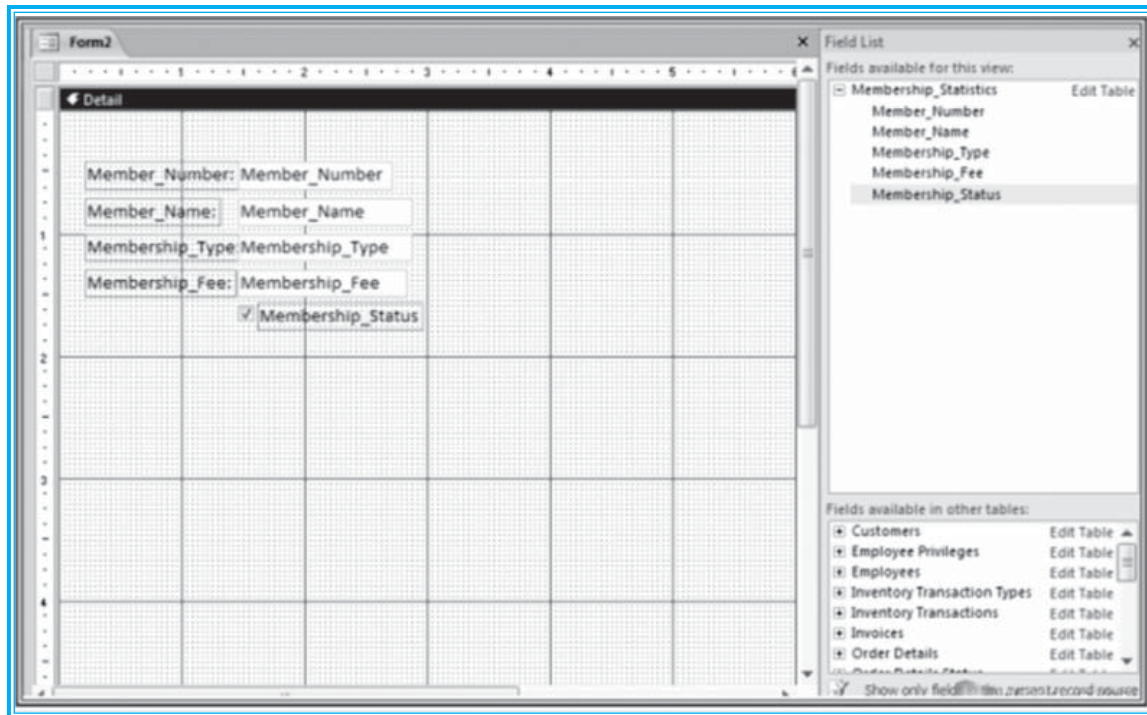


Fig. 2.14.26: Insert Bound Controls (iv)

Note: Depending on the setting of the field's Display Control property, a check box, a text box or a combo box is created and bound to the field. When the user creates a new Yes/No field in a table, the default setting of the field's Display Control property is Check Box.

The form when shown in form view will look similar to Fig. 2.14.27:

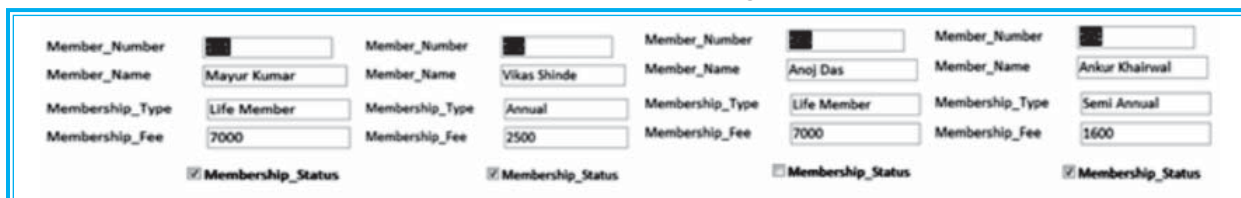
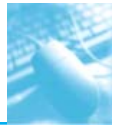


Fig. 2.14.27: Form in Form View

2.14.10 Insert Option Group

An option group displays a limited set of alternatives and only one option in an option group can be selected at a time. An option group consists of a group frame and a set of check boxes, toggle buttons or option buttons. If an option group is bound to a field, only the group frame itself is bound to the field, not the controls contained inside the frame. Instead of setting the Control Source property for each control in the option group, the user sets the Option Value property of each control to a number that is meaningful for the field to which the group frame is bound. When the user selects an option in an option group, Access sets the value of the field to which the option group is bound to the value of the selected option's Option Value property. The value of an option group can only be a number, not text.



1. Create a table Customer_Status with the structure as shown in Fig. 2.14.28:

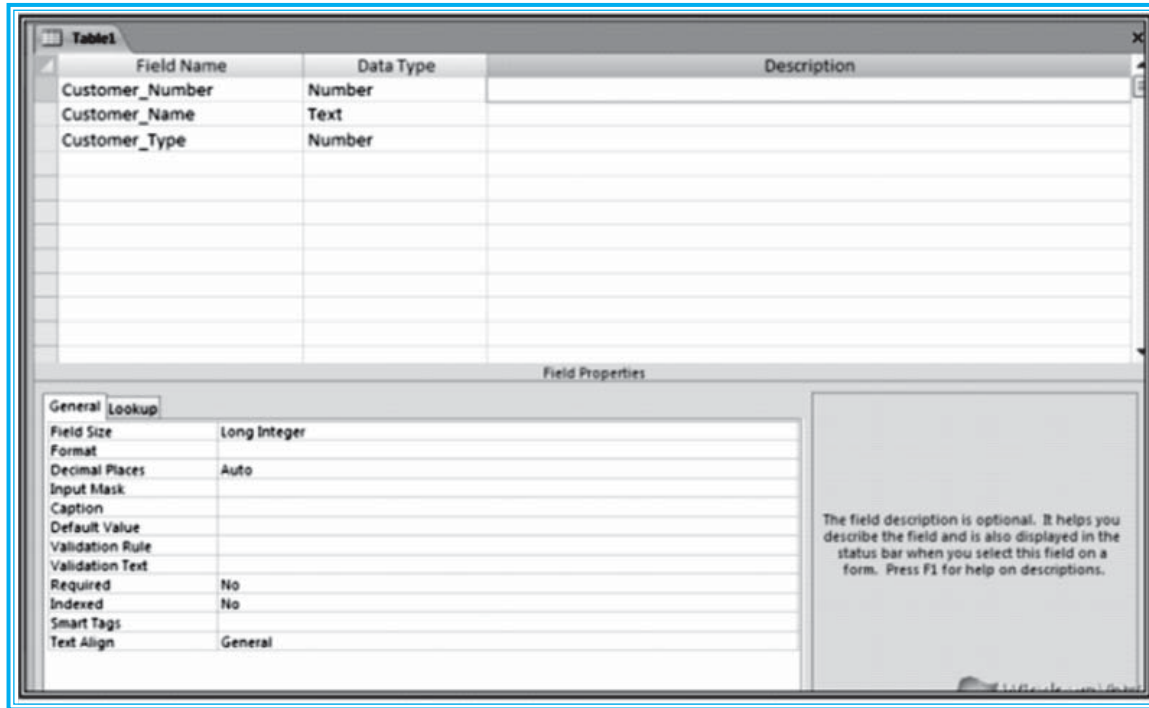


Fig. 2.14.28: Insert Option Group (i)

2. Add the following data as shown in Fig. 2.14.29.

Customer_Status			
Customer_Number	Customer_Name	Customer_Type	Click to Add
101	Mayur Kumar	1	
102	Vikas Shinde	2	
103	Anoj Das	1	
104	Ankur Khairwal	3	
*			

Fig. 2.14.29: Insert Option Group (ii)

3. Save and close the table.
4. Open a form in **design** view and click the field list pane and select Customer_Status Table.
5. Add Customer_Number and Customer_Name field from the field list pane.
6. Now, select option group from **Design** tab. Add three **Option Button** and provide name to them as shown in Fig. 2.14.30:



Fig. 2.14.30: Insert Option Group (iii)

7. Select the Option Group control and in its property sheet click Data tab. Specify the control source as Customer_Type as shown in Fig. 2.14.31:

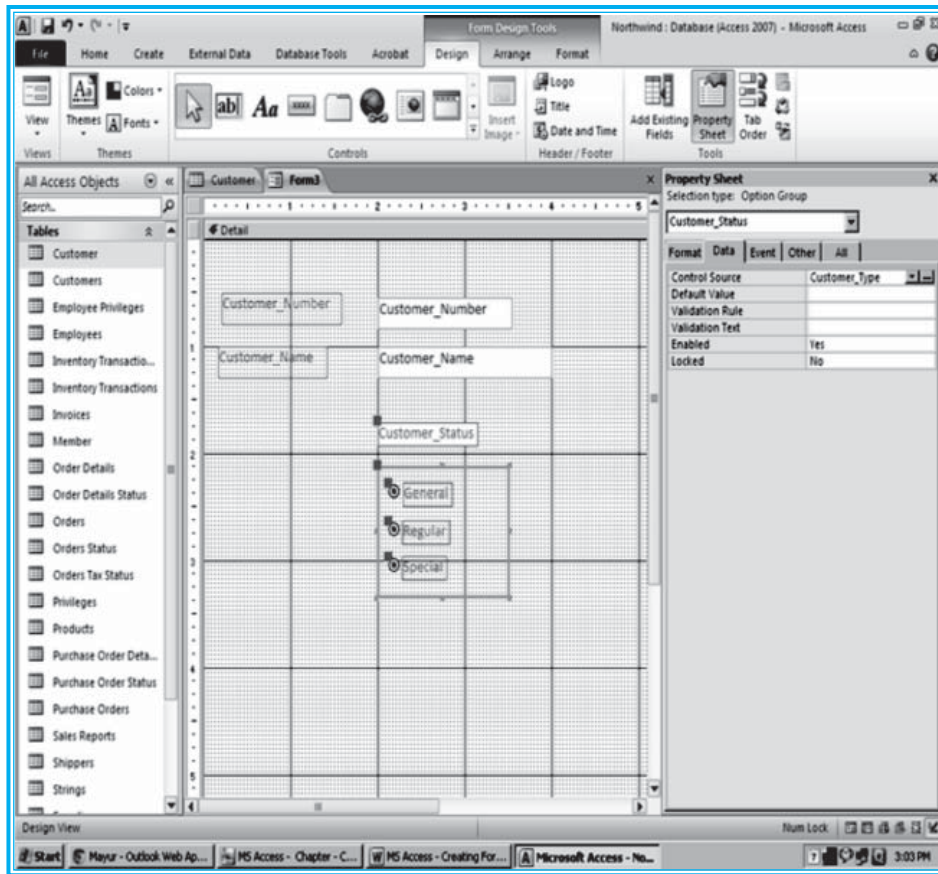


Fig. 2.14.31: Insert Option Group (iv)

8. Now, click individual **Option** Buttons and specify their option value as follows:-

Option Button	Option Value
General	1
Regular	2
Special	3

9. Select the **Form View** to see a form similar to Fig. 2.14.32.



Fig. 2.14.32: Insert Option Group (v)

Note: As the user will go to the next record, the value of Customer Status will change as per the data entered in the table and the same will be reflected on the form, too.

2.14.11 Insert Image

1. Select the image from Controls under **Design** tab.
2. Click on insert image, then browse it.
3. Specify the image that user wants to use in the form.
4. Click the form view to see the output as shown in Fig. 2.14.33.

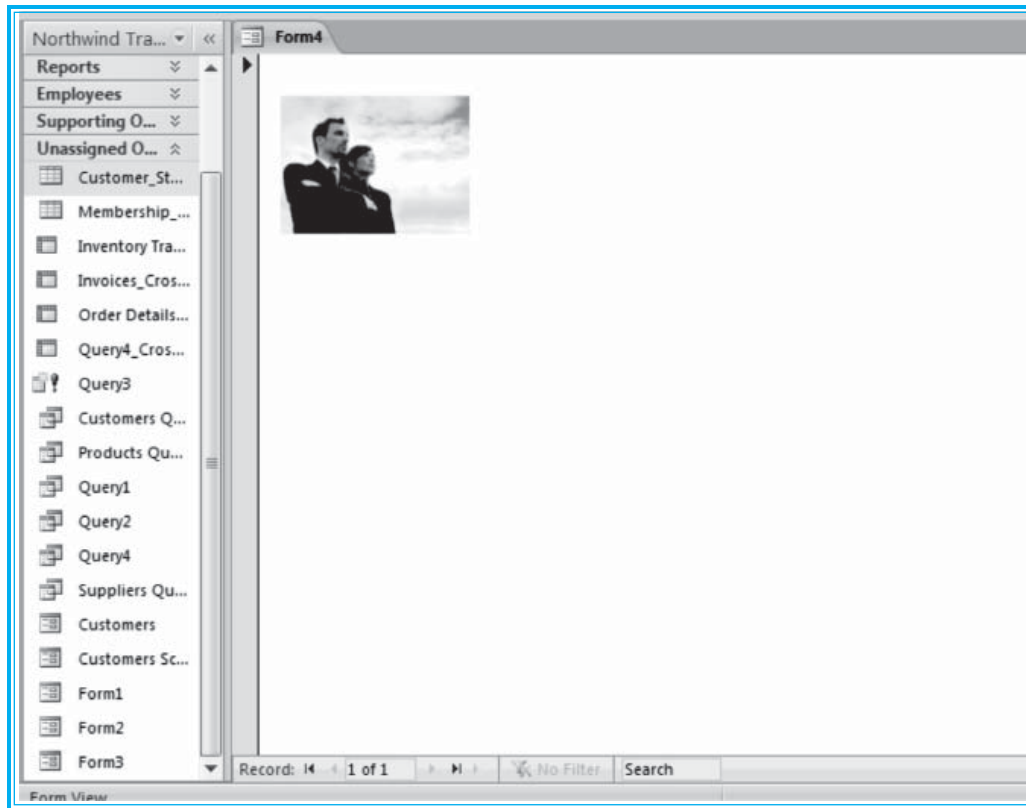


Fig. 2.14.33: Insert Image

2.14.12 Insert Hyperlink

1. Open a form in **design view**.
2. Select the hyperlink from controls under **Design** tab.
3. Specify the text the user wants to have for the hyperlink message along with the file name to open as shown in Fig. 2.14.34:

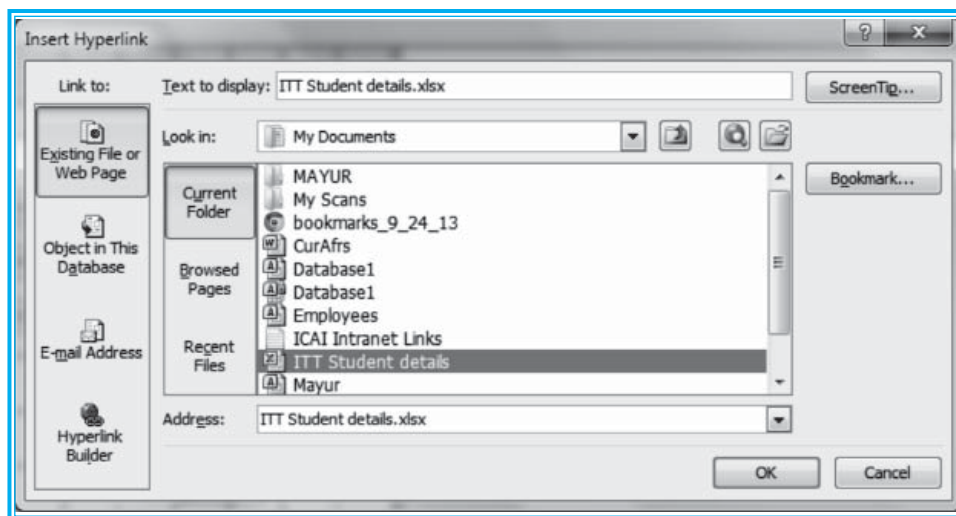


Fig. 2.14.34: Insert Hyperlink (i)



4. Click the **Form View** to see the output as shown in Fig. 2.14.35.

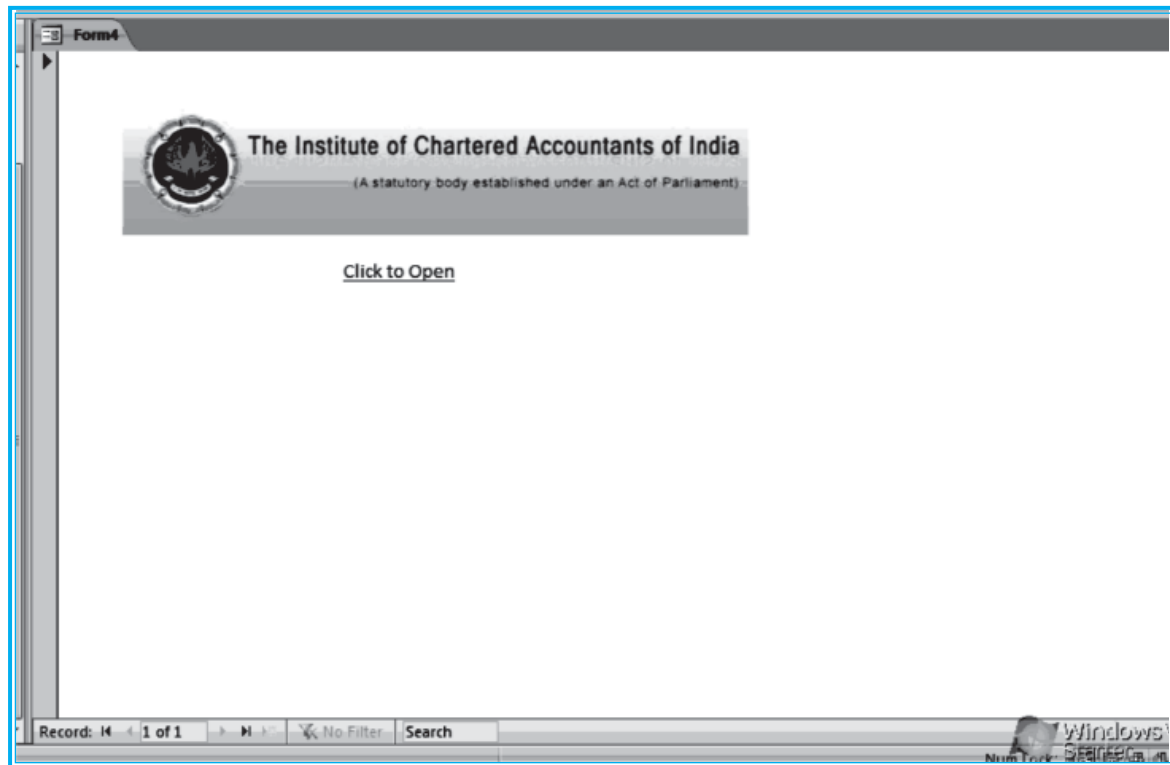


Fig. 2.14.35: Insert Hyperlink (ii)

LEARNING OBJECTIVES

In this chapter, we will learn:

- Types of queries.
- General steps in creating a query.
- Query using query wizard & design view.
- Sorting a query.
- Running & saving query.
- Create parameter query.
- Creating query using multiple tables.
- Reports & its importance.
- Types of reports.
- Steps in creating a report.
- Creating a report with the report wizard & design view.
- Saving & printing report.

3.1 INTRODUCTION

At times the data stored in a single table is so large in volume that it becomes difficult for a user to find specific information. Further, it becomes more complex when two or more tables get involved in searching specific information. In such situation, it is a good idea to use the concept of queries. Query is a mechanism for retrieving information from a database and consists of questions presented to the database in a predefined format. A user may use a query to answer a simple question, to perform calculations, to combine data from different tables or even to add, change or delete data from a table(s). A user may use queries to filter the desired data, to perform calculations with the data and to summarize the data present in table(s). Queries can also be used to supply data for a form or report. Additionally, queries can also be used to automate many data management tasks and to review changes in the data before actually committing the changes the user wants to make.



3.2 DEFINITION

Query can be defined as an operation that extracts record(s) from a database based on a given condition. A query consists of search criteria expressed in a database language called SQL. For example, the query can specify that only certain columns or only certain records be included in a result.

3.3 QUERY AND ITS TYPES

The user can create a query in MS-Access in either of the following two ways:-

- Choose the **Query Wizard** provided by **Microsoft Access** for the ease of user to build a query.
- Create own queries from scratch using query design.

Now, before a user start to build query, he / she should know the general types of queries that MS-Access offers as follows:-

3.3.1 Select Query

The **select query** is the simplest and most common type of query available in MS-Access. Such queries may be used to select and display data from either one or more table(s) depending upon the requirement. The user-determined criteria convey to the database about the selection of records from table(s). After the select query is called, it creates a "virtual" table where the data can be changed one record at a time.

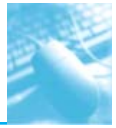
3.3.2 Crosstab Query

Crosstab queries are useful for summarizing information, calculating statistics, spotting bad data and looking for trends. The results of a crosstab query are read-only - data cannot be added, edited or deleted in a crosstab result. An aggregate function, such as sum or count, is used to help summarize the data. At times, the user wants to create a query for some specific purpose such as to group data into categories and display values in a spreadsheet like format with summary totals. Such queries can also be used to compare values and observe the trends in the data and to obtain summary data such as monthly, quarterly, semiannually or annually sales figures.

3.3.3 Action Query

Action query is used to create new table(s), delete rows from existing table(s) and update records or creating entirely new ones in a table(s). When the action query is called, the database undergoes a specific action depending on what was specified in the query itself. Action queries are very popular in data management because they allow for many records to be changed at one time unlike only single record in a select query. There may be four sub-types of action queries which are as follows:-

- **Append Query:** The append query takes the set results of a query and "appends" them to an existing table. In other words, we can say that, an append query copies specified or all the records from one table to the bottom of another table. This query is useful when two different tables with similar structures are used. If the source table has more fields than the target tables, extra fields are ignored. Moreover, if the source table has fewer fields than the target table, fields with matching names are updated and any additional fields are left blank.
- **Delete Query:** The delete query deletes all records in an underlying table from the set results of a query. In simpler terms, we can say that, the delete query is used to delete a group of records that meets specific search criteria. The process for setting up a delete query depends on whether the user wants to delete records from single table or from multiple tables that have an established and valid relationship among them.



- **Make Table Query:** The make table query creates a table based on the set results of a query. In simpler terms, we can say that, the make table query is used to create a new table and populate it with data from one or more existing tables. By creating a make table query, the user actually created a backup copy of a table. Moreover, it may be useful, when the user wants to save delete records in a separate history table for future use. It may also be useful in situations, where a subset of data needs to be generated as a report and may be created as a table for exporting to other applications.
- **Update Query:** The update query allows for one or more field in table(s) to be updated. In other words, we can say that, the update query allows the user to make global changes to data in one or more tables.

3.3.4 Parameter Query

A **parameter query** is used to pass a parameter to a different query such as an action or a select query. The parameter can either be a value or a condition. This parameter conveys to the other query what is supposed to be done. It allows for a dialog box where the end user can enter whatever parameter value they wish each time the query is run. The parameter query can be seen as a modified select query.

3.3.5 Aggregate Query

Aggregate query is a special type of query which works on other queries such as selection, action or parameter but instead of passing a parameter to another query it totals up the items by selected groups. It essentially creates a summation of any selected attribute in a table. The SQL aggregate functions available to Microsoft Access are:

- Sum
- Avg
- Min
- Max
- First
- Last
- Group By
- Count
- StDev
- Var
- Expression
- Where

3.4 GENERAL STEPS TO CREATE A QUERY

The general steps to create a query in MS-Access are as follows:-

- Choose the tables or queries as sources of data.
- Specify the fields that the user wishes to include from the data sources.
- Optionally, specify criteria to limit the records that the query returns.
- Run the query to see the results.



3.5 CREATING SELECT QUERY USING QUERY WIZARD

Query wizard may be used by a user to automatically create a simple query. Although, the query wizard provides less control in handling a query but surely, query once created using query wizard can always be modified using design view.

Before, running the query wizard, the user must ensure that all relationships are created before hand in case the query is created using two or more tables.

Source:

Database : Northwind 2010

Table : Customers

Steps:-

1. On the **Create** tab, in the **Queries** group, click **Query Wizard**, as shown in Fig. 3.5.1

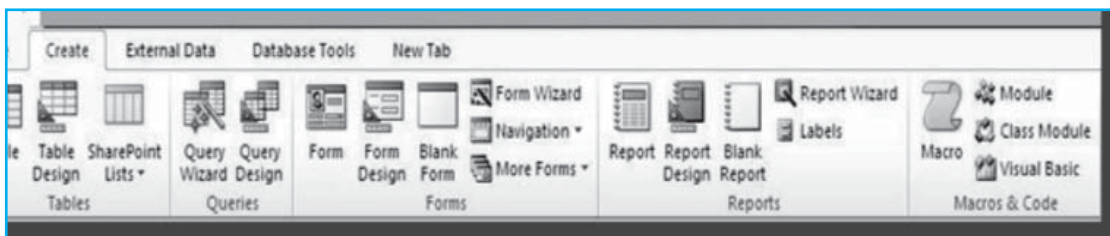


Fig. 3.5.1: Query Wizard option

2. In the **New Query** dialog box, click **Simple Query Wizard** and then click **OK**, as shown in Fig. 3.5.2.

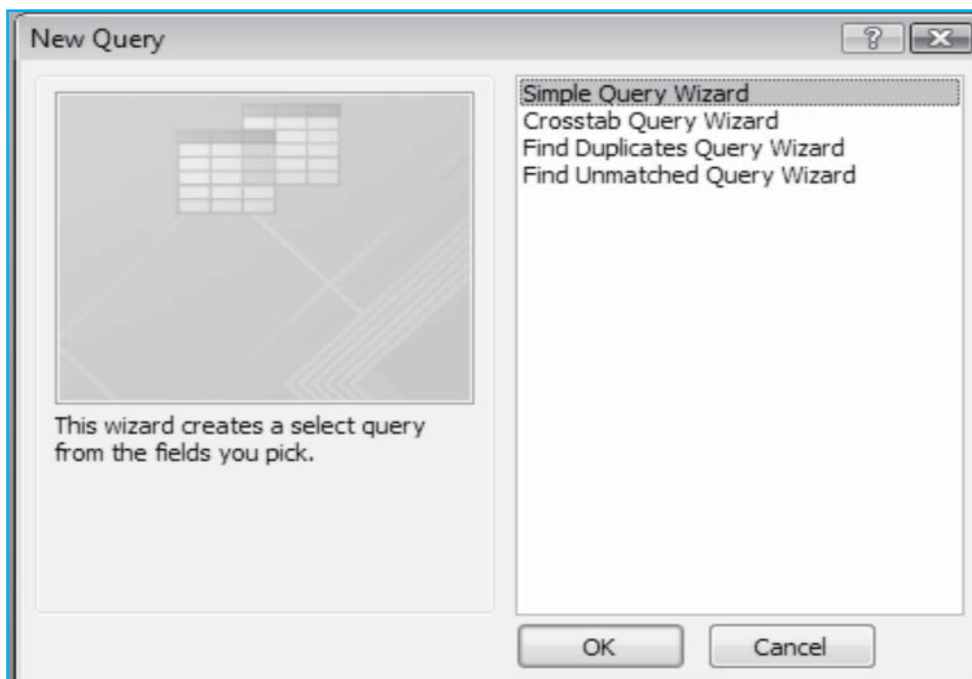
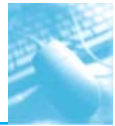


Fig. 3.5.2: New Query Dialog Box



We will see a screen similar to Fig. 3.5.3 as shown below:-

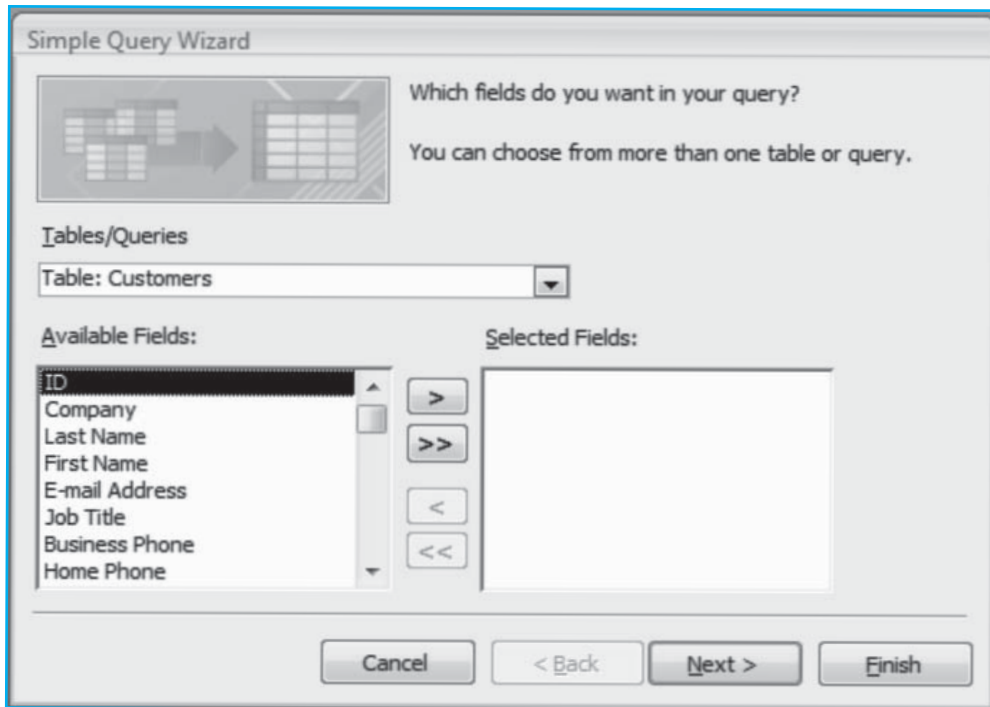


Fig. 3.5.3: Simple Query Wizard (i)

3. After selecting the desired field(s) from the table, the result is as shown in Fig. 3.5.4.

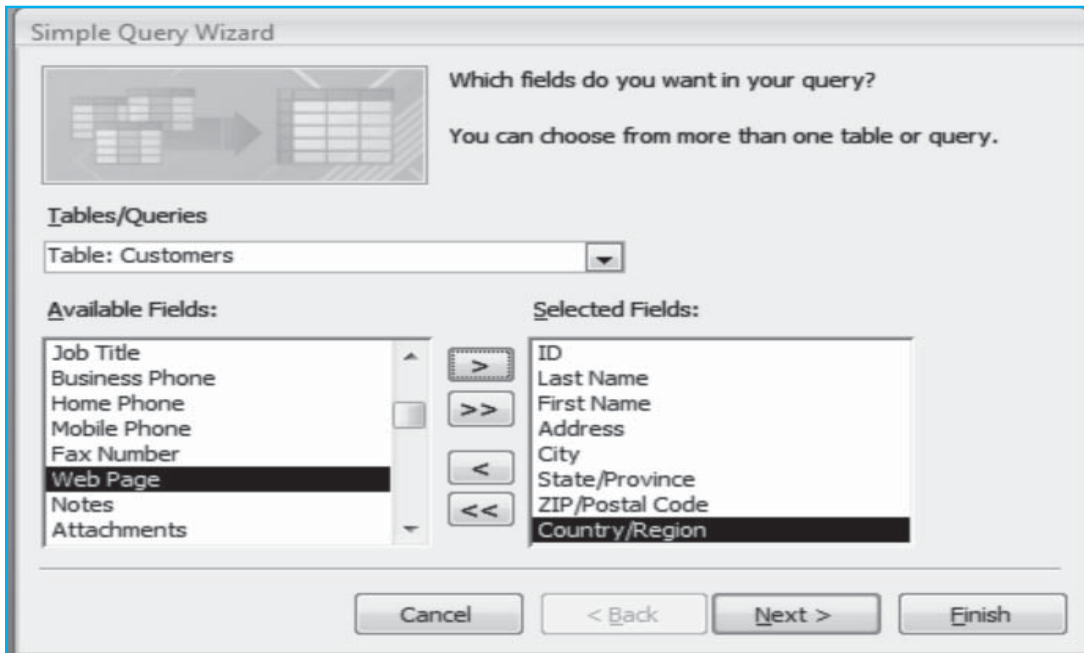


Fig. 3.5.4: Simple Query Wizard (ii)

The user can add up to 255 fields from as many as 32 tables or queries.



For each field, the user depending upon the requirement may perform the following two steps:-

- Under **Tables/Queries**, click the table or query that contains the field.
 - Under **Available Fields**, double-click the field to add it to the **Selected Fields** list.
4. When the user has added all the desired fields, he / she may click **Next** and may see Fig. 3.5.5 as follows:

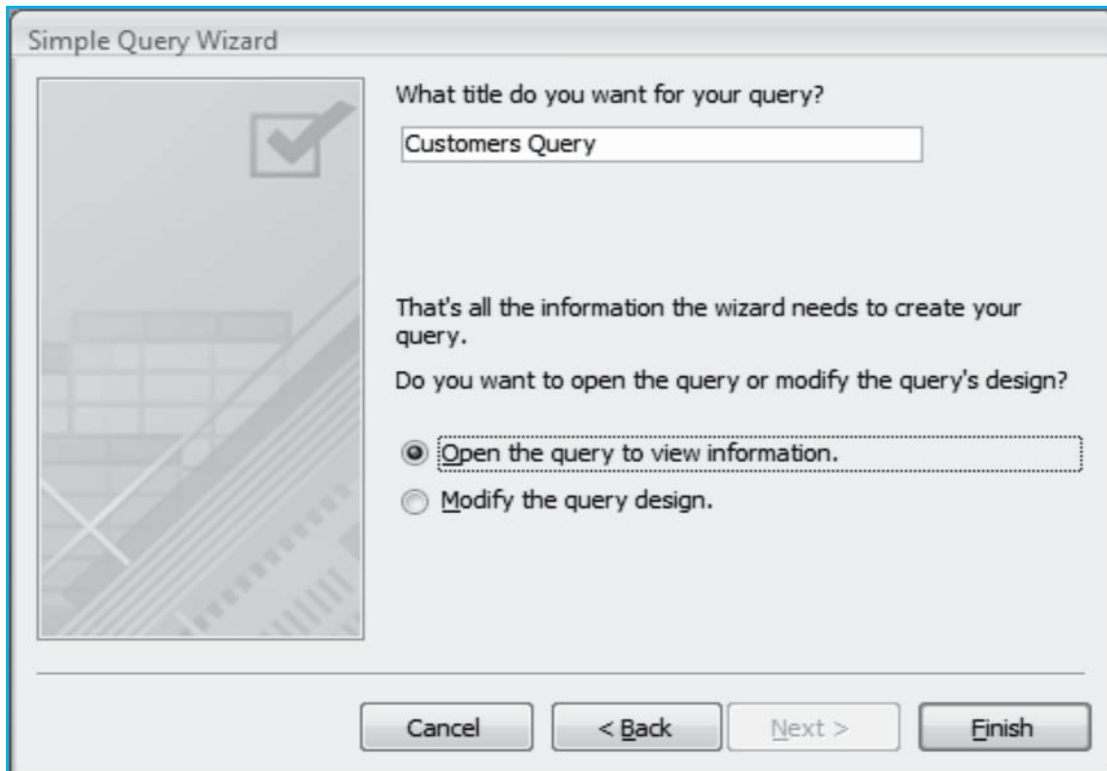
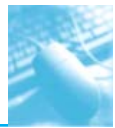


Fig. 3.5.5: Simple Query Wizard (iii)

Although, the query wizard suggests a query title for the query being prepared still the user may specify his / her own query title. For this, the user has to type the desired query title inside the text box provided for the same as shown in Fig. 3.5.5. Moreover, the query wizard provides the user with a choice to either open the query to view information or to modify the query in query design view.



5. The user may click **Finish** to complete the query wizard and may see the results of the query as shown in Fig. 3.5.6 as follows:-

ID	Last Name	First Name	Address	City	State/Provir	ZIP/Postal C	Country/Reg
1	Bedecs	Anna	123 1st Street	Seattle	WA	99999	USA
2	Gratacos Solso	Antonio	123 2nd Street	Boston	MA	99999	USA
3	Axen	Thomas	123 3rd Street	Los Angeles	CA	99999	USA
4	Lee	Christina	123 4th Street	New York	NY	99999	USA
5	O'Donnell	Martin	123 5th Street	Minneapolis	MN	99999	USA
6	Pérez-Olaeta	Francisco	123 6th Street	Milwaukee	WI	99999	USA
7	Xie	Ming-Yang	123 7th Street	Boise	ID	99999	USA
8	Andersen	Elizabeth	123 8th Street	Portland	OR	99999	USA
9	Mortensen	Sven	123 9th Street	Salt Lake City	UT	99999	USA
10	Wacker	Roland	123 10th Street	Chicago	IL	99999	USA
11	Krschne	Peter	123 11th Street	Miami	FL	99999	USA
12	Edwards	John	123 12th Street	Las Vegas	NV	99999	USA
13	Ludick	Andre	456 13th Street	Memphis	TN	99999	USA
14	Grilo	Carlos	456 14th Street	Denver	CO	99999	USA
15	Kupkova	Helena	456 15th Street	Honolulu	HI	99999	USA
16	Goldschmidt	Daniel	456 16th Street	San Francisco	CA	99999	USA
17	Bagel	Jean Philippe	456 17th Street	Seattle	WA	99999	USA
18	Autier Miconi	Catherine	456 18th Street	Boston	MA	99999	USA
19	Eggerer	Alexander	789 19th Street	Los Angeles	CA	99999	USA
20	Li	George	789 20th Street	New York	NY	99999	USA
21	Tham	Bernard	789 21th Street	Minneapolis	MN	99999	USA
22	Ramos	Luciana	789 22th Street	Milwaukee	WI	99999	USA
23	Entin	Michael	789 23th Street	Portland	OR	99999	USA
24	Hasselberg	Jonas	789 24th Street	Salt Lake City	UT	99999	USA
25	Rodman	John	789 25th Street	Chicago	IL	99999	USA

Fig. 3.5.6: Resultant Sheet

Now, if the user has included any numeric field (number field) from table(s), the wizard asks the user, whether, he / she may want the query to return details or summary data. The following step by step discussion will explain few more options which the user may use for a specific need:-

Source:

Database : Northwind 2010

Table : Products

- Step 1 and Step 2 given above for Customers table step by step instruction to be repeated. After selecting the desired field(s) from the table, the result will be shown as Fig 3.5.7.

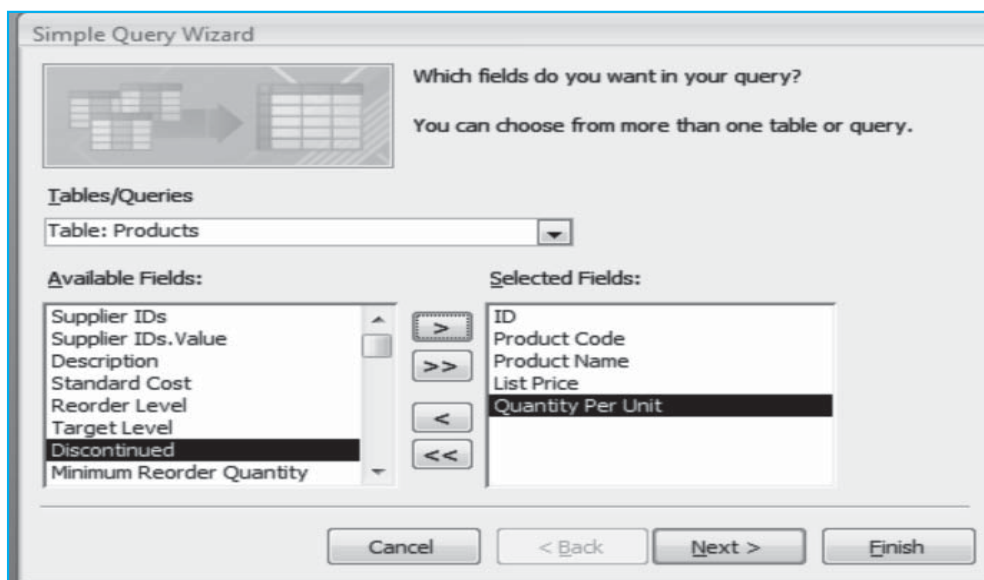


Fig. 3.5.7: Simple Query Wizard (iv)



2. When the user has added all the desired fields, he / she may click **Next** and may see Fig. 3.5.8 as follows:-

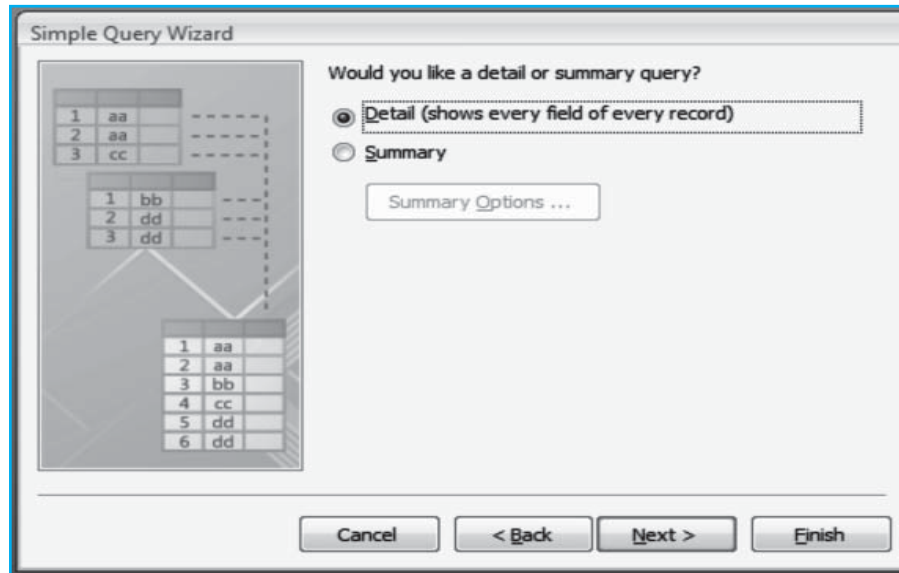


Fig. 3.5.8: Simple Query Wizard (v)

The user will be provided with two choices and are supposed to do one of the following activities:-

- If the user wishes to see individual records, they will be required to click **Details** and further, the user will be required to go directly to step 5.
- If the user wishes to see summarized numeric data, such as averages, they will be required to click **Summary**, followed by **Summary Options** as shown in Fig. 3.5.9.

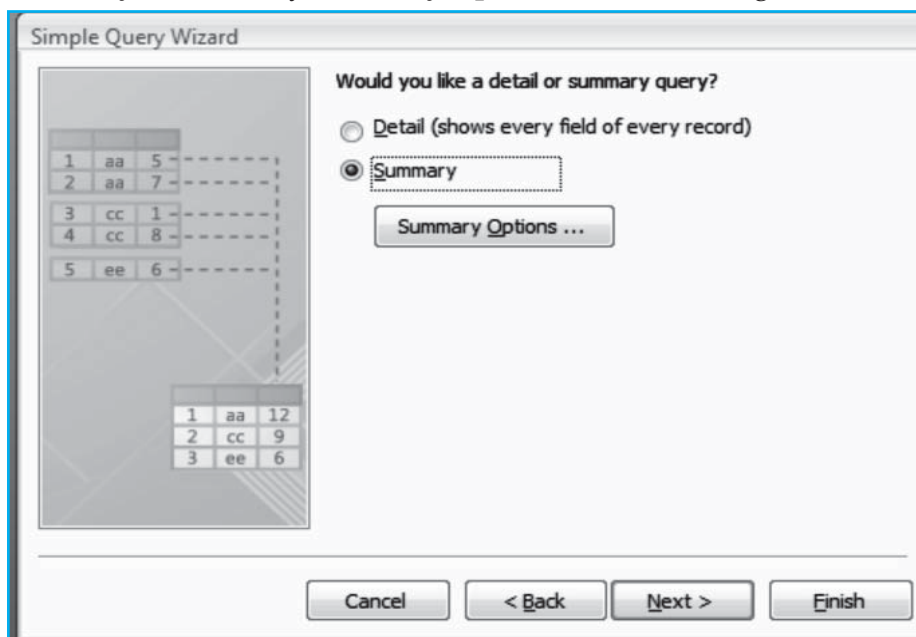


Fig. 3.5.9: Simple Query Wizard (vi)



3. The following Fig. 3.5.10 will be provided to the user for further inputs, when the user will click **Summary Options**:-

Field	Sum	Avg	Min	Max
List Price	☒	☐	☐	☐

☐ Count records in Products

Fig. 3.5.10: Summary Options (i)

4. In the **Summary Options** dialog box, the user will be required to specify which fields he or she wants to summarize and how the user wants to summarize the data. Only number fields will be listed in the dialog box. For each number field, the user may choose one of the following functions:
- **Sum:** If the user wants that the query should returns the sum of all the values of the field.
 - **Avg:** If the user wants that the query should returns the average of the values of the field.
 - **Min:** If the user wants that the query should returns the smallest value of the field.
 - **Max:** If the user wants that the query should returns the largest value of the field.

After providing all the necessary details, the user will be required to click **ok** as shown in Fig 3.5.11.



Field	Sum	Avg	Min	Max
List Price	☒	☐	☐	☐

☐ Count records in Products

Fig. 3.5.11: Summary Options (ii)

5. The user will be taken to figure 4.9, where the user will be required to click Next.
6. The user will be required to perform Step 4 and Step 5 given above for Customers table step by step instructions. The resultant screen will look as shown in Fig. 3.5.12.

ID	Product Code	Product Name	Quantity Per Unit	Sum Of List Price
1	NWTB-1	Northwind Traders Chai	10 boxes x 20 bags	\$18.00
3	NWTCO-3	Northwind Traders Syrup	12 - 550 ml bottles	\$10.00
4	NWTCO-4	Northwind Traders Cajun Seasoning	48 - 6 oz jars	\$22.00
5	NWTO-5	Northwind Traders Olive Oil	36 boxes	\$21.35
6	NWTJP-6	Northwind Traders Boysenberry Spread	12 - 8 oz jars	\$25.00
7	NWTDNF-7	Northwind Traders Dried Pears	12 - 1 lb pkgs.	\$30.00
8	NWTS-8	Northwind Traders Curry Sauce	12 - 12 oz jars	\$40.00
14	NWTDNF-14	Northwind Traders Walnuts	40 - 100 g pkgs.	\$23.25
17	NWTCFV-17	Northwind Traders Fruit Cocktail	15.25 OZ	\$39.00
19	NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	10 boxes x 12 pieces	\$9.20
20	NWTJP-6	Northwind Traders Marmalade	30 gift boxes	\$81.00
21	NWTBGM-21	Northwind Traders Scones	24 pkgs. x 4 pieces	\$10.00
34	NWTB-34	Northwind Traders Beer	24 - 12 oz bottles	\$14.00
40	NWTCM-40	Northwind Traders Crab Meat	24 - 4 oz tins	\$18.40
41	NWTSO-41	Northwind Traders Clam Chowder	12 - 12 oz cans	\$9.65
43	NWTB-43	Northwind Traders Coffee	16 - 500 g tins	\$46.00
48	NWTCA-48	Northwind Traders Chocolate	10 pkgs	\$12.75
51	NWTDNF-51	Northwind Traders Dried Apples	50 - 300 g pkgs.	\$53.00
52	NWTG-52	Northwind Traders Long Grain Rice	16 - 2 kg boxes	\$7.00
56	NWTP-56	Northwind Traders Gnocchi	24 - 250 g pkgs.	\$38.00
57	NWTP-57	Northwind Traders Ravioli	24 - 250 g pkgs.	\$19.50
65	NWTS-65	Northwind Traders Hot Pepper Sauce	32 - 8 oz bottles	\$21.05
66	NWTS-66	Northwind Traders Tomato Sauce	24 - 8 oz jars	\$17.00
72	NWTD-72	Northwind Traders Mozzarella	24 - 200 g pkgs.	\$34.80
74	NWTDNF-74	Northwind Traders Almonds	5 kg pkg.	\$10.00
77	NWTCO-77	Northwind Traders Mustard	12 boxes	\$12.00

Fig. 3.5.12: Resultant Screen



3.6 CREATING SELECT QUERY USING DESIGN VIEW

The user may use the query design view to create a select query manually. The query design view provided by MS-Access offers more control during the design of query. The user may commit some design mistakes while creating a query using query design view. Moreover, designing a query may take longer time than creating the same query through a query wizard.

Source:

Database : Northwind 2010

Table : Customers

Steps:-

1. On the **Create** tab, in the **Queries** group, click **Query Design**, as shown in Fig. 3.6.1.

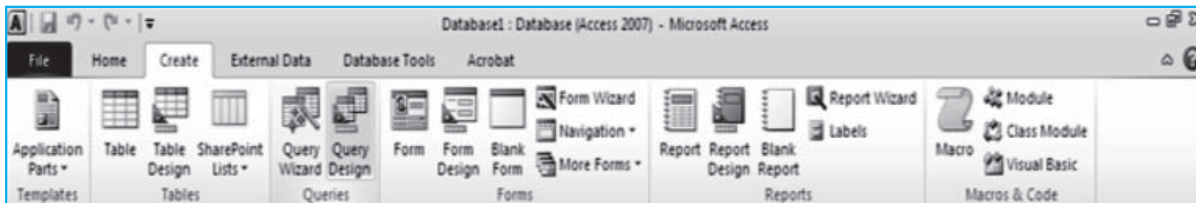


Fig. 3.6.1: 'Query Design' option

2. Following Fig. 3.6.2 containing the details of tables and queries available under **Show Table** dialog box will be shown to the user:-

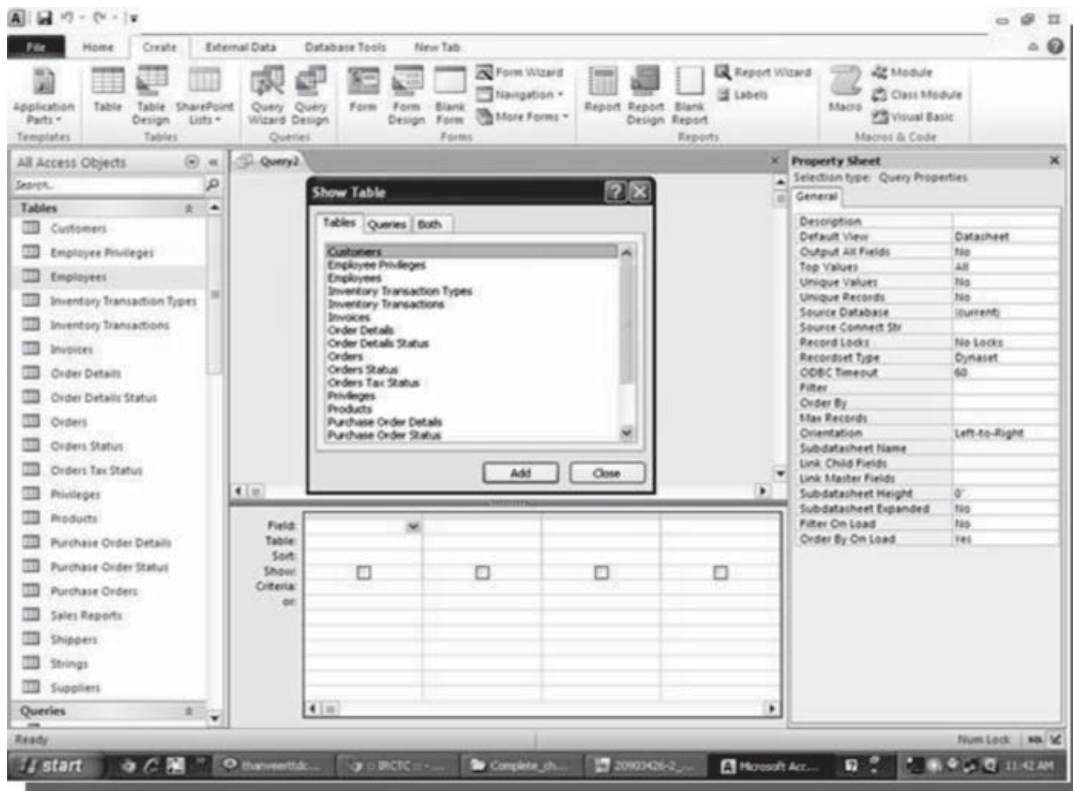


Fig. 3.6.2: 'Show Table' Dialog box (i)



3. Choose any table / query from the list provided in the **Show Table** dialog box and click **Add**. The following Fig. 3.6.3 will be shown to the user:-

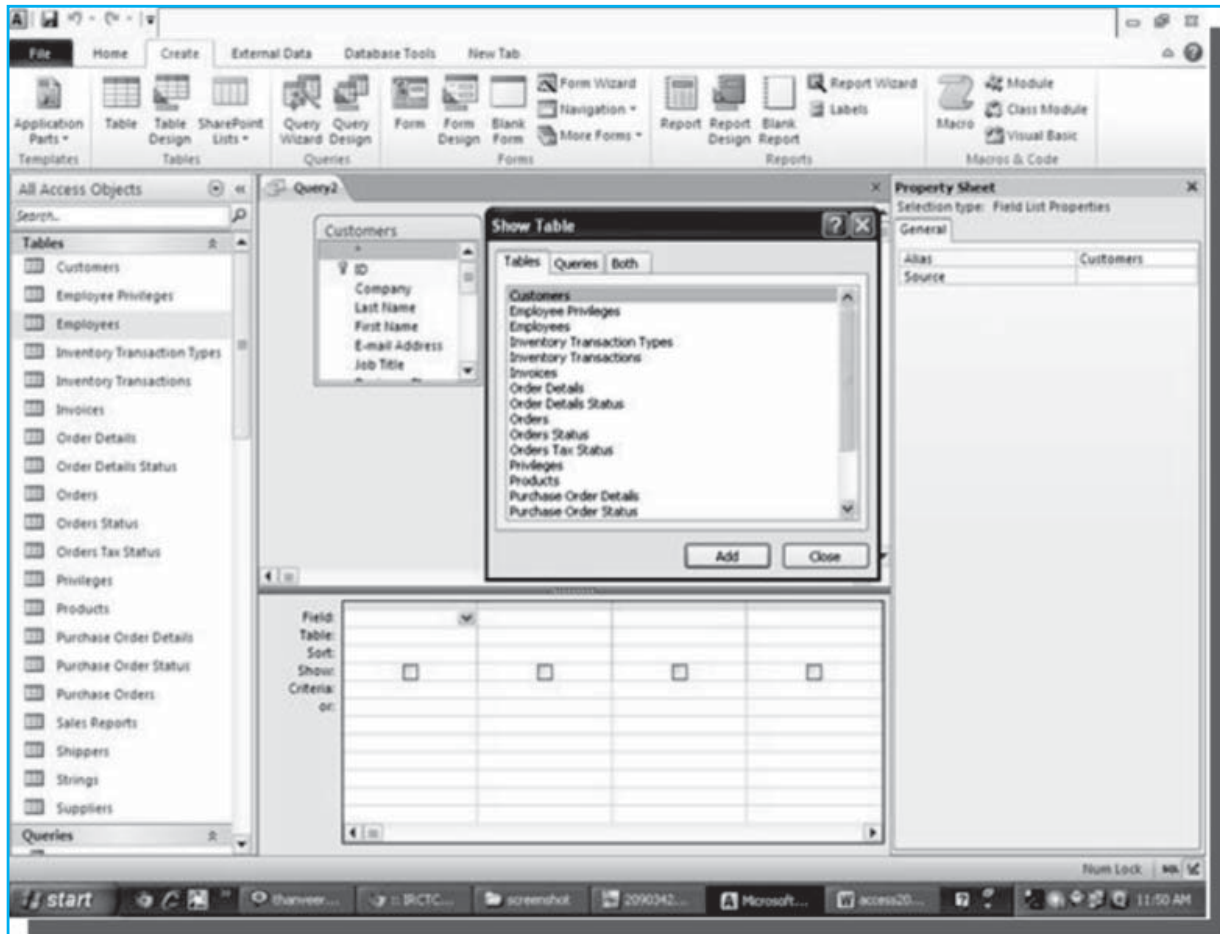


Fig. 3.6.3: 'Show Table' Dialog Box (ii)

4. If the user wants to add more table(s) or query(s), he / she may do so as per requirement. Further, the user has to click **Close** to see Fig. 3.6.4.

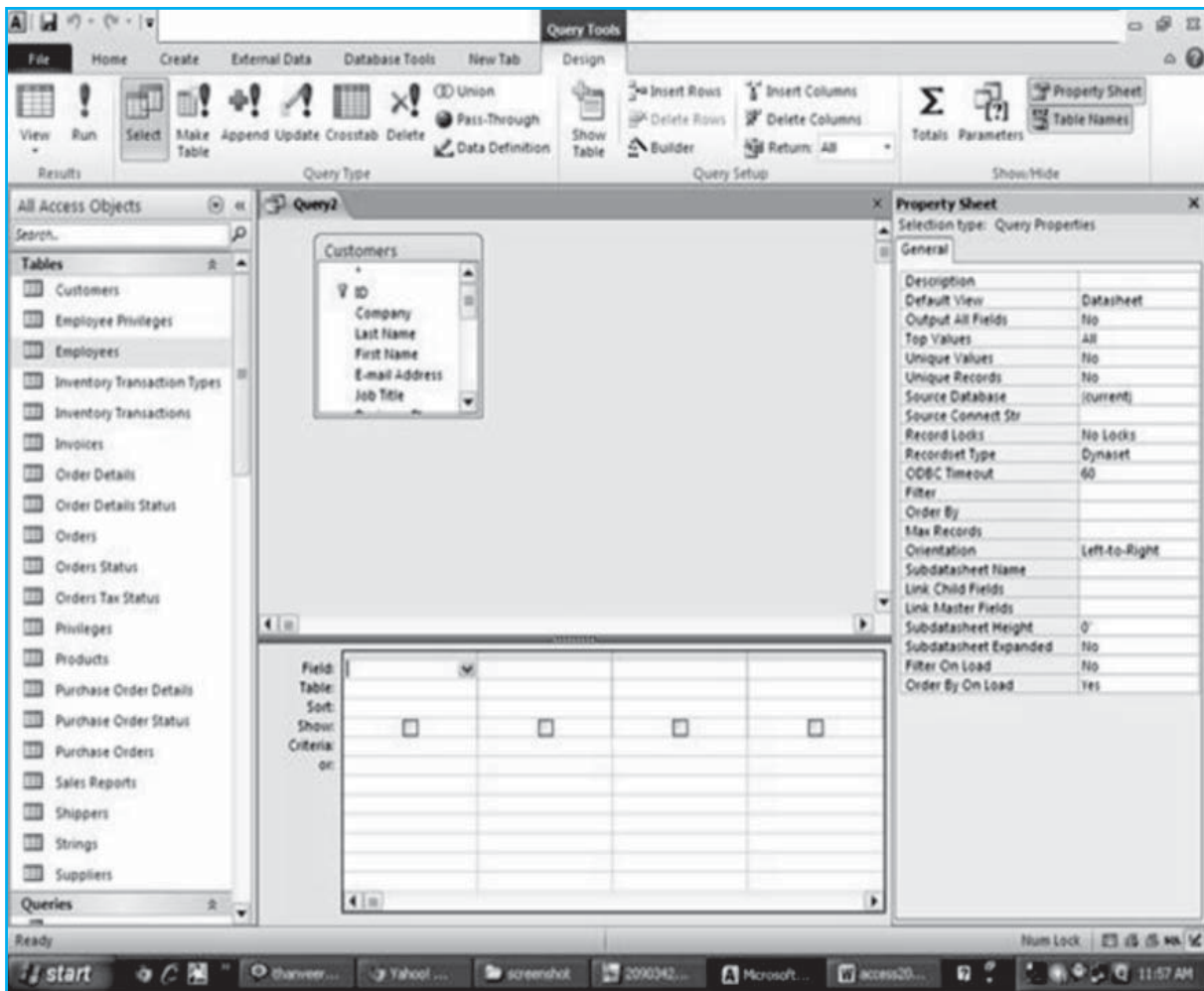


Fig. 3.6.4: On Close of 'Show Table'

4. To choose field(s), the user will be required to click the down-arrow available with the Field option as shown in Fig. 3.6.5. The table name appears on the table option. The user may choose as many fields as required for the query by repeating this step.

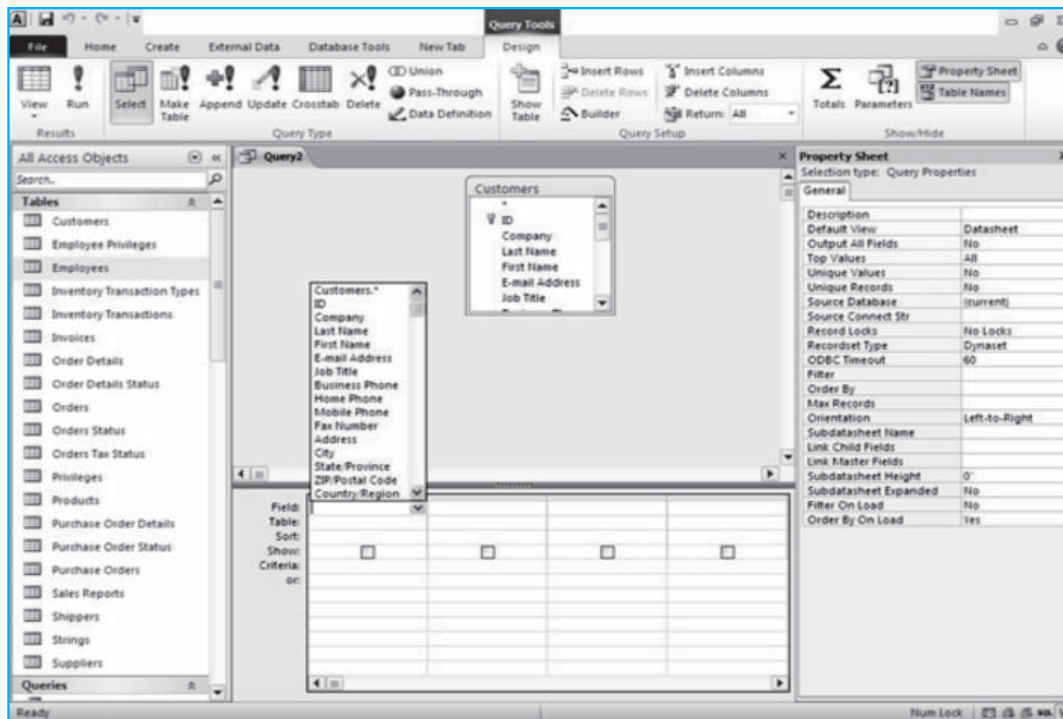


Fig. 3.6.5: Query Tools (i)

After selecting the desired number of fields, the screen will look as Fig. 3.6.6 which is as follows:-

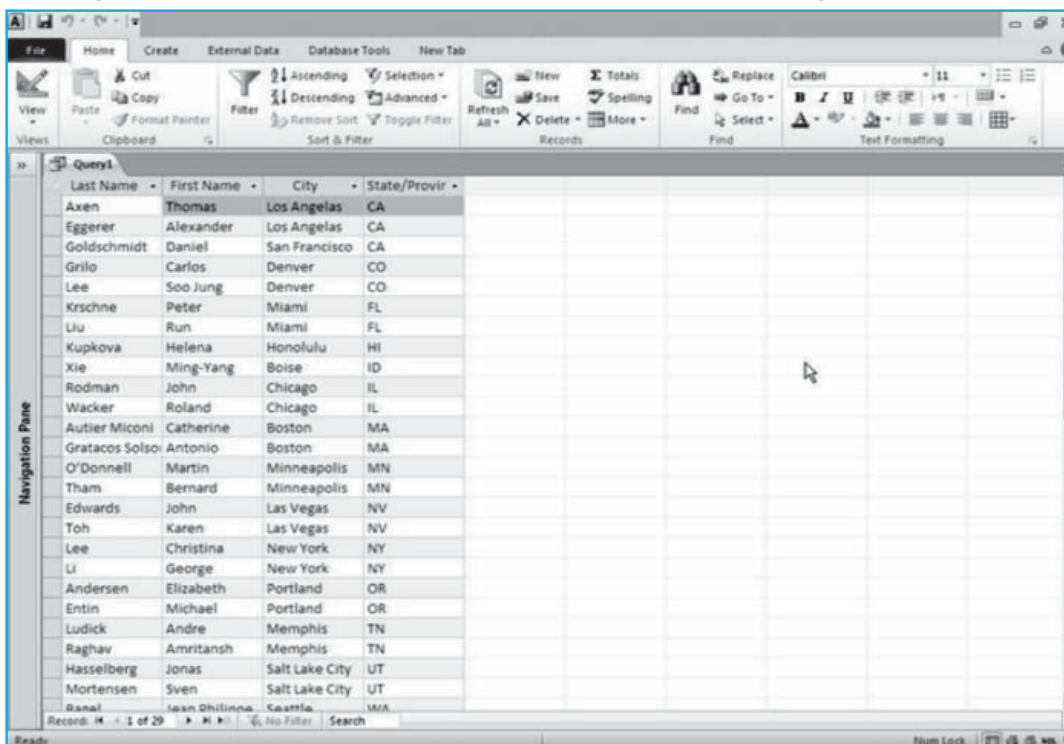


Fig. 3.6.6: Query Tools (ii)



5. On the **Design** tab, in the **Results** group, click **Run**, as shown in Fig. 3.6.7.

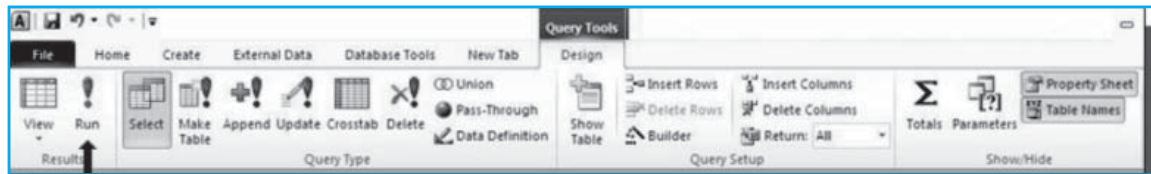


Fig. 3.6.7: 'Run' option of Query

6. The user will be shown a screen similar to Fig. 3.6.8 as follows:-

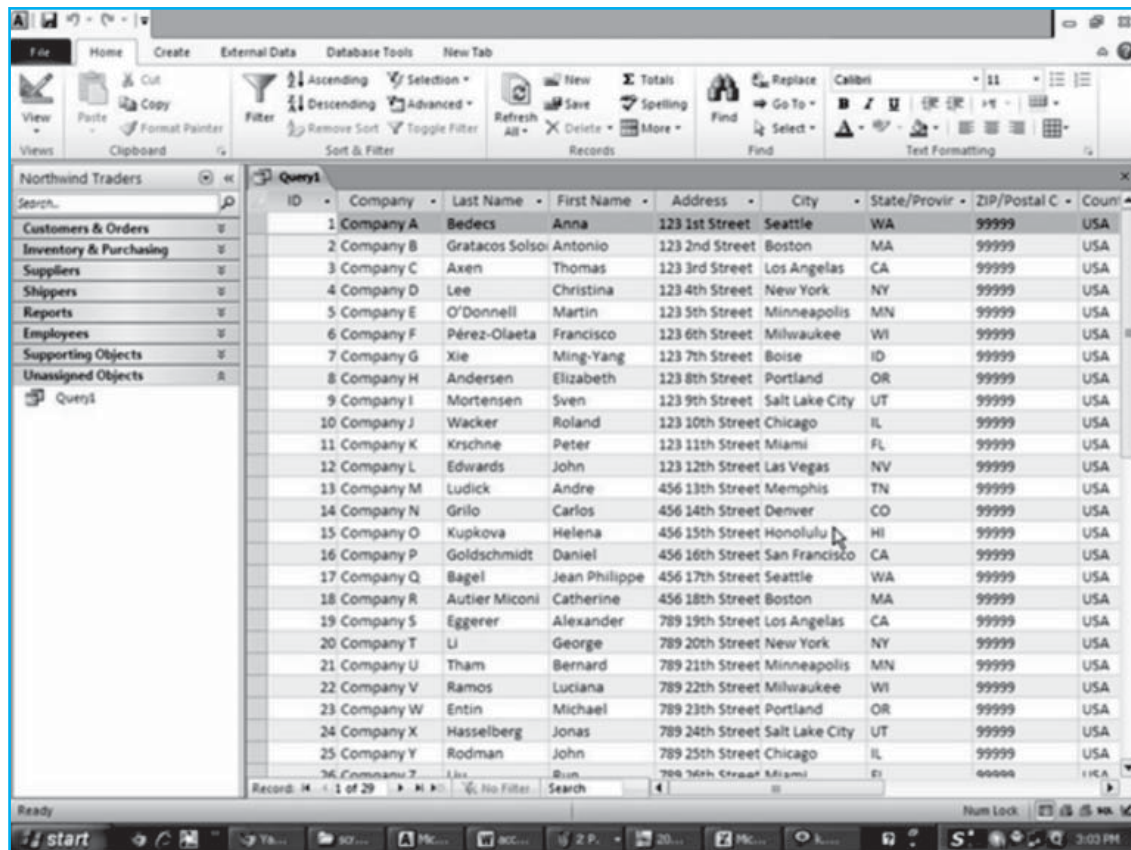


Fig. 3.6.8: On executing a Query

Note: For saving a query the user may follow the normal steps for saving a file in MS-Office environment. Alternatively, the user may follow the steps mentioned as follows to save a query:-

1. Right click **Query** tab as shown in Fig. 3.6.9 as follows:-

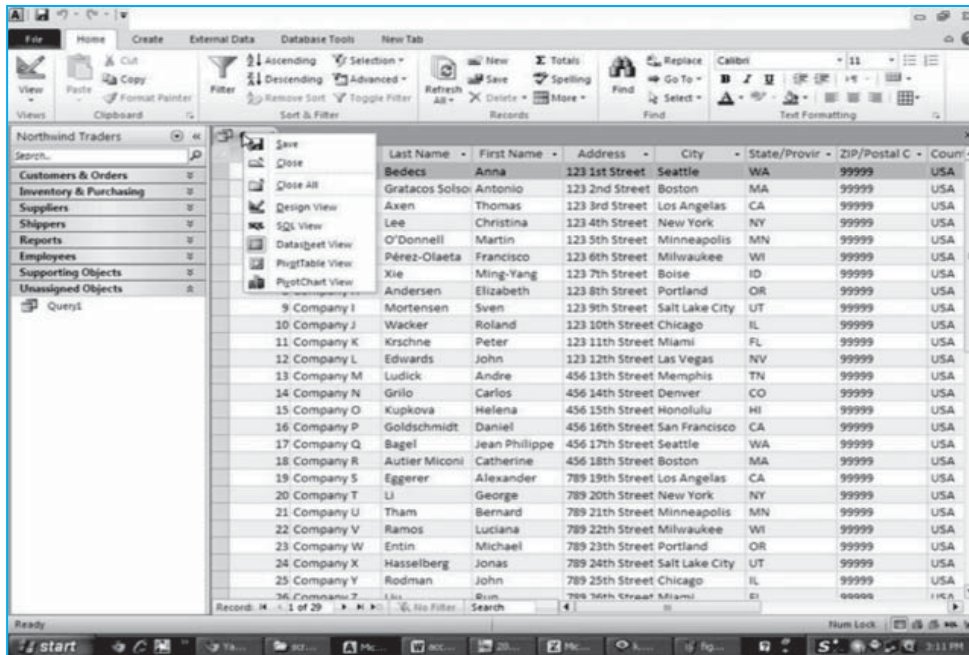


Fig. 3.6.9: Saving a Query

2. Choose **Save** option from the drop down box available. The user will be shown the following Fig. 3.6.10.

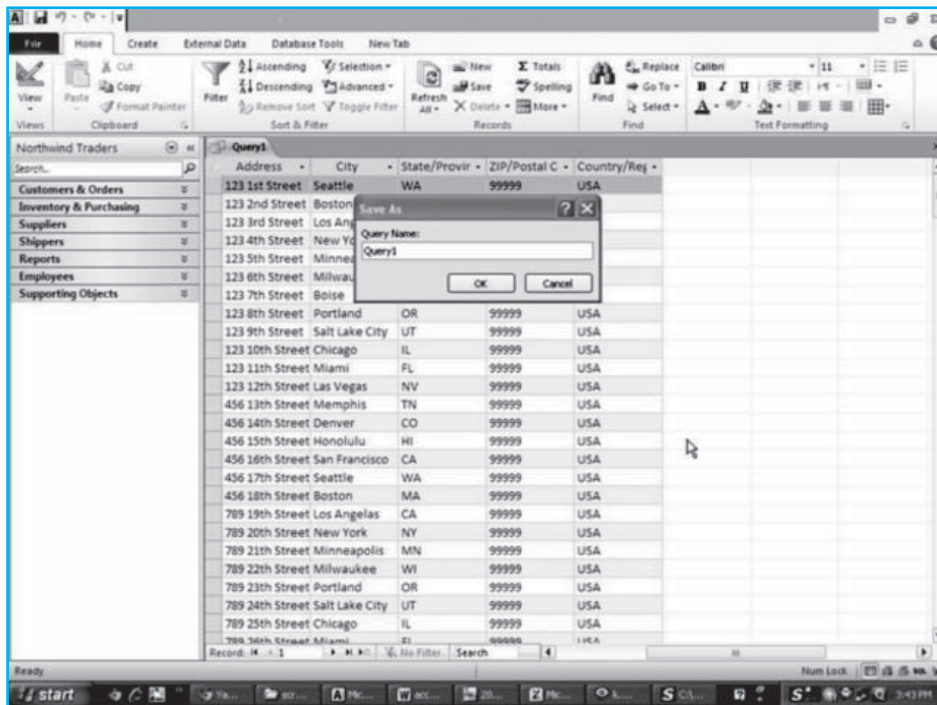


Fig. 3.6.10: Naming a Query

3. Provide a meaningful name to the query and click **OK** to complete the save process.



3.7 DISPLAY ALL RECORDS AND ALL FIELDS

Sometime the user wants to see all complete information contained in the table. The query design view offers an option that lets the user display all of the fields and all the records from the table as shown in Fig. 3.7.1, which is as follows:-

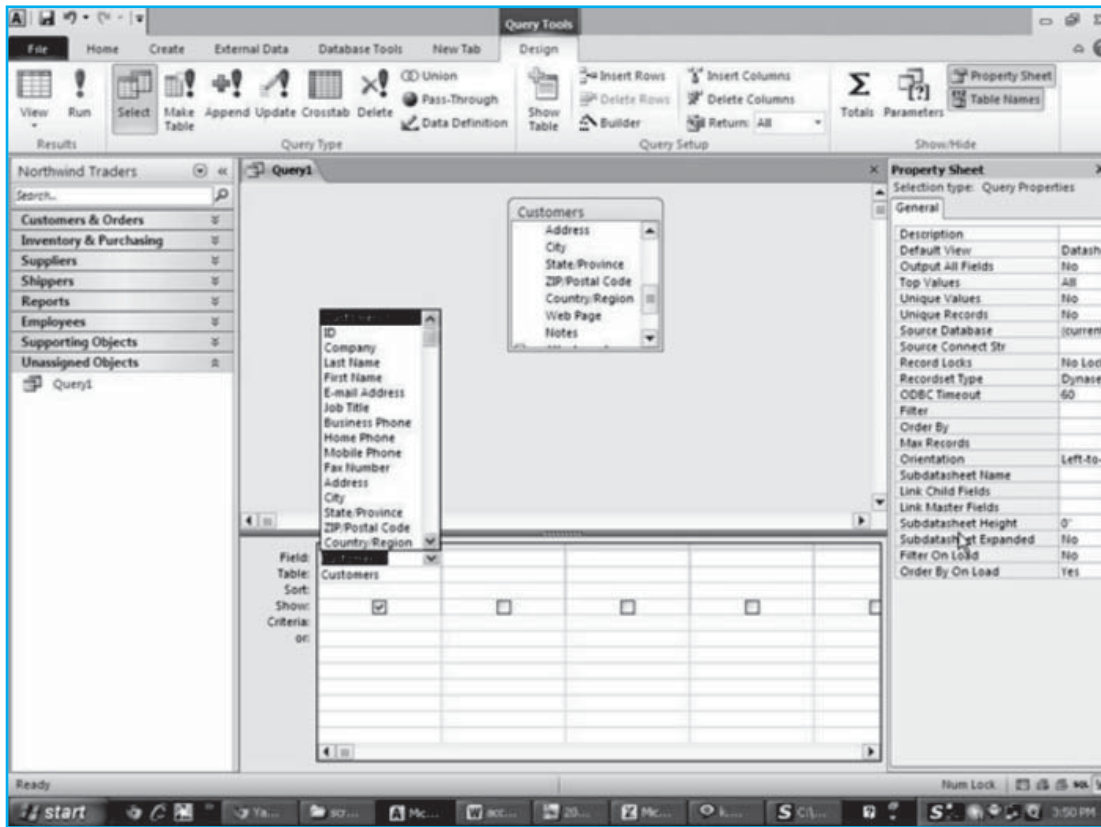


Fig. 3.7.1: Query Design View (i)

3.8 CHANGE FROM DATASHEET VIEW TO QUERY DESIGN VIEW

Once the user has seen the result of the query created, he or she may wish to do some modification in the query as per a particular requirement, in such case, the user has to switch from datasheet view to query design view by clicking **View**, under results group in **Design** tab option and choosing **Design** view as shown in Fig. 3.8.1.

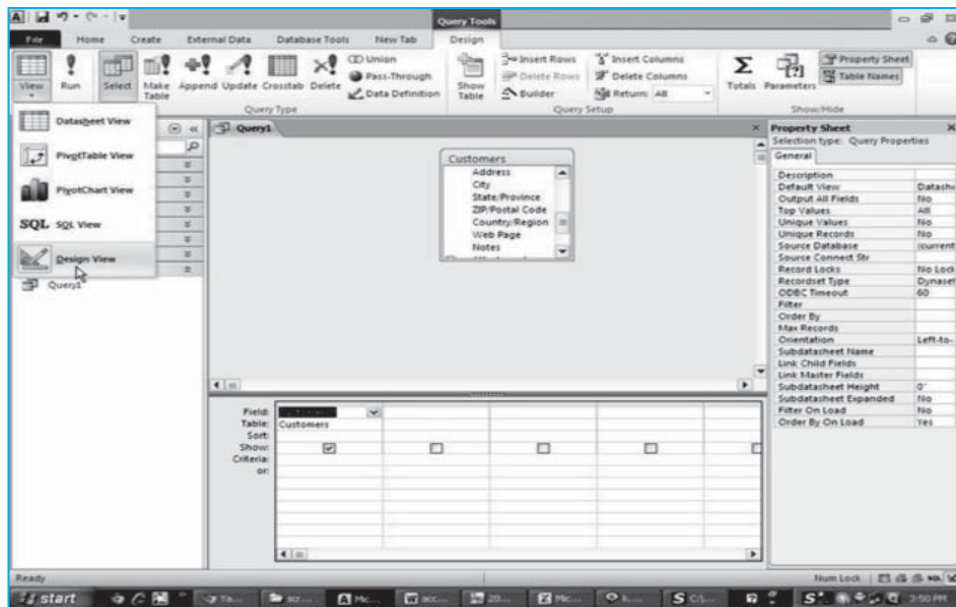


Fig. 3.8.1: Query Design View (ii)

3.9 SORTING A QUERY

The query created by the user may be sorted in ascending and descending mode, as per requirement. For sorting, the user may specify the order of sorting available under **Sort** option as shown in Fig. 3.9.1, which is as follows:-

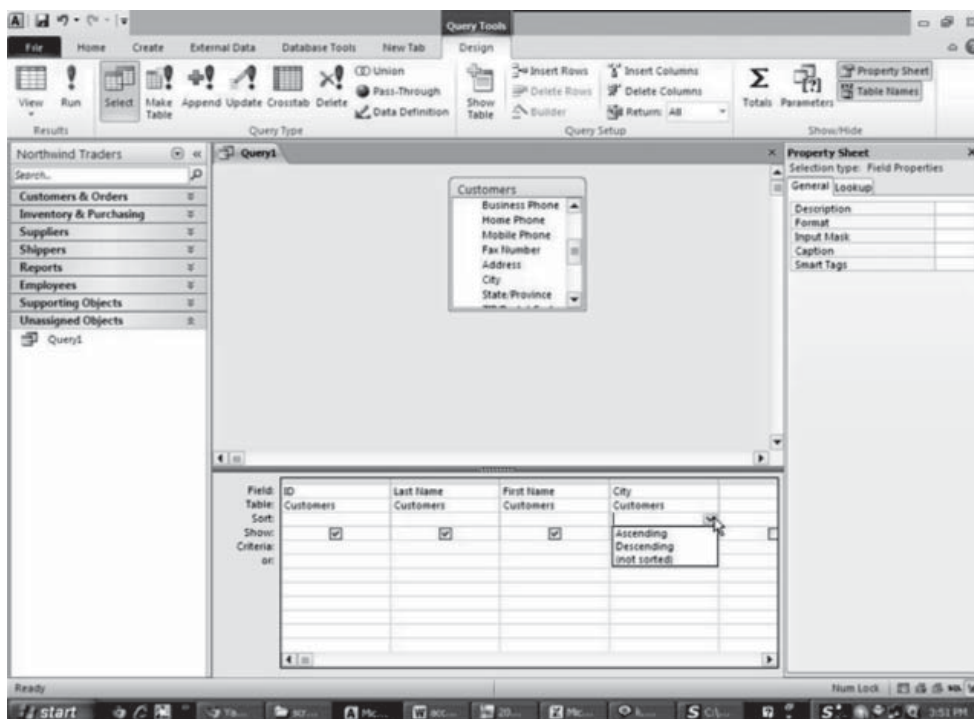


Fig. 3.9.1: Query Sorting



3.9.1 Sorting Multiple Columns in a Query

For sorting the result of a query based on multiple fields, the user may specify sort within a sort. For example, taking the customer table as source, the user may sort the query result by state and then within a state, the user may sort by city and within a city, the user may sort as per last name and then by first name as shown in Fig. 3.9.2, which is as follows:-

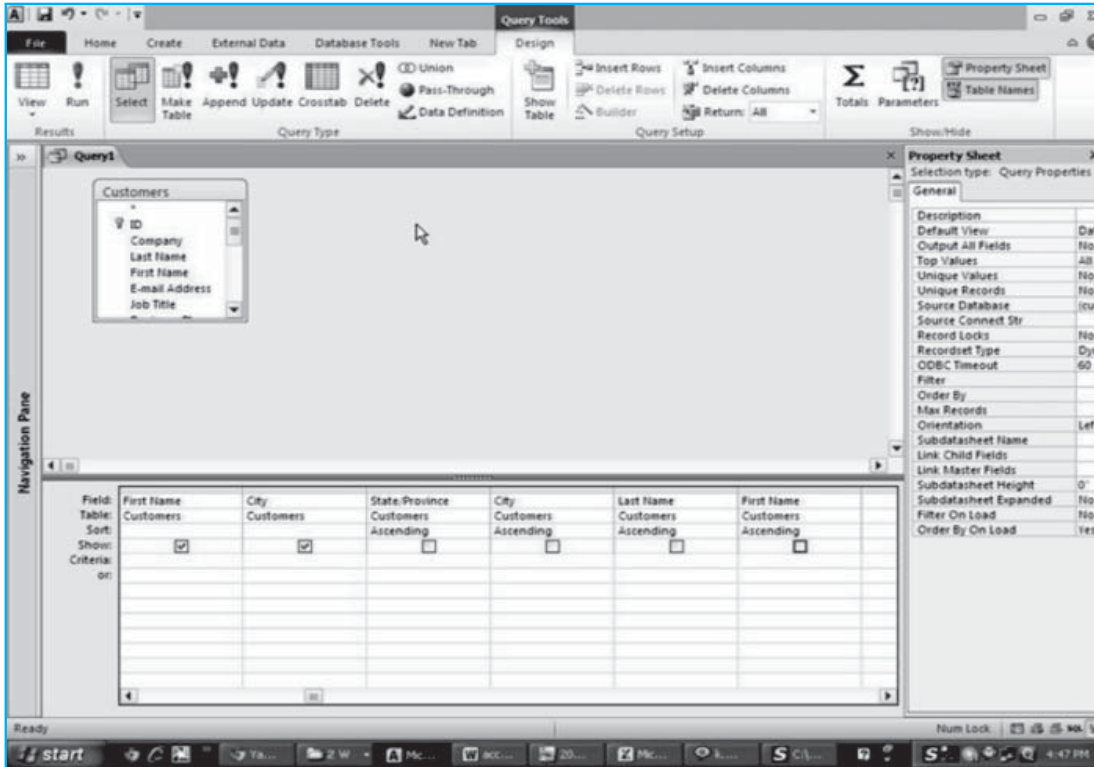


Fig. 3.9.2: Sorting multiple columns

Note: The user may want to sort by state, then by city within a state and then by last name within a state and then by first name within last name. The user is required to enter the sort in the following order: state, city, last name, first name. The sort order may not agree with the order in which the user wants to display fields in the result. In such a case, the user may first choose the required fields for display in the query result and along with that, the user then mention the fields as per sort order. To prevent a field from displaying twice, the user will have to deselect the Show box on the Show row option.

The result of the query thus generated is shown in Fig. 3.9.3, which is as follows:-



Last Name	First Name	City	State/Province
Axen	Thomas	Los Angeles	CA
Eggerer	Alexander	Los Angeles	CA
Goldschmidt	Daniel	San Francisco	CA
Grilo	Carlos	Denver	CO
Lee	Soo Jung	Denver	CO
Krschne	Peter	Miami	FL
Liu	Run	Miami	FL
Kupkova	Hefena	Honolulu	HI
Xie	Ming-Yang	Boise	ID
Rodman	John	Chicago	IL
Wacker	Roland	Chicago	IL
Autier Miconi	Catherine	Boston	MA
Gratacos Solso	Antonio	Boston	MA
O'Donnell	Martin	Minneapolis	MN
Tham	Bernard	Minneapolis	MN
Edwards	John	Las Vegas	NV
Toh	Karen	Las Vegas	NV
Lee	Christina	New York	NY
Li	George	New York	NY
Andersen	Elizabeth	Portland	OR
Entin	Michael	Portland	OR
Ludick	Andre	Memphis	TN
Raghav	Amritansh	Memphis	TN
Hasselberg	Jonas	Salt Lake City	UT
Mortensen	Sven	Salt Lake City	UT
Ranal	Isan Dhillon	Seattle	WA

Fig. 3.9.3: Query Result

3.10 RETRIEVING SPECIFIC RECORDS

As per requirements, the user may wish to retrieve specific records, instead of retrieving all the records. For example, the user may wish to retrieve only those records where the product list price is greater than \$ 18.00. In such cases, the user may specify some criteria (condition) to retrieve specific records. For this purpose, logical operators are used. The valid logical operators which could be used by the user to specify criteria are as follows:-

Logical Operators			
Operator	Meaning	Field Type	Entry Format
=	Equal to	Character Number Date	= "DE" = 5 = #2/16/88#
<>	Not equal to	Character Number Date	<> "DE" <> 5 <> #2/16/88#
>	Greater than	Character Number Date	> "DE" > 5 > #2/16/88#
>=	Greater than or equal to	Character Number Date	>= "DE" >= 5 >= #2/16/88#



<	Less than	Character Number Date	< "DE" < 5 < #2/16/88#
<=	Less than or equal to	Character Number Date	<= "DE" <= 5 <= #2/16/88#
In	Equal to any item in a list	Character Number Date	In ("DE", "NJ") In (5, 9, 17) In (#2/16/88#, #2/3/ 90#, #12/15/88#)
Not In	Not equal to any item in a list	Character Number Date	Not In ("DE", "NJ") Not In (5, 9, 17) Not In (#2/16/88#, #2/3/ 90#, #12/15/88#)
Between	Between two values, greater than or equal to one and less than or equal to the other	Character Number Date	Between "C" And "F" Between 5 And 10 Between #1/1/88# And #12/31/88#
Not Between	Not between two values	Character Number Date	Not Between "C" And "F" Not Between 5 And 10 Not Between #1/1/88# And #12/31/88#
Is Null	The value is missing from the field	Character Number Date	Is Null Is Null Is Null
Is Not Null	The value is not missing from the field	Character Number Date	Is Not Null Is Not Null Is Not Null
Like	Like a specified pattern. * means any series of characters. ? means any single character.	Character Number Date	Like "S*" Like "1*" Not Applicable
Not Like	Not like a specified pattern. * means any series of characters. ? means many single character.	Character Number Date	Like "S*" Like "1*" Not Applicable

Table 3.10.1: Logical operators

Taking the above mentioned example of product table, the screen will look like Fig. 3.10.1 which is as follows:-

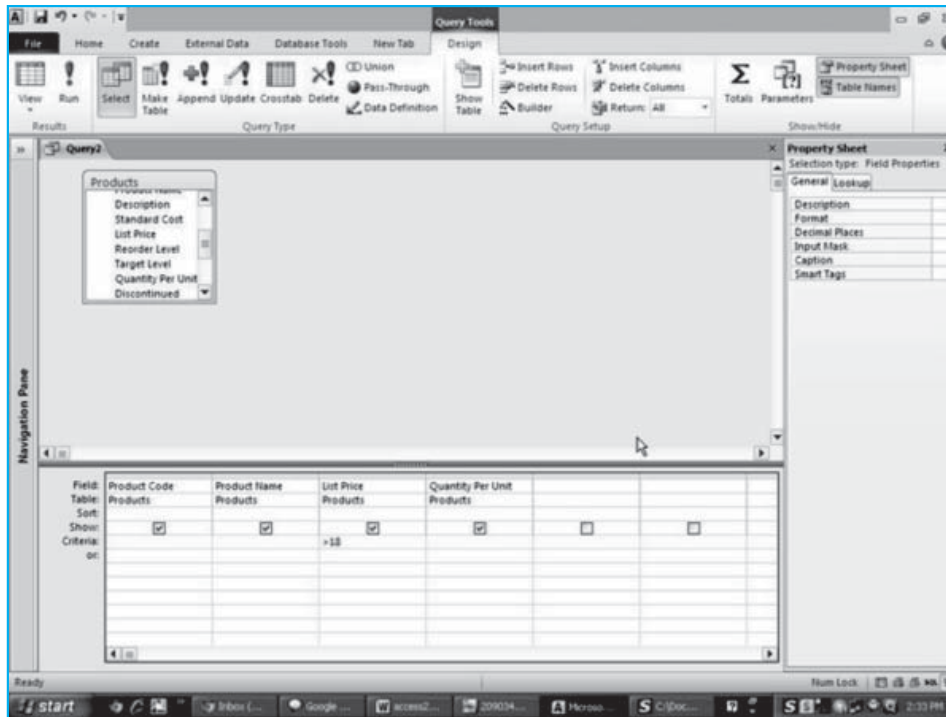


Fig. 3.10.1: Resultant Screen (i)

The resultant screen would be like Fig. 3.10.2 which is as follows:-

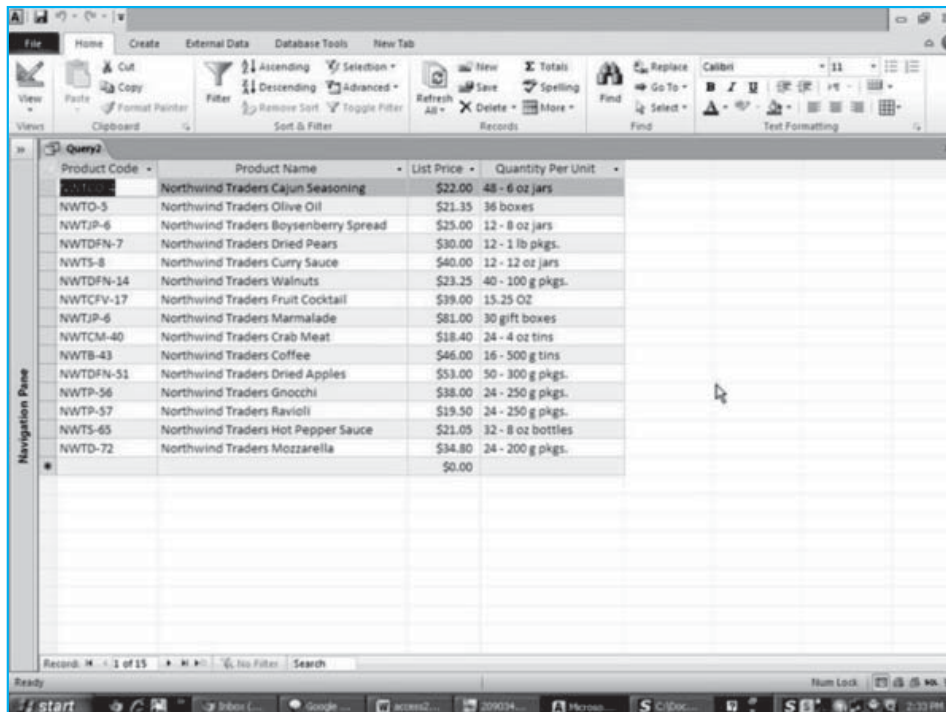
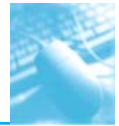


Fig. 3.10.2: Resultant Screen (ii)



3.10.1 Applying Multiple Criteria

Multiple criteria could be applied to the same table as shown in Fig. 3.10.3, which is as follows:-

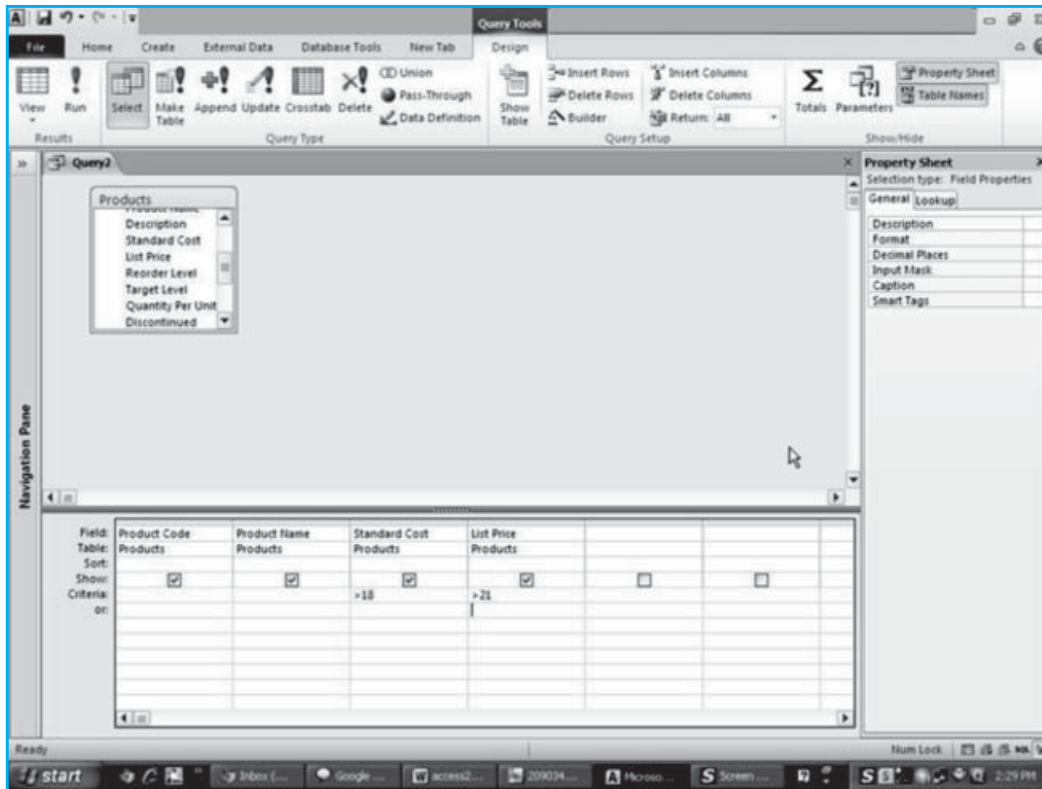


Fig. 3.10.3: To apply multiple criteria

Here, the user wants to view only those records from the product table where the Standard Cost of a product is above 18 and the List Price is above 21. The resultant screen is shown as Fig. 3.10.4, which is as follows:-



The screenshot shows the Microsoft Access interface with a query named 'Query2' displayed in Datasheet View. The table has four columns: Product Code, Product Name, Standard Cost, and List Price. It contains 9 records. The status bar at the bottom indicates 'Record: 1 of 9' and 'No Filter'.

Product Code	Product Name	Standard Cost	List Price
NWTFN-7	Northwind Traders Boysenberry Spread	\$18.75	\$25.00
NWTFN-7	Northwind Traders Dried Pears	\$22.50	\$30.00
NWTS-8	Northwind Traders Curry Sauce	\$30.00	\$40.00
NWTCFV-17	Northwind Traders Fruit Cocktail	\$29.25	\$39.00
NWTJP-6	Northwind Traders Marmalade	\$60.75	\$81.00
NWTB-43	Northwind Traders Coffee	\$34.50	\$46.00
NWTFN-51	Northwind Traders Dried Apples	\$39.75	\$53.00
NWTP-56	Northwind Traders Gnocchi	\$28.50	\$38.00
NWTD-72	Northwind Traders Mozzarella	\$26.10	\$34.80
		\$0.00	\$0.00

Fig. 3.10.4: Resultant Screen (iii)

3.11 CREATING QUERIES USING MULTIPLE TABLES

The user can create a query using two or more tables. In such cases, it is necessary to establish proper relationship between the concerned tables. Following are the steps which will show how to create query using two tables:-

Source:-

Database : Northwind 2010

Table 1 : Products

Table 2 : Purchase Order Details

1. Repeat the steps for opening **Query Design** View as explained earlier.
2. Repeat steps for inserting the table(s) as explained earlier.
3. Choose the fields as shown in Fig. 3.11.1, which is as follows:-

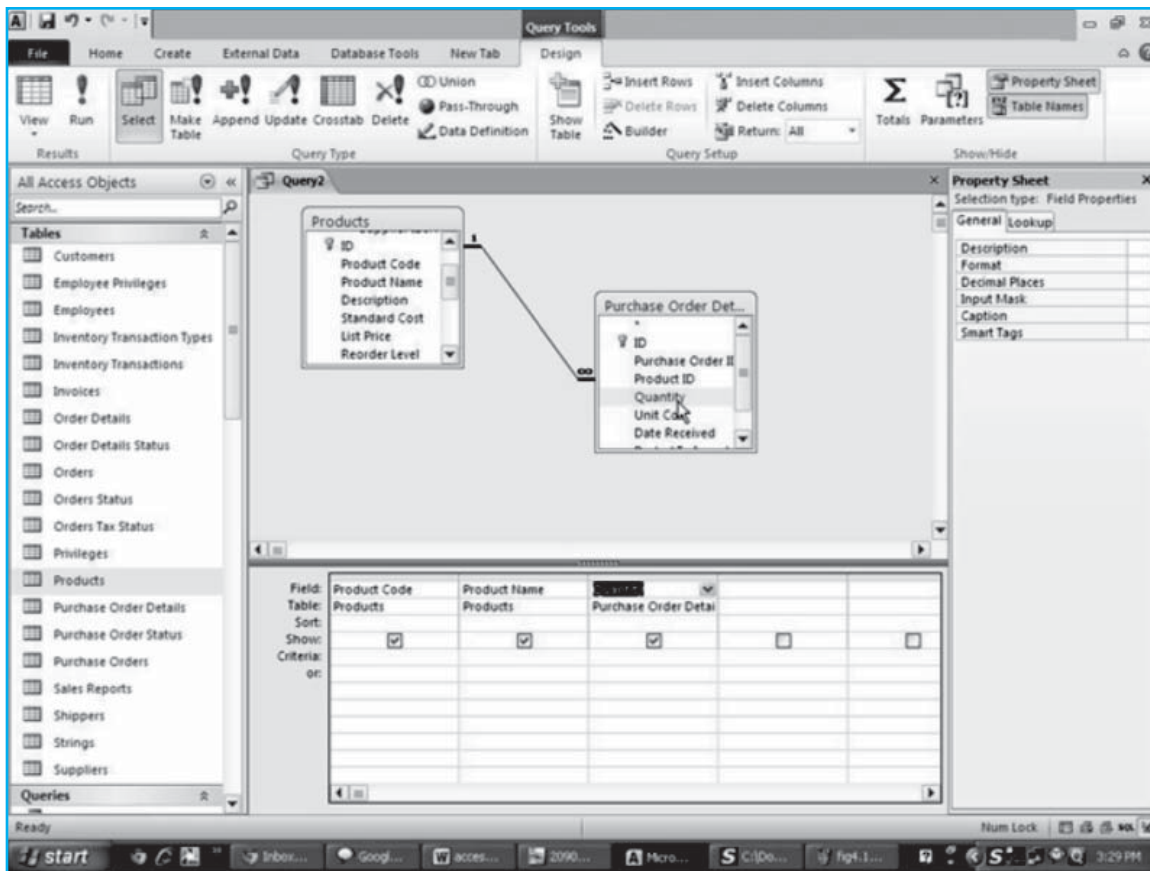


Fig. 3.11.1: Query Design using two tables

4. On the **Design** tab, in the **Results** group, click **Run** and see the result as shown in Fig. 3.11.2 as follows:-



The screenshot shows the Microsoft Access interface. The 'Northwind Traders' database is open. The 'Query2' window displays a table with three columns: Product Code, Product Name, and Quantity. The data is as follows:

Product Code	Product Name	Quantity
NWTB-1	Northwind Traders Chai	40
NWTB-1	Northwind Traders Chai	40
NWTB-1	Northwind Traders Chai	1
NWTCO-3	Northwind Traders Syrup	100
NWTCO-3	Northwind Traders Syrup	50
NWTCO-4	Northwind Traders Cajun Seasoning	40
NWTCO-4	Northwind Traders Cajun Seasoning	40
NWTO-5	Northwind Traders Olive Oil	40
NWTJP-6	Northwind Traders Boysenberry Spread	100
NWTJP-6	Northwind Traders Boysenberry Spread	10
NWTFN-7	Northwind Traders Dried Pears	40
NWTS-8	Northwind Traders Curry Sauce	40
NWTS-8	Northwind Traders Curry Sauce	25
NWTFN-14	Northwind Traders Walnuts	40
NWTCFV-17	Northwind Traders Fruit Cocktail	40
NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	20
NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	30
NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	10
NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	25
NWTBGM-19	Northwind Traders Chocolate Biscuits Mix	20
NWTJP-6	Northwind Traders Marmalade	40
NWTJP-6	Northwind Traders Marmalade	40
NWTBGM-21	Northwind Traders Scones	20
NWTB-34	Northwind Traders Beer	60
NWTB-34	Northwind Traders Beer	100
NWMTL-34	Northwind Traders Beer	300

Fig. 3.11.2: Resultant Screen

Note: The same example can be performed by the user by opting for **Query Wizard**.

3.12 CREATE MAKE TABLE QUERY

There are instances, when a user wants to save the result of a query as a table, which containing multiple and selected fields from more than one table, for future use. This can be achieved by using **Make Table** available under **Query Type** option as shown in Fig. 3.12.1. A query saved using make table option retrieves data from one or more tables and then loads the result set into a new table. That new table can be saved in the database that is the working database or the user may also create it in another database.

Source:-

Database : Northwind 2010

Table 1 : Products

Table 2 : Purchase Order Details



Fig. 3.12.1: 'Make Table' option

Once, query is created, as explained in the above sections, the user is required to do the following steps:-

1. Click **Make Table** available under **Query** Type option, the user will see a screen similar to the one shown in Fig. 3.12.2, which is as follows:-

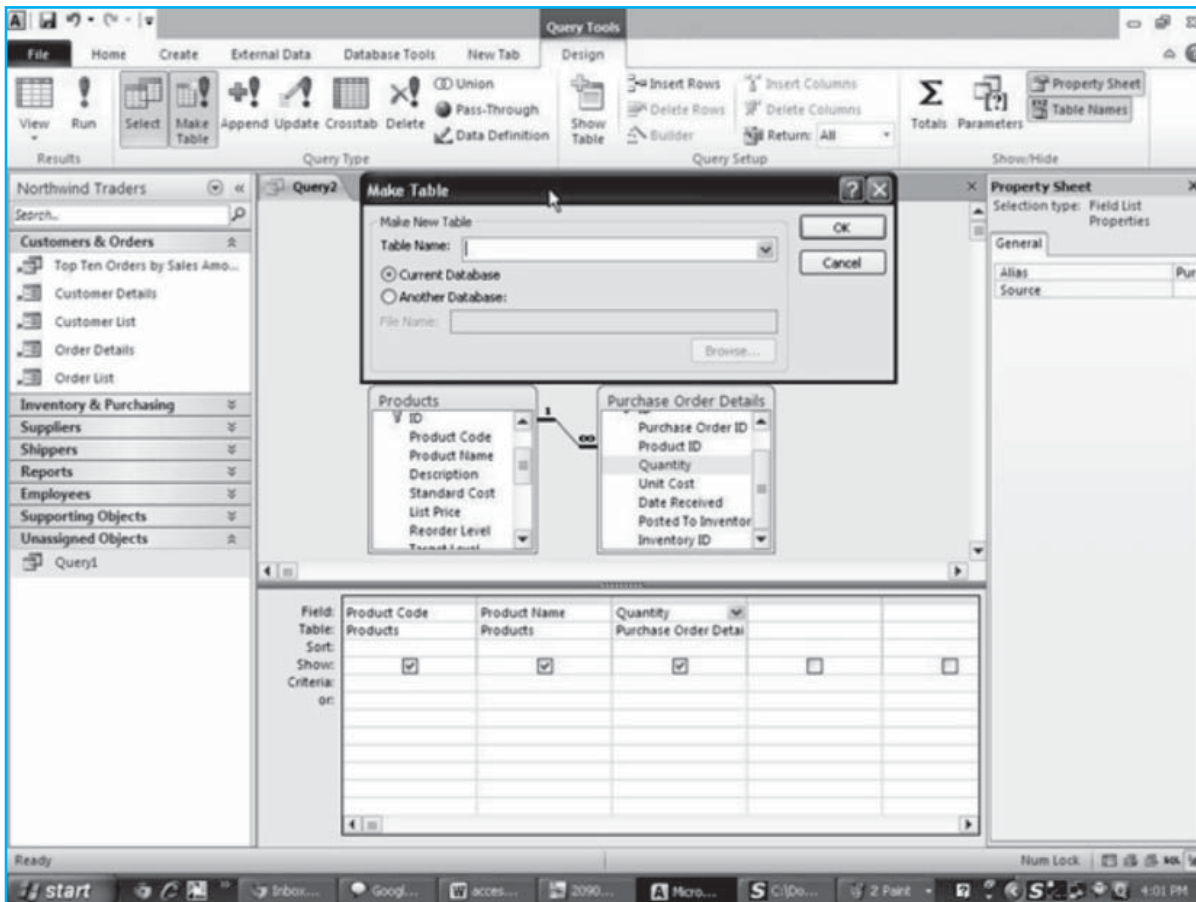


Fig. 3.12.2: 'Make Table' Dialog Box (i)

2. The user will be required to give some meaningful name to the new table as shown in Fig. 3.12.3, which is as follows:-

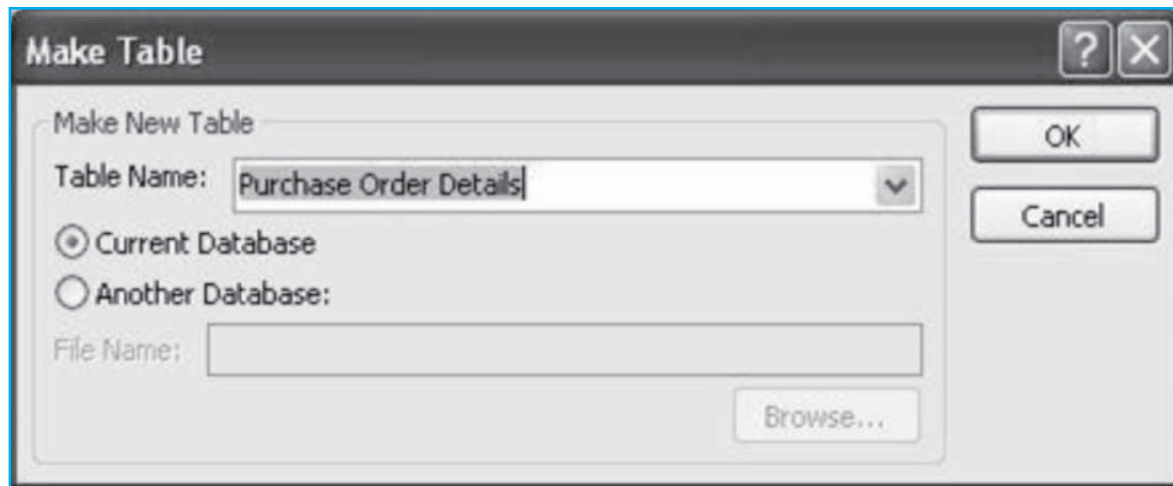


Fig. 3.12.3: 'Make Table' Dialog Box (ii)

3. Further, the user is required to specify the location of the table as either Current Database or as Another Database. In the case the user choose Current Database, he or she needs to simply click OK, else, the user will have to specify the location of the database in which the user wished to save the file and after specifying the location of the database, the user needs to click OK to finish the activity.

3.13 CREATE PARAMETER QUERY

There are times, when a user wants to supply value to a query as parameter. This can be achieved by using parameter query. A parameter query prompts a user for some input before running a query. To achieve this, the user needs to enclose a question in square brackets ([]). Taking the previous example in to consideration, if the user wishes to see the purchase order quantity of a selected product, the user needs to do the following steps:-

Source:-

Database : Northwind 2010

Table 1 : Products

Table 2 : Purchase Order Details

1. The user needs to mention [Which Product Name?] in the criteria row as shown in Fig. 3.13.1, as follows:-

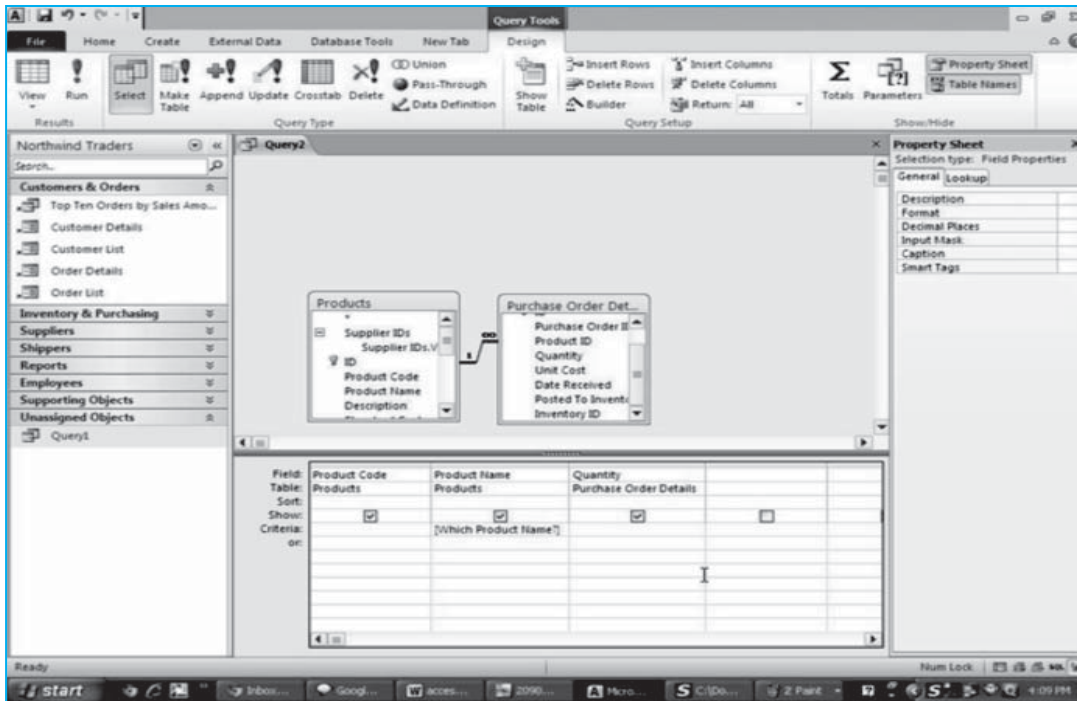


Fig. 3.13.1: To Supply value to a query

- The user then needs to click **Run** and the a screen similar to the one shown in Fig. 3.13.2 will be displayed to the user:-

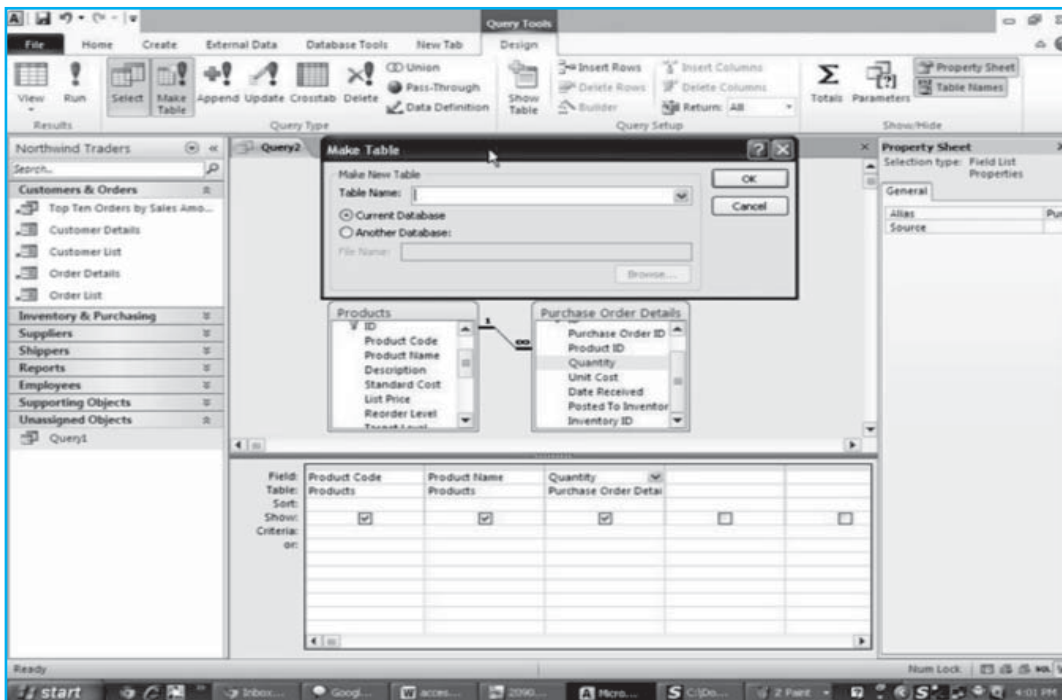


Fig. 3.13.2: On 'Run' of Query



3. Click **OK** and the user will be shown the result as shown in the following Fig. 3.13.3.

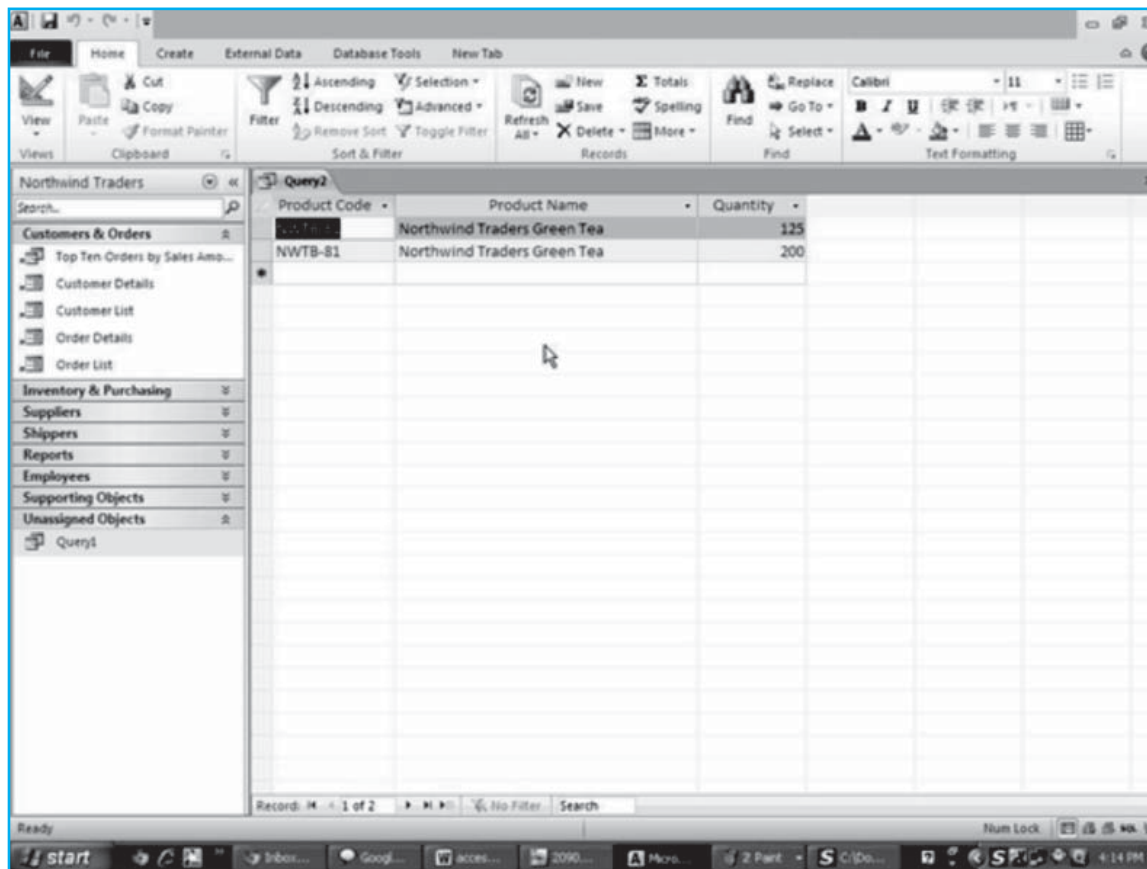


Fig. 3.13.3: Resultant Screen

Following Table 3.13.1 provides some options which the user can use in parameter query:-

Like "*" & [Prompt] & "*"	Returns all records that contain the value you enter. Example: If you enter ad , Access returns all records that include the sequence ad anywhere in the field.
Like "*" & [Prompt]	Returns all records that end with the value you enter. Example: If you enter S , Access returns all records that end with S .
Like [Prompt] & "*"	Returns all records that begin with the value you enter. Example: If you enter S , Access returns all records that begin with S .
> [Prompt] Note: You can also use < (less than) ,<= (less than or equal to) >=, >= (greater than or equal to), or <> (not equal)	Find all records with a value greater than the value you enter. Example: If you enter 5 , Access returns all records that are greater than 5 .

Table 3.13.1: Parameter Query Option



This topic deals with reports, their importance, general types of reports available under MS-Access and how to create simple reports using form wizard and report design view. It also put focus on the various report sections which could be used while designing a report using report design view.

3.14 INTRODUCTION

Reports provide the most flexible way of viewing and printing summarized information. Reports display information with the desired level of detail, while enabling the user to view or print the information in almost any format. The user can add multilevel totals, statistical comparisons and pictures and graphics to a report.

3.15 DEFINITION

A database report presents information retrieved from a table or query in a preformatted, attractive manner.

3.16 REPORTS AND ITS TYPES

There are basically following types of reports provided by MS-Access:-

3.16.1 Tabular Report

Tabular reports (also known as groups/totals reports) are similar to a table that displays data in neat rows and columns. Tabular reports, unlike forms or datasheets, usually group data by one or more fields. Often, tabular reports calculate and display subtotals or statistical information for numeric fields in each group. Some reports include page totals and grand totals. You can even have multiple snaked columns so that you can create directories (such as telephone books). These types of reports often use page numbers, report dates or lines and boxes to separate information. Reports may have color and shading and display pictures, business graphs and memo fields. A special type of summary tabular report can have all the features of a detail tabular report but omit record details.

3.16.2 Columnar Report

Columnar reports generally display one or more records per page, but do so vertically. Columnar reports display data very much as a data-entry form does but are used strictly for viewing data and not for entering data. Another type of columnar report displays one main record per page (like a business form) but can show many records within embedded subforms. An invoice is a typical example. This type of report can have sections that display only one record and at the same time have sections that display multiple records from the many side of a one-to-many relationship and even include totals.

3.16.3 Labels

Another type of columnar report displays one main record per page (like a business form) but can show many records within embedded subforms. An invoice is a typical example. This type of report can have sections that display only one record and at the same time have sections that display multiple records from the many side of a one-to-many relationship and even include totals.

3.17 GENERAL STEPS IN CREATING A REPORT

The report process begins with your desire to view your data in a table, but in a way that differs from datasheet display. You begin with a design for this view; Access begins with raw data. The



purpose of the report is to transform the raw data into a meaningful set of information. The process of creating a report involves several steps:

- Defining the report layout
- Assembling the data
- Creating the report design using the Access Report Design window
- Printing or viewing the report

3.18 CREATING A REPORT WITH REPORT WIZARDS

Report wizard helps the user to create the report in a easy and efficient manner. Report Wizards give the user a basic layout for the report. The report can further be customized as per requirement. Report Wizards simplify the layout process of the controls that are meant to be used in the report. It helps the user to create a report by asking a series of questions about the type of report that the user wants to create and then automatically creates the report for the user.

1. Select the **Report Wizard** button in the **Reports** group of the **Create** Ribbon tab as shown in Fig 3.18.1.

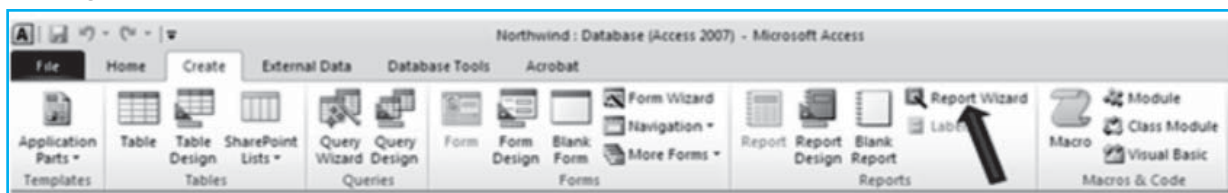


Fig. 3.18.1: Report Wizard (i)

2. Select a query or a table for the report as shown in Fig. 3.18.2:

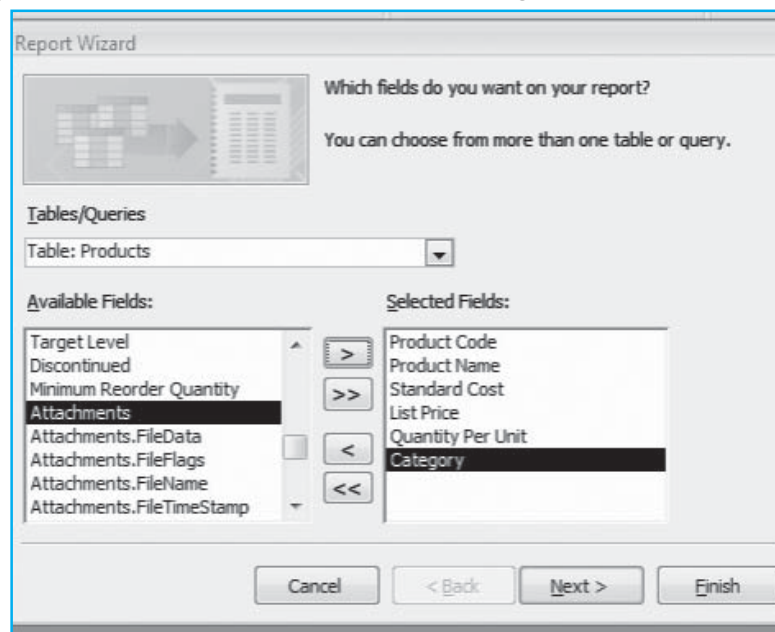


Fig. 3.18.2: Report Wizard (ii)

Note: The user can also choose fields from more than one table or query.



3. Next, specify the fields that should be included in the table as shown in Fig. 3.18.2.
4. Now, the user is prompted through a dialog box which enables the user to specify the field(s) for grouping data in the report as shown in Fig. 3.18.3 (A) and Fig. 3.18.3 (B):

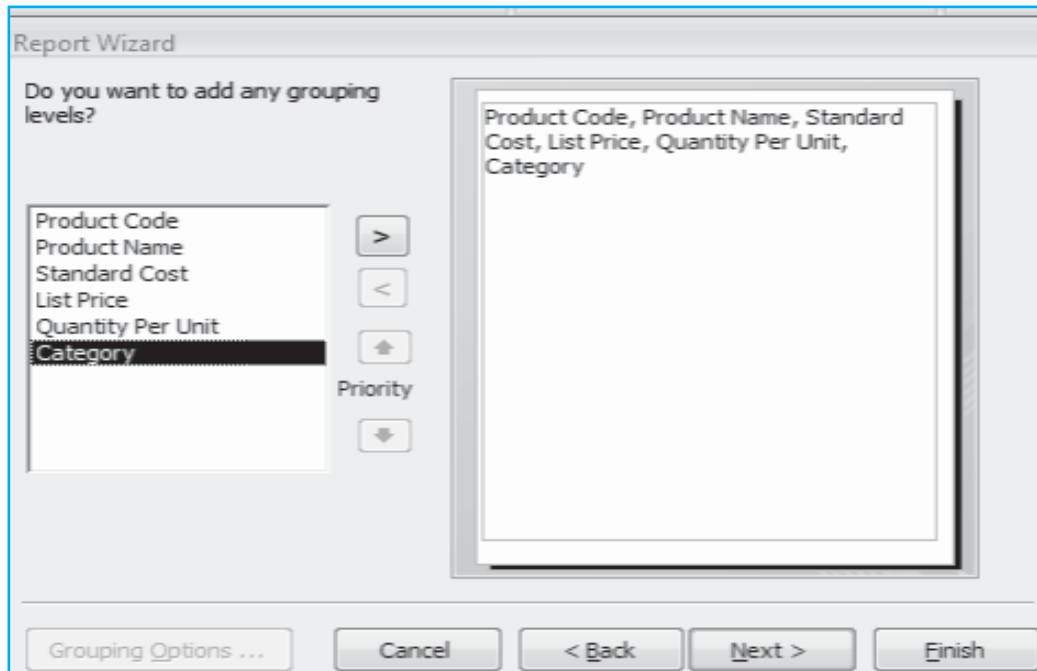


Fig. 3.18.3 (A): Before Grouping

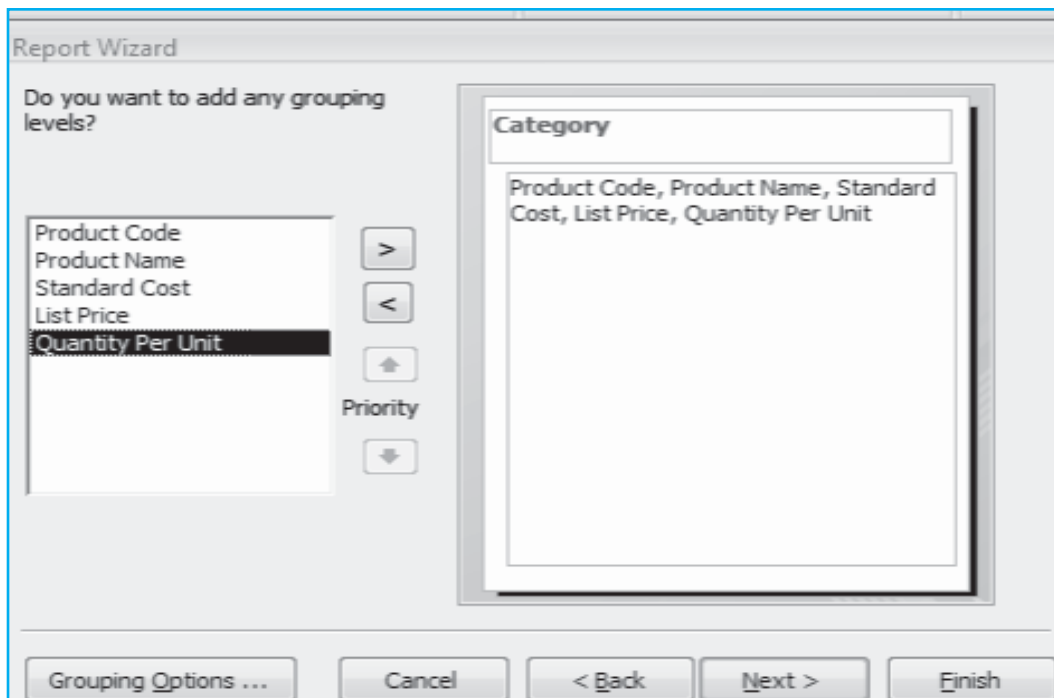


Fig. 3.18.3 (B): After Grouping



The user may click the Grouping Options button provided at the bottom left corner of the Group dialog box to display another dialog box, which enables the user to further define how the report uses the group field. For instance, the user can choose to group by only the first character of a field chosen for grouping. This means that all records with the same first character in the grouping field are included as a single group. If the user group a customers table by the CustomerName and specify to group on the first character of the CustomerName field, a group header and footer appears for the set of all customers whose name begins with the same character. There would be a group for all records with a CustomerName beginning with the letter A, another group for all records with CustomerName beginning with the letter B and so on.

The Grouping Options dialog box, which is displayed when the user click the Grouping Options button enables the user to further define the grouping. The selection is dependent on the type of data being grouped. The Grouping intervals list box displays different values for the various data types as also shown in Fig. 3.18.4:

Text: Normal, 1st Letter, 2 Initial Letters, 3 Initial Letters, 4 Initial Letters, 5 Initial letters

Numeric: Normal, 10s, 50s, 100s, 500s, 1000s, 5000s, 10000s, 50000s, 100000s.

Date: Normal, Year, Quarter, Month, Week, Day, Hour, Minute.

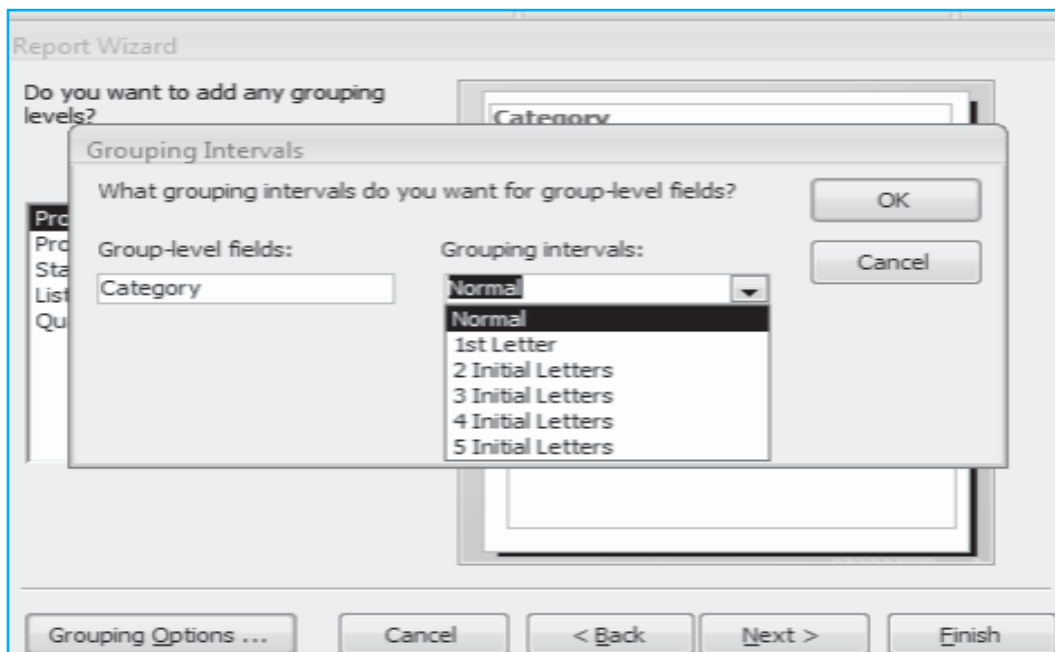


Fig. 3.18.4: Report Wizard (iii)

- Further, the user is prompted to specify the sorting order as ascending or descending as shown in Fig. 3.18.5. The user can select fields that they have not already chosen to group and can use them as sorting fields. The fields selected in the sorting dialog box does not affect grouping.

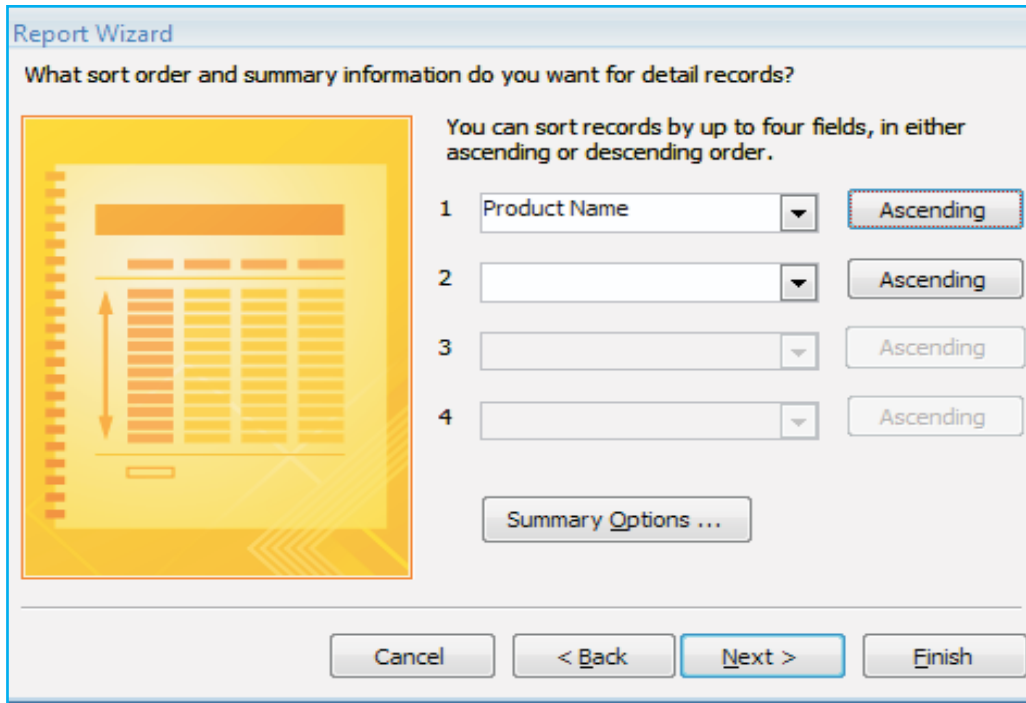


Fig. 3.18.5: Report Wizard (iv)

6. The user may use the **Summary Option** button which opens up a dialog box which provides additional display options for numeric fields as shown in Fig. 3.18.6.

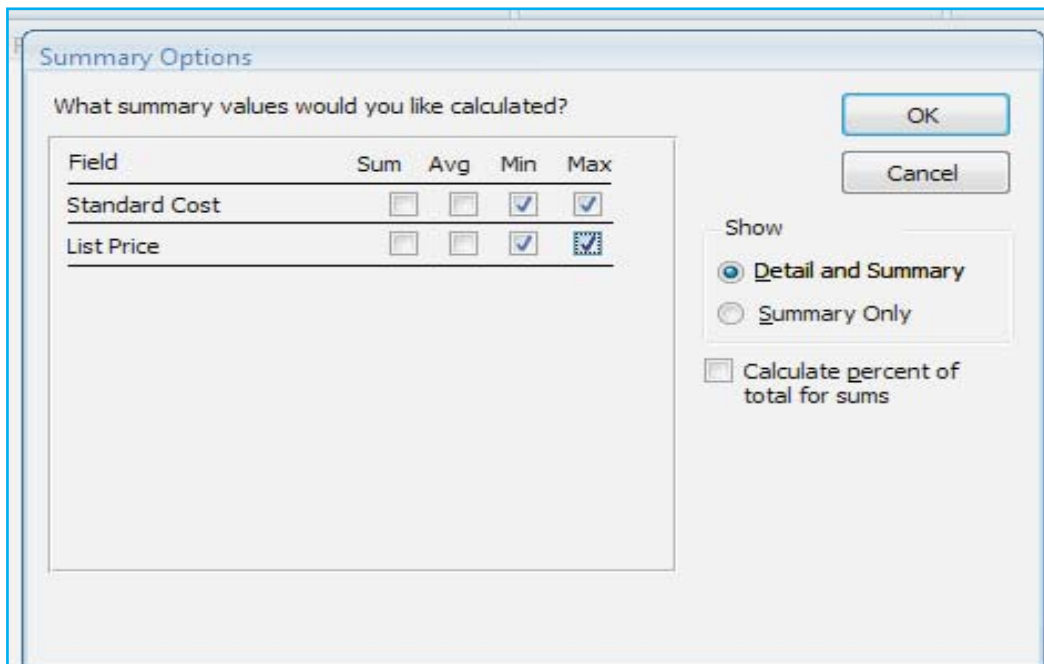


Fig. 3.18.6: Summary Options Dialog Box



- Further, the user is prompted to specify the layout of the report. The dialog box shown in Fig. 3.18.7, enables the user to determine the basic layout of the data. The user can also specify the orientation of the report as portrait or landscape.

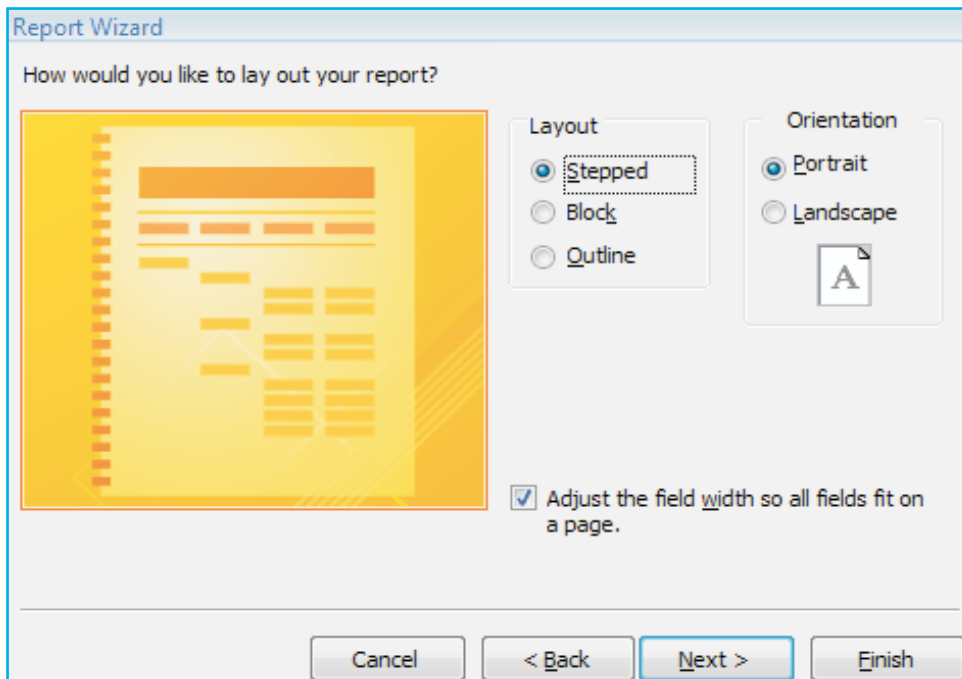


Fig. 3.18.7: Report Wizard (v)

- The user is further prompted to specify the title of the report as shown in Fig. 3.18.8:

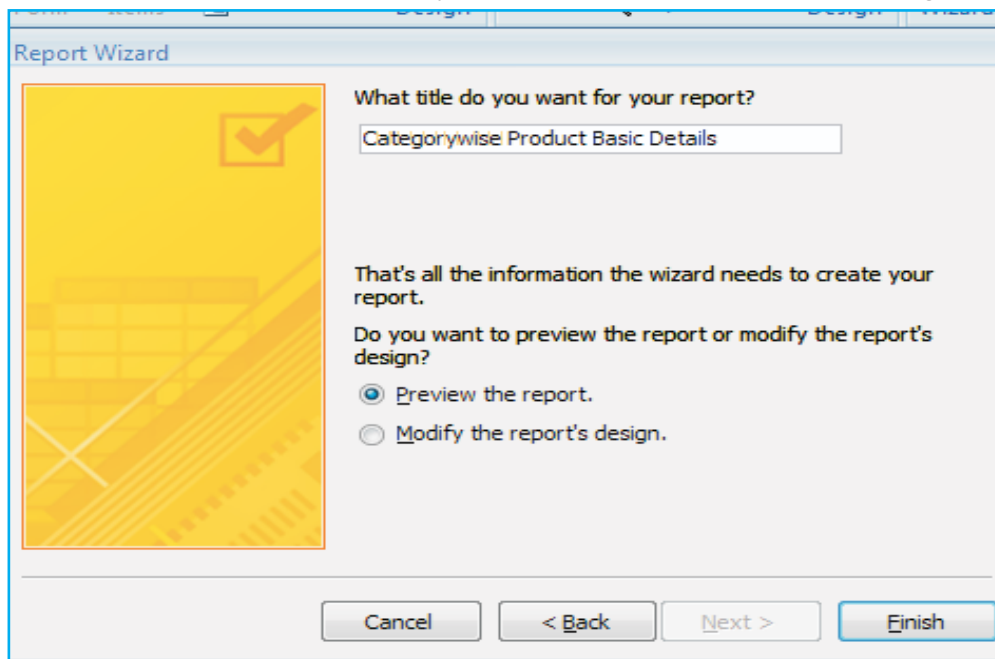


Fig. 3.18.8: Report Wizard (vi)



9. The user is then provided with the option of either to preview the report or to modify the report in report design view as shown in Fig. 3.18.9.
10. The user may click finish to see a report as shown in Fig. 3.18.9 (A).

Categorywise Product Basic Details

Category	Product Name	Product Code	Standard Cost	List Price	Quantity Per Unit
Baked G	Northwind Traders Brownie Mix	NWTBGM-85	\$9.00	\$12.49	3 boxes
	Northwind Traders Cake Mix	NWTBGM-86	\$10.50	\$15.99	4 boxes
	Northwind Traders Chocolate Bis	NWTBGM-19	\$6.90	\$9.20	10 boxes x 12 pieces
	Northwind Traders Scones	NWTBGM-21	\$7.50	\$10.00	24 pkgs. x 4 pieces
	Summary for 'Category' = Baked Goods & Mixes (4 detail records)				
	Min			\$6.90	\$9.20
	Max			\$10.50	\$15.99
Beverage	Northwind Traders Beer	NWTB-34	\$10.50	\$14.00	24 - 12 oz bottles
	Northwind Traders Chai	NWTB-1	\$13.50	\$18.00	10 boxes x 20 bags
	Northwind Traders Coffee	NWTB-43	\$34.50	\$46.00	16 - 500 g tins
	Northwind Traders Green Tea	NWTB-81	\$2.00	\$2.99	20 bags per box
	Northwind Traders Tea	NWTB-87	\$2.00	\$4.00	100 count per box
Summary for 'Category' = Beverages (5 detail records)					
	Min			\$2.00	\$2.99
	Max			\$34.50	\$46.00

Candy

Page: 14 of 1

No Filter

Windows Starter

Fig. 3.18.9 (A): Report Resultant

Fig 3.18.9 (B) shows the report in report design view, from where the user can further customize the report.

Categorywise Product Basic Details					
Category	Product Name	Product Code	Standard Cost	List Price	Quantity Per Unit
Category	Product Name	Product Code	Standard Cost	List Price	Quantity Per Unit
Summary for 'Category' = 'Baked Goods & Mixes' (4 detail records)					
Min				=Min([Standard Cost])	=Min([List Price])
Max				=Max([Standard Cost])	=Max([List Price])
Summary for 'Category' = 'Beverages' (5 detail records)					
Min				=Min([Standard Cost])	=Min([List Price])
Max				=Max([Standard Cost])	=Max([List Price])
Page: 1 of 1					

Fig. 3.18.9 (B): Report Design View



3.19 CREATING REPORT IN REPORT DESIGN VIEW

The report design view gives the user a high level of control over the controls on a report, as well as the report itself. The report design view is divided into a number of sections. The following Access sections are available in report design view:

Report Header Section

Controls in the Report Header section are printed only once at the beginning of the report. A common use of a Report Header section is as a cover page or a cover letter or for information that needs to be communicated only once to the user of the report. The user can also have controls in the Report Header section print on a separate page, which enables them to create a title page and include a graphic or picture in the section. The Force New Page property in the Report Header section needs to be set to After Section that will place the information in the report header into a separate page.

Page Header section

Text or text box controls in the Page Header section normally print at the top of every page. If a report header on the first page is not on a page of its own, the information in the Page Header section prints just below the report header information on the first page. Page headers serve as column headers in group/total reports; they can also contain a title for the report. The user can also change special effects such as color, shading, borders, line thickness, font type and font size for each control. Both the Page Header and Page Footer sections can be set to one of four settings through the Report's properties as follows:

- **All Pages:** The page header and page footer print on every page.
- **Not with Report Header:** Neither the page header nor footer prints on a page with the report header.
- **Not with Report Footer:** The page header does not print with the report footer. The report footer prints on a new page.
- **Not with Report Header/Footer:** Neither the page header nor the footer prints on a page with the report header or footer.

Group Header Section

A **Group Header** section normally displays the name of the group. Access knows when all the records in a group have been displayed in a Detail section when the group name changes. It is possible to have multiple levels of group headers and footers. However, in some reports the user ou might have groups of information with date values. The user could group these sections by year or month and year and within those sections by another group such as category.

Detail Section

The **Detail section** processes every record in the data and is where each value is printed. The Detail section frequently contains a calculated field such as profit that is the result of a mathematical expression.

Group Footer Section

The **Group Footer** section is used to calculate summaries for all the detail records in a group. The value of this text box control is automatically reset to 0 every time the group changes.



Page Footer Section

The **Page Footer** section usually contains page numbers or control totals. In very large reports, such as when there are multiple pages of detail records with no summaries, the user may want page totals as well as group totals. The user can also print the date and the time printed. A text box control with the following expression in the Control Source property can be used to display page number information that keeps track of the page number in the report:

= "Page: " & [Page] & " of " & [Pages]

Report Footer Section

The **Report Footer** section is printed once at the end of the report after all the detail records and group footer sections are printed. Report footers typically display grand totals or other statistics such as averages, percentages, etc for the entire report. The Report Writer in Access is a two-pass report writer, capable of preprocessing all records to calculate the totals such as percentages needed for statistical reporting. This capability enables the user to create expressions that calculate percentages as Access processes those records that require foreknowledge of the grand total.

1. Click the **Report Design** button of **Reports Section** under **Create** tab as shown in Fig. 3.19.1.



Fig. 3.19.1: 'Report Design' Option

2. Click **Add Existing Fields** button on **Tools** section and select the desired table(s) / query(s) as shown in Fig. 3.19.2.

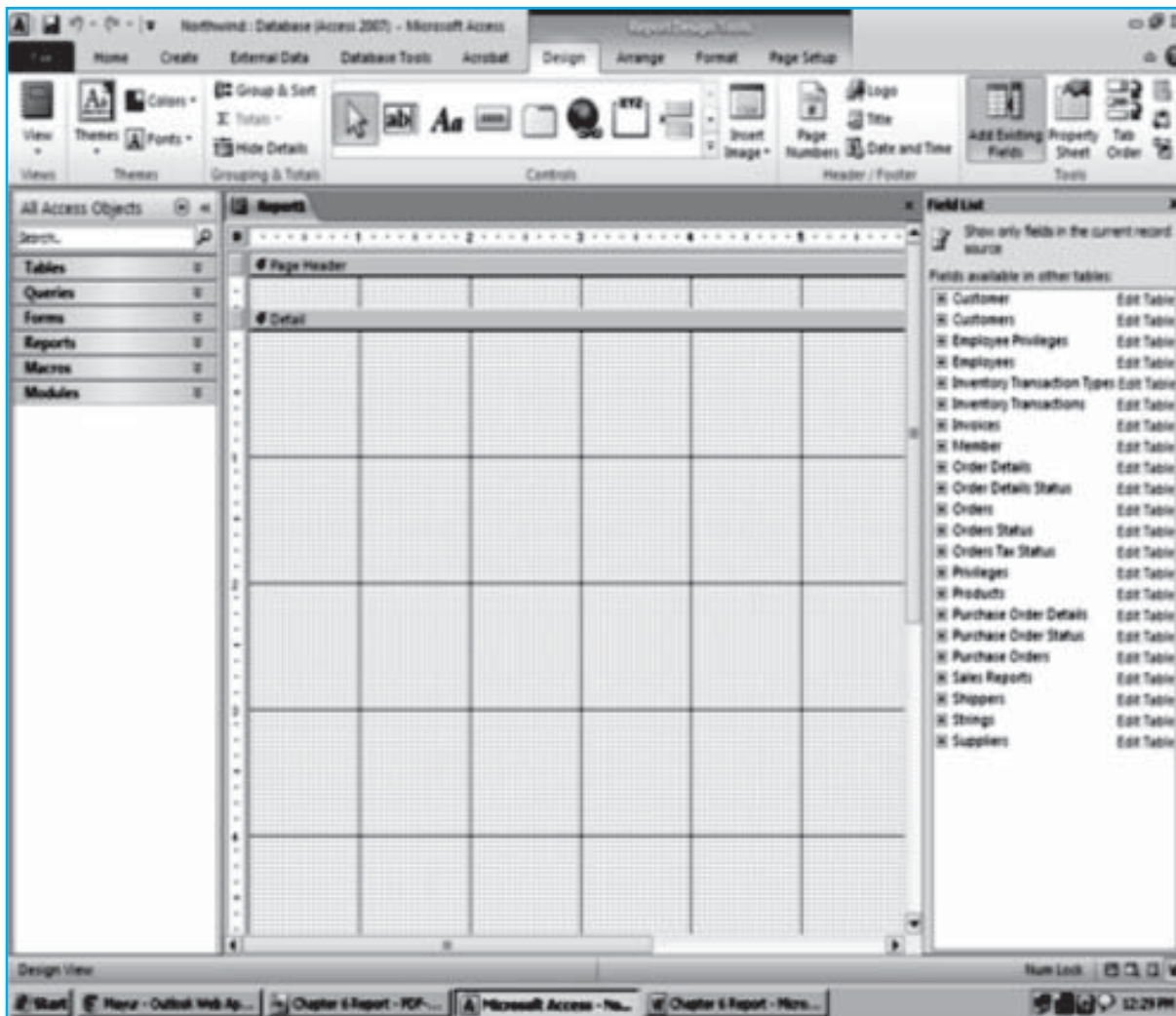


Fig. 3.19.2: Report Design Tools (i)

Note: By default the report contains only Page Header, Details and Page Footer section in the report design view. IF the user wishes to have Report Header and Report Footer section then he or she may right click inside the report design window and include Report Header / Report Footer.

3. The user may specify the Report Title as shown in Fig. 3.19.3.

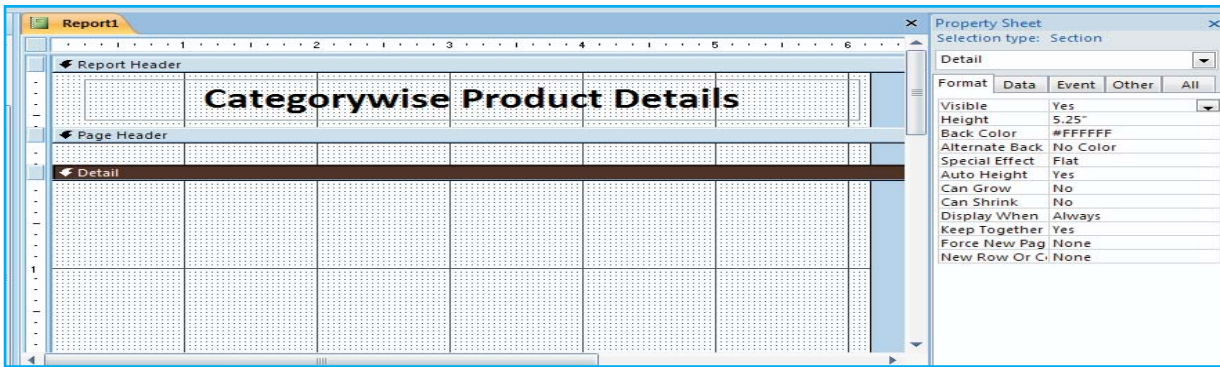


Fig. 3.19.3: Report Design Tools (ii)

4. Right Click on the report **design view** to select **Sorting and Grouping** as shown in Fig. 3.19.4.

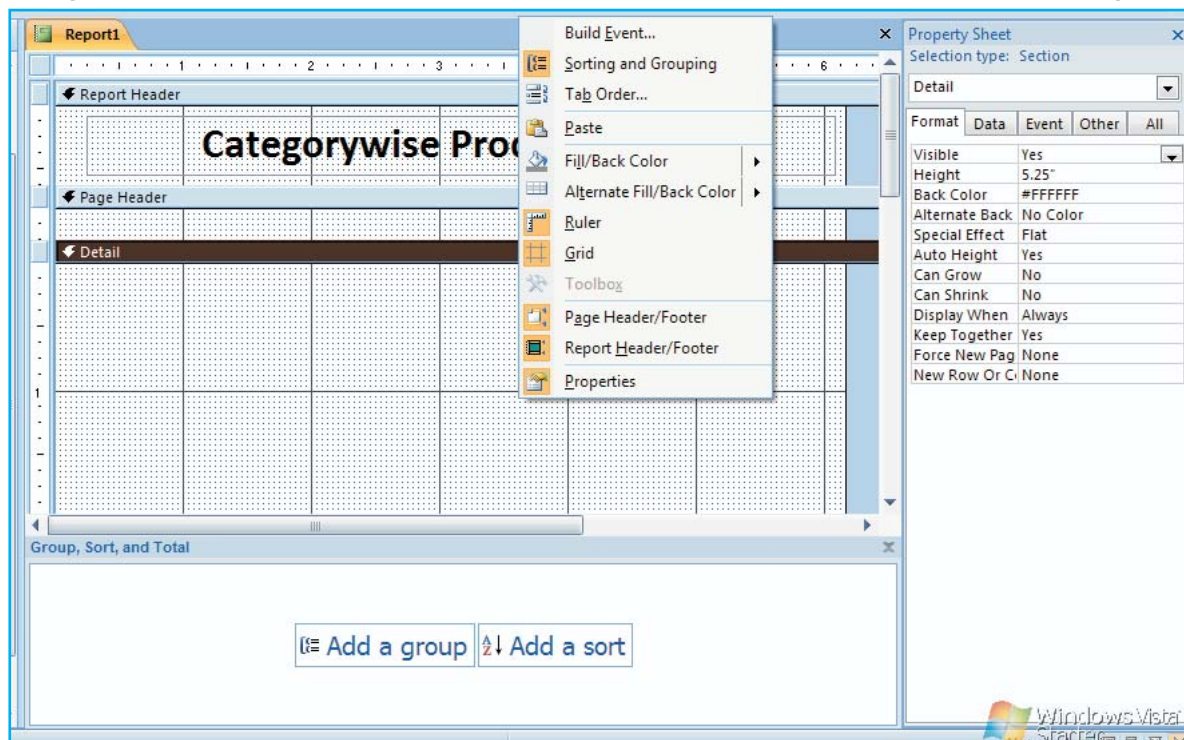


Fig. 3.19.4: Report Design Tools (iii)

5. Click the **Add a group** button shown in Fig. 3.19.4.

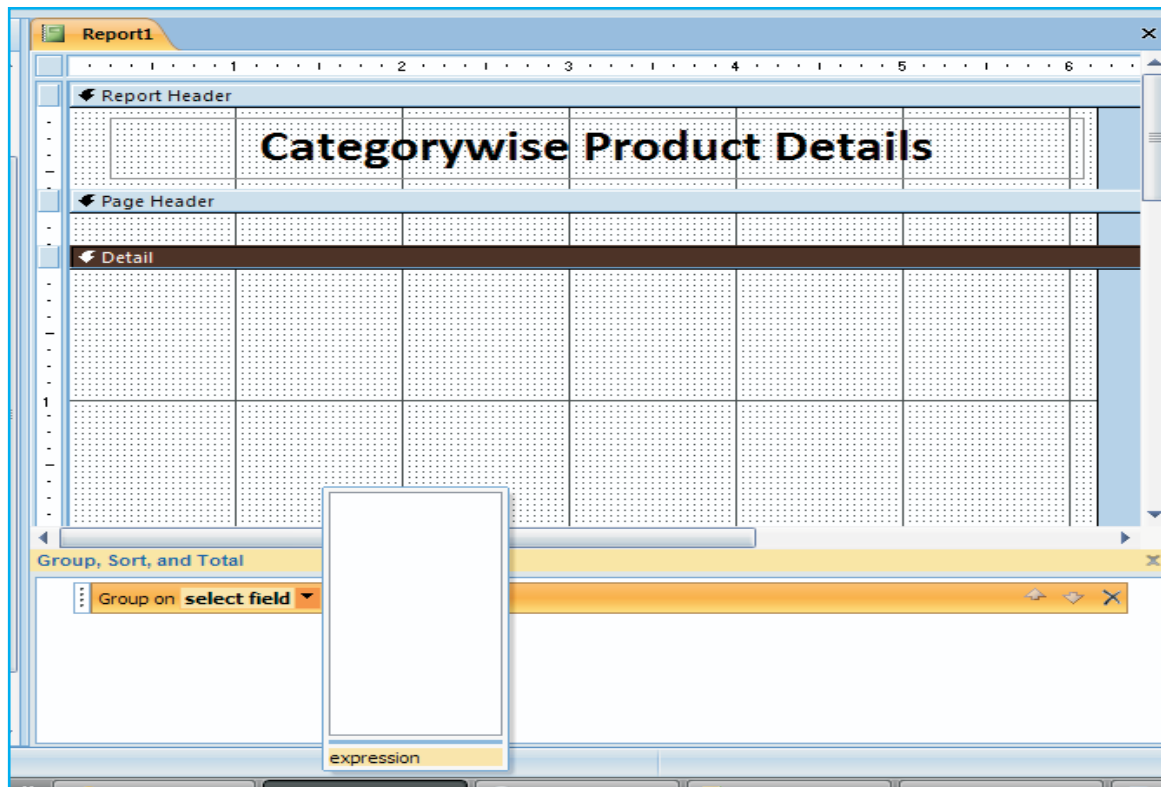


Fig. 3.19.5: Report Design Tools (iv)

6. Either select from the list of available fields in the select field dropdown box of **Group** on as shown in Fig. 3.19.5 or Click the expression option as shown in Fig. 3.19.5.
7. For grouping, specify the table to be used and select the field from the list of available fields as shown Fig. 3.19.6.

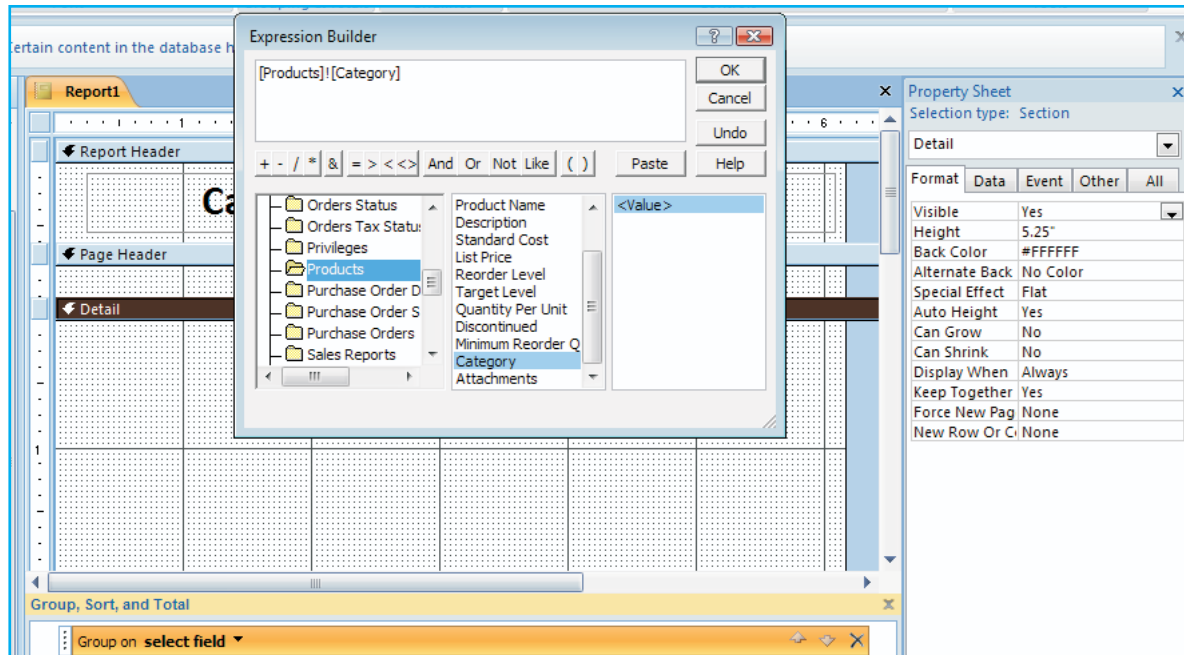


Fig. 3.19.6: Report Design Tools (v)

8. Click **OK** to return to the report design. A separate section as **Group Header** Section will appear as shown in Fig. 3.19.8.

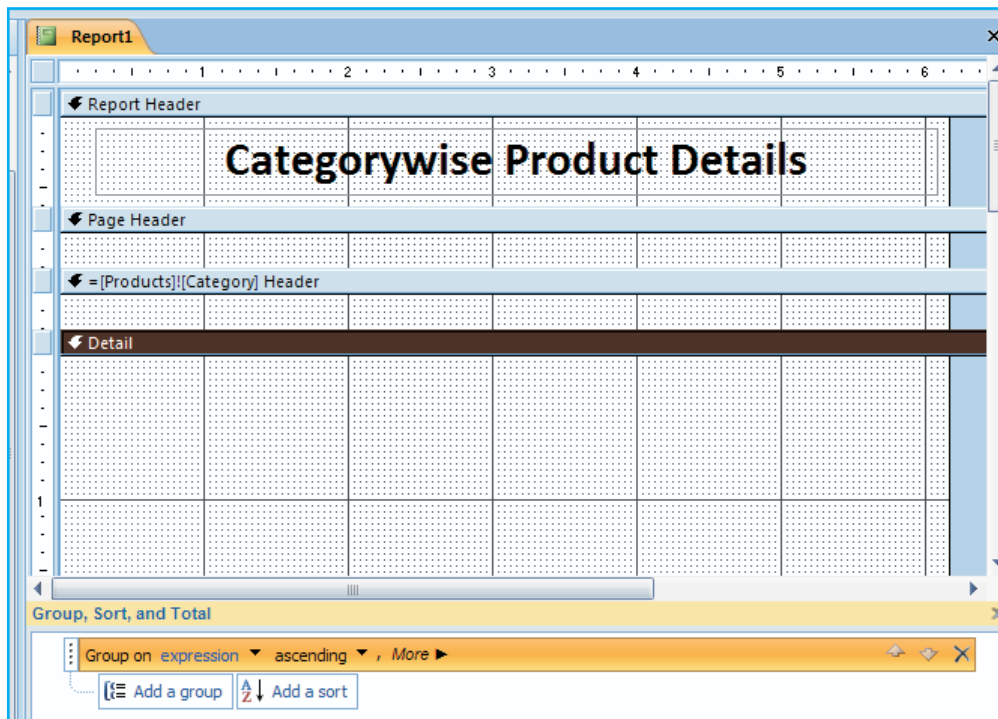


Fig. 3.19.7: Report Design Tools (vi)



9. Now, from the field list pane select the table and put the fields as shown in Fig. 3.19.8.

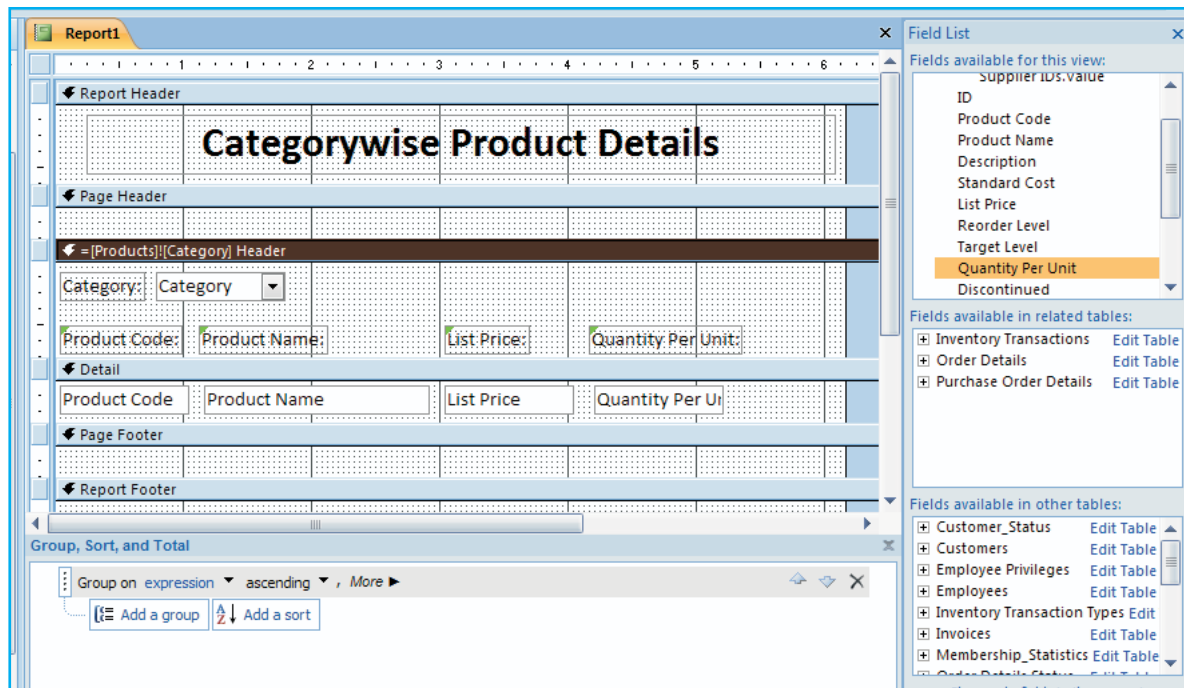


Fig. 3.19.8: Report Design Tools (vii)

10. Further, as per Fig. 3.19.9, the user can attach totals.

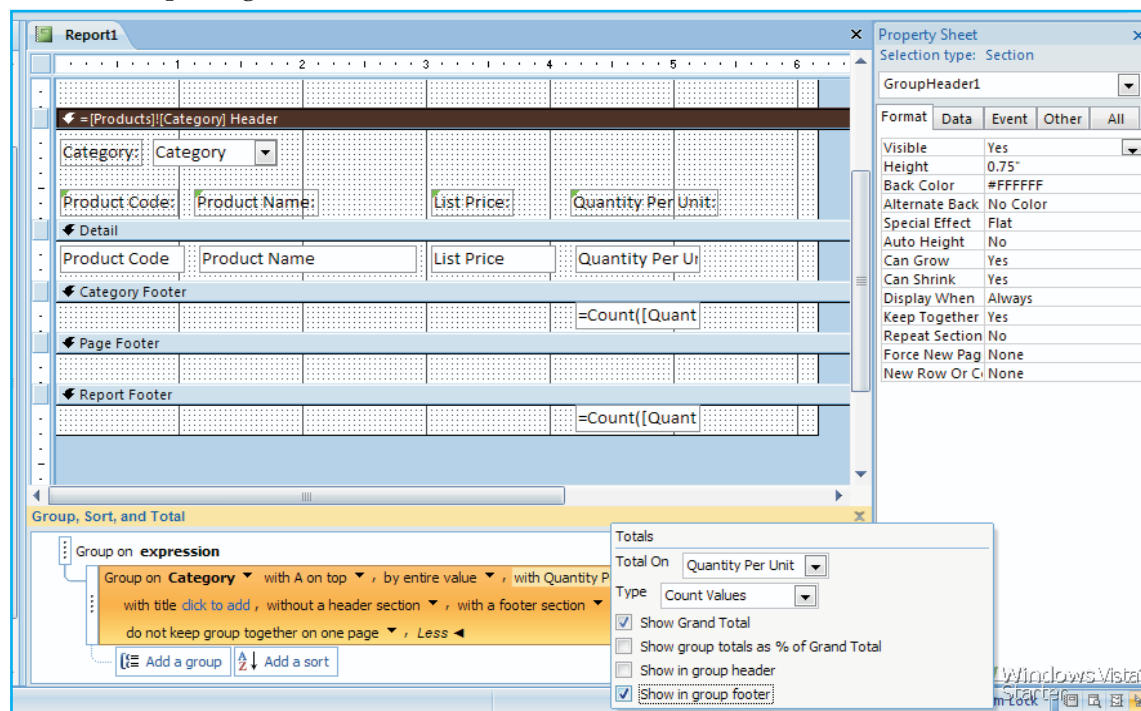


Fig. 3.19.9: Report Design Tools (viii)



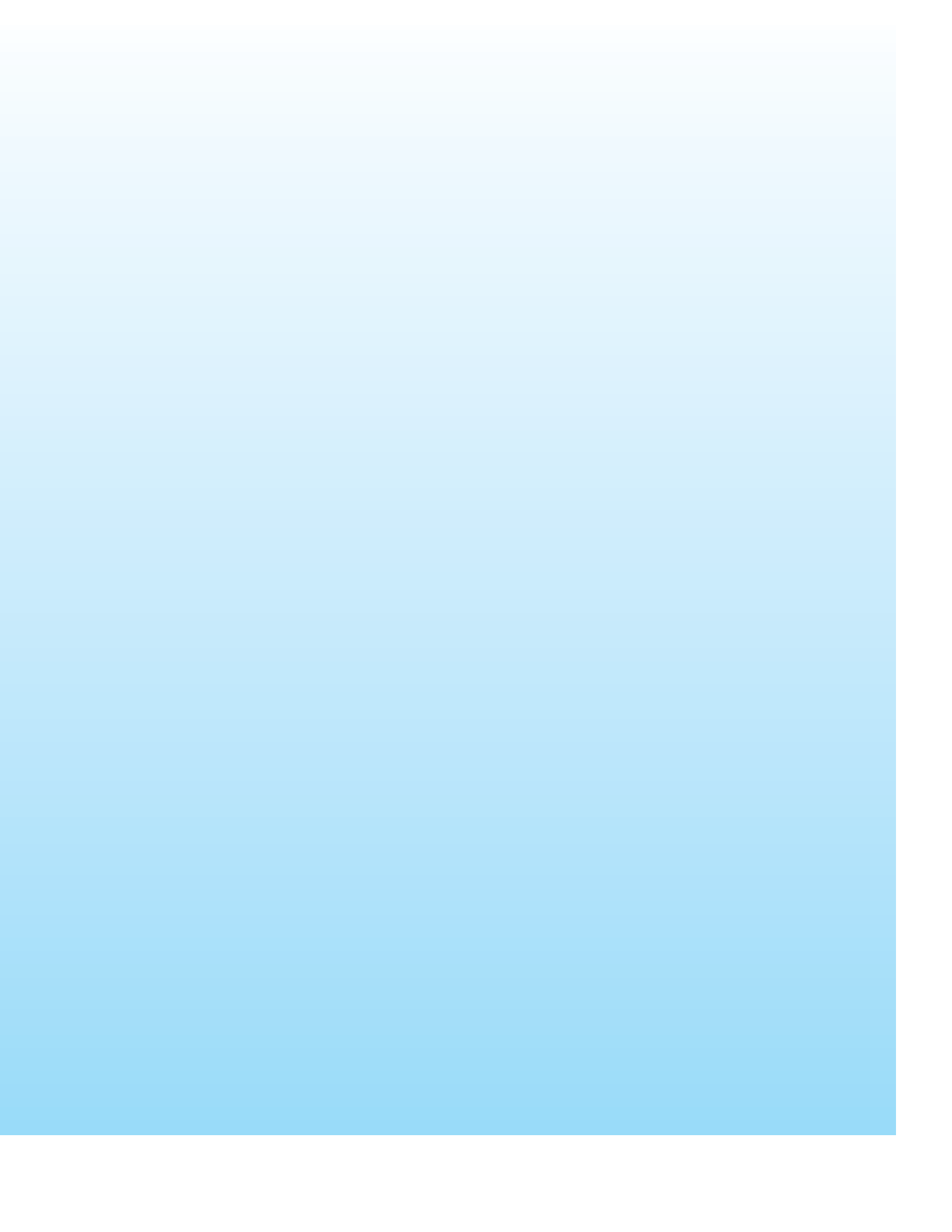
11. The resultant output that will generated as a report will be similar to the one shown in Fig. 3.10.10.

Categorywise Product Details			
Category: Baked Goods &			
Product Code:	Product Name:	List Price:	Quantity Per Unit:
NWTBGM-86	Northwind Traders Cake M	\$15.99	4 boxes
NWTBGM-21	Northwind Traders Scones	\$10.00	24 pkgs. x 4 pie
NWTBGM-19	Northwind Traders Chocola	\$9.20	10 boxes x 12 p
NWTBGM-85	Northwind Traders Browni	\$12.49	3 boxes
4			
Category: Beverages			
Product Code:	Product Name:	List Price:	Quantity Per Unit:
NWTB-81	Northwind Traders Green T	\$2.99	20 bags per box
NWTB-43	Northwind Traders Coffee	\$46.00	16 - 500 g tins
NWTB-34	Northwind Traders Beer	\$14.00	24 - 12 oz bottle
NWTB-1	Northwind Traders Chai	\$18.00	10 boxes x 20 b

Fig. 3.19.10: Resultant Report

3.20 SAVING AND PRINTING A REPORT

The process of saving and printing a report is similar to that of a normal document under windows environment.





Unit - 4

Core Banking Solution

The central banner features a dark, abstract background with a mouse cursor icon pointing towards the text. Faint binary code (0s and 1s) is visible in the background of the banner. The text is white and bold.

CBS BASICS AND ITS WORKING METHODOLOGY

LEARNING OBJECTIVES

- What is Core Banking Solution
- Technology behind CBS
- Comparison of TBA (Total Branch Automation) with CBS
- Data Centre and Network Connectivity
- Functions of IT Department under CBS environment
- Modules of CBS
- Operations of CBS Branch
- Security and Controls at Data Centre and Branch

1.1 WHAT IS CORE BANKING SOLUTION?

Core Banking Solution (CBS) is centralized Banking Application software. It has several components which have been designed to meet the demands of the banking industry. Core Banking Solution is supported by advanced technology infrastructure. It has high standards of business functionality. These factors provide the banks a competitive edge.

There are different vendors in the market providing CBS. The software, (CBS) is developed by different software development companies like Infosys, TCS, Iflex Solutions etc., Each of the software has different names:

Name of the Vendor	:	Software
Infosys	:	Finacle
TCS	:	Quartz
Iflex Solutions	:	Flex Cube

Apart from the above, some institutions have developed the software in house.

The software resides in a Central application server which is located in the Central Office Data Centre. The application software is not available at the branch but can be accessed from the branches. Along with Data base servers and other servers, application server is located at the Central Data Centre.



All of the branches of the bank are connected to the Central Data Centre as shown in Fig.1.1.1

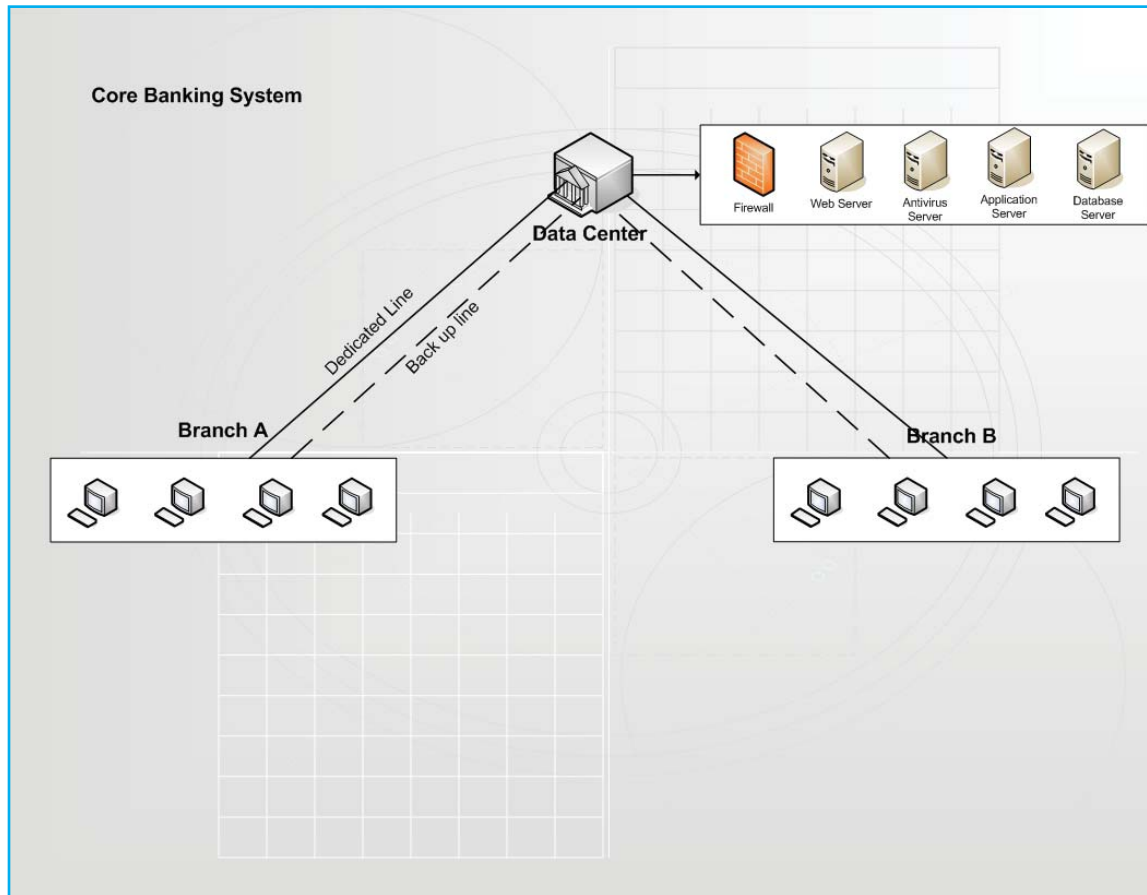


Fig. 1.1.1. Branches of the bank are connected to the Central Data Centre

Core Banking Solution brings significant benefits.

A customer is a customer of the bank and not only of the branch.

The CBS is capable of being implemented in stages.

Initially basic modules like Savings Account, Current Account, Fixed Deposits, Bills & Remittances, Loans and advances models implemented. Subsequently alternate delivery channels like ATM, Internet banking, RTGS/ NEFT, Mobile Banking, Treasury, Government Business etc., could be added.

As servers are on all 24 hours on all days, banking can be done any time and also from anywhere. Data base of customers is updated on line, e.g., amount withdrawn at ATM is deducted from the customer's balance almost instantly.

1.2 TECHNOLOGY BEHIND CORE BANKING SOLUTIONS

As already observed Core Banking describes the banking services provided by a group of networked bank branches.



Core Banking Solution

As they are networked, customers can access their accounts and perform certain transactions from any of the bank's branches.

Broadly speaking, the customer is no longer a customer of the branch but a customer of the bank. Core banking solutions (CBS) is a combination of an application software and network devices. There is a Central Data Centre. Data Centre is a large data housing infrastructure that provides high band width access to its clients. The Data Centre houses many services, Networking devices, Firewalls and other related equipments. The figure below represents the technology and connectivity details in a very simple structure for the implementation of the CBS. The circled portion in the diagram would normally be in the Data Centre as shown in Fig.1.2.1

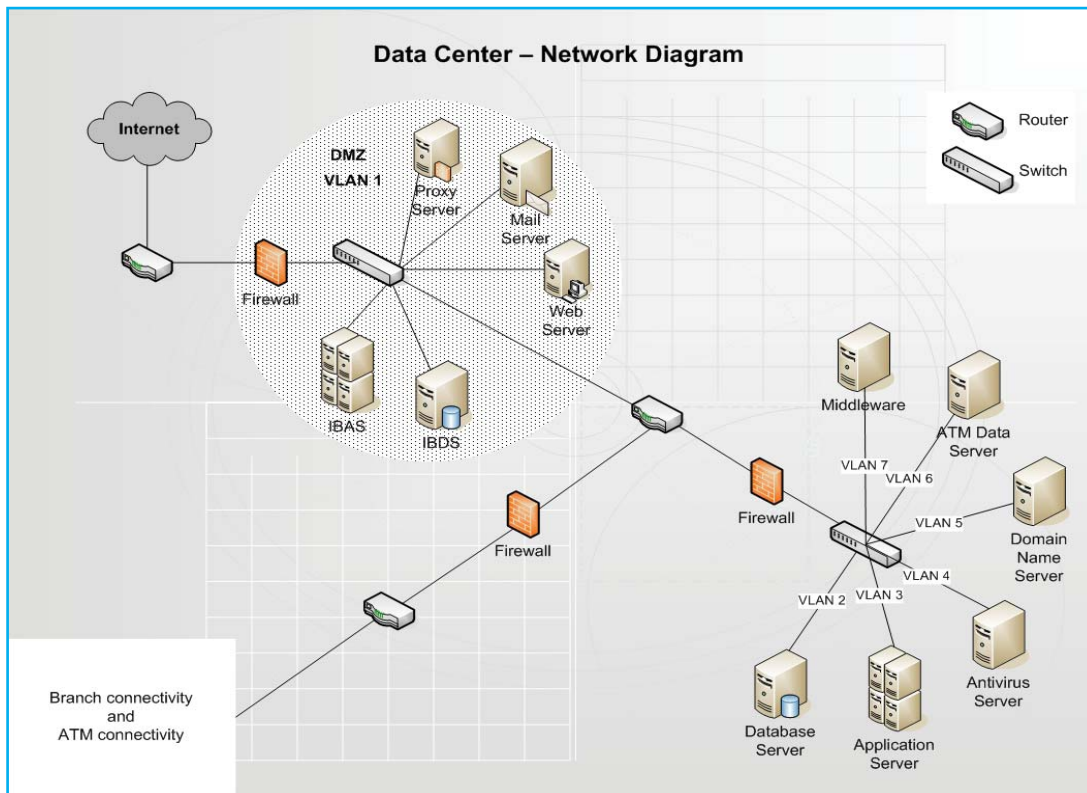


Fig. 1.2.1. CBS Network Diagram

The servers in the Data Centre could be many e.g., there are application servers, Data Base Servers, Web server, mail server, Report Generating Servers etc. It needs to be specifically emphasised that all the servers though placed in the same Data Centre are not in the same Local Area Network (LAN). Each of the servers are segregated using the concept of Virtual Local Area Network (VLAN). VLAN is a method of creating virtual networks within a physical network. Each virtual network thus created will act as a separate network. This concept has got distinct advantages:

Data communication between the 2 VLANs can be controlled as per business requirements.

Thus you will observe that in the diagram application server and data base servers are on two different VLANs (In the picture VLAN2 and VLAN3).

The various components of a core banking environment would be:



A Central Application Server that runs the core banking solutions (CBS). The application is centrally accessed by the branches. There are different core banking solutions available in the market like, Finacle developed by Infosys, Flexcube developed by I-Flex Solutions, Bankmate developed by the HCL Technologies, Quartz developed by TCS. There are other CBS software also some developed in-house by the bankers; others developed by other vendors.

Central Data Base Servers that store the data of the bank. It must be noted only this data base server that is centrally located stores the data for the bank which means that the data for all of the branches of the bank are stored in this central data base server.

Other infrastructure needed for internet banking and automated teller machine (ATM) operations.

Necessary infrastructure to provide security for stored data and data transferred across the network.

In the following paragraphs, we shall briefly discuss the various servers and their location and the purpose served.

At this juncture let us recapitulate the concept of a server. The server is a sophisticated computer that accepts service requests from different machines which are called clients. The requests are processed by the server and sent back to the clients. There are different types of servers as follows:

Application Server, Data Base Server, Anti Virus Server, Web Server, ATM Server, Internet Banking Application Server (IBAS), Internet Banking Data base Server, Proxy Server, Mail Server etc

Application server hosts the core banking application like Finacle, Flexcube, Quartz or Bankmate etc. This server has to be a powerful and robust system as it has to perform all the core banking operations. The branch does not have the entire application. It will have only a version which is called the "client version" of the application. The client version of the application is capable of only entering the data at the end point that is branches.

The validation is a complete process in the computer so that it ensures that data that is fed in conforms to certain prerequisite conditions e.g., if an operator keys in data for withdrawal of money, the account number of the customer would be entered by the operator naturally. But there would be a built in control so that further processing would be entertained only after the systems verifies that the account number which is now entered is already in the data base i.e., it is an existing customer. After the data is validated at the branch, it would be sent to the application server in the centralised data centre. The application server (which houses the banking software) after receiving the data performs necessary operations and updates the central data base etc., Customer "A" deposits Rs.10000/- is passed on to the data centre. The application server performs necessary operations and this updates the account of the customer "A" in the data base server. The customer may do some other operation in branch "Y". The process is validated at branch "Y" and the data is transmitted to the application software at the data centre. The results are updated in the data base server at the centralised data centre. Thus it would be observed that whatever operations a customer may do at any of the branches of the bank the accounting process being centralised at the centralised data centre is updated at the centralized data base e.

The application software which is in the application server is always to be a latest version as accepted after adequate testing; the application software is never static and would require some changes to be effected either due to any bugs discovered or a change in this process or any other justified reason. Such changes are never made directly into the live application server. These changes are made to a separate server called a test server. The programs are debugged and certified that the program is



now amended as required and performs as expected. The changed and latest application software will be moved into the application server under proper authority. Earlier version would be archived. The latest copy of the software would always have a back up copy.

Location

The application server would be placed in a trusted inside zone in a separate Virtual Local Area Network (VLAN) - please see diagram.

There is no direct access to the application server. The communication has to pass through a firewall, properly directed by a switch which is also located behind the firewall.

Data Base Server

The Data Base Server of the Bank, as already observed contains the entire data of the Bank. The data would consist of various accounts of the customers, as also certain master data e.g., master data are – base rates FD rates, the rate for loans, penalty leviable under different circumstances, etc., Application software would access the data base server. The data contained in the data base has to be very secure and no direct access would be permitted to prevent unauthorised changes. Strict discipline is followed regarding the maintenance of the data base server. There is a designated role for maintenance of the data base. This individual who performs the role is called the Data Base Administrator. His activities will also be monitored as all changes made would be recorded in a Log. Scrutiny of the log would disclose the type of activities and the effect of such activities. Security aspects of data base server are an audit concern. Apart from the normal application server, the Automated Teller Machine server (ATMS) and Internet Banking Application Server (IBAS) would also access the Data Base Server.

However, it would be only through VLAN. It must be noted that whatever be the operation that the customer has performed, etc., at the branch, through ATM, by Internet, mobile banking or any other alternate delivery channels his account at the Centralised Data Base would be updated.

Automated Teller Machines Server

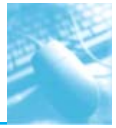
This server contains the details of ATM account holders. Soon after the facility of using the ATM is created by the Bank, the details of such customers are loaded on to the ATM server.

When the Central Data Base is busy with central end-of-day activities or for any other reason, the file containing the account balance of the customer is sent to the ATM switch. Such a file is called Positive Balance File (PBF). Till the central data base becomes accessible, the ATM transactions are passed and the balance available in the ATM server. Once the central data base server becomes accessible all the transactions that took place till such time as the central data base became un-accessible would be updated in the central data base. This ensures not only continuity of ATM operations but also ensures that the Central data base is always up-to-date.

The above process is applicable to stand alone ATM at the Branch level. As most of the ATM are attached to central network the control is through ATM SWITCH only.

Internet Banking Data Base Server

Just as in the case of ATM servers, where the details of all the account holders who have ATM facility are stored, the Internet banking data base server stores the user name, password of all the internet banking customers IBDS (Internet Banking Data Base Server) software stores the name and password of the entire internet banking customers (Please note that the ATM server does not hold



the PIN numbers of the ATM account holders). For further discussion, please refer to the chapter dealing with ATM. IBDS server also contains the details about the branch to which the customer belongs. The Internet Banking customer would first have to log into the bank's website. The next step would be to give the user name and password. The Internet Banking software which is stored in the IBAS (Internet Banking Application Server) authenticates the customer with the log in details stored in the IBDS. Authentication process as you know is a method by which the details provided by the customer are compared with the data already stored in the data server to make sure that the customer is genuine and has been provided with internet banking facility.

Location

The IBDS is located in a demilitarised zone. It has a separate VLAN that connects a proxy server, mail server, web server and IBAS.

Internet Banking

Internet Banking refers to banking transactions routed through the Internet. This facility permits registered customers of the bank to perform banking operations at any time of the day from any computer - now it may also be possible to do it from a cell phone.

No doubt, Internet Banking facilitates banking through the medium of internet. However, it also needs specialized software and hardware. The internet as you all know is a public network. Hence proper security features are built into the system to maintain confidentiality and integrity of the data that is being transferred through the internet.

Some Banks provide this facility automatically soon after a customer opens an account with them. Some others require a special request from the customer to provide this facility.

However, whatever be the method of providing internet facility, there is a process to be followed.

The main components of Internet banking system consist of Web Server, Internet Banking Application Server (IBAS), Internet Banking Data Base Server (IBDS), Middleware, and Central Data Base Server.

Anti Virus Software

In the pre Core Banking Solution scenario, when Total Branch Automation systems were in force updating the Anti Virus Software was yet another problem. As separate servers not connected to each other or to the Data Centre at the head office were in existence each of the server had to be updated with the latest version of the Anti-Virus Software separately

While in theory, it was agreed and presumed that all of the branches would have latest version of the Anti Virus Software, it was practically not so. As each one of the servers had to be updated manually with the latest version, the logistics proved to be inadequate with the result different versions of the Anti Virus Software were in existence in the different servers in the various branches.

In the Core Banking Solution as there is a Centralised Data Centre and also as there was a Centralised Data Base server, application server etc., the Anti Virus Software was also available only in the Centralised Data Centre. This copy of the Anti Virus Software was updated promptly and regularly at the Data Centre and pushed into all of the servers and in all the systems in the branches by push-pull method

Some Banks had, for back up purposes as also for business of the bank continuity planning had decided to have servers in the different branches. All the servers also were updated with the latest Anti Virus Software automatically every day as day beginning operations.



This process ensured that there was only one version of the Anti Virus Software and that too the latest one present in all of the bank's servers unlike in the TBA scenario.

1.3 COMPARISON OF TBA WITH CBS

Total Branch Automation System (TBA) was in existence before Core Banking Solution (CBS) was implemented. TBA itself was deemed a technology development compared to its predecessor ALPMS (Advanced Ledger Printing Machines).

In the Total Branch Automation system each branch was performing the branch operations in totality at the respective branch. The final output was transmitted to the head office. The data was transmitted either on a CD or a Floppy. The information on this media was processed at the Central Office for consolidation of accounts and preparation of reports.

As each branch was self reliant in as much as all the information regarding the branch operations was available at the server located at the branch.

- The technology infrastructure at the branch was as follows:
- There would be a server which would be either in the Branch Manager's room or more commonly kept in a separate air conditioned enclosure with a separate entrance, so that entry to the server room can be restricted.
- At the most the Systems Administrator may be inside the cabin along with the server.
- There would be four or five nodes or more depending upon the need of the branch or the volume of transactions. Each of the nodes would be connected to the server.
- The server would have the application systems as also the data base.
- The bank as a whole would have one banking software which might have been developed in-house or purchased from an outside vendor. A copy of this software is loaded in each of the servers in all the branches of the bank.
- The server also hosts data base of the branch.
- The data base would have a master data, and all the details of the transactions entered into.
- The master data consists the data relating to standing information like the name, address of the customer interest payable on all Deposits. This would have the details of interest payable for various Deposits with different tenures eg. 8.5% pa, 9% pa 9% for two years and so on.
- Additional/ concessional interest for senior citizen, staff members, educational loan for girl child, various concessional rates during festive seasons etc.

Transactions of the customers would be stored account-wise, so that it would have the opening balance and the details of the transactions which have taken place.

The application software which is also residing in the server at the branch actually does the banking operations. Eg. A person operating a particular node (also called a client) (which is nothing but the front end machine from which the operations take place, enters the transactions. The customer might have come to withdraw Rs.10,000/-. The operator accesses the machine when he is prompted to give the user ID and password. Once he gives it correctly, a screen would pop up by which he would click the SB A/c and in the SB menu he would type the name of the customer as also the account number. He has now accessed to the specific account of the customer.



Next step that he would be doing would be entering this transaction and request for withdrawal for the customer. In the example specified, he would be typing cash Rs.10,000/- in the appropriate fields. This command executed at the node end (client's end) is transmitted to the server through the communication channels (or net working cables).

At the server level the application accesses the data available of the customer in the data base and if there is balance available gives back the information. The transaction is put through.

Once the transaction is put through again this information is retransmitted to the server. The customer's data base is updated by the application and the customer's account would be suitably modified.

At this point of time, we are only discussing the process and not going into the details of the normal controls which are in place. Eg.

- If the customer does not have the required balance at his credit
- Is the withdrawal of cash a routine procedure which the person at the counter can authorise through controls built in the system whether the transaction can be entered by the person but would have to be authorised by an individual at a higher level say, the Accounts Officer. These procedures are built into the application software as part of built in controls of the software. This is known as maker-checker system or four-eye principle.

Similarly transactions relating to Current Accounts, Fixed Deposits, Loans, Foreign Exchange (where the branch is authorised to also deal with foreign exchange) would have to be dealt with by different nodes or same node and the data base of the branch is updated. By this process by the end of the day all the transactions which have taken place during the day have all been recorded and correct postings have been made to the respective accounts held in the database which resides in the server.

At the end of the day under the authority of the Branch Manager the Branch level Systems Administrator would perform End of Day operations (EOD).

The End of Day operations when completed would result in all the entries being posted and a final trial balance and other financial statements (including the complete ledger)(Opening Balance+Transactions leading to the Closing balance would be available).

The introduction of the Total Branch Automation hastened processing activities at the branch and also totally eased the time consuming End of Day Operations of preparing a tallied trial balance with all the ledger entries having been posted. A copy of the ledger is available in the system and this would be copied on a CD or a Floppy for outward transmission to the Head Office/ Central Office.

At the Head Office, the CDs and the floppies received from various branches would form a copy for them to prepare a consolidated ledger/ Balance sheet/ General Ledger

- The advantage of the TBA was that maintenance of manual ledgers and day books were dispensed with.
- At the end of the day, a neatly printed set of day books and ledgers with totals tallying (!) would be ready after last of the transactions are posted (in the initial stages due to technology snags or due to inadequate resources, the end of day operations were taking even 6-8 hours. However, after ironing out the teething problems, the time frame was considerably reduced.

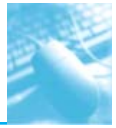


Disadvantages

- As mentioned in the earlier paragraphs a copy of the software had to be loaded into each of the servers at various branches
- As we all know, the program require constant changes either due to bugs in the program or due to changes in the business process or for any other justifiable reasons.
- These changes are made at the central office (Computer Planning and Policy Department- CPPD). Copies of this program would have to be made effective at the branches.
- The methodology adopted for updating is that a copy of the programme would be taken on a CD or Floppy and passed over to a branch or personally carried by a member of the staff of the CCPD for updating the copy of the programme residing in the server of the branch. Sometimes it was also communicated through e-mail.
- While theoretically it seems simple, the problems that have been faced are with the need to change program often. There were different versions of the program available and operational at different branches of the bank. Version control mechanism was not effective.
- In addition to changes in programme master data regarding rates of Fixed Deposits, Loans, Penalties, etc., have to take place almost immediately in the entire bank at a single point of time. This was possible only by sending e-mails to the branches and instructing the Branch Managers to get the Systems Administrators of their respective branches to update the masters.
- The Branch Managers being busy with operations were not devoting time to personally ensure that these corrections are made properly. This resulted in a situation when modifications were made differently at different branches at different points of time.
- Also intentionally some 'mistakes' could be committed. This situation led to a great extent of chaotic condition of branch transactions at the head office and not to speak of suspense or sundry accounts created in each branch to ensure the trial balance tallied.

To get over this problematic situation, certain steps were taken to resolve the problems.

- For speedy resolution of problems at the branches, it was decided that source code would be made available at the regional office. All bugs would be dealt with at the regional level and corrected copies of the program would be given to the branches much earlier than it was possible earlier when all corrections were made only in the CPPD.
- The availability of the source code at the regional office and the different corrections being made by different people on different occasions lead to lack of control of programme changes and implementation of master data.
- The availability of source code at the different regional office itself was a matter of serious concern. The source code is the basic code which later becomes an object code. It is not possible easily to change a object code while the source code could be changed by anybody who knows the programming language.
- Apart from the serious operational problems and security concerns, there were certain other disadvantages like updation of anti-virus software.
- Scalability of the software was restricted. It wasn't possible to introduce further useful products like ATMs and Internet banking etc. It would have meant a great deal of patch work and it



will restrict new products. Already with various versions of program being available (and made necessary) in the total branch automation system, the programme was very weak with different versions having too many patches. To think of enhancing this to add further banking products like ATMs and Internet banking was bound to be impossible. ATM was introduced and work for the account holder of that branch only.

1.4 DATA CENTRE AND NETWORK CONNECTIVITY:

Data Centre houses all the main servers. They are:

1. Application Server
2. Database Server
3. ATM Server
4. Web Server
5. Antivirus Server
6. Internet Banking Application Server
7. Internet Banking Data Base Server
8. Proxy Server
9. Mail Server

Most of the servers are placed behind a firewall. The firewall is generally hardware and it plays the role of preventing unauthorized access. The servers though located in the same place will not be in the same Local Area Network (LAN). These servers are segregated by using the concept of Virtual Area Network (VLAN). VLAN has got its own security. The fig 1.4.1 below shows the network diagram at the data centre.

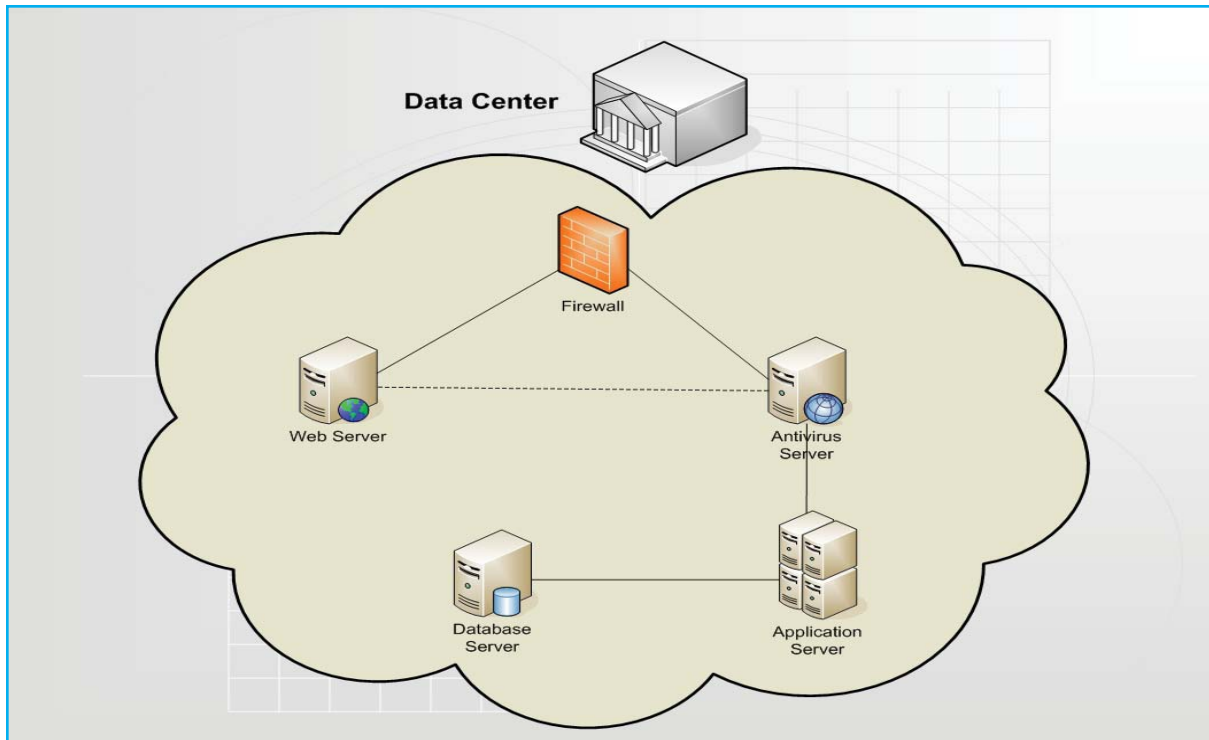


Fig. 1.4.1. Network Diagram at Data Center

Network connectivity

In a core banking concept all the systems of the bank are connected to the Central Office by means of a connectivity which may be either a leased line or a dial up line.

As the connectivity of the branch bank to the data centre is very critical arrangements was made for back up connectivity. In case the primary connectivity fails, there will be a fall back arrangement with a secondary line. There should be adequate band width capacity to deal with the volume of transactions that are expected to take place. When the band width is not adequate and the transaction load is higher, the system slows down and the efficiency also drops. Hence the banks should ensure that there is adequate band width to manage heavy load of transactions even during peak period like beginning of the month or end of the month/ year

Apart from the cables other important components of a network are devices like routers, switches and hubs. Routers enable data transmission over different networks. They are capable of making intelligent decisions to ensure data is transmitted across the network by using the best path. Switches have many ports that are connected to different systems. Switches facilitate data transmission with the network (this switch should not be confused with the ATM switch - discussed later). Virtual networks are capable of being connected only when devices are connected to a switch as shown in Fig 1.4.2.

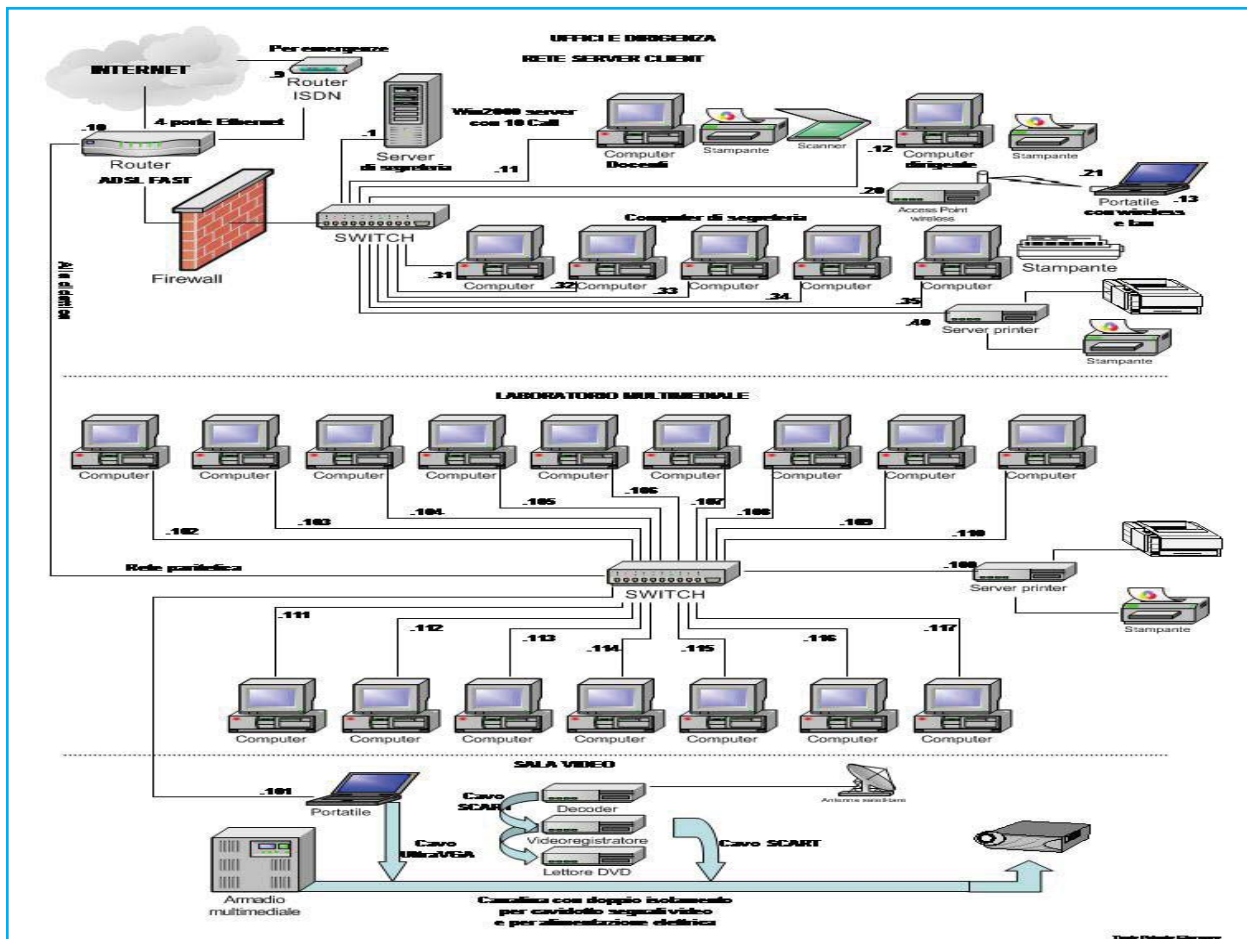


Fig. 1.4.2. Virtual Network Diagram

The picture above describes how the various servers are connected and where exactly the firewalls, routers and switches are placed. It will be observed that firewalls will always be placed whenever there is an access from outside the network.

Proxy Server

A Proxy server always acts in conjunction with a firewall. The Proxy Server provides network security by preventing malicious data from entering the network. In the network diagram, it will be noticed that the Proxy server is placed inside the demilitarized zone wherein the mail server, web server, internet banking application server, are placed.

Domain Controller

This is used for authentication. Access to a set of servers is controlled by the Domain Controller.

Network connectivity and security thereof plays a very important role in any organization especially in a core banking environment as the entire system is networked. The importance of network connectivity and its security can never be over emphasized. As dependence upon the network being available is crucial, adequate arrangements should be made for a fall back. The moment the primary network fails for any reason, the fall back arrangement comes into place due to the steps



already taken while establishing the connectivity. The network is vulnerable to “hacking”. The hacking is a process of unauthorized entering a network. To prevent this hacking there have to be many controls in place. It is necessary to constantly monitor the network to ensure that there is no potential possibility of the vulnerability being exploited. All network traffic is required to be tested for vulnerability against hacking, phreaking, malware, spyware etc. There should be a specific team who will have the sole responsibility of constantly testing the network connectivity to ensure that it is secure. There are software tools available which would be utilized to assess the vulnerabilities. The tools when used would highlight any vulnerability discovered. The team in charge of maintaining the network would immediately take adequate steps that the weak points are strengthened. It is also possible that the network can be intruded. In any application and more so in banking applications vulnerability in the network or the possibility of an intrusion into the network are matters of grave concern. It is possible to use certain procedures so that any time an intrusion would be detected and prevented. A simplification of the concept could be that of installing a burglar alarm. Preventive controls have to be in place and it is the responsibility of the bankers to ensure the same. However, it is the duty of an auditor to verify and satisfy himself that the controls are in place and that competent and qualified people have verified and given satisfactory reports. Care should be taken to improve the security on ongoing basis as hackers are employing newer methodologies to attack network and stealing confidential information.

1.5 FUNCTIONS OF IT DEPARTMENT IN CBS ENVIRONMENT

As explained earlier, in core banking solution environment of Information Technology functions (IT functions) are centralised at the data centre. There are specific roles and responsibilities for different individuals like in all IT Departments. There are certain functions which are incompatible, which means that under no circumstance can one individual perform two different functions as those specific functions are sensitive. These functions have to be performed by two different individuals. This concept is similar to what we are aware of in a purchase function. The officer who is in charge of the purchase would not be the person who would be passing the goods. The person who passes the purchase invoice will be definitely different from these two. The rationale for the separation is that control will be compromised. This is known as segregation of duties and is very important in any computerized function. A brief description of the roles of different individuals in an IT Department is given below:

- ❑ **Security Administration:** It is advisable and necessary for all organizations including banking to have a security policy which is approved at the Board level. The officer in charge of the security administration is expected to understand the policies and procedures mentioned in the security policy. He should be able to assess the risks for non compliance. His duties would include deciding on access rules to data and other IT resources.
- ❑ There will be separate set of people who will be Issuing of user ID passwords and manage it. Monitoring the security architecture constantly with a view to ensuring that there are no weak points which can be exploited is the duty of security administrator. Security administrator should not have any access to transaction level data
- ❑ **System Administration:** This particular job is more sensitive. The Systems Administrator has the powers to create, modify and delete users in accessing the system. The individual is to be technically competent. He is also expected to have a proven record of integrity. His duties would briefly include the following:



- User creation
 - User deletion
 - Locating a branch code and providing connectivity to the branch
 - Creation of new products
 - Defining interest rates for deposit loans and other products.
- Be responsible for processing of end of day operations and beginning of day operations.
 - Be responsible for introducing latest application of the program.
 - **Data base administration:** As the very name indicates, the Data Base Administrator is the custodian of the bank's data. He is responsible for ensuring that access is given to the Central Data Base in a secure manner in line with business requirements. His responsibilities would include
 - Ensuring data integrity
 - Ensuring data availability
 - Ensuing security to access data
 - Importantly ensure recoverability of data in case of system failure
 - Maintaining size and volume of database and corresponding processes
 - **Network Administration:** Networking, generally and more specifically in a core banking environment plays a very significant role. The Network Administrator has the following important responsibilities:
 - To place routers, switches and hubs at the appropriate places and ensure a secure network configuration.
 - Sensitive devices like firewalls and intrusion detection systems/ IPS need to be strategically placed to ensure security for the network.
 - At periodical intervals arrange for vulnerability assessment and penetration tests to take corrective action whenever these tests throw up weak points.
 - **Librarian:** Normally we understand that the Librarian is in charge of maintaining the Library, issuing books and receiving them back. In a computerised environment, the Librarian has got similar functions excepting that instead of dealing with books, he will be dealing with software. As we are aware, the software, which is being developed and tested, would be clear as a complete product ready for use by the Project Leader. Such a program then moves from a test environment into the production environment. But there is an intermediary process by which the Project Leader hands over the finished product to the Librarian. The Librarian maintain records of the various versions of the program records all the various versions of the program just as we have different editions of a book and generally a later edition is expected to be important over the earlier one. Similarly, software may have different versions and it is extremely important to remember them and this number is referred to as the version number. The Librarian has the following responsibilities:
 - Moving the correct version of the software into production environment.



- Maintain detailed documentation of all receipts and issues of software.
- Keep a record of all licenses obtained for the usage of software.
- Be in charge of user manual and system manual

None of these groups of administrators should have access to the database having transaction data. Implementation of maker checker concept will ensure proper segregation of duties.

Changed Management Procedures

In the normal course, due to any change in the business process or upgradation of technology or due to program bugs discovered subsequent implementation changes are warranted in hardware, software and communication systems.

There needs to be a well documented procedure in place and a strict adherence to such procedure.

Changes to hardware and communication systems need to be entered in a register apart from a softcopy of the register being available on the system. The latest copy of the network program should always be available. These documents should always be maintained up to date incorporating all the changes and the dates when such changes have been incorporated.

Application Software

There needs to be a control on the various versions of software. At the stage of initial implementation of the software (for the first time software which has been debugged thoroughly moved from the test environment to the production environment) a specific version number should be provided e.g. CBS Version No: 1.1. There needs to be a document which contains details regarding the Version No. and date of implementation.

Thereafter for all subsequent procedures, there needs to be a strict procedure to be adhered to. The procedures would be as follows:

- There should be a specific request from an authorised person like the Manager of the user department. The request should be approved by the person in charge of the Systems Department.
- Changes to programs should necessarily be made in the test environment.
- After thoroughly debugging the program, the corrected program would be handed over to the Librarian.
- The Librarian would then give the next Version No. for the changed program, e.g. Version No: 1.2 (as compared to the previous Version No:1.1).
- The documentation would contain details of the changes made and the date when it was made.

Strict adherence to the procedures and technologies

The changes would ensure that the corrected latest version of the program alone is used. If such a procedure is not strictly adhered to, there is every possibility of an earlier version of the program being used, which would result in inaccurate processing.

Organization Structure of the IT Department

The standard for the organization structure for the IT Department is the same whether it is a banking environment or any other. The standards stipulate as follows:



- Production environment should be different from development environment.
- In the development environment all aspects of the program viz., functionality, built in controls, etc., will be tested by both the users as also the programmers. The programmers would test it first and then it would be provided to the user department for them to test it. This version is called the 'beta version'. Various types of tests like unit test, system test, and integration test conducted at this stage.
- After it has been tested by the users also, the Project Leader would hand over the software copy to the Librarian, who after completing the necessary documentation, transfers the program into the production environment. This is also known as user acceptance test (UAT)
- No one in the development and testing environments should have access to the production system.
- Production system is in a live environment and is accessible only by authorized users.
- Under no circumstances, should there be any connectivity between a test server and a production server.

As already discussed, there are certain incompatible functions which under no circumstances should be performed by the same individual. The Matrix provided below highlights the functions which are incompatible and those which are not.

	Help Desk	Database Admin.	Network Admin.	Security Admin.	Tape Librarian
Help Desk		X	X		X
Database Admin.	X		X		
Network Admin.	X	X			X
Security Admin.					X
Tape Librarian	X		X	X	

1.6 OPERATIONS OF CBS BRANCH

A branch in a Core Banking Solution environment is very different from a branch in a total branch automation system, as explained in detail earlier. Branches in a Core Banking Solution do not have independent operation in the sense that a copy of the application software or a copy of the data base of the customer is not separately available in the branch. Branches are connected to the central data centre, wherein there are separate servers housing the application software, data base as also antivirus software. Users at the branch have to be created by the System Administrator at the central data centre after due authorisation by the Branch Manager. Even a Branch Manager will not be able to create his own user access rights as everything is centralised.

At the Branch all operations that take place normally in an banking environment do take place; however, all master data are parameterised at the central office e.g., FD rates for various time periods, penalty, interest payable for premature closure, rates for different loans, interest rates applicable for staff members for loans and deposits, rates applicable to senior citizens etc., are to be decided centrally and parameterised at the central office. There is no possibility of any changes being made at the Branch as they have no rights to do so. There are certain account level parameters like preferential rates, addresses etc. can be controlled at branch level.



The various staff members operating at the branch have been given access rights by creating a User ID by the Central Office and also providing an initial password which necessarily will have to be changed by the individual employees soon after they make the initial log in.

There would be a register maintained at the branches, where in each of the individual would have acknowledged their user ID and the recommended format for the register would be as follows:

1. Name of the Employee	2. User ID	3. When created	4. When deactivated	5. Signature of the employee

Maintenance of this register is of utmost importance as it acts as evidence that the respective employees have acknowledged their user IDs. All the transactions performed during the period from the time the account was created to the time it was deactivated would be attributable to the employee in view of the accountability being established, employees would be extremely careful not to disclose their password or share it with others. The minimum level of controls which needs to be in operation would include the following:

- A branch should have an extract of the bank's security policy as applicable to it.
- There should be some evidence of having created awareness amongst the employees regarding the existence of the security policy of the bank.
- There should be a well written procedure in place to record and document all incidents of security lapses.
- There should be regular procedures to create basic IT security awareness amongst employees.

Access Control Procedures

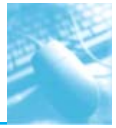
- The system should prompt for change of password during the first log in.
- There should be a maximum number (usually 3) of failed log in attempts. The rationale for this requirement is to prevent multiple guesses being made by unauthorized user
- There should be a procedure for reviving such accounts which should have been deactivated.
- All USB ports, the CD Rom drives should all be disabled. This is necessary to both prevent unauthorised data or software being loaded and also to prevent any leakage of data and information. If this facility is not strictly adhered to, the possibility of virus being introduced into the system is very high & there is a chance of data loss/ leakage to unauthorized user.

Server related procedures

Generally there should be no servers available at the branch. However in some instances a local server is installed to get over slow connectivity problems. Under such circumstances, the local server serves as a temporary storage. The discipline connected with the local server is as important as any server and there should be a specially designated branch system administrator who would be having a specific password to access the server. A copy of the password should be kept in a sealed cover under the control of the Branch Manager, so as to enable him to utilize the same should the system administrator of the branch be not available on any day.

Physical and environmental controls

Moisture and temperature in the room where the server is located should be under control. There should be no inflammable material stored in the server room. In some instances, it is not uncommon



to find bundles of paper and some thermo cool boxes being stored safely in the server room which need to be reused immediately

There should be a fire extinguisher in the room, which should always be in an active condition with the refills of gas being done at regular intervals or there should be other mechanized process for extinguishing the fire.

Network related procedures

Network devices like the router, switches and hubs should be secured. Unused routers, switches and hubs should be protected, if not they could be misused and there could be unauthorised use of handling the system but also leakage of important data. All network cables should also be protected properly. There are instances when these cables are running outside the building without being properly encased. Unprotected cables have the potential for being hacked.

ATMs being attached to the Branches

- ATM cards which are awaiting to be handed over to the customers should be secured with a lock and key.
- There should be regular reconciliation procedures for the stock of ATM cards.
- There should be procedures to update core banking solutions with details of cards issued to the customers. This would prevent the possibility of usage of the card before it is issued to the customers.
- Frauds do occur when ATM cards and Pin mailers are not kept separately & securely. Especially the ATM cards should be with one officer and the Pin Mailer should be with another officer. Under no circumstances both the ATM cards and Pin Mailers are kept together. When they are kept together any employee can pick up the ATM card and a pin mailer with similar address and try using them fraudulently at the ATM. Such occurrences of fraud have been reported several times.
- When ATMs are attached to the branch, there should be procedures for loading cash, recording and reconciliation of cash. The master key of the ATM should be under dual control. The ATM journal rolls should be stored safely in the branch as they form an important document for reconciliation purposes & for detecting any unauthorized use/ transaction
- There should be strict procedures for dealing with swallowed card.
- There should be clear procedures for dealing with cash which is in the reject bin.

Business Continuity Planning and Disaster Recovery Planning

- There should be a document detailing the Disaster Recovery procedures as well as Business Continuity Planning.
- There should be evidence of having created awareness amongst the employees for action to be taken for DRP and BCP.
- There should be evidence of periodic drills having taken place. This would act as a proactive control.
- There should be clear documentation and alternate connectivity being established by the banks with the data centre in case of their being a brake down in the primary connectivity.



1.7 SECURITY AND CONTROLS AT THE DATA CENTRE AND BRANCHES

Branch

Branches are not generally in a position to generate new reports locally. Only those already provided in the application would be generated at the data centre. In some core banking environments at the data centre, there is a server normally referred to as “Report Generating Server”. The CBS application generates these reports and stores it in the report generation server. The branches have access to the report generation server and would be in a position to download the required reports. There is also a practice of a folder being created for each branch in the report generation server. Evaluation of security controls are as already mentioned very different from that in a total branch automation (TBA) environment. In all the reports that may be required for audit is available in the branch for ‘view’ & print only.. Given below is a brief check list for evaluation of security and controls of a branch in the CBS environment. The various aspects which would be covered are as follows:

1. Information Security Policy
2. Access Control Procedures
3. Procedures connected with branch servers
4. Physical and environmental control for the servers
5. Network & Communication control
6. Limited verification of applications
7. Operations connected with ATM/ Internet Banking
8. Business Continuity Plan
9. Change control procedures
10. Others

In the core Banking scenario, auditors may be given specific access through which he can download the data as per his requirement and export to a excel sheet for further analysis. In certain Bank, various other analytical reports are available from data ware house system which takes the data dump from core banking solution and generates various intelligent reports as per requirements.

Information Security Policy

- Does the Bank have a Security Policy? Is a copy available at the Branch? If the whole copy is not available at least those relating to the Branch Operations are available? Any job-cards available?
- Are the employees aware of the existence of the security policy, its contents and the expectation of the management regarding their compliance?
- Is there any record maintained of any security lapses? Are security incidents reported?
- Are there guidelines available at the branch for reporting such incidents of security handling?



Access Control Procedures

Password Management:

- Is there a procedure built into the system by which change of password is enforced before password lapses?
- Does the system ensure that during the first log in the password is changed?
- The original password given is known to the system administrator as he has allotted it. Hence it is absolutely essential that at the first log in using the default password, the process of creating a fresh password should be completed. If this process is not in place the sanctity of having a password is lost.
- Verify the procedure adopted for communicating the user ID to new employees. This is generally done by e-mail. But it is necessary to have a hard copy and the signature of the employee obtained on the same.
- Is there a procedure in place to ensure that the account gets locked if wrong password is used for say three times? This is to ensure that an unauthorised person would not indulge in accessing the password.
- Verify the procedure in place to revive locked accounts. The locked accounts should be capable to being unlocked only by the system administrator at the data centre. Or a centralized process is available to unlock by the same user after authenticating himself via previously set question answer.

User ID Register

There should be an user ID register (a hard copy) which should contain details of when the user ID was given and when it was disabled. This information should be signed by the employee. Obtaining the employee's signature alone establishes accountability and also the time period for which he has been using the user ID. In the absence of such conclusive evidence established, fool proof evidence of accountability in a case of fraud or any other unauthorised activity would be difficult.

Session Activity

Is there a procedure to ensure that a system is not open after a certain period of time? Generally the session will not be allowed to be idle for more than ten minutes. This is to ensure that when the session is kept open unauthorised usage will not be made. The users are expected to log off if they are going to be away from their seats for more than a reasonable length of time.

Disabling the drives

All external drives like floppy drive, CD Rom drives or USB ports should be disabled in all the systems at the branch. If this procedure is not followed, it is possible both to insert and leak unauthorised information. More importantly also virus may be introduced.

Server related procedures

In a core banking solution as already mentioned all servers are hosted only at the central data centre. However, in some cases, for the purpose of operational efficiency, a bank may decide to have a server installed at the branch. It should be ensured that the contents of the servers are verified. At the most, it would be acting as an intermediary server to solve connectivity problems. It is not uncommon to find that when the traffic is slow, band width seems insufficient and processing slows down. Some



banks have a server at the branch for this purpose. In some other cases, at the time of beginning of the day, the opening balances of the branches are loaded so that if connectivity is lost with the data centre, the bank will be able to continue with the operations till such time such connectivity is reestablished.

It should be verified whether there is a specifically designated systems administrator for the server at the branch. His password should be available in a sealed envelope which can be used by the Branch Manager in his absence.

Physical and environmental controls

- Ensure that there is some automated system installed to monitor humidity and temperature in the server room.
- Are there procedures in place to restrict entry only to authorised persons to the server room. Whether multi factor authentications are in place?
- Is there a register being maintained where the name of the person and his signature and time of entry to the server room are entered.

Network

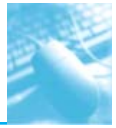
- Verify whether all network cables are protected adequately. In some instances, the network cables may be running on the external walls of the building. In such circumstances potential for intrusion is very high and communication passing through those cables is insecure.
- Verify that there are no unused ports in router, hubs and switches.
- Unused ports should not be available or if available should be adequately protected. If they are not adequately protected an unauthorised node could be connected.

Application level verification

- Application needs to be decided to verify whether it permits back dated entries.
- Does the system have built in control which ensures that significant parameters like interest on deposits, interest on loan are range bound.
- Testing this aspect would ensure that unreasonable parameterization by mistake or intentionally would get introduced.
- Verify whether application logs are generated. This needs to be comprehensive enough to provide information regarding user ID for each of the transactions. It should also provide information as to be able to identify node/ machine from each transaction was generated.

Process regarding to ATM Operations attached to the Branch

- Are the procedures for storing the ATM cards secure?
- Are there procedures in place to reconcile the physical stock of ATM cards, eg., a register should be maintained regarding cards received and cards issued to customers. Cards returned by customers and balance on hand.
- Is the branch received pin mailers. Generally the mailers should be sent by secure methods like reputed couriers directly to the customer. Should the Pin mailer and the ATM card be received at the branch and retained their security is a matter of concern. The possibility of matching the



pin mailer with the corresponding card by looking at the address could lead to unauthorised and fraudulent transactions.

- Are there procedures in place to ensure that the pin mailers and cards are under the safe custody of two different officers?
- Procedures for returned PIN mailer & cards to be verified invariably.
- Are there procedures in place for updating the main core banking system with the details of the cards issued to the customers?
- It is necessary that this procedure should always be in a set of updatedness as otherwise there is a possibility of a customer being denied ATM access as the details of his card are not available in the main data base.

Operations of ATM that are attached to the branch itself

- Verify whether there are procedures for cash loading, recording of cash transactions and a final reconciliation of the balance.
- Verify whether the ATM master key is under dual control. This is extremely important as encryption process depends upon the security procedure adopted. The encryption key is divided into two parts and each of the officers would be able to load only one half. Hence, if the dual control is effective no one person will know the encryption key.
- Verify the procedures for storing the ATM journals. The ATM journals play a very significant role in reconciling the transactions which have taken place in the ATM.
- Verify the procedures which are in place for dealing with swallowed cards. Swallowed cards should be kept in safe custody and after proper scrutiny they have to be returned to the established owners of the cards or returned safely to the central office.
- Verify the procedures for reconciling the cash in the reject bin.

2 CBS INTERFACES THEIR FUNCTIONALITY AND CONTROLS

LEARNING OBJECTIVES

- Automated Teller Machine (ATM)
- Internet Banking / e-banking
- Real Time Gross Settlement (RTGS)
- Cash Management System (CMS)

2.1 AUTOMATED TELLER MACHINE

Automated Teller Machine (ATM) is a computerised telecommunication device. Usage of this facility dispenses with the need for a bank teller. This facility provides a customer to access financial transactions in a public place. ATMs may be installed within the branches, away from the branches and at shopping malls also.

The facility of ATMs provided by one bank may be utilised by ATM card holders of other banks also, who would have entered into an agreement to share such facility.

ATM Card

The ATM card has a magnetic strip. The card contains a unique number and some other security information apart from date of expiry of the card. The ATM card is issued only to existing customers of the bank. The customer has to fill up an application form and submit the filled-in form to the branch to which he belongs. The concerned Branch Manager recommends and authorises the issue of an ATM card by forwarding the application to the Central Office which deals with the issue of ATM cards.

In view of the severe competition now almost all the banks provide to their customers soon after they open an account with the facility to perform internet banking and possess an ATM Card.

Procedure for issuing ATM Cards

At the Central Office, there is a specifically designated computer system which has specific software. The application form received from the customer is the input for the process and the output consists of a file containing data for the preparation of an ATM card. The software checks whether the customer details provided in the application tally with the data contained in the Central Data Base of the Core Banking Solution. Only after the details tally, the output file is generated. The Personal Identification



Number (PIN) is generated by the software and directly sent to equipment for printing the Pin Mailer. It is to be noted that the PIN generated is not stored in the memory of any machine.

As a concurrent process, a natural PIN is generated and stored in the data base of the ATM switch.

ATM switch should not be confused with normal switches.

ATM switch is a computer with a server attached to it. Data base resides on the server.

Natural Pin

There are different methods of generating a natural PIN. The natural PIN is a number. One of the methods adopted is to encrypt the card number. After encryption, the encrypted value of the card number is obtained. This encrypted value is decimalized which in turn will produce a number with several digits. The first four digits of the above number is called natural PIN. The natural PIN (the first four digits of the above mentioned number) is deducted from the PIN value. As mentioned in the earlier paragraphs, the PIN number is generated even while preparing a file for preparation of ATM Cards. The value of the natural PIN is deducted from the PIN value which gives the offset value.

PIN No (-) Natural Pin (=) offset value.

It will thus be observed that every time the value of the natural PIN is added to the offset value, the PIN of the customer is generated. It is important to note that the PIN number of the ATM customer is not stored in any ATM machine or ATM switch. Only the offset value is stored and only the customer knows the PIN number. The PIN is communicated to the customer by means of delivery of a cover which contains the PIN mailer. As we all know neither the PIN mailer nor the ATM card is sent through ordinary mail but only through trusted couriers. It is a good practice to send the ATM cards to the concerned branches and the PIN mailer by courier to the customer directly.

ATM Operations

The ATM generally performs the following functions:

- (a) Cash Withdrawal
- (b) Balance Inquiry
- (c) Registering requests for cheque book
- (d) Changing of PIN number

A sample of the ATM network would be as shown in the fig 2.1.1 below:

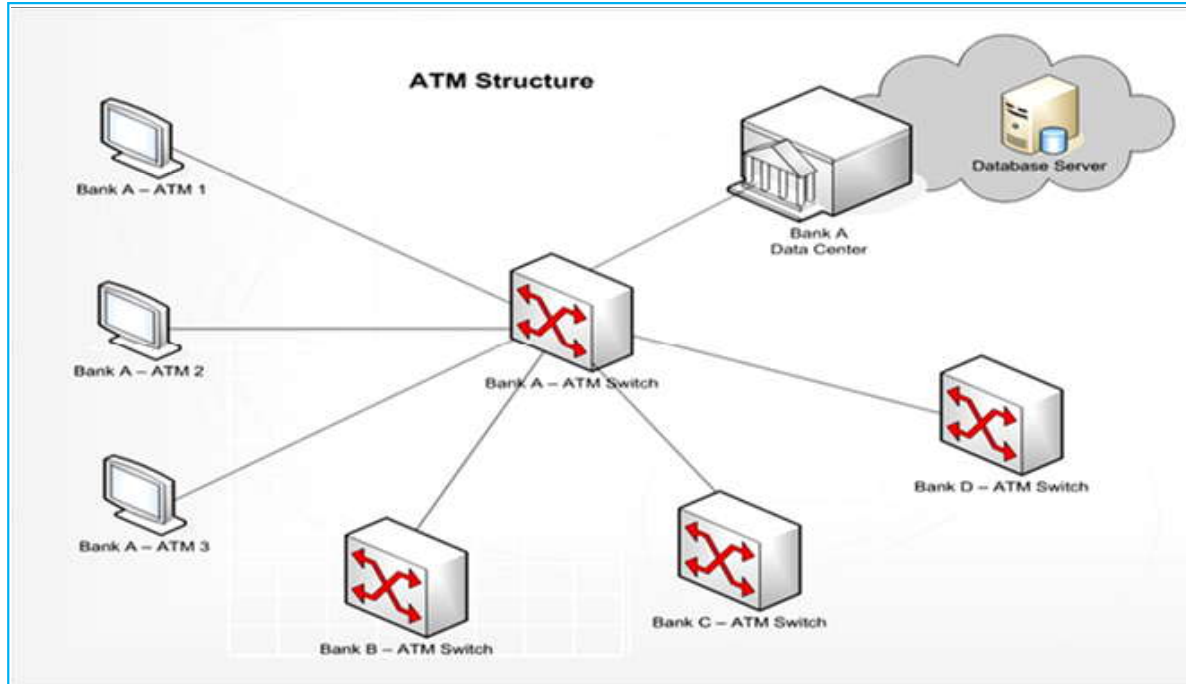


Fig. 2.1.1. ATM Network Structure

All the ATMs of a particular bank are connected to an ATM switch of the bank and the ATM switch in turn is connected to the server of the bank by means of internet connection. The ATM switch is not like other switches; but it is a server. There is an operating system residing in the server.

ATMs may also be connected to the switch by means of a leased line or dial up line.

A single data base of all the customers of the bank resides in the Central Data Base at the Data Centre of the Bank. The data base itself resides in the data base server to the Data Centre.

Functioning of the ATM

- The customer swipes his ATM card and information provided in the magnetic strip is read by the machine.
- The customer has to key in his Personal Identification Number (PIN), which he has received by means of PIN mailer sent by the bank
- The PIN entered is immediately encrypted by the machine called the PIN machine. Sometimes this process is also achieved by means of the software which resides in the ATM server. The encryption may be done by means of a hardware or software. When it is done by the hardware, there is a hardware security model (HSM); if this is done by software, there is a Software Security Model (SSM). HSM or SSM encrypts the PIN entered by the customer by means of an encryption algorithm. This algorithm is loaded into the machine by the officers of the bank. As it is necessary to ensure security, the loading process is done under dual control by two officers each loading one half of algorithm.
- When the account number and PIN provided by the customer tally with the data available at the data base of the switch and PIN generated by the PIN machine the customer is authenticated; it means that the customer has been recognized as a genuine customer of the Bank.



- It will be observed that loss of ATM card alone is not a matter of concern such as losing both the ATM card and the PIN information
- Once the customer is authenticated the process requested by the customer is initiated, e.g., the customer has asked for cash withdrawal. This request for withdrawal of cash is passed on to the data base of the bank, which is available in the data base server at the central data base. At this juncture, the system verifies whether the customer has adequate balance to enable him to withdraw the cash required. Once it is ascertained that adequate balance is available, the ATM switch which receives the information authorises dispensation of cash required at the ATM machine.
- The activity of the cash disposal is facilitated by the ATM switch. The cash is then picked up by the customer.
- After the cash has been dispensed and the customer has picked up the cash, the ATM switch communicates with the Central Data Base server so that the cash withdrawal is recorded and the balance is accordingly reduced.

At the ATM: Cash journal and the ATM log are generated recording the process which has taken place. There are also electronic journals which are generated at the ATM. When ATMs are located in remote places, the information with the electronic journal can be retrieved by a process called as Electronic Journal Pulling.

- As we all know, there are arrangements between banks by which ATM card of one bank can be processed at the ATM kiosk of another bank. This process is possible within the banks which have entered into an agreement to this effect. The process that follows when the ATM card of a different bank is swiped at the ATM kiosk is slightly different. As the ATM card of another bank is swiped, the information regarding the bank and the customer number are available to the ATM. The information so obtained is directed to the ATM switch of the other bank. The process thereafter is similar to the process discussed in the above paragraphs.
- It is possible that a customer did not or could not collect the cash dispensed by the cash dispenser. In such a case, the cash dispensed would be collected in a secure tray for collecting rejected cash. Also the fact that cash was not collected would be reported by the ATM to the switch. The switch in turn would request the host computer for reversal of entry. This would result in the original debit entry passed at the central data base being reversed so that the customer is not debited with an amount he did not or could not collect.
- The switch and the host computer log all the events, thus facilitating reconciliation of cash and entries.

In view of the facility of the usage of ATM card of one bank in another bank's ATM kiosk there are certain other factors of importance. The cash is dispensed by one bank on behalf of another bank. As this operation takes place in all the banks, there is a process of reconciling these cash transactions, so that the respective banks are reimbursed with the net amount due to them.

Verification of the PIN

The customer enters his PIN and there is a process which takes place before the PIN is accepted and authentic by the machine. The various steps are as follows:

1. The customer inserts the card and thereafter types the PIN.



2. The encrypted PIN is sent to the ATM switch.
3. The details of ATM card issued are already in the data base and when the ATM card is inserted the machine verified to see whether the number is in the data base and satisfies itself of its existence.
4. From the card number natural PIN is generated. As already discussed natural PIN is generated by decimalizing the encrypted value of the card and considering only the first four digits represent the natural PIN.
5.
 - (a) The difference between the actual Pin and the natural PIN is stored in the ATM switch as an initial step. Subsequently whenever the customer inserts his ATM and keys his PIN in the machine, the correctness of the PIN is verified by the system by adopting a process as described below: The system has stored the offset value (offset value is the Difference between the actual PIN and the natural PIN)
 - (b) When the card is inserted, the card number is encrypted by the HSM or the SSM. The encrypted value is decimalized and the natural PIN is obtained (which is the first four digits of the value obtained by encrypting the card number and decimalizing the same).
6. This value of the natural PIN obtained is added to the offset value available already in the system. At this stage, the relevant PIN is generated within the system.
7. The generated PIN as described above is compared with the PIN typed by the customer; if they tally the customer is authenticated.

Knowing the PIN alone will not facilitate a person to access the ATM facility. It is a combined effect of the ATM card and the PIN which permits access to the ATM.

Change of PIN

Just as there is a facility for an user of a computer to change his password, it is admissible and possible for an ATM card user also to change his PIN. This may be done for security reasons. The process of changing the PIN is as follows:

On the key pad at the ATM, there is a key 'Change No.' when this key is pressed the ATM will ask for the old PIN. The customer is to key in his old number and then only key in the new PIN number he proposes to have. By making use of the process of generating the natural PIN and summing it up with the card number, the ATM will be able to arrive at the old number and satisfy itself that the person who wants to change his PIN is an existing customer, who has been given an ATM facility. After thus satisfying, the machine permits the customer to enter his new PIN. As the natural PIN is already available the new offset value is computed and stored. The old offset value is erased. For all future operations making use of the natural PIN and the offset value available, it generates a new PIN with which it able to compare the PIN keyed in by the customer. It is important to note that nowhere in the system is the PIN stored. There is only a process of computing PIN corresponding to the ATM card inserted.

Normal operational problems faced with the ATMs

- Cash may not be sufficient. There may be a sudden overdraw of cash contrary to expectations.
- The journal paper roll might have been exhausted and a refill may not have been placed.
- If the network connection is lost or there is some other operational problem, the ATMs may not function.



- There is a monitoring facility available with the Bank by which information is available as to which ATM has stopped for what reason.

It is possible that a card holder by mistake may key in a wrong PIN. The ATM machine will not give him right to access. Generally all ATMs permit only three chances to commit mistakes and should a fourth attempt be made, the card will be rejected.

It is also possible that the card may be stolen. The owner of the card might have instructed the bank to hot list it. Hot listing is similar to countermanding of a cheque. If a card which is hot listed is inserted into an ATM, the machine will swallow the card thus preventing the usage of the card.

Evaluation of Control of ATM Operations

As already discussed, there are various processes in ATM operations and it is absolutely essential to evaluate the adequacy of controls in each of these areas. In the paragraphs to follow, the controls which have to be in place in the different operations are discussed. The different heads of operations are:

1. Card and Pin generation
2. Method of dealing with surrendered and captured cards
3. Security of the PIN
4. Control over cash
5. Minimum records to be maintained for transactions
6. Method of dealing with lost and stolen cards
7. ATM switch operations

For evaluating adequacy of controls one should be aware of what controls need to be in place.

Card and Pin generation

- There should be separate departments and members of staff for card and pin generation.
- The pin mailer tape should have card and account number
- There should be reconciliation procedure for the number of PIN mailer and cards produced.
- This should take into account not only the number of cards and pins produced but also those spoiled.
- There should be adequate security procedures for
 - (a) Access to the building
 - (b) Stock of blank cards
 - (c) Stock of live cards and pin mailers
- The pins on the tape should be in an encrypted state.
- Live cards and pin mailers should be dispatched separately from different locations eg.,
 - (a) ATM card should be dispatched from the Branch and
 - (b) Pin mailer should be dispatched from the Central Office.



- There should be proper records for all delivered cards.
- The returned cards and returned pin mailers should be with two different officers. This procedure is extremely important to avoid any fraud being committed by a person picking up a card and the corresponding pin mailer. This could be easily done with reference to the address being the same on both.

Surrendered and Captured Cards

- There should be clear documentation regarding surrendered and captured cards.
- There should be documentation for issuing replacement for cards and pin numbers.
- There should be procedures for making the captured cards ineffective either by the card holder or by the bank.
- Instructions should be in place to inform the customer that the pin mailer should not be returned to the bank.
- There should be a register maintained for all surrendered cards. The captured cards in the bin should be opened in the presence of two officers and details thereof entered in a register duly signed by both of them.
- The journal roll at the ATM would also be recording details of the captured cards. The captured cards should be removed on a regular basis and reconciled with the journal roll.
- The host computer at the data centre should be producing a report on the captured cards.
- There should be clear procedures available for reissue of cards or change of the PIN numbers.
- There should be a control procedure by which the ATM swallows the customer's card after the customer has made three failed attempts to key in the correct PIN number.

Security of the PIN

There should be a procedure in place to stop the card operation, when the card holder reports to the bank that his PIN has been compromised.

The customer should be advised never to disclose the PIN number to any other third party including the Police.

- There should be procedures in place for generating a new PIN number on a timely basis should the PIN be lost or stolen.
- PIN number should be held in data files only in a encrypted form.
- PIN offsets also should always be encrypted.
- There should be a process in place for either hardware encryption or software encryption (HSM - Hardware Security Model and SSM - Software Security Model).
- There should be procedures in place by which all work and storage areas used for PIN encryption are zeroized after each calculation.
- There should be no hard copy available in the system of records of PIN produced.

Control over Cash

- There should be documented procedures for cash control and balancing process.



- Data roll should automatically record all insertion and withdrawal of cassettes.
- There should be records indicating amount of cash inserted into each cassette.
- The Bank staff should reconcile duly the following:
 - (a) Cash inserted
 - (b) Cash dispensed
 - (c) Cash remaining
 - (d) Miffed notes
- There should be a procedure to monitor all discrepancies reported.
- Individual responsibility for the reconciliation should naturally be a person different from the person responsible for the maintenance of cash.
- There should be a procedure to ensure that wrong denomination notes are not inserted into the cassettes.
- Daily balancing process should ensure that:
 - (a) The currency deposited and dispensed should agree with the ATM cumulative total;
 - (b) The total of the deposit and withdrawal transactions generated by ATM should also be logged by the host computer and the branch System.

Minimum records to be maintained for transactions

- There should be a journal roll fitted to each ATM. The journal roll records all events at the ATM and hence is of great importance.
- Hard copies of the journal should be preserved securely.
- There should be a built-in procedure to have a soft copy of the journal.
- The soft copy is also called an 'Electronic Journal'. It should not be possible to modify the soft copy. The soft copy should be stored securely.
- Only the authorised key holders should be permitted to make weekly check of the journal roll machine record. Verification by the of the record would disclose if there had been any unauthorised opening of the ATM or any operation removal of cassettes.

Standard methods of dealing with Lost and Stolen Cards

- There should be documented procedures to be followed to deal with stolen /lost cards.
- An up-to-date file containing all details of reported lost and stolen cards should be available.
- The access to this file should be restricted.
- There should be a facility to immediately identify when a stolen or lost card is used.
- There should be a trigger to reject the transaction or capture the card.
- Even when instructions to stop usage of ATM cards are given verbally there should be provision to take action against the same.
- There should be a written notification from the card holder about his card being stolen or lost and then only a replacement card issued.



- There should be a policy in line with legal provisions relating to the liability for withdrawals made prior to and after notification of a card being stolen or lost.
- All reports regarding lost and stolen cards should be retained for a reasonable length of time,

ATM Switch Operations

As already mentioned ATM switch consists of a computer with a server attached to the same. Details of the ATM card holders is available at the data base, The details would include

- (a) Card No. and corresponding offset value (offset value has already been discussed earlier)
- (b) Details of hot listed cards
- (c) Details of surrendered cards and
- (d) Account balance of customers. (This account balance is also called positive balance file - PBF. This is made available at the ATM switch. Even when the ATM is offline, the balance of the customer is available.

The important control points to be reviewed for audit purposes would include the following:

- There should be a Security Guard as also a CCTV (Close Circuit Camera)
- A register should be maintained at the entry point.
- The server has an operating system. The settings of the operating system need to be reviewed to ensure it is in line with the best practices.
- Only the Systems Administrator and none else capable should be capable to access to the operating system.
- The ADMIN Password should be kept secure.
- The application software, which is in the switch, has details of the maximum number of withdrawals per day, the limit for the withdrawal, number of failed attempts etc., these are parameterized.
- The procedure for configuration the parameter should be reviewed.
- Only an authorised person should be capable of making these modifications.
- Procedures in place for key storage should be reviewed. Security of key used for encryption and decryption purposes should be evaluated.
- Review of procedure for hot listing of ATM cards needs to be reviewed.
- Examination of the types of logs that are generated and review of such logs is important.
- When there is an agreement with other bank's for usage of their ATMs such agreement should be reviewed especially with reference to customer claims for "money not received but account debited".
- Very importantly, review should be undertaken of procedures in place to deal with another bank / branch reconciliation.
- Any undue delay in reconciling these may give rise to mushrooming of unauthorised entries getting masked in the account



2.2 INTERNET BANKING

Internet Banking refers to banking transactions routed through the Internet. This facility permits registered customers of the bank to perform banking operations at any time of the day from any computer - now it may also be possible to do it from a cell phone.

No doubt, Internet Banking facilitates banking through the medium of internet. However, it also needs specialized software and hardware. The internet as you all know is a public network. Hence proper security features are built into the system to maintain confidentiality and integrity of the data that is being transferred through the internet.

Some Banks provide this facility automatically soon after a customer opens an account with them. Some others require a special request from the customer to provide this facility.

However, whatever be the method of providing internet facility, there is a process to be followed.

Process

The main components of Internet banking system consist of Web Server, Internet Banking Application Server (IBAS), Internet Banking Data Base Server (IBDS), Middleware, and Central Data Base Server.

We give below a broad Data flow diagram describing the Internet Banking Process.:

Customer Customer using a browser such as Internet Explorer to access the Web	Web Server & Web host	IBAS Internet Banking application Server	IBDS Internet Banking Database Server	Middleware	Central Database Server All data to and from the Core Database server is scanned by Firewall
	De-Militarized Zone (DMZ)			Trusted Inside Zone	

Web host is a system that has an operating system and runs the services from the Web server. All data to and from the Web server are scanned by the Firewall as shown in Fig 2.2.1(A) and Fig 2.2.1(B)

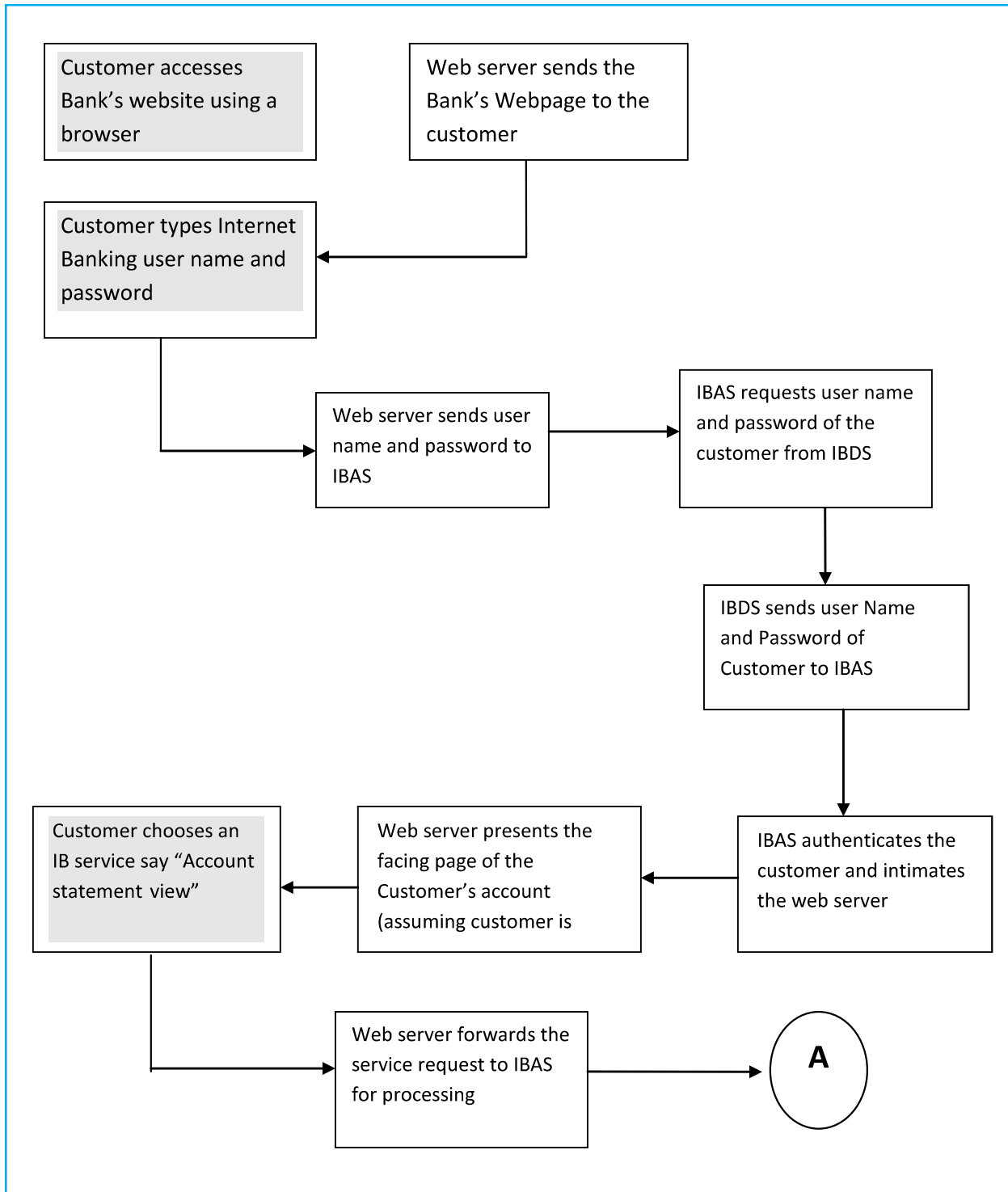


Fig 2.2.1(A): Broad Data flow diagram describing the Internet Banking Process

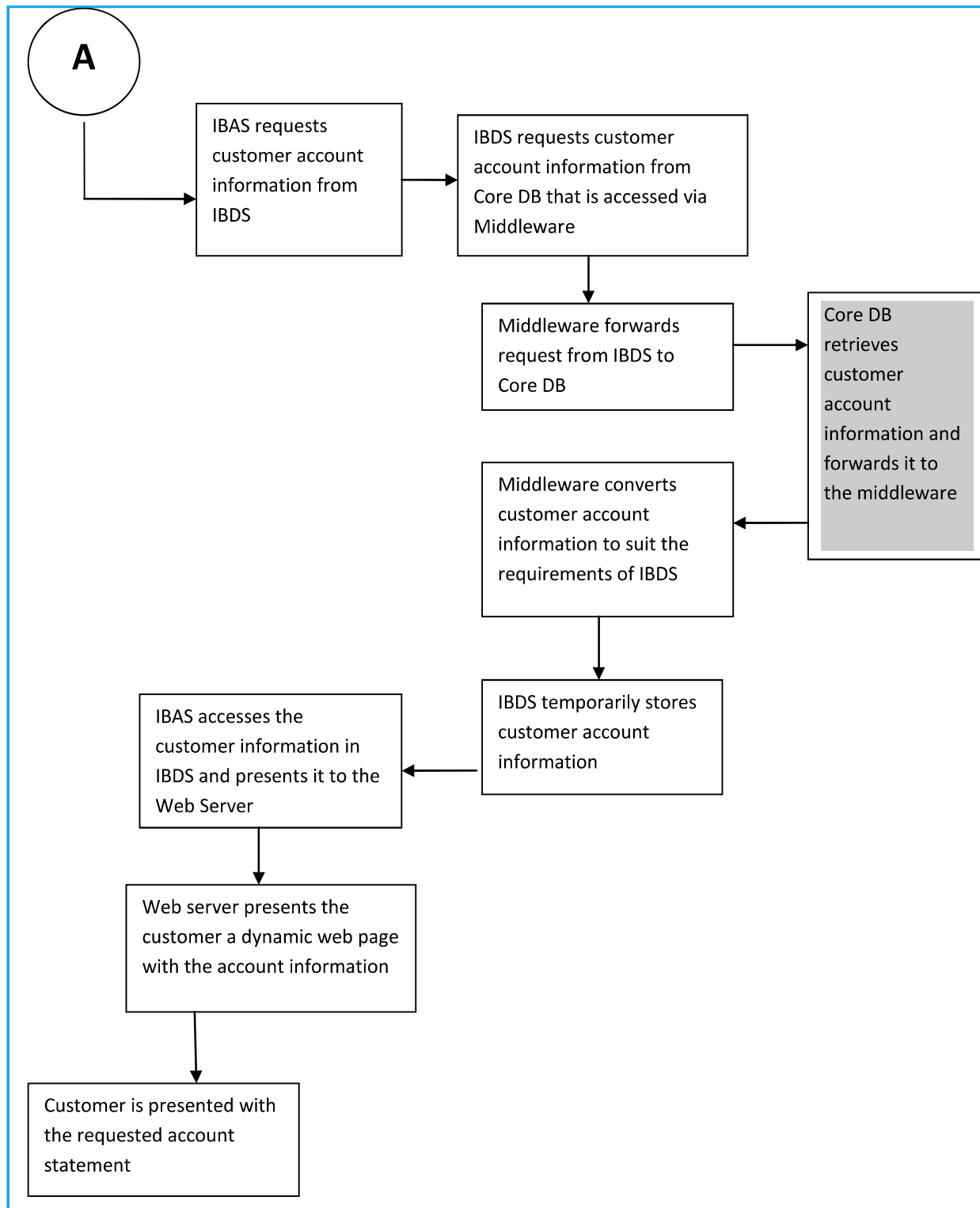


Fig 2.2.1(B): Broad Data flow diagram describing the Internet Banking Process



The customer applies to the bank for such a facility. He is provided with an User ID and Password. As is he best practice the password is expected to be changed soon after the first log on.

- Internet facility could be used only by accessing the website of the bank. For accessing the website, naturally a browser like internet explorer is used.
- The website is hosted in the web server. The web server is in the central data centre of the bank. Access to the web server is permitted only to authorised users.
- To protect the web server from unauthorised use and abuse, the traffic is necessarily to go past a firewall. The firewall is designed in such a fashion that only traffic addressed to the web server through the authorised port is permitted.
- An individual who accesses the website of bank through the browser will be able to access the web server and there will be a display of the bank's web page on the screen of the client's computer.
- The web page will also provide all information generally of interest to the public. The web page also will have a specified area wherein a mention of user ID and password will be made. Those who have been provided with the user ID and password would be expected to enter the same.
- As we are all aware, the password will not be displayed in plain text but will only be in an encrypted form.
- The web server forwards the customer details to the internet banking applications server which in turn accesses the IDBS. The server has already the data base of all the customers who have been provided with internet banking facility. For each customer, it would be having details about user ID and password.
- The information received from the web server is verified with the data of the customer held in the internet banking (IBAS).
- Should the information not tally, the message 'access denied' would appear giving the reason giving the 'user ID wrong / password wrong'. The customer realising the mistake may rectify the mistake and make another attempt. Normally three such attempts would be permitted. After three attempts, the customer will be logged out for security reasons. If more attempts are permitted, there is a possibility of a person just trying out different combination of user ID and password to break into the system.
- Based on the authentication check, the IBAS sends an acknowledgement to the web server. The web server displays the message. Once the authentication process is completed correctly, the customer is provided internet banking facility, which would include:
 - (a) Password change
 - (b) Balance inquiry
 - (c) Fund transfer
 - (d) Request for cheque book
 - (e) Stop payment
 - (f) Copy of statement of account and
 - (g) ATM / Credit Card related queries



- The customer then chooses one of the services from the list. The service requested is directed by the web server to the IBAS for processing. The IBAS will access the internet banking data base server for further processing.
- The IBDS will retrieve the data from the central data base server. The IBDS will be able to access the central data base server only through a middleware and firewall. The middleware is expected to convert the data to suit the requirements of IBDS.
- Internet banking data base server then forwards the customer data to the IBAS which processes the transaction eg., The statement of account from the central data base server is made available to the internet banking data base server (IDBS). The IBDS then sends the data to the IBAS. The IBAS then sends the same to the web browser (internet explorer).
- The web server generates a dynamic web page for the service requested eg., the accounts statement generated by the web server and presented to the internet explorer (say) the information is provided to the web browser in an encrypted form.

The customer would be able to get the service required eg., viewing of the statement of account or a screen made available for him to request for a cheque book or instructions for 'stop payment' etc., After the services provided, the explorer may choose to log out.

Depending upon the software, the customer may be permitted to request for more than one service in one session. Some software would automatically log out the customer after one service has been completed and expect him to log in again.

It needs to be emphasised that security is a serious concern in internet banking and should be implemented with great care.

The security concerns could be:

- (a) Privacy issues - customers being able to view accounts other than their own.
- (b) Wrong or fraudulent fund transfers. The transfer requested by the customer may be executed wrongly i.e., instead of one account being credited or debited, a different account may be accessed.
- (c) This weakness could be exploited by customers with fraudulent intentions by making unauthorised access to certain customers' accounts and transferring to their account.

PROCEDURES FOR EVALUATING CONTROLS

In any process of evaluation of controls, one needs to be aware of security concerns in an environment.

Main security concerns in Internet Banking are:

- Unauthorised access to any of the access points
- Incomplete or inappropriate procedure regarding identification of user.
- Lack of segregation of duties in the operation facilities, applications and data.
- Roles and responsibilities of system administrator not clearly defined.
- Firewall not clearly configured and monitoring procedures absent / inadequate.
- Absence of segregation of lives and test environments.
- Inadequate network security.



- Routers improperly positioned.
- Inadequacy of security of web server.
- Inadequate security of Internet Banking system.
- Inadequate security of Data Base System.
- Insufficient built in Application Controls.
- User authentication.
- Incomplete and cancelled transaction.
- Insufficient data security.
- Informal / unstructured change management procedure.

Broadly, the audit program should be on following lines

1. Security Policy

Verify whether there is a written Internet Banking Security Policy – which should include firewall policy and access policy. Overall policy guidelines should be documented and available. It should cover policy and procedures for all access points to the Internet Banking system.

The access points should include:

- (a) User System.
- (b) Front end application.
- (c) Router, switch, firewall.
- (d) Application Server.
- (e) Web Server.
- (f) Database Server.
- (g) Network.
- (h) Infrastructure of Internet Banking.

2. User Identification

Unauthorized access to other customer accounts will amount to violation of privacy rights.

Existing security mechanisms should be verified to ensure this requirement. Even weak password could lead to security lapse.

- Internet Banking Application Program should be accessible only to authorised users. In the absence of such discipline, unauthorised changes could be made to application program.
- There should be adequate logs maintained to provide monitoring facility.
- Any attempt at penetrating the network should be proactively detected by installing Intrusion detection / prevention systems.
- There should be provision to automatically log such attempts and these logs should be reviewed on a daily basis.



3. Access Control to Operation facilities

- (a) There should be adequate segregation of duties. Incompatible functions should not be performed by the same individual.
- (b) There should be a procedure in place to ensure that soon after an employee designs his user ID and password are revoked. His logical access should be denied.

4. Roles and Responsibilities of System Administrator

System administration is a sensitive function and should be allocated to a specific individual. He needs to have access only to perform system administration function. There should be built in control to report by means of a log if he performs any other function.

5. Firewall

It has to be ensured that internet banking services is only through a dedicated Firewall.

Periodically penetration tasks (tests to unauthorized enter the network) should be performed to ensure it is not possible

If vulnerabilities are highlighted it should be verified whether immediate corrective steps have been taken.

There should be approval from appropriate senior management before firewall, routers and other associated systems are changed or upgraded.

6. Segregation of Live and Test Environments

Like in all Computer Systems, test environment should be separate from live environment. No testing should be done in the live environment. Live environment is the environment where the live program is running. Such a program would have been thoroughly tested and moved under proper authority from test environment to live environment.

7. Network Security

There should be adequate control mechanism in place to ensure that access to both in and out of internal network are controlled.

Review whether there is any provision (usage of tools) to monitor suspicious activity.

8. Router Configuration

Routers should be properly configured to ensure that network is restricted to only necessary systems and none else.

9. Web Server Security

Web Server should run only required processes and none else. The Web Server would have its own operating system (e.g., Windows 2003) and it should be ensured that all security settings of the operating system are in order.

10. Security of Internet Banking System

A list of authorised users should be maintained and the system should not allow access to any other user.

Internet Banking system configuration should be well documented.



There should be adequate controls in place to ensure that integrity and security of transactions are not affected.

11. Data Base

Data Base should be accessible only to the Computer application in the normal course. In addition Data Base administrator has access for maintenance. There should be a log generated if any other access has been made.

Personal Identification Number (PIN) of clients which will be stored in the Data Base should be only in encrypted form.

12. Operational Controls - Built in Controls

Application should have been tested extensively so that all validity criteria are complied with before a transaction is processed.

13. Operational Controls - User Authentication

User authentication mechanism should be in the place to ensure access is restricted to authorised personnel.

14. Operational Controls - Incomplete and cancelled transactions

Procedure for incomplete processing needs to be reviewed. Special attention needs to be paid to study the possibility of a client canceling a transaction which has been entered. E.g., Fund transfer might have been entered and authorised - whether system will permit reversal - needs to be studied.

Operational Controls - Data Security

Key management procedures (for encryption) in place must be in line with best practices (Dual control)

Review whether critical data like PIN encryption keys should be stored in a physical environment e.g., in a physically secure hardware like HSM (Hardware Security Model). There should be satisfactory restart and recovery procedures in place.

Review application testing procedure for its adequacy i.e., conforming to best accepted procedures.

15. Change Management Procedure

Ensure there is a formal procedure in place for change management. Special attention needs to be paid for Emergency Procedures..

16. Library Procedures

Documenting and numbering of different version of programs, storing safely different version of programs, moving program from test environment to production environment etc. needs to be reviewed for their adequacy and conformity to standard procedures.

2.3 REAL TIME GROSS SETTLEMENT

The acronym RTGS stands for "Real Time Gross Settlement". RTGS system enables transfer of money from one bank to another on a "Real Time" and on "Gross" basis. Real time means that the transactions are settled as soon as they are processed. There is no waiting period. Gross settlement means that this transaction is settled on a one to one basis. There is no bunching with another transaction. The money transfer takes place in the books of the Central Bank of the country - Reserve Bank of India



in our country. As the money transfer takes place in the books of the RBI, the payment is final and irrevocable.

Difference between Electronic Fund Transfer System (EFT) or National Electronics Fund Transfer System (NEFT) and RTGS:

EFT and NEFT are also electronic fund transfer modes. However, they operate on a Deferred Net Settlement (DNS) basis. In DNS basis transactions are settled in batches. Transactions which take place after a particular settlement time would have to wait till the next designated settlement time.

In RTGS, transactions are processed continuously throughout the RTGS business time.

RTGS system is primarily for large value transactions. As of now, the minimum amount to be remitted through RTGS is Rs.1.00 lakh and there is no upper ceiling. In EFT and NEFT systems, there is no stipulation regarding the minimum and maximum amount. The time taken for the transaction to be effected would be within two hours. The beneficiary bank (Bank which is receiving the amount) has to credit to the beneficiary's account within two hours of receiving the fund transfer message. The remitting customer would receive an acknowledgment for the money credited to the beneficiary's account as the remitting bank receives a message from the RBI that the money has been credited to the receiving bank.

However, if the money is not credited for any reason, the receiving bank would have to return the money to the remitting bank within two hours. The remitting bank would in turn reverse the original entry - the debit entry in the customer's account.

The essential information that the remitting customer would have to provide to the bank for the remittance to be effected are:

- (a) Amount to be remitted
- (b) His account number
- (c) Name of the beneficiary bank
- (d) Name of the beneficiary customer
- (e) Account number of the beneficiary customer
- (f) Sender to receive information if any and
- (g) IFSC Code of receiving branch (IFSC stands for Indian Financial System Code. (Explained later in the Chapter)

The beneficiary customer would be able to obtain the IFSC Code from his branch. This information is also available in the cheque leaf. The beneficiary can inform the remitting customer details regarding Code number and Bank branch.

Most of the Banks are providing RTGS service. The latest list of such branches is also available in the RBI Website.

Procedure for tracking the remittance transaction

Some banks which have the internet banking facility provide the service on line. The remitting customer would be able get confirmation from his bank either by e-mail or SMS on the Mobile phone.



Real Time Gross Settlement Process

The Banks which wish to be recognized for RTGS processing need to apply to the Reserve Bank of India to be recognized as participant banks by the Reserve Bank of India. The various steps involved in the transaction processing of RTGS are as follows:

- The customer, who wishes to remit from his account in Bank A to the recipient in Bank B, approaches Bank A.
- The transaction is entered in the client machine at the Bank A.
- The client machine is connected to a server.
- Each of the participants Bank is allotted a code number.
- This code number is called Indian Financial System Code (IFSC).
- Each of the branches of the participant bank of RTGS is allotted a unique code (RTGS Branch Code).
- A combination of these two codes referred to, act as the identification.

R.T.G.S. Technical Environment

The Diagram below explains the functional architecture of Next Generation Real Time Gross Settlement System, (NG-RTGS) as shown in Fig. 2.3.1

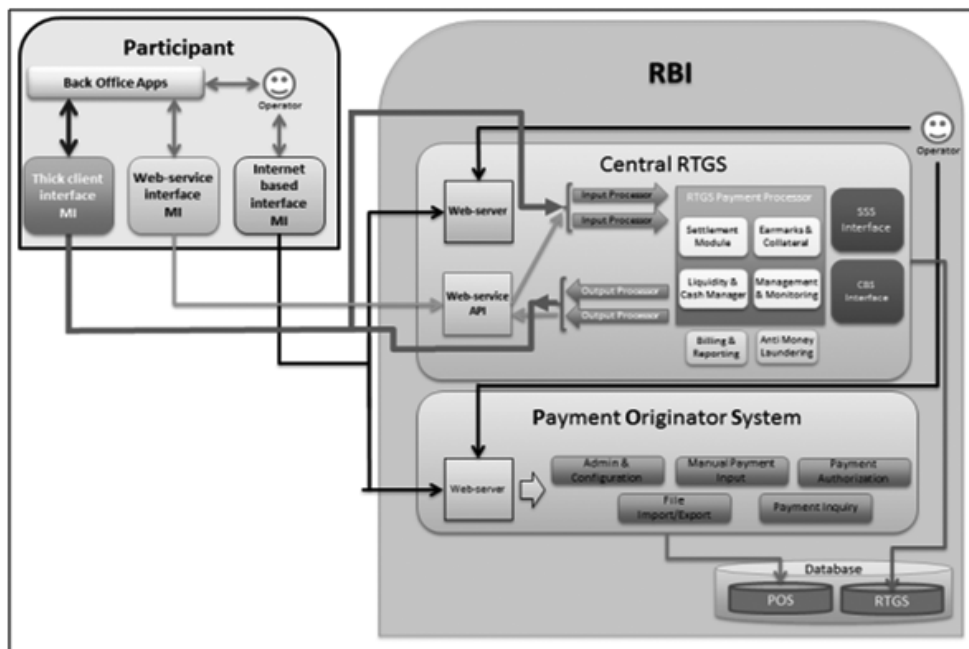


Fig.2.3.1: Functional Architecture of NG-RTGS

Features of NG-FTGS

- Interface with RBI's CBS
- STP capability with Ancillary systems



- Advanced MIS tools for report generation
- Scalability of system, including efficient and optimal threading time for transaction and capability to handle large volume of transaction
- Flexibility to add new transaction types and participant membership types
- Future value date settlement
- Balance status enquiry from central system
- Compliance to international standards including Core principles for SIPS issued by BIS
- Multi currency system
- Extended business hours
- Centralized Anti Money Laundering filtering
- Monitoring and control of payment messages

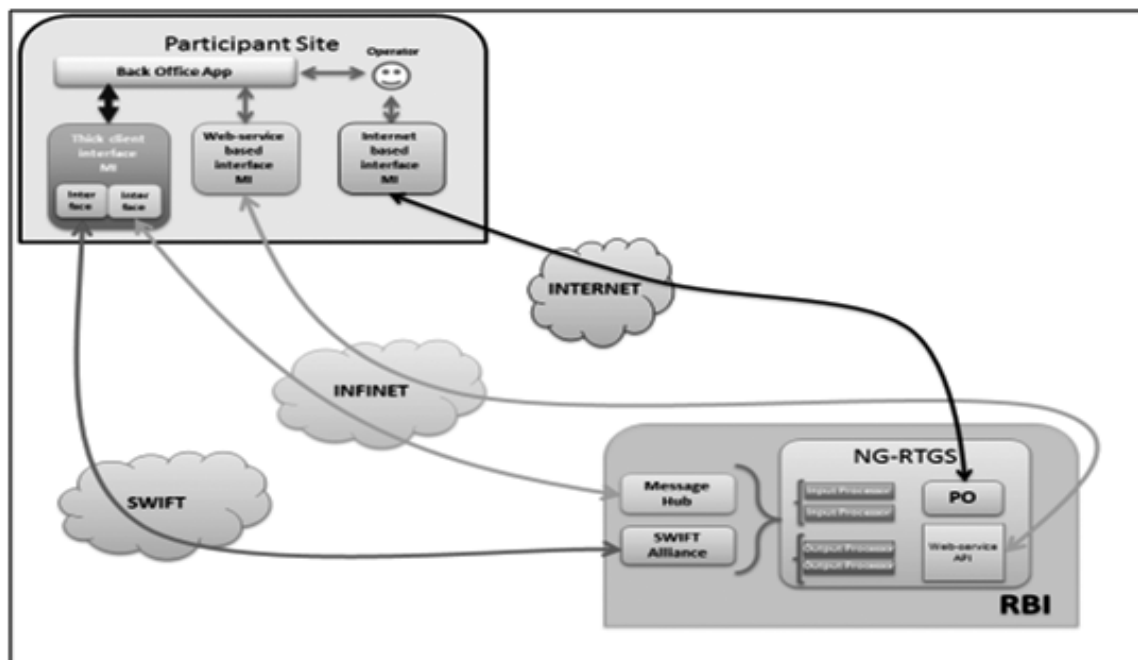


Fig 2.3.2: Communication Channels

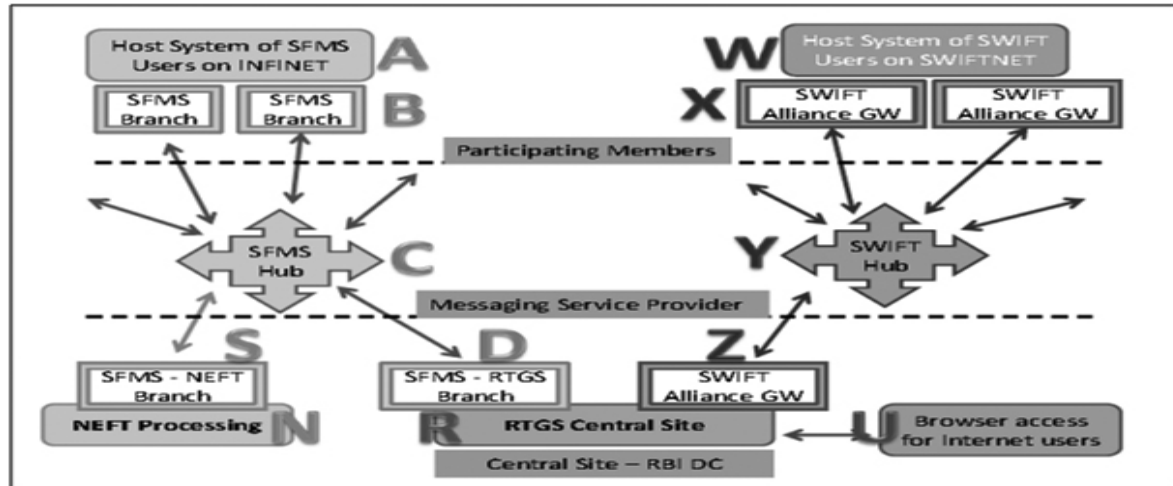


Fig 2.3.3. Design Architecture

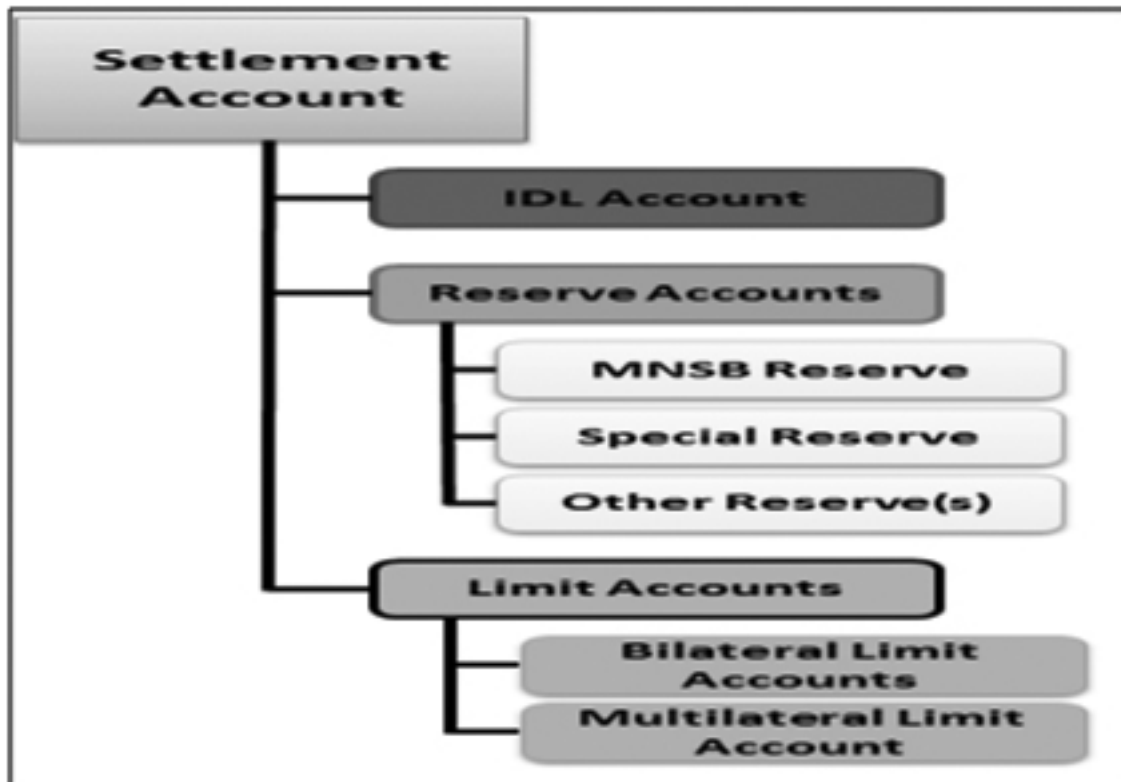


Fig 2.3.4: Settlement Account Structure

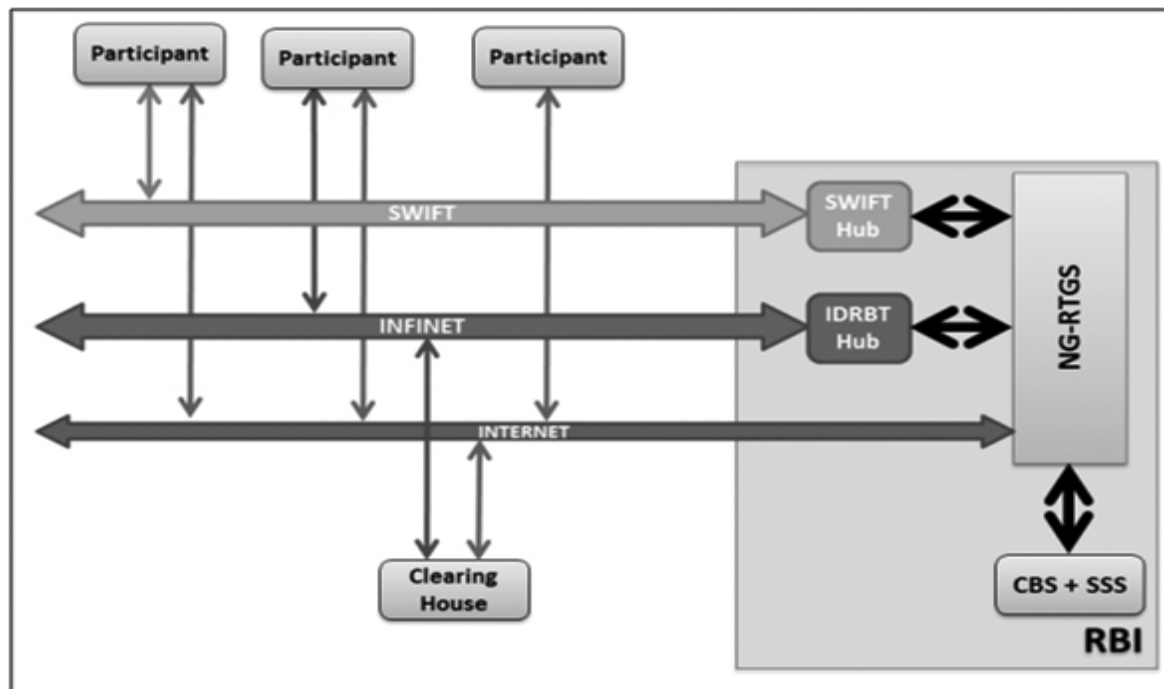


Fig 2.3.5 RTGS External Interfaces

Alerts

- Alerts are predefined, parameterized notifications generated by the NG-RTGS automatically and sent to the Participant users.
- Format:
- Visual, audible or pop-up window: delivered only to the users logged in to the Web interface of the NG-RTGS.
- Email: delivered by email to the address specified in the user's RTGS profile
- Sample alerts:
- User account was blocked due to repetitive failed login attempts
- System's timetable has been updated by the RBI
- Suspicious high amount transaction was received by NG-RTGS

MIS Reports

- Generated automatically, at predetermined moments (e.g. EOD)
- Ad-hoc, upon user request
- Format:
- XML (ISO camt.053), PDF, Excel (CSV).
- Availability:
- Online, as file download from the central NG-RTGS



- As email attachments for EOD statements
- Content:
- Analytic reports of the RTGS activity: summary of the transactions, net position, charging reports etc.

Benefits of new messaging System

- The standard supports end-to-end inter-operability.
- ISO 20022 is more powerful to represent complex data structures (because of its modeling approach and XML data representation).
- It offers synergies with other payment instruments and markets allowing for convergence into a single platform.
- It reduces the impact of proprietary technology.
- It is independent of transport mechanism
- It allows easier adoptability to payment system participants to connect to their varied functional systems & channels with low investment.
- Availability of and access to growing pool of technical resources and expertise on technologies used in the standard.
- ISO 20022 enables use of inexpensive and widely available tools for basic data manipulation & simplifies integration with XML enabled applications and processes.
- Majority of format & business validations can be implanted inside ISO 20022 thus minimizing application level coding requirements.
- XML approach allows incremental expansion for scope as and when new business case arrives with no changes to the processing system to accommodate or validate the message
- It helps improve straight through processing.
- It reduces the impact of maintenance.
- Standardized validation processes.
- Faster and more flexible development if messages needed to be extended.
- Standardized status & error codes.
- End-to-end customer references (with more characters than are used today).
- Fewer processing errors, due to consistent formatting standards.

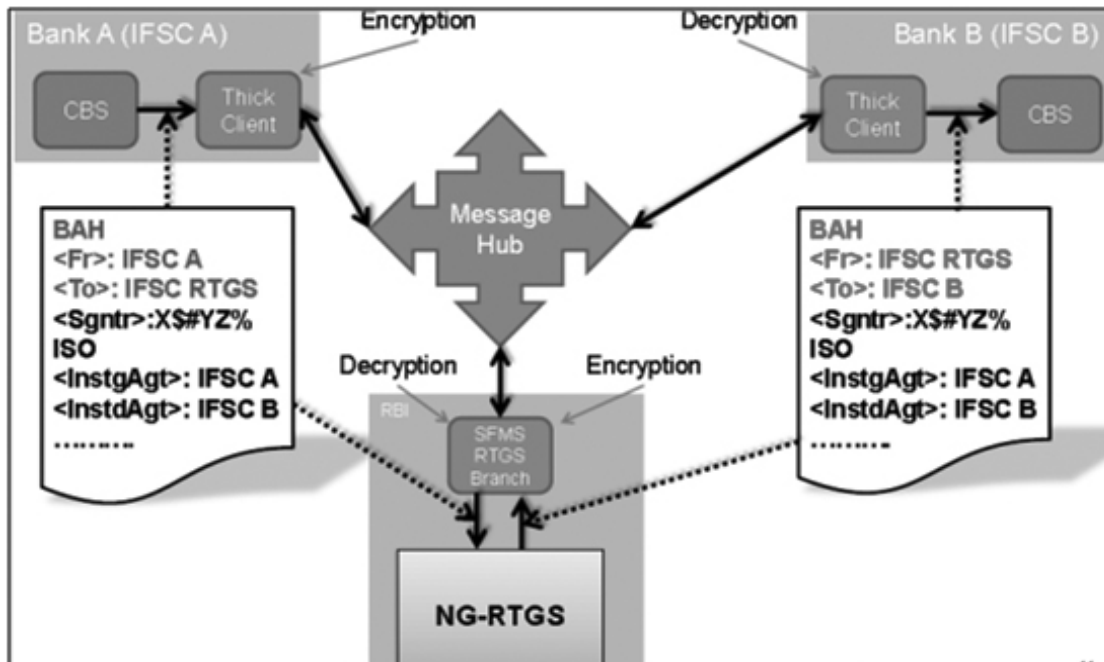


Fig.2.3.6: Message transformation in NG-RTGS

SMS securities settlement scheme

In the initial days of RTGS, transactions were manually keyed into the member institutions account system and into the RTGS system. These two independent manual operations often led to data inaccuracies. But today many member institutions have implemented Straight Through Processing (STP) modules. STP implies that the member institutions software system and RTGS software talk to each other through defined interfaces. As a result it is sufficient if data is entered in one system only and it automatically flows into the other. Thus an outward remittance transaction is entered into the member institution's system (say, a Bank's Core Banking System) and it is automatically processed and posted into the RTGS PI. Similarly an incoming remittance transaction automatically flows from the RTGS PI to the member institutions accounting system.

A special feature of STP is that Uniform Transaction Reference (UTR) number for any outbound RTGS transaction is generated by the STP system. However, such a message has to be necessarily routed through the RTGS Member's PI to RBI's IFTP system.

Obviously STP system requires that the member institutions internal processes and back office functions are robust and reliable. Incidentally some of the big banks now allow their customers to initiate an RTGS remittance transaction through the bank's Internet Banking facility also.

Important Security Features of RTGS

Unique Transaction Reference (UTR) Number:

Every message, sent by the member bank to the RTGS system is allotted a Unique Transaction Reference (UTR) and this number is embedded in the RTGS message itself. This UTR is used by the parties to identify the transaction among them for any enquiry / investigation / complaint. A message without a UTR will be rejected by all systems forming part of the RTGS.



Also every message released by the member bank to the RTGS system will be assigned a Sequence Number (SN). The Sequence Number (SN) is continuously incremented with every message. Therefore, any message, received at the RTGS system with a SN, which is not the next expected SN from the concerned member bank, will be rejected by the RTGS System.

Handling Duplicate Messages:

If the RTGS system receives a duplicate copy of an earlier message (i.e., two messages with the same UTR and contents), then it will be treated as a duplicate. It will not be processed by the RTGS System. In case a response to the earlier message had already been sent, then the same response will be sent again. Also the response will be marked as a potential duplicate emanation.

On the other hand, if the contents of the duplicate message (i.e. message with the UTR as an earlier one) are difference from those of the earlier message, then the RTGS system will consider the situation as a breach of security and will disconnect the PI associated with the duplicate message. However, such situations are rare. _

2.4 CASH MANAGEMENT SYSTEM (CMS)

Cash Management System (CMS) is a new product developed by banks. The objective of the product is to meet the needs of the customers who have operations all over the country. Such organizations would naturally have collection and payments in various locations.

In the normal course, cheques would be collected in one single location and then deposited in the main branch. This causes cash flow problems as there is uncertainty regarding the dates when the cheques would be realised. In view of this uncertainty both scenarios of excess cash and deficit cash were arising. As in receipts by way of cheques a similar situation arises when a high volume of disbursement has to be made e.g.,

- (a) Salaries for the different branches
- (b) Dividend payments.

To get over these problems of cash management and to make the process of cash management effective, banks have introduced this new product - CMS. The broad features of CMS are as follows:

- Multiple collection centres have been authorised to receive the cheques / drafts of the customers.
- It is not necessary to open a separate account in each of these centres.
- At the client's main account which is maintained at the pooling centre credit is offered on the same day for all the cheques / drafts deposited and cleared at the branches.
- The product also provides Management Information System to customers providing details location wise and also party wise.
- If necessary, information can even be provided by e-mail.

Evaluation of Controls of CMS:

Parameter settings (Master Settings): There needs to be adequate controls over parameter settings, authorization as also modification of such settings. E.g., Parameters would include:

- (a) Clearing cycle
- (b) Credit limit



(c) Charges (various slabs)

(d) Interest (“)

Processing Charges: When the bank offers CMS product to the customer, naturally there are associated charges for the same which would include:

(a) DD / Pay Order issue charges

(b) Courier Charges

(c) Cheque return charges

(d) Interest charges for credit offered.

There needs to be a process logic for computing the various charges. Any defect in the logic would lead to income leakage. While evaluating the controls, it is necessary to verify the correctness of the parameters and also test the program logic. It is important to verify the authorization process for creating and modifying parameters.

In certain circumstances the customer may be offered a credit limit which exceeds the sanctioned limit. This can be done only under proper authorization. Aspects of this nature need to be verified at the time of performing the audit.

End of Day Processing

The various amounts collected and different amounts disbursed are all pooled in a designated account. There needs to be a control to ensure the accuracy of such pooling.

The CBS product is interfaced with the core banking solution. The charges and other items need to find a place in the general ledger. Mapping of entries need to be verified. It should also be verified whether there is a built in control to prepare an exception report in case of apparently wrong entries e.g., collection charges being credited. Normally the CMS product provides various audit trails which include listing of parameter settings, transaction authorization and waiver charges. While evaluating the trails and performing the audit, the adequacy of audit trials need to be verified.

3 SYSTEMS AUDIT OF CBS AND ITS INTERFACES

LEARNING OBJECTIVES

- Introduction to ISA
- Evaluation of security and Controls in CBS
- CBS control and Audit of branches
- Using reporting / SQL feature for analysis, reviewing controls at different layers with case study.

3.1 INTRODUCTION TO INFORMATION SYSTEMS AUDIT

Systems auditing is an important aspect in the present context of extensive computerisation. The control objectives and audit objectives always remain the same. However, audit methodology in a computerised environment is distinctly different from that in a manual environment.

In 1967, in the United States, a significant event took place in history of systems audit. It is commonly and popularly referred to as the “Equity Funding Case”. The Managers and Directors of Equity Funding Corporation of America, with the idea of increasing the share value of their company profits were falsified by creating bogus insurance policies. Apart from that, other methods were also used. The auditor for the parent company was not the auditor of the insurance company. This was done with the main idea of confusing and confounding the audit process so that over dues could not be detected.

These matters were further complicated by the external auditors confirming the existence of the insurance policies (the faked ones)! The confirmation was obtained on the telephone. It was reported that the calls went through the equity fund switch board to the employees who were colluding with the managers and they confirmed the existence of the policies.

In 1973, after nearly six years, the fraud was exposed, that too by a disgruntled employee who alerted the authorities. Thereafter the Stock Exchange suspended trading of Equity Fund shares. A leading audit firm with partners who had necessary knowledge and experience to perform audit in a computerised environment was appointed. It was discovered that US \$2.00 billion worth of bogus insurance policies were there. Thereafter all the things that happened is history.

The fact that came to light was that the original external auditors missed out many clues that there was an apparent fraud. The management to proliferate the bogus insurance policies had used the computers to take advantage of their speed. The computer files contained details of the policies, a mere reading of which would have highlighted the fraud.



The importance of performing systems audit was very much appreciated as the cause for the non detection of the fraud was more because there was lack of knowledge on the part of the auditors. Though some auditors colluded in the equity funding case provoked a well-known authority on the subject of systems audit to comment that the equity funding case contributed a great deal to systems audit! He further said that recognition and development of the systems audit than any other single event. The case had however certain other positive effects too. The management which previously did not want the auditors to be “snooping around” the computer department changed its attitude and welcomed the auditors and their report.

The management sought an independent assurance as to whether the information systems on which they rely is dependable in terms of controls, were built into the system or outside.

Confidentiality, Integrity and Availability (CIA) are the components of information security. Systems Audit, which verifies the controls in a computerised environment evaluates the controls and provides assurance regarding adequacy.

In a banking environment, where all of manual maintenance of accounts have been shifted to computers, the importance of performing systems audit can never be over emphasised.

Many controls for information systems and important ones at that are built into computers. Hence as verification of internal controls are of utmost importance, systems audit as distinct from manual audit assumes importance.

With the Core Banking Solution being implemented, the computer technology has become more advanced and all of the operations at all of the branches are all networked to the Central Office. The hardware and the communication are distributed and the software is centralised. Audit objectives of performing audit of banks have not undergone any change. However, audit methodology has undergone a ‘sea change’. Reserve Bank of India has in these circumstances issued many circulars which are available in the RBI website - www.rbi.org.

The Institute of Chartered Accountants has issued guidelines for performing audit in an information technology environment. As of now, many of them are as guidelines and hence though not mandatory, members are expected to comply with the requirements. One such important guideline came in the name of Gopalakrishnan committee report which is taken as a mandatory guidelines by RBI.

In certain cases, the RBI has as a prerequisite instructed that systems audit should be performed before implementation of certain products e.g., internet banking. The bank would not be permitted to commence internet banking operations unless the requisite security and controls have been certified by a competent systems auditor.

3.2 SECURITY AND CONTROLS IN CBS

In any information technology environment, there are certain controls and standards to be adhered to. When specific products like internet banking, ATM, RTGS/ NEFT, and CMS are introduced, there are certain additional controls specific to those systems which have been discussed in the respective chapters. In the following pages, we would be discussing the security and controls which need to be in place. Given below are the broad specifications of controls. Under each head there are other specific controls. The main heads would be

- (a) Management Controls
- (b) Organizational Controls



(c) Operational Controls and

(d) Application Controls.

(Infrastructure controls already covered in previous chapter)

Management Controls

Management controls would include (a) formulating a security policy, (b) developing a business continuity planning and (c) laying down procedures for systems development.

Security Policy

Security Policy is a document approved at the Board level. Reserve Bank of India mandates that every bank should have a security policy. The contents of the policy at the minimum should cover the following:

1. Formation of Security Committee/ Steering Committee
2. Asset Management
3. Human Resources Management
4. Physical and Environmental security
5. Communication and operative management
6. Access Control
7. Systems development and Change Management Procedure

Business Continuity Planning

There should be a comprehensive document in place taking into consideration critical operations of the bank. Reserve Bank of India mandates on every bank having a Business Continuity Plan in place. From the accounting point of view, one needs to look at it from the “going concern concept”. The existence of a Business Continuity Plan, evidence of testing and evidence of updating are essential. The various likely scenarios of business interruptions should be envisaged and a plan to meet such situations and keep the business going should be documented. There should be evidence of awareness being created among the employees.

Systems Development and Change Management

Best practices for development of systems and change management should be documented. Constant monitoring of its being complied with should be in place. The procedures would include program development, program testing, and movement to library, movement from library to production, roles and responsibilities of Computer Team members, highlighting incompatible functions.

Organizational Controls

Organizational Controls would include the organization structure of the IT Department, IT Strategies roles and responsibility including incompatible functions would include.

Operational Controls

This would include physical access, logical access, environmental controls, evaluation controls in operation systems and evaluation controls of network.



Application Controls

The controls would broadly come under the following heads:

- Input
- Output
- Process

Input

The input controls would ensure that the data entered is complete and correct. To ensure the same the following built in checks would be in the application software.

- Data validation
- Reasonableness check
- Format check (Mandatory files)
- Range check

Process

Controls ensure that the software comprehensively covers the business process in the different modules. Process control would also include the existence of built in controls in the system to ensure proper processing of input data so as to provide the required output.

Core Banking Solution

The various application modules which would normally form part of the total Core Banking Solution would be

- (a) Customer ID generation (create a customer with a specific No.
- (b) Accounts Management. (To ensure that the account opening process is in line with the bank's laid down procedures. This module will deal with creating savings account, current account, cash credit account, overdraft etc.,
- (c) Savings Bank and Current Accounts
- (d) Fixed Deposits, Recurring Deposits and other Term Deposits.
- (e) Cash Operations Module
- (f) Clearing Module - which would include inward clearing as also outward clearing?
- (g) Bank Guarantee: This module would cover bank guarantees issued by the bank on behalf of the customers in favour of third party's guaranteeing to fulfill the terms of the guarantee. Guarantees may be in the nature of
 - (i) Performance guarantee or
 - (ii) Deferred Payment guarantee.
- (h) Bills: Bills involve trade transactions and would include
 - (i) Clean supply of bills
 - (ii) Payment Usance Bills



- (iii) Outward Bills (Cheques)
- (iv) Inward bills
- (i) Letter of Credit: Letter of Credit refers to an arrangement wherein the issuing bank acts on the request and instructions of a customer.
- (j) Remittances: This process involves remittances of money by way of DDs or Money Transfers etc.
- (k) Advances: The banks collect demand deposits and term deposits. Out of the funds collected they maintain Statutory Liquidity Ratio (SLR) and Cash Reserve Ratio (CRR) as per the RBI's requirements. Out of the balance funds available they lend to priority and non priority sectors.

The functionality of each of the modules has to be comprehensive.

- I. Master Maintenance - the core banking solution would need to have master data
 - (i) Parameter setting for account type and structure settings keeping in view the General Ledger
 - (ii) Parameter settings for interest rates applicable. These interest rates would vary for different parties e.g., staff, senior citizens etc.
 - (iii) Rates would vary also for the tenor deposits eg. 1 year, 2 years etc.

The parameters should be entered into the system with due care. The updation of the parameters is more important if not more than the original creation. Other examples of critical parameters used by CBS applications would include list of holidays, authorization rights for exceptional transactions, list of deposits, penalty payable in case of default in RD etc., defining various warning, exceptions, error codes, work class of various user, type of user etc.

Operational Parameters

Given type wise operational parameters - TDS, Anywhere banking parameters.

Charges Parameters

Standing instructions charge, Stop Payment instruction charge, cheque book issues, account closing charges.

User Related Password Change Parameters: validity, password history, length, structure etc.

Interest related parameters

Term Deposits interest rates, Interest calculation for advances, interest calculated for staff, loan interest calculation for senior citizens – frequency, start date, end date, fixed-flexible, simple-compound etc.

Authorization Parameters

Authorization of users varies for exceptional transactions.

Log Maintenance

Logs are record of activities that have taken place in the system irrespective of the modules. The contents of the log would include:

- The activity



- The user (system)
- Date and Time

These logs need to be preserved carefully as they are the conclusive and relevant evidence to prove that a transaction occurred. Naturally the logs should not be capable of being modified. The logs should be accessible only by the authorised person and by none other.

The points discussed above provide an over view of controls that need to be in place in a Core Banking Solution.

3.3 AUDIT OF CORE BANKING SOLUTION

Audit is the process of evaluating the adequacy of controls and also ensuring relevant application modules deal comprehensively with business process. The various aspects to be verified while performing the audit in the Core Banking Solution environment would be:

- (a) Review of Security Policy
- (b) Review of Business Continuity Planning & BCP policy
- (c) Review of Systems Development and Change Management Procedures & process
- (d) Network vulnerability Assessment of Effectiveness of Intrusion Detection Systems.
- (e) Evaluation of controls in operating systems.
- (f) Control in databases

When any of the services like software development, database management, network management are outsourced, review of the service level agreement to ensure that confidentiality integrity and availability are taken care of is extremely important. Service level agreements should provide for a systems auditability clause. So that Banks will have the right to have systems audit conducted of the third party services.

- (g) Testing of application modules of the Core Banking Solution.
- (h) Review of Systems logs.
- (i) Audit of Internet Banking, Audit of ATM and RTGS/ NEFT also need to be done and these have been considered separately under their respective heads.

That means IS Audit of outsourcing activities should form part of IS Audit of Core Banking.

A. Review of Security Policy

Reserve Bank of India has mandated that every bank should have a security policy which is approved by the management. The document should be constantly updated. There should be awareness of the contents of the security policy amongst the employees as applicable to different operations. The security policy applies to the entire organization and to all of its employees, customers and also to third parties to whom services have been outsourced.

The broad contents of the security policy should be

1. Formulation of a security committee to manage information security within the organization.



2. **Asset Management:** The policy would deal with the procedure for maintaining proper protection of organizational assets. The assets need to be classified according to their sensitivity and criticality to the organization.
3. **Human Resources:** This would deal with procedures to be followed in connection with the employees, contractors and third party users. There should be procedures to be followed under the following circumstances.
 - (i) Prior to employment
 - (ii) During employment and
 - (iii) On termination or change of employment.

Before employing, background verification should be done. During employment, there should be absolute compliance of the requirements of the security policy. A formal disciplinary procedure for violation of the security requirements should be in place.

On termination all access rights to information processing facilities should be removed immediately

4. **Physical Environment:** Procedures should be in place to ensure unauthorized access, damage or interference is prevented.
5. **Communications and Operations Management:** Operating procedures should be documented and proper segregation of duties should be implemented, where appropriate, to reduce risk or intentional systems misuse. This would also apply to outsourced third parties.

The other aspects would include network security management policy, e-mail policy, firewall security policy, internet policy etc., access control policy, cyber security policy etc.
6. **Media Handling:** It is important that media should be disposed off securely and safely when no longer required. This would prevent leakage of data specially the sensitive data.
7. **Access Control:** There should be an Access Control Policy to control access to information which needs to be reviewed based on business and security requirements. There should be a formal user registration and deregistration procedure. Allocation of password should be controlled through a formal management process. There should be a regular review of user access rights at frequent intervals.

Users also have their own responsibility and should follow the security practices, e.g., selecting passwords, having a clear desk etc.

8. **Network Access Policy:** Access rights should be purely on a need to know basis. Groups of information service users and information systems should be segregated on networks.
9. **Operating System Access Control:** Access to operating system should be controlled by a secure log on procedure. There should be proper monitoring procedures in place.
10. **System Acquisition Development and Maintenance:** Best practices should be in place for program development, testing, modification, library maintenance and also back up procedures for programs and data.
11. **Information Security Incident Management:** In spite of best intentions and documentations, there could be a security lapse. Any such incident notices would be required to be reported to the appropriate management channels.



B. Business Continuity Planning

A well managed process should have been developed and maintained for business continuity throughout the organization. Thus information security is needed for the organization's business continuity. Business Continuity Planning should be tested and updated regularly.

(a) **Compliance with local requirements:** There should be appropriate procedures in place to ensure proper compliance and legislative, regulatory and contractual requirements.

(b) **Review of Business Continuity Planning:** The Business Continuity Planning is a process by which the bank ensures the maintenance and recovery of operations. The objectives of Business Continuity Planning would include minimizing financial losses, continue to serve customers without interruption, and keep up the image of the bank. The Business Continuity Planning is distinct from Disaster Recovery Planning (DRP). The Disaster Recovery Planning has the objective to plan to recover from the impact of disaster, to bring back support service and to restore normalcy. The Business Continuity Planning should take into consideration critical business functions and priorities them. The plan should cover the following important & critical processes:

- Branch Operations
- Administrative Operations
- Internet Banking
- ATM Operations
- RTGS/ NEFT
- All other alternate delivery channels

The various disaster scenarios need to be considered and a few examples are given below:

- There is no access to the Computer Services Department building and also to the Data Centre.
- There is access to the Computer Systems Department building; but Data Centre cannot be accessed.
- The main server at the data centre would have gone down though access to systems department is available.
- Computer systems department and data centre site are available but connection to all branches and Head Office is unavailable.

The various likely scenarios need to be envisaged and a plan has to be in place so that the bank's business operations are carried on without interruption.

So, while auditing, we need to verify whether there is a Business Continuity Plan and whether it has been tested and whether it is constantly updated.

C. Review of Systems Development and Change Management Procedures: Core Banking Solution software will consist of many modules. System Development refers to the process of developing software which would produce the required output from the input provided of course, using the necessary hardware and communication systems. The systems whether supplied by outsiders or



developed in house should meet the deliverables, accepted and approved by the management. The objectives of audit would include reviewing the following:

- (a) Whether the systems are implemented with adequate internal controls.
- (b) Whether the business functionality is comprehensive.

In a banking scenario the management may requisition the services of the audit for implementation or while in the process of being implemented. Irrespective of when the audit is going to be done, there needs to be a procedure which is strictly adhered to as far as development of systems. There should be a formal request from an authorised person. The programs after they are developed should be tested in a test environment. The programs would be tested for functionality and adequacy for internal controls. When programs are tested certain inadequacies and deficiencies could be discovered. It would go back to the Programming Team for correction. Again it would be tested. This is an iterative process. It is important that whenever a program is changed to set right a particular situation, the entire program should be tested. This would ensure that the changed program continues to perform in the same manner in all other aspects before the change was implemented.

Process of moving a tested program from the Testing Environment to the Production Environment.

The Development Department and the Production Department should be separate and isolated. Under no circumstances should any members of the development team have access to the production environment. These aspects have been discussed in detail while discussing the organization structure of a computer department and incompatible functions.

A completely tested program from the development department should be moved to the library and the librarian should move the same to the production environment with full documentation being maintained.

Change Management:

However, well developed software, it could require to be changed. This could arise either due to additional business process requirements or technology changes as also additional bugs being discovered.

There should be a formal and well documented procedure in place for changes effected. There should be a register maintained to keep a tag on different versions in the program. These registers could also be maintained on the computer.

(d) Network Security: In a core banking solution, as discussed in the earlier chapters, there is a complicated network system. All the servers (Application Server, Data Base Server, Antivirus Server, Web Server, Internet Server etc.,) are all at the data center in a central location. The branches are situated all over the country. ATM kiosks, e-lobby are situated in different places and customers are accessing the facilities from different places. Customers are provided internet banking. In view of all these facilities, we can imagine the complicated network which has to be in place. In view of this network security assumes great importance. Performing the vulnerability assessment of a network, it requires technical knowledge. However, it is necessary that network vulnerability assessment is performed periodically by competent people and a report should be available. Weaknesses in the communication systems which would have been highlighted need to be plugged. Vulnerability assessment is a continuous process. 'Patches' (solution for dealing with vulnerabilities discovered) are made available on the net. The network administrator is to constantly be applying the patches. If the patches are not updated and the weak points highlighted by the vulnerability assessment is



not attended to immediately the bank's network is open to exploitation. It can easily be hacked. To prevent such security lapses, it is imminent that vulnerability assessment is performed by competent people. There are certain tools available which properly trained people can use.

The systems auditor must verify whether constant network vulnerability assessments have been performed by the competent people. Similarly, it is also important to ensure that intrusion detection and intrusion prevention is taken care of. There are tools again which could be used by competent people, who would evaluate the strength of the network and detect if there are any weak points, which could be exploited by an intruder.

(e) Evaluation of Controls in Operating Systems: Operating System is a set of computer programs that manage the hardware and software resources of a computer. Operating systems contain the whole list of policies and the systems administrator administers the policies. It is the responsibility of the system administrator to ensure that all patches applicable to the particular operating system are applied. The systems administrator should also ensure that unnecessary services and facilities are disabled. Applying of patches is an ongoing process. An Administrator Guide is available with every operating system and it provides all important information including implications of security settings. Proper testing is required before applying any patches.

(f) Testing Application Systems: This process consists of independently ensuring that computer systems (hardware, software and communication systems) produce the required output from the given input. Each of the modules needs to be tested. The auditor needs to be knowledgeable of the business process of each of the modules e.g., Savings Bank Account, Current Account, Fixed Deposits, Loans, Bills etc.,

Procedure for testing:

The Bank would be required to provide separate systems complete with copy of the Core Banking Solution software, data base, master files etc.,

The auditor should request the bank to create at least two user IDs and passwords. The software has to be the exact replica of the one running in the live environment i.e., the version number should be the same.

The auditor will verify all the application modules one by one to verify the completeness of the functionality, built in controls in the system and controls if any outside the system.

Broad guidelines for testing one of the modules viz, Fixed Deposits are provided below:

When the system is switched on, it will ask for the user ID and password. The auditor should give the user ID and password provided by the Bank. He should take necessary steps to change the password, as otherwise the accountability for the usage of the computer would be lost. There will be a screen which would give the option for choosing the module. The FD module could be chosen. A study of the flow of the process for the FD system and the various screens need to be initially studied to get an over view.

The FD system cannot be tested straight away as a customer would need to be created. KYC (Know Your Customer) norms required by the Reserve Bank of India need to be complied with.

Now the process to be tested is FD system. Choose one customer and create a cheque deposit for the deposit account. Naturally unless the customer is got adequate funds the cheque cannot be honoured. So the program has to verify the same presuming that there are enough funds. Data for the cheque is keyed in the relevant screen.



The auditor is always testing to verify whether system will function properly under specific conditions. In principle, a post dated cheque should not be accepted. For testing purposes the auditor can try to enter a cheque with a date which is beyond the system date. Having entered the data on the screen, the user can now press “accept”. If the programme is working properly, the computer would pop up a message “cheque date beyond system date” or similar message to convey that it is a post dated cheque. Whatever be the attempts made, the cheque should not be accepted by the system. Similarly a cheque not belonging to the customer or a cheque belonging to a customer but the customer is having no balance could be one of the many testing conditions. In case an error message is flashed, corrective action needs to be taken and the data is properly entered.

However, the system should not accept it unless another individual authorises the same. The entry should wait for authorization. The authorization should be capable of being done only with another user ID and password. This concept is called “maker-checker concept”. This is very essential as this ensures there is dual control. To test the “maker-checker concept”, the auditor can try to authorise a transaction using his user ID and password. The system, if correctly functioning, should not accept the operation. It should flash a message similar to “illegal”. Similarly after an authorization has been completed properly, none of the entries should be amenable to modification. Hence the auditor can try to change any of the fields like maturity date, amount etc., That should not be possible.

Presuming there are no errors in logic after passing through certain sequential menus, the FD would be created in the system depending upon the tenure (one year, two years etc.,). The interest rate will be picked up from the master data. One of the earlier screens may require information regarding the customer type. When it expects them, we should provide information regarding the customer like ‘senior citizen’, ‘staff member’ etc.

Based upon the customer type and time period of FD, the programme (the CBS software) will look up the parameterised table and choose the correct rate.

If parameterization of master data is not correctly done (and also not tested properly), naturally an incorrect rate would be picked up. Under normal circumstances, these basic components of the program would have been tested before releasing the same. However, the auditor who tests these aspects as while changing the rates, errors are likely to crop up.

The auditor could test it for other aspects like pre closing of FD, for issuing of duplicate receipt etc., while testing for the pre closing, the auditor would verify whether the logic is working properly like applying the appropriate penalty rate and making proper adjustments against the amount payable to the customer. In the case the application for issue of duplicate FD receipt, the system should verify whether the original FD is in existence and also before issuing a duplicate FD receipt that fact should be noted in the system by “flagging -the FD record in the computer system”. If such a procedure is not in place, possibilities of amounts being repaid both on the original as well as on the duplicate cannot be ruled out. This may be discovered much later!

This extensive and exhaustive testing of the program depends entirely on the in-depth knowledge of the auditor and his capability to test the system in different conditions.

All of the application modules in core banking solution would need to be tested similarly, taking into consideration the respective business process and accepted built in controls.

Testing of internet banking, ATM, RTGS as mentioned earlier are not considered here as the same have been dealt with separately.



(g) Review of Systems Logs: Logs as already mentioned are reports generated by the system automatically. However, it needs to be mentioned that they generate automatically once it is programmed to do so. Auditors should review the systems logs. The systems logs could be classified as:

- (a) Operating System Logs
- (b) Application Logs and
- (c) Data Base Logs

Above are exclusive of logs generated by network devices.

Operating System Logs:

Depending upon the operating systems (Windows-2000, Windows 2003, Unix etc.) logs are generated containing authentic information related to security. The concerned administration manual of the operating system would provide enough guidance to evaluate security concerns, if any.

Application Logs:

Application logs are logs generated by the application programs. While developing the programs, decisions are taken regarding the aspects to be reviewed and logs to be prepared.

In banks, logs would be generated for loan authorisation, limit creation, preclosure of deposits & all such activities etc.,

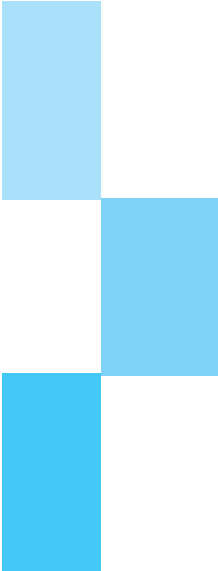
A review of these logs would provide information to the auditor for security evaluation. The system could also be programmed to provide to generate exception reports. An auditor should collect details about exception reports which have been generated. The exception reports could include:

- (a) Account opened and closed during the month and
- (b) Loan Arrears and
- (c) Temporary Over Drafts granted etc.,

Date Base Logs:

These logs are available only for the computer systems department and could be viewed only by an authorised user like data base administrator. There could be other significant data base logs to review changes at the data base level but not through the application. This is a matter of serious data concern,

The log management is essential to ensure that computer security records are stored in sufficient detail for appropriate period of time.



Unit - 5

Computer Assisted Audit Techniques



INTRODUCTION TO CAAT

LEARNING OBJECTIVES

The learning objectives of the CAAT module are:

- Understand how to use office automation software for performing various tasks as relevant to services provided by chartered accountant in areas of accounting, assurance and compliance.
- How to use CAAT/SQL queries for data analysis as required.
- How to review controls implemented at various levels/layers such as: Parameters, user creation, granting of access rights, input, processing and output controls in enterprise applications.

1.1 INTRODUCTION

Auditors deal with information in myriad ways encompassing the areas of accounting, assurance, consulting and compliance and most of this information is now available in electronic form. This is true not only in case of large and medium enterprises but even in small enterprises. In case there are enterprises who have still not adapted the digital way, then it is an opportunity for Auditors to help such enterprises to ride the digital wave. Hence, it has become critical for Auditors to understand and use information technology as relevant for the services we provide. It is rightly said: “one cannot audit data which is flying in bits and bytes by using the ancient method of riding on a horse back”. We are living in a knowledge era where the skill sets are keys to harnessing the power of technology to be effective as knowledge workers. Computer Assisted Audit Techniques (CAATs) refers to using technology for increasing the effectiveness and efficiency of auditing. CAATs enable auditors to do more with less and add value through the assurance process which is more robust and comprehensive. This chapter provides an overview of the process, approach and techniques which could be used across various technology platforms and in diverse enterprises.

1.2 THE ALL-ENCOMPASSING ELECTRONIC DATA

A great blessing in ancient times was: “May you live in exciting times”. Indeed, we are living in exciting times without even being aware of it. We are experiencing how technology innovations are making our life and living simpler by bridging global boundaries and bringing global information on our finger tips. For enterprises as well as professionals, the question is no longer what technology can do for us but what we can do with technology. The question “do I need to use technology” is no longer relevant instead the relevant decision is about “how do I use technology to remain relevant”.

Information technology is all pervasive and more so as the government and regulatory agencies also are using technology platform to provide services to citizens and compelling information to be filed in electronic form. The government at all levels has drawn up ambitious plans to implement e-Governance initiatives to improve speed, access and transparency of services. The Information Technology (IT) Act 2000 with IT Amendment Act 2008 and IT rules 2011 provide the regulatory framework and mechanism for recognizing electronic records and electronic transactions thereby facilitating ecommerce and also identifying cybercrimes and providing penalties and compensation for them. Hence, we can expect IT usage to only keep growing in the near future impacting all areas of life more so in our work as professionals.

1.3 AUDITORS AND CAATs

As auditors, we come across computers and communication technology as the most common denominator among our clients, both large and small. Further, we use computers and communication technology for providing services to our clients. In today's complex and rapidly changing technology environment, it is important to master the right techniques which could be used across enterprises and across various technology platforms. Typical of a IT environment are the speed of processing, large capacity of storage, lack of the paper based trails, the radically different way of information processing, the ease of information access, internal controls being imbedded and the ever-present risk of failure of IT and loss of data. All these factors make it imperative for auditors to harness power of technology to audit technology environment by taking into consideration the risks, benefits and advantages. CAATs empower Auditors with the key survival techniques which effective used in any IT environment. CAATs are not specialist tools designed for use by specialist IT auditors but these are common techniques which can be easily mastered to audit in a computerized environment for statutory audit, tax audit and internal audit as also for providing consulting services.

1.4 AUDITORS AND CAATs

CAATs are tools for drawing inferences and gathering relevant and reliable evidence as per requirements of the assignment. CAATs provide direct access to electronic information and empower auditors not only to perform their existing audits more efficiently and effectively but also facilitate them in knowing how to create and execute new type of IT related audit assignments. CAATs provide a mechanism to gain access and to analyze data as per audit objective and report the audit findings with greater emphasis on the reliability of electronic information maintained in the computer system. There is higher reliability on the audit process as the source of the information used provides and greater assurance on audit findings and opinion. CAATs are available in specific general audit software designed for this purpose but the techniques of CAATs can be applied even by using commonly used software such as MS Excel and by using query/reporting features of commonly used application software. CAATs can be used to perform routine functions or activities which can be done using computers, allowing the auditors to spend more time on analysis and reporting. A good understanding of CAATs and know where and when to apply them is the key to success. ICAI has published a guidance note on CAAT and publication titled: "Data Analysis for Auditors" which may be referred for more details.

1.5 NEED FOR CAATs

In a diverse digital world of clients' enterprises, the greatest challenges for an Auditor is to use technology to access, analyze and audit this maze of electronic data. CAATs enable auditors to move from the era of ticks of using pencil or pen to the era of clicks by using a mouse. CAATs will help



auditors to change focus from time-consuming manual audit procedures to intelligent analysis of data so as to provide better assurance to clients and also manage audit risks. Some of the key reasons for using CAATs are:

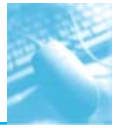
1. Absence of input documents or lack of a visible paper trail may require the use of CAATs in the application of compliance and substantive procedures.
2. Need for obtaining sufficient, relevant and useful evidence from the IT applications or database as per audit objectives.
3. Ensuring audit findings and conclusions are supported by appropriate analysis and interpretation of the evidence
4. Need to access information from systems having different hardware and software environments, different data structure, record formats, processing functions in a commonly usable format.
5. Need to increased audit quality and comply with auditing standards.
6. Need to identify materiality, risk and significance in an IT environment.
7. Improving the efficiency and effectiveness of the audit process.
8. Ensuring better audit planning and management of audit resources.

1.6 OBTAINING AUDIT DATA

In most cases where CAATs are used, it becomes necessary to obtain copy of data in their original format for independent analysis. The data has to be obtained in commonly accepted format. It is important to understand the format in which the data is stored in the application which is being audited. If the data is a native format which is not readable by audit software, then it is necessary to use the reporting feature of application software and export this data to commonly recognizable format of audit software. For example, auditor may not be aware of the data structure/tables of a software developed through a vendor by the client. In such case, auditor may have to study the reporting features and use the export feature to get the data in the required format. It is very important to educate the client about the need to obtain copy of the data as required for audit. Based on the audit scope and relevant audit environment, auditor may have to finalize the required approach for getting the data for audit. This may include installing audit software on client system or using the application software for audit as feasible.

1.7 KEY STEPS FOR OBTAINING DATA

1. Discuss with client about the requirement of raw data for audit and issue a request letter for getting the requested data in specified form as per the audit objectives.
2. Discuss with the IT personnel responsible for maintain data/application software and obtain copies of record layout and definitions of all fields and ensure that you have an overall understanding of the data. The record layout should describe each field and provide information about the starting and ending positions and the data type (numeric, alphanumeric, character, etc.).
3. Print sample list of the first 100 records in the data file and compare this to a printout of the obtained data to confirm they are correct.



4. Verify data for completeness and accuracy by checking the field types and formats, such as identifying all records with an invalid date in a date field.
5. Obtain control totals of all the key data and compare with totals from the raw data to ensure all records have been properly obtained. This can be performed by importing the data in audit software and reviewing the statistics of all the key fields.

1.8 KEY CAPABILITIES OF CAATs

CAATs refer to using computer for auditing data as per audit objectives. This requires understanding of the IT environment and most critically the core applications and the relevant database and database structure. CAATs could be used by using the relevant functionalities available in general audit software, spreadsheet software or the business application software. However, broadly the key capabilities of CAATs could be categorized as follows:

1. **File access:** This refers to the capability of reading of different record formats and file structures. These include common formats of data such as database, text formats, excel files. This is generally done using the import/ODBC function.
2. **File reorganization:** This refers to the features of indexing, sorting, merging, linking with other identified files. These functions provide auditor with an instant view of the data from different perspectives.
3. **Data selection:** This involves using of global filter conditions to select required data based on specified criteria.
4. **Statistical functions:** This refers to the features of sampling, stratification and frequency analysis. These functions enable intelligent analysis of data.
5. **Arithmetical functions:** This refers to the functions involving use of arithmetic operators. These functions enable performing re-computations and re-performance of results.

Precautions in using CAATs

CAATs have distinct advantages for Auditors and enable them to perform various types of tests. However, it is important to ensure that adequate precautions are taken in using them. Some of the important precautions to be taken by Auditors are:

1. Identify correctly data to be audited
2. Collect the relevant and correct data files
3. Identify all the important fields that need to be accessed from the system
4. State in advance the format the data can be downloaded and define the fields correctly
5. Ensure the data represent the audit universe correctly and completely.
6. Ensure the data analysis is relevant and complete.
7. Perform substantive testing as required.
8. Information provided by CAATs could be only indicators of problems as relevant and perform detailed testing as required.



1.9 STEP BY STEP METHODOLOGY FOR USING CAATs

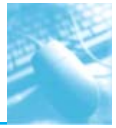
CAATs are very critical tools for Auditors. Hence, it is important to formulate appropriate strategies to ensure their effective use. Some of the key strategies for using CAATs are:

1. Identify the scope and objectives of the audit. Based on this, auditor can decide about the need and the extent to which CAAT could be used.
2. Identify the critical data which is being audited as per audit scope and objectives.
3. Identify the sources of data from the enterprise information system/application software. These could be relating to general ledger, inventory, payroll, sundry debtors, sundry creditors.
4. Identify the relevant personnel responsible for the data and information system. These personnel could be from the IT department, vendors, managers, etc.
5. Obtain and review documents relating to data/information systems. This should provide information about data types/data structures and data flow of the system.
6. Understand the software by having a walk-through right from user creation, grant of user access, configuration settings, data entry, query and reporting features.
7. Decide what techniques of CAATs could be used as relevant to the environment by using relevant CAAT software as required.
8. Prepare a detailed plan for analyzing the data. This includes all the above steps.
9. Perform relevant tests on audit data as required and prepare audit findings which will be used for forming audit report/opinion as required.

1.10 EXAMPLES OF TESTS PERFORMED USING CAATs

CAATs can be used for compliance or substantive tests. As per the audit plan, compliance tests are performed first as per risk assessment and based on the results of the compliance tests; detailed compliance tests could be performed. Some examples of tests which can be performed using CAATs are given below:

1. **Identify exceptions:** Identify exceptional transactions based on set criteria. For example, cash transactions above Rs. 20,000.
2. **Analysis of Controls:** Identify whether controls as set have been working as prescribed. For example, transactions are entered as per authorised limits for specified users.
3. **Identify errors:** Identify data, which is inconsistent or erroneous. For e.g.: account number which is not numeric.
4. **Statistical sampling:** Perform various types of statistical analysis to identify samples as required.
5. **Detect frauds:** Identify potential areas of fraud. For example, transactions entered on week-days or purchases from vendors who are not approved.
6. **Verify calculations:** Re-perform various computations in audit software to confirm the results from application software confirm with the audit software. For e.g.: TDS rate applied as per criteria.
7. **Existence of records:** Identify fields, which have null values. For example: invoices which do not have vendor name.



8. **Data completeness:** Identify whether all fields have valid data. For example: null values in any key field such as date, invoice number or value or name.
9. **Data consistency:** Identify data, which are not consistent with the regular format. For example: invoices which are not in the required sequence.
10. **Duplicate payments:** Establish relationship between two or more tables as required. For example duplicate payment for same invoice.
11. **Inventory obsolescence:** Sort inventory based on data of purchase or categories as per specified aging criteria or period and identify inventory which has become obsolete.
12. **Accounts exceeding authorized limit:** Identify data beyond specified limit. For example, transactions entered by user beyond their authorized limit or payment to vendor beyond amount due or overdraft allowed beyond limit.

1.11 ANALYTICAL REVIEW PROCEDURES

The various standards on auditing highlight need for acquiring the required skill-sets to audit in an IT environment and using relevant techniques. Many of the requirements of the auditing standards can be complied by adapting them for use in an IT environment as required. For example: Standard on Auditing (SA) 520 Analytical Procedures states:

A1. Analytical procedures include the consideration of comparisons of the entity's financial information with, for example:

- Comparable information for prior periods.
- Anticipated results of the entity, such as budgets or forecasts, or expectations of the auditor, such as an estimation of depreciation.
- Similar industry information, such as a comparison of the entity's ratio of sales to accounts receivable with industry averages or with other entities of comparable size in the same industry.

A2. Analytical procedures also include consideration of relationships, for example: Among elements of financial information that would be expected to conform to a predictable pattern based on the entity's experience, such as gross margin percentages.

Most of the analytical procedures can be performed in an IT environment using CAATs which makes the audit process much more effective and efficient.

SUMMARY

CAATs enable auditors to use computers as a tool to audit electronic data. CAATs provide auditors access to data in the medium in which it is stored, eliminating the boundaries of how the data can be audited. As auditors start using CAATs, they will be in a better position to have a considerable impact on their audit and auditee as more time is spent on analysis and less time on routine verification. It is important to understand the client IT environment and chart out which techniques of CAAT could be used. Initially, time needs to be invested in this Endeavour but once the audit plan is prepared based on the IT environment as per audit scope, re-use becomes easier. However, the audit plan and tests need to be updated based on changes in the IT environment as relevant. Using CAATs provides greater assurance of audit process to the auditor and also to the auditee. The key to using CAAT is recognizing the need, learning how to use CAATs and using them in practical situations.

ICAI has issued guidelines on CAAT and the various assurance standards highlight the importance of using CAATs as relevant for audit. ISACA has also issued standards and guidelines on auditing and CAATs. Some of the key aspects from these standards and guidelines are given below.

2.1 NEED FOR USING CAATs

As entities increase the use of information systems to record, transact and process data, the need for the auditors to utilize tools to adequately assess risk becomes an integral part of audit coverage. The use of computer-assisted audit techniques (CAATs) serves as an important tool for the auditor to evaluate the control environment in an efficient and effective manner. The use of CAATs can lead to increased audit coverage, more thorough and consistent analysis of data, and reduction in risk.

CAATs include many types of tools and techniques, such as generalized audit software, customized queries or scripts, utility software, software tracing and mapping, and audit expert systems.

CAATs may be used in performing various audit procedures including:

- Tests of details of transactions and balances
- Analytical review procedures
- Compliance tests of general controls
- Compliance tests of application controls

CAATs may produce a large proportion of the audit evidence developed on audits and, as a result, the auditor should carefully plan for and exhibit due professional care in the use of CAATs.

2.2 KEY FACTORS TO BE CONSIDERED IN USING CAATs

When planning the audit, the IS auditor should consider an appropriate combination of manual techniques and CAATs. In determining whether to use CAATs, the factors to be considered include:

- Computer knowledge, expertise, and experience of the IS auditor
- Availability of suitable CAATs and IS facilities
- Efficiency and effectiveness of using CAATs over manual techniques
- Time constraints
- Integrity of the information system and IT environment
- Level of audit risk



2.3 CAATs PLANNING STEPS

The major steps to be undertaken by the auditor in preparing for the application of the selected CAATs include the following:

- Set the audit objectives of the CAATs, which may be included in the terms of reference for the exercise.
- Determine the accessibility and availability of the organization's IS facilities, programs/systems and data.
- Clearly understand composition of data to be processed including quantity, type, format and layout.
- Define the procedures to be undertaken (e.g., statistical sampling, recalculation, confirmation).
- Define output requirements.
- Determine resource requirements, i.e., personnel, CAATs, processing environment (the organization's IS facilities or audit IS facilities).
- Obtain access to the organization's IS facilities, programs/systems and data, including file definitions.
- Document CAATs to be used, including objectives, high-level flowcharts and run instructions.

2.4 AUDIT EVIDENCE AND CAATs

Audit is primarily said to be the process of collecting and evaluating audit evidence as per audit objectives. Based on the scope and objectives of audit, auditor can obtain the audit evidence by:

- Inspection
- Observation
- Inquiry and confirmation
- Re-performance
- Recalculation
- Computation
- Analytical procedures
- Other generally accepted methods

2.5 CAATs DOCUMENTATION

Work papers

The step-by-step CAATs process should be sufficiently documented to provide adequate audit evidence. Specifically, the audit work papers should contain sufficient documentation to describe the CAATs application, including the details set out in the following sections.

Planning

Documentation should include:

- CAATs objectives



- CAATs to be used
- Controls to be exercised
- Staffing and timing

Execution

- Documentation should include:
- CAATs preparation and testing procedures and controls
- Details of the tests performed by the CAATs
- Details of inputs (e.g., data used, file layouts), testing periods, processing (e.g., CAATs high-level flowcharts, logic) and outputs (e.g., log files, reports)
- Listing of relevant parameters or source code

Audit Evidence

Documentation should include:

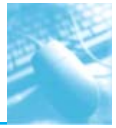
- Output produced
- Description of the audit analysis work performed on the output
- Audit findings
- Audit conclusions
- Audit recommendations

In audits where CAAT is used, it is advisable that the audit report includes a clear description of the CAATs used in the objectives, scope and methodology section. The description of CAATs used should also be included in the body of the report, where the specific finding relating to the use of CAATs is discussed. This description should not be overly detailed, but it should provide a good overview for the reader.

2.6 AUDIT TEST USING CAATs

If the data to be audited is available in electronic form, then CAATs could be used for:

- Inquiry and confirmation – identifying accounts for which external confirmation is to be obtained. Request letters for confirmation of balances can be printed using CAAT software.
- Re-performance: The processing of transactions done by the application software can be re-performed and the resultant data can be compared to verify correctness and completeness. For example: Postings of transactions to personal ledger can be re-performed using the original transaction data base and compared with classified transactions as per ledgers.
- Re-calculation: All the computations which were done electronically by the application software used in the enterprise can be independently validated by re-performing the computations. For example, Tax deducted at source or VAT charged on sales, interest computation, etc. can be re-computed in CAAT software and validated with the computed totals from the original application software to confirm correctness of processing of transactions.



- **Computation:** using CAAT software, it is possible to compute totals to confirm correctness. For example, the VAT payments made for the year can be total in CAAT software to compare with the total payments as per VAT returns. The interest debited can be computed and compared with actual debit to interest a/c for the year.
- **Analytical procedures:** Based on the data available in electronic format, various analytical procedures can be performed by comparing and relating various aspects of financial and on-financial information.

2.7 AUDIT SAMPLING

Auditor has to design and select an audit sample and evaluate sample results. Appropriate sampling and evaluation will meet the requirements of 'sufficient, reliable, relevant and useful evidence' and 'supported by appropriate analysis. Auditor should consider selection techniques that result in a statistically based representative sample for performing compliance or substantive testing.

When using either statistical or non-statistical sampling methods, auditor should design and select an audit sample, perform audit procedures, and evaluate sample results to obtain sufficient, reliable, relevant and useful audit evidence. Audit sampling is defined as the application of audit procedures to less than 100 percent of the population to enable the IS auditor to evaluate audit evidence about some characteristic of the items selected to form or assist in forming a conclusion concerning the population.

Statistical sampling involves the use of techniques from which mathematically constructed conclusions regarding the population can be drawn. Non-statistical sampling is not statistically based, and results should not be extrapolated over the population as the sample is unlikely to be representative of the population.

Design of the Sample

When designing the size and structure of an audit sample, IS auditors should consider the specific audit objectives, the nature of the population, and the sampling and selection methods.

Auditor should consider the need to involve appropriate specialists in the design and analysis of samples.

Selection of the Sample

There are four commonly used sampling methods. Statistical sampling methods are:

- **Random sampling** – Ensures that all combinations of sampling units in the population have an equal chance of selection
- **Systematic sampling** – Involves selecting sampling units using a fixed interval between selections, the first interval having a random start. Examples include Monetary Unit Sampling or Value Weighted selection where each individual monetary value (e.g., Rs. 1) in the population is given an equal chance of selection. As the individual monetary unit cannot ordinarily be examined separately, the item which includes that monetary unit is selected for examination. This method systematically weights the selection in favour of the larger amounts but still gives every monetary value an equal opportunity for selection. Another example includes selecting every 'nth sampling unit



Non-statistical sampling methods are:

- **Haphazard sampling**— The IS auditor selects the sample without following a structured technique, while avoiding any conscious bias or predictability. However, analysis of a haphazard sample should not be relied upon to form a conclusion on the population
- **Judgmental sampling**— The IS auditor places a bias on the sample (e.g., all sampling units over a certain value, all for a specific type of exception, all negatives, all new users). It should be noted that a judgmental sample is not statistically based and results should not be extrapolated over the population as the sample is unlikely to be representative of the population.

Auditor should select sample items in such a way that the sample is expected to be representative of the population regarding the characteristics being tested, i.e., using statistical sampling methods. To maintain audit independence, the IS auditor should ensure that the population is complete and control the selection of the sample. For a sample to be representative of the population, all sampling units in the population should have an equal or known probability of being selected, i.e., statistical sampling methods.

LEARNING OBJECTIVES

- To gain understanding on Importing different file formats into IDEA.
- To understand on how to generate field statistics for the database.
- To understand formatting Data.

There are many audit software available in the market. However, for the purpose of learning CAATs, we will be using IDEA software in this chapter and also for performing exercises in the lab. Students may refer to the ICAI publication titled: “Practical application of CAAT-case studies” for more examples and details of CAATs using IDEA Software.

3.1 IMPORTING DATA

Function Description

Important Assistant brings the selected file or files into IDEA database management system. User-friendly Import assistant guides user through a series of steps and instructions for importing the file into the Software. All the functionalities of IDEA can be performed only when the file is available within IDEA. Hence, the first step in data analysis is ensuring that the files to be audited are in selected format acceptable in IDEA and are imported into IDEA.

Let us assume you have an Excel or Access file and you want to perform certain idea functionalities on it, then it is important to import these files into IDEA. IDEA facilitates user to import external files in different formats like Access, Excel, dbase or other ODBC/DSN formats into IDEA database.

We are explaining below step by step how to import a file into IDEA. If you have access to IDEA Server, you can also import files to IDEA Server. For now, you will have to import a file to your Working Folder. A Working Folder is simply a folder that contains the IDEA databases that you wish to analyze. It is recommended that all the files related to each audit or investigation be stored in a separate folder or directory to simplify file management and housekeeping.

Note: The sample files which are used for explaining how to perform various functionalities of idea are available in the C:\Program Files\IDEA\UserFiles\Tutorial\ when IDEA is installed with default settings. You can perform exercises using the relevant sample data files. Please check with your lab instructor about the location of these files. We will be using tutorial/sample files for explaining different functionalities of IDEA in this booklet.



You can import files of different format into IDEA. However, for this exercise, we are giving below an example for importing an Access file into IDEA.

Step by Step Procedure for Importing Data into IDEA

Location

- File>Import Assistant>Import to IDEA
- Alternatively, on the Operations toolbar, click the Import to IDEA button. Import Assistant dialog box appears as shown in Fig 3.1.1.

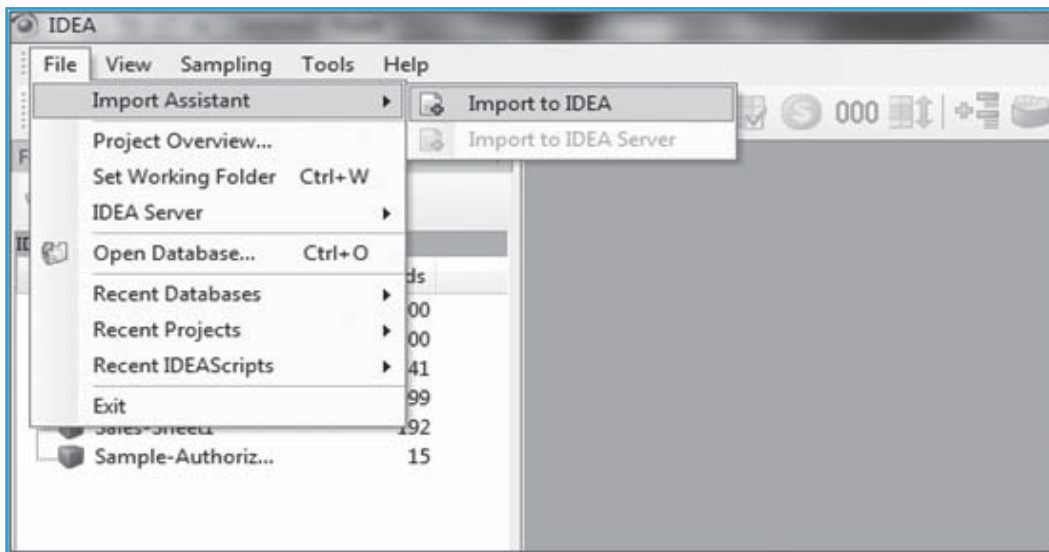


Fig. 3.1.1 Import Assistant Location

Step 1: Select the Format

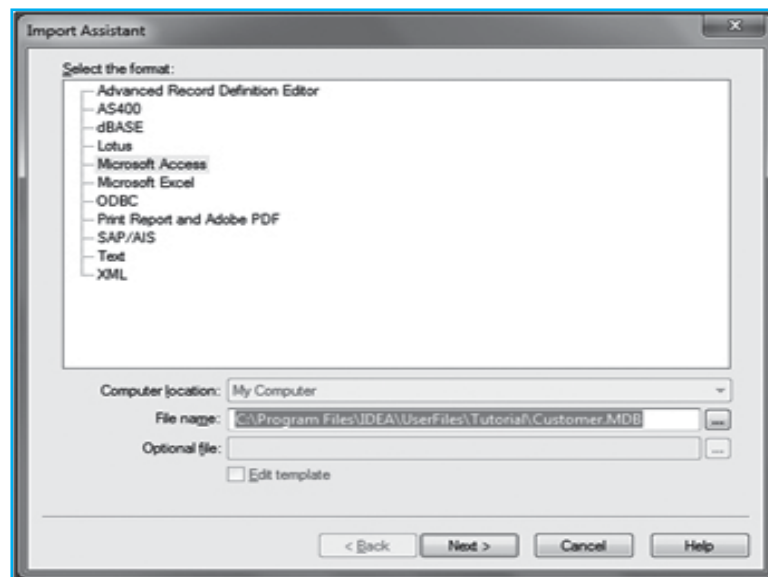


Fig. 3.1.2 Import Assistant Step 2

- The **Microsoft Access** dialog box appears.

The screenshot displays the IDEA software interface. The main window shows a data table with the following columns: INVOICENO, NO_OF_INCS, and SALES_SUM. The table contains 31 rows of data. The interface includes a menu bar (File, Edit, View, Data, Analysis, Sampling, Tools, Window, Help), a toolbar with various icons, a file explorer on the left, and a properties panel on the right.

	INVOICENO	NO_OF_INCS	SALES_SUM
1	1000	1	167500
2	1001	1	20500
3	1002	1	20500
4	1003	1	10500
5	1004	1	10500
6	1005	1	18500
7	1006	1	18500
8	1014	1	12500
9	1015	1	12500
10	1016	1	21500
11	1017	1	11500
12	1018	1	10500
13	1019	1	10500
14	1020	1	5500
15	1021	1	5500
16	1022	1	5500
17	1023	1	5500
18	1024	1	1500
19	1025	1	1500
20	1026	1	1200
21	1027	1	1200
22	1028	1	1200
23	1029	1	1200
24	1030	1	1050
25	1031	1	1300
26	1032	1	750
27	1033	1	750
28	1034	2	1800
29	1036	1	27500
30	1037	1	27500
31	1038	1	26500

(g) In the **Select tables** box, select **Database1**.

(h) All Character fields will be imported with a length of 255 characters unless changed. This is not likely to be the underlying Character field length. Therefore, leave the **Scan records for field length** check box selected. Also, accept the default value in the **Scan only** box in order to scan 10,000 records to determine the maximum field length.

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Step 3: Result - Customer-Database

On clicking Ok, the Customer Database is imported into IDEA. The imported database is opened in the Database Window. In the File Explorer Window the imported database is highlighted as shown in Fig 3.1.4

CUST_NO	FIRST_NAME	LAST_NAME	COUNTRY	STATUS	CREDIT_LIM
1	DWANE	BURROWS	SOUTH AFRICA	M	4000
2	KEVIN	NICHOLSON-KNOWLES	SOUTH AFRICA	M	20000
3	JENNIFER	DE FREITAS	SOUTH AFRICA	M	13000
4	CHABRAJ	SAWYER	SOUTH AFRICA	F	10000
5	KATHARINE	BURROWS	SOUTH AFRICA	F	13000
6	DONGMAN	ELLIS	NIGERIA	M	8000
7	MALINDA	JOHNSTON	NIGERIA	M	3000
8	TANVIA	POUFFE	NIGERIA	M	2000
9	NATASHA	MACDONALD	NIGERIA	R	28000
10	KENNETH	HIGGS	NIGERIA	M	10000
11	FLOREN	GOOSSENS	BELGIUM	M	7000
12	BENOIT	LAMMERANT	BELGIUM	M	5000
13	ANNICK	VANDERHUST	BELGIUM	F	19000
14	PAUL	FLAMAND	BELGIUM	M	3000
15	CHRISTIAN	SUN	BELGIUM	M	23000
16	REGINE	FULGEANU	BELGIUM	F	27000
17	NADJA	KALAMBAH	BELGIUM	F	2000
18	ALAIN	BUNCK	BELGIUM	M	5000
19	CHRISTIANE	DUQUESNE	BELGIUM	F	25000
20	MIBALANGA	VLADESCU	BELGIUM	M	30000
21	DENISE	KHAN	BARBADOS	F	2000
22	SAMUEL	GONCALVES	BARBADOS	R	15000
23	STEVEN	ARCHER	BARBADOS	R	20000
24	CECIL	CLARKE	BARBADOS	R	26000
25	DEAN	SPRINGER	BARBADOS	R	18000
26	LINDA	GREENE SMALL	BARBADOS	R	34000
27	MARINELA	HRESTOV	BULGARIA	F	2000
28	LUCIMIL	TOMOV	BULGARIA	M	6000
29	DENISLAV	PROVNOV	BULGARIA	R	14000
30	MILJANA	STANTCHEVA	BULGARIA	R	74000
31	STANBOM	KANTCHEV	BULGARIA	M	13000

Fig. 3.1.4. Customer Database is imported into IDEA

Exercises:

1. Please perform the following exercises in your lab.
2. Please import excel file following the above steps.
3. Please import text delimiter file and notice the different steps.
4. Please import excel file using ODBC option.

3.2 IMPORTING DATA

Click on field statistics after importing the files and understand the nature of data which is imported.

Function Description

You can use the Export Database task to create an external file from an IDEA database so that you can use the data in other applications, such as a spreadsheet package. IDEA exports data in a number of text, database, spreadsheet, and mail merge formats.



You can use the Export Database task to create an external file from an IDEA database so that you can use the data in other applications, such as a spreadsheet package. You can also use Copy and Paste to incorporate portions of text or sections of database into other Windows applications. IDEA also supports drag and drop into any other OLE2 container application, such as Microsoft Excel. IDEA exports data in a number of text, database, spreadsheet, and mail merge formats.

Step by step process for exporting files from IDEA.

Location

- File>Export Database

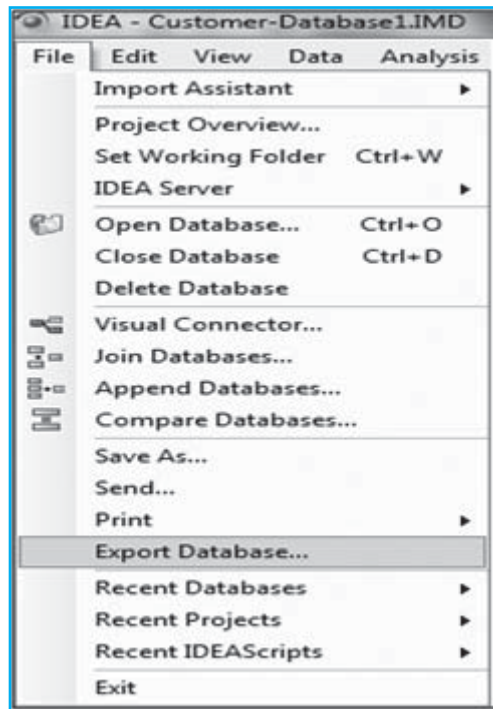


Fig. 3.2.1 Export Database Location

Database Used

- Customer-Database1



Export Dialog Box

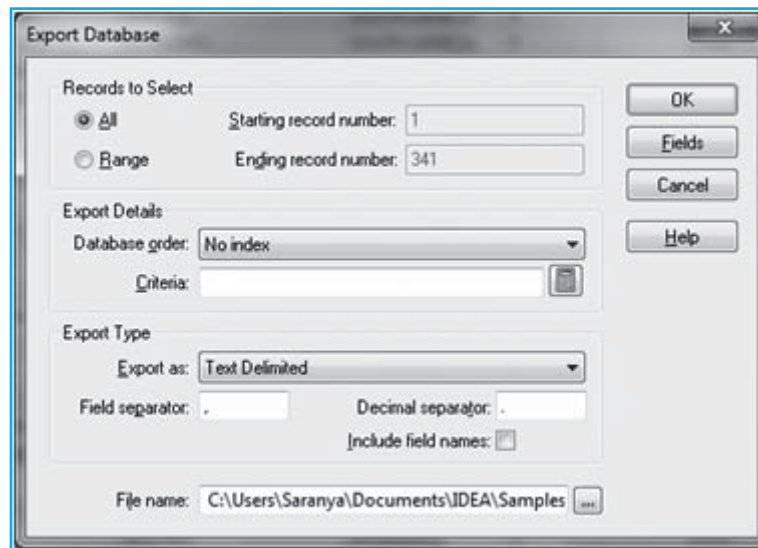


Fig. 3.2.2. Export Database

- (a) In Records to Select, on selecting **All** will select the entire records. On selecting Range allows the user to select the **Starting** and **Ending record number**.
- (b) By default the path is set to C:\Users\Saranya\Documents\IDEA\Samples\Customer-Database1.
- (c) In Export Type, user can select the format in which the current file has to be exported and also name the resultant exported file.
- (d) In **Filename** allows the user to select the path to which the file has to be exported.
- (e) On clicking **Fields**, we can select or unselect the fields that have to be exported.
- (f) During Exporting process, condition or criteria can be applied using the criteria button. On clicking this button, Equation Editor Dialog box is opened which facilitates the user to write in query or condition.
- (g) Clicking Ok, exports the active file into given desired format.

Exercise:

1. Export actual idea file to different formats such as: HTML, Excel, text delimited file and check the results.

3.3 SUMMARIZATION

Learning Objectives:

To total the sales transaction by INVOICENO to produce a list of outstanding Sales as well as to identify the number of INVOICENO and the Sales per INVOICENO.

Function Description

Summarization accumulates the values of Numeric fields for each unique key. For example,



summarizing an Accounts Payable database by account number (the key) and totalling invoice amounts produces a database or **Results** output of outstanding liabilities by supplier. The Summarization task provides:

- A list of unique items (keys) in the database
- The number of records for each key
- Totals of one or more numeric fields for each key

You may select up to eight fields to summarize by or if using one field you can use the Quick Summarization option. If using multiple fields, the Summarization task works faster and is more efficient on a database that has been sorted.

You may select any number of Numeric fields to total. The resultant database provides a list of unique key items and the number of records (NO_OF_RECS) for each key from where you can drill down to display the individual records for the key. You can select additional field data to be selected from fields from the first occurrence or the last occurrence.

The summarization result grid is limited to 4,000 rows and does not display results beyond 4,000 rows. If you expect your result will have more than 4,000 rows, you must choose to create a database.

Step by Step Procedure for summarization

Ensure that **Sales Transactions** is the active database and the **Data** property is selected in the **Properties** window.

Location

- **Analysis > Summarization**

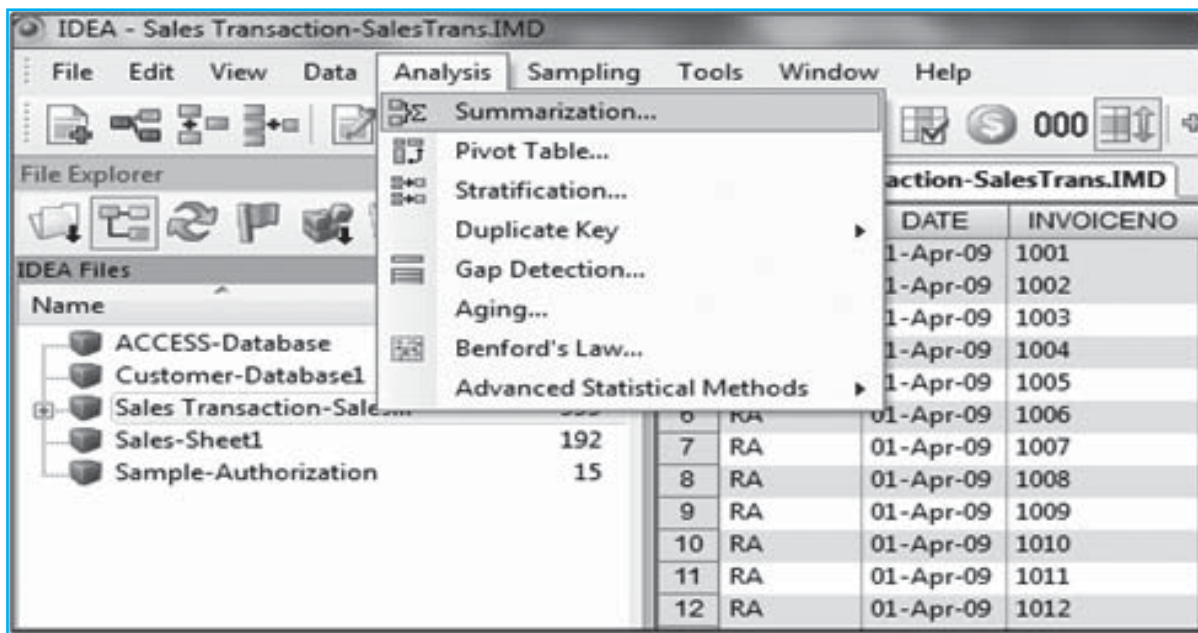


Fig. 3.3.1 Summarization Location

(a) In the Summarization Dialog Box, select the following:

- Fields to summarize: INVOICENO



- Numeric fields to total: SALES

- (b) Click **Fields**. The **Fields** dialog box appears. Note that no fields are selected. This stops unnecessary information from being included in the summarized database.
- (c) Click **OK** to return to the **Summarization** dialog box.

Select the **Use Quick Summarization** check box. The Use Quick Summarization check box may be selected as a faster means to summarize your database. However, Quick Summarization may only be used if the database has no more than 4,000 unique keys. In addition, Quick Summarization allows you to select only one field to summarize.

There are two types of output from the **Summarization** task:

- Summarization database
- Summarization result

Note that as with most tasks in IDEA, you may apply a criterion to the task, for example; only summarize transactions for a specified period. As with all other tasks where you can apply a criterion, if you apply the criterion to the database using the **Criteria** link in the Properties window, the criterion equation appears in the **Criteria** text box on the task dialog box. However, you may enter a new criterion or modify an existing one using the Equation Editor as shown in Fig 3.3.2.

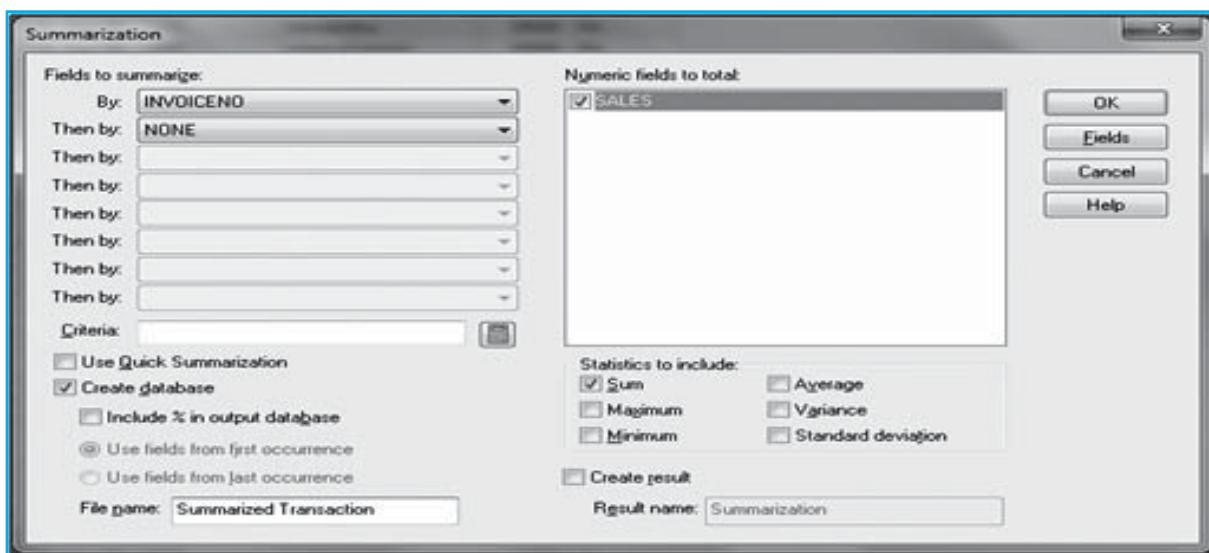


Fig. 3.3.2 Summarization

- (d) In the **Statistics to include** area, accept the default selections of **Sum**.
- (e) Click **OK**.

View the resultant database and note the following fields:

- **INVOICENO**- List of unique **INVOICENO**
- **NO_OF_RECS** - Number of records for each **INVOICENO**
- **Sales_SUM**- Total Sales of the transactions for each **INVOICENO**



Also note the number of records (989) on the **Status** bar displayed in the below figure. Note that IDEA automatically creates an Action Field link to the parent database (**Sales Transactions**). It allows you to display the records from the **Sales Transactions** database by clicking on a value (in blue) in the **NO_OF_RECS** field as shown in Fig 3.3.3.

INVOICENO	NO_OF_RECS	SALES_SUM
1	1	187500
2	1	20000
3	1	20000
4	1	20000
5	1	20000
6	1	20000
7	1	20000
8	1	20000
9	1	20000
10	1	20000
11	1	20000
12	1	20000
13	1	20000
14	1	20000
15	1	20000
16	1	20000
17	1	20000
18	1	20000
19	1	20000
20	1	20000
21	1	20000
22	1	20000
23	1	20000
24	1	20000
25	1	20000
26	1	20000
27	1	20000
28	1	20000
29	1	20000
30	1	20000
31	1	20000

Fig. 3.3.3 Summarization Result

Exercises:

1. Use the sample employees file in the sample database of idea and perform summarization on branch and total on salary. Click on the hyperlink of the number of records and check the result.
2. Use the sample employees file in sample database of idea and perform summarization on country and total on salary and check the result.

3.4 STATISTICS

Learning Objectives

Understanding to view the field statistics for the Numeric fields in the active database.

The statistics is used for reconciling totals, obtaining a general understanding of the ranges of values in the database, and highlighting potential errors and the area of weakness to focus subsequent tasks.

Function Description

The Field Statistics property provides statistical information about all Numeric, Date, and Time fields within the active database. The field statistics are available and displayed for all records in the database, with any applied criteria ignored.

By default, the Field Statistics window displays the statistics for Numeric fields. Ensure that **Customer-Database** is the active database and the **Data** property is selected in the Properties window.

Step by Step Procedure for Statistics

Location

- In the **Properties** window, click **Field Statistics**.

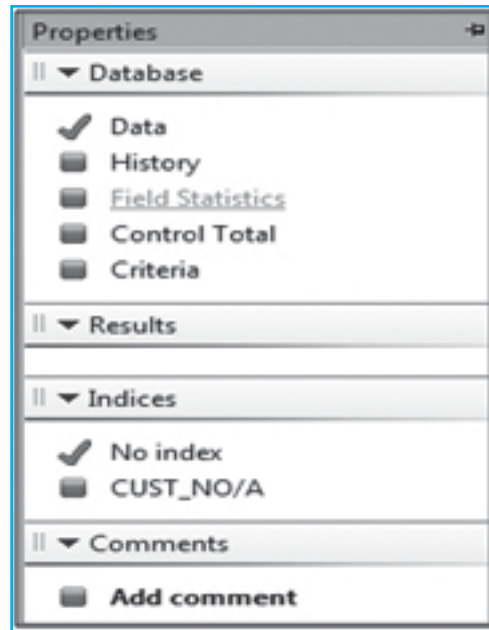


Fig. 3.4.1 Statistics Location

- (a) On clicking Field Statistics in property window, IDEA displays below message box.
- (b) Click **Yes** to generate field statistics for all fields.

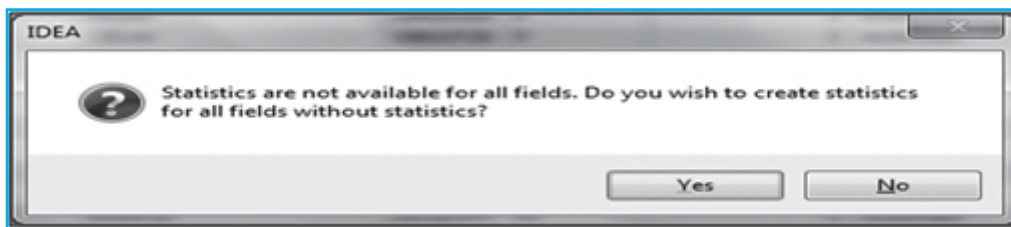


Fig. 3.4.2 Statistics

- (c) By Default By default, the **Field Statistics** window displays the statistics for Numeric fields. In this case, field statistics appear for all the available numeric fields. To view field statistics for the Date fields and Time fields in a database, click **Date** and **Time** in the **Field Type** area of the **Field Statistics** window. In the current database, there are no Date or Time fields.
- (d) If the database contained more than one Date, Numeric, or Time field, multiple date, numeric, or

Time field statistics would appear together on the same screen for easy comparison of values.



Statistics for Numeric Fields

Field Type	Summary Statistics	COUNTRYNO	UNIT_PRICE	QTY	PROD_CODE	AMOUNT	PAYMENT_AMT
Net Value		8.075	8.084.43	90.074	9.627.416	710.356.44	710.356.44
Absolute Value		8.075	8.084.43	90.074	9.627.416	710.356.44	710.356.44
# of Records		1,000	1,000	1,000	1,000	1,000	1,000
# of Zero Items		0	0	49	0	49	0
Positive Value		8.075	8.084.43	90.074	9.627.416	710.356.44	710.356.44
Negative Value		0	0.00	0	0	0.00	0.00
# of Positive Records		1000	1000	951	1000	951	951
# of Negative Records		0	0	0	0	0	0
# of Data Errors		0	0	0	0	0	0
# of Valid Values		1,000	1,000	1,000	1,000	1,000	1,000
Average Value		8.08	8.08	90.07	9.627.42	710.36	710.36
Minimum Value		3	3.84	0	9598	0.00	0.00
Maximum Value		10	9.99	3496	9951	27,793.20	27,793.20
Record # of Min		1	640	6	191	6	6
Record # of Max		965	191	26	191	26	26
Sample Std Dev		2.14	0.66	227.30	96.49	1,758.47	1,758.47
Sample Variance		4.60	0.43	51,663.19	9,310.30	3,092,214.89	3,092,214.89
Pop Std Dev		2.14	0.66	227.18	96.44	1,757.59	1,757.59
Pop Variance		4.60	0.43	51,611.53	9,300.99	3,089,122.68	3,089,122.68
Pop Skewness		-1.882584	0.056460	6.793836	3.016606	6.973450	6.973450
Pop Kurtosis		1.645513	14.736605	68.926272	7.176397	74.416881	74.416881

Fig. 3.4.3 Numeric Statistics

As shown in the above image, active database contains six numeric fields and the statistics for all six numeric fields are displayed in Field Statistics window which allows easy comparison between them.

Study the field statistics for the all Numeric fields. Note in particular:

		UNIT_PRICE	QTY	PROD_CODE	AMOUNT	PAYMENT_AMT
# of Records	1,000	1,000	1,000	1,000	1,000	1,000
# of Zero Items	0	0	49	0	49	49
Average Value	8.08	8.08	90.07	9627.42	710.36	710.36
Minimum Value	3	3.84	0	9598	0.00	0.00
Maximum Value	10	9.99	3496	9951	27793.20	27793.20

Below two Images displays statistics for Date and Time fields for current active database.

Statistics for Date Fields

Field Type	Date Statistics	ORDER_DATE	PAYMENT_DATE	SHIPMENT_DATE
# of Valid Values		1,000	199	199
# of Zero Items		0	801	801
# of Records		1,000	1,000	1,000
# of Data Errors		0	0	0
Earliest Date		13-Nov-93	11-Nov-93	13-Nov-93
Latest Date		23-Nov-01	21-Nov-01	23-Nov-01
Record # of Earliest		610	610	610
Record # of Latest		158	158	158
Most Common Day		Tuesday	Monday	Wednesday
Most Common Month		July	August	August
Days in January		27	19	22
Days in February		17	13	14
Days in March		31	11	11
Days in April		23	6	6
Days in May		38	10	9
Days in June		60	13	14
Days in July		199	20	20
Days in August		189	31	31
Days in September		161	18	18
Days in October		185	22	24
Days in November		87	18	16
Days in December		23	18	17
Days on Sunday		13	27	6
Days on Monday		25	46	8

Fig. 3.4.4 Date Statistics



Statistics for Time Fields

Customer-Database.IMD				
Field Type	Time Statistics	ORDER_DATE_TIME	PAYMENT_DAT_TIME	SHIPMENT_DA_TIME
Numeric	# of Records	1,000	1,000	1,000
Date	# of Valid Values	1,000	1,000	1,000
Time	# of Data Errors	0	0	0
Time Fields	# of Zero Items	0	801	801
☒ ORDER_DATE_TIME	Latest Time	11:55 PM	11:59 PM	11:59 PM
☒ PAYMENT_DAT_TIME	Earliest Time	12:01 AM	12:00 AM	12:00 AM
☒ SHIPMENT_DA_TIME	Most Common Hour	11	0	0
	Most Common Minute	12	0	0
	Most Common Second	0	0	0
	# of Records in AM	788	801	801
	# of Records in PM	212	199	199
	# of Records Before 6 AM	373	801	801
	# of Records After 6 PM	104	95	100
	Average Time	8:39 AM	3:31 AM	3:35 AM
	# of Records Less Than...	1000	1000	1000
	# of Records More Than...	0	0	0

Fig. 3.4.5 Time Statistics

Exercise:

- Click on field statistics for sample employees and understand profile of data.
- Click on field statistics for sample-inventory and understand profile of data.

3.5 SAMPLING

Learning Objectives

- To draw a number of records with fixed interval for testing.
- To select a random sample of records for testing.
- To extracts a random sample with a specified number of records from each of a series of bands.

Function Description

Sampling in IDEA is broadly statistical and probability-based.

The probability-based sampling techniques are: Systematic, Random and Stratified Random

The statistical sampling techniques are: Attribute, Classical Variable and Monetary Unit sampling

We will be covering examples of systematic and random sampling only in this training. Students may try other forms of sampling in the lab exercise.

Systematic Record Sampling

Systematic Record Samplings a method to extract a number of records from a database at equal intervals to a separate database. It is often referred to as interval sampling.



There are two methods of determining the sample:

- Entering the number of records, in which case IDEA computes the interval size.
- Entering the selection interval, in which case IDEA computes the number of records.

IDEA calculates the above parameters on the number of records in the database and defaults to the first to last records. However, we can extract the sample from a range of records, if required.

Step by Step Procedure for performing Systematic Sampling

Ensure that **Sales Transaction-Sales Trans** is the active database and the **Data** property is selected in the **Properties** window.

Location

- **Sampling > Systematic.**
- Alternatively, click the **Random Record Sampling** button on the **Operations** toolbar. The **Random Record Sampling** dialog box appears as shown in Fig 3.5.1

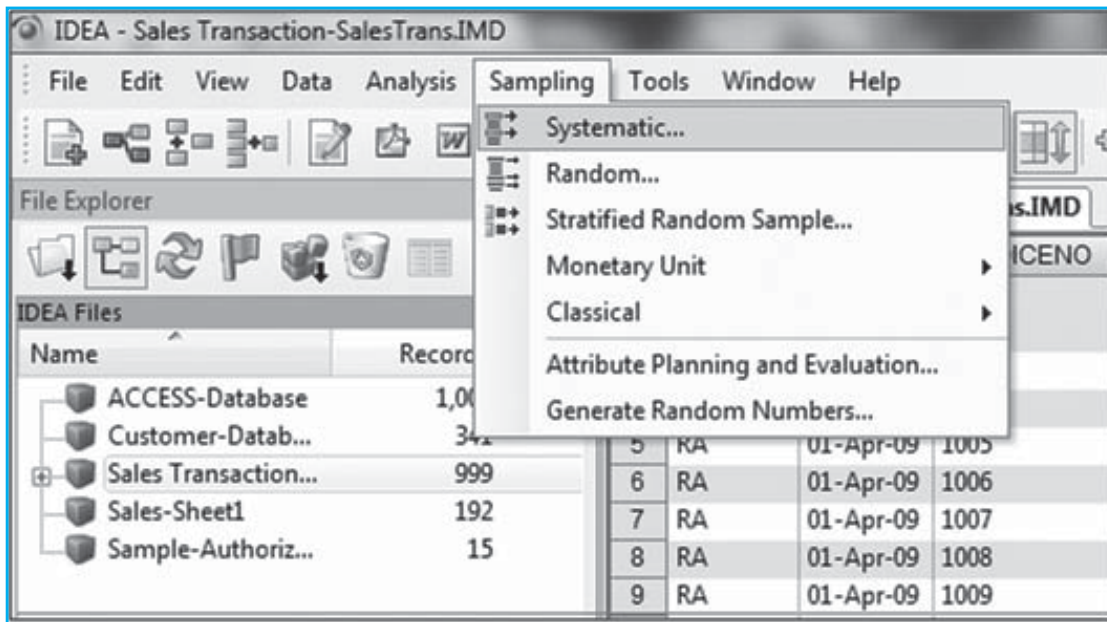


Fig. 3.5.1 Systematic Sampling



Step 1: Number of Records

Systematic Sample

Number of Records Selection Interval

Selection interval: 10

Number of records to select: 100

Starting record number to select: 1

Ending record number to select: 1000

File name: Systematic Sales

Fields Compute Help OK Cancel

Fig. 3.5.2 Number of Records

- (a) In the **Number of records to select** box, enter **100**.
- (b) Accept the random number seed provided by IDEA. IDEA uses the random number seed to start the algorithm for calculating the random numbers. If a sample needs to be extended, then entering the same seed but with a larger sample size produces the same original selection plus the required additional records.
- (c) Accept the defaults in the **Starting record number to select** and the **Ending record number to**
 - (a) **Select** boxes.
 - (b) IDEA sets the defaults as the first and last records; in this case 1 and 1000.
- (d) In the **File name** box, enter **Systematic Sales**.

Step 2: Selection Interval

Systematic Sample

Number of Records Selection Interval

Number of records to select: 100

Selection interval: 10

Starting record number to select: 1

Ending record number to select: 1000

File name: Systematic Sales

Fields Compute Help OK Cancel

Fig. 3.5.3 Selection Interval



- In **Selection Interval** tab page, enter 10 for selection interval. This means it picks every 10th records from 1 to 1000 records. Total records picked are 100.
- Click Ok.

Step 3: Result of Systematic Sampling

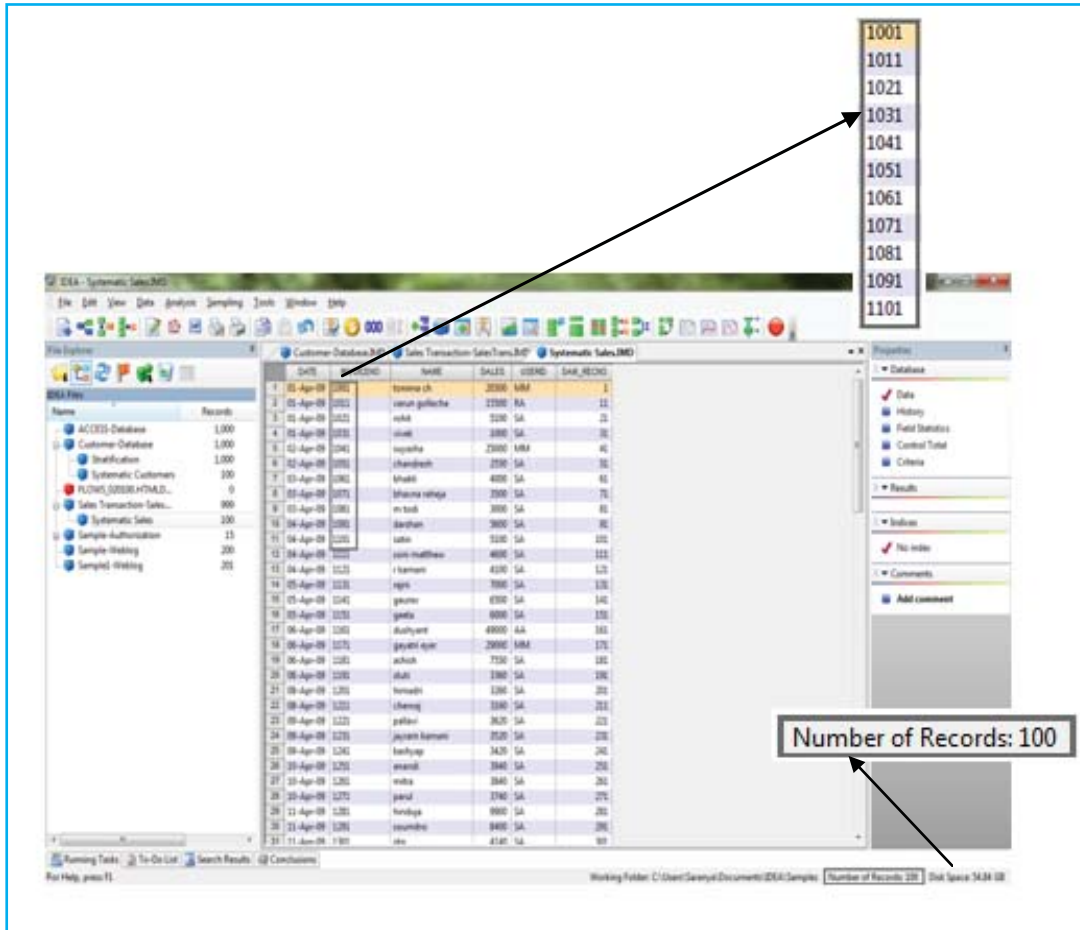


Fig. 3.5.4 Systematic Result

- As displayed in the result, every 10th record is picked from the active database and total numbers of records are 100.

Random Record Sampling

Random Record Sampling is a commonly used method of sampling. With it we enter the sample size as well as the range of records from which the sample is to be extracted to a separate database. Then, using a random number seed, IDEA generates a list of random numbers and selects the appropriate records associated with these numbers.

Step by Step Procedure for performing Random Sampling

Ensure that **Sales Transaction-Sales Trans** is the active database and the **Data** property is selected in the **Properties** window.



Location

- **Sampling > Random.**
- Alternatively, click the **Random Record Sampling** button on the **Operations** toolbar. The **Random Record Sampling** dialog box appears as shown in Fig 3.5.5

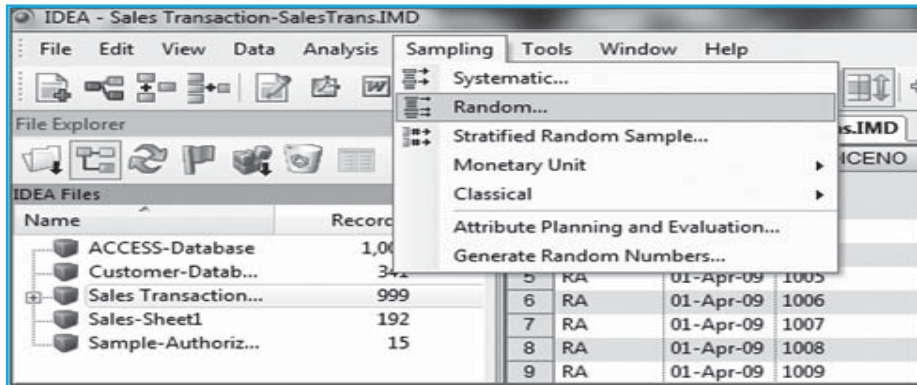


Fig. 3.5.5 Random Sampling Location

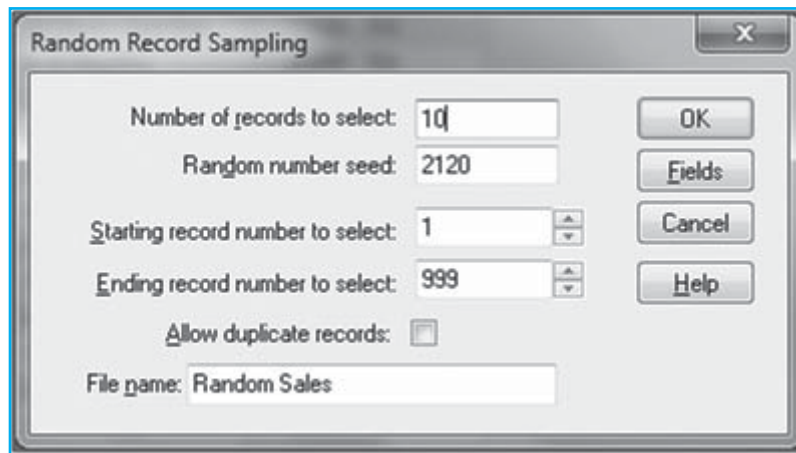


Fig. 3.5.6 Random Sampling

- In the **Number of records to select** box, enter **10**.
- Accept the random number seed provided by IDEA. IDEA uses the random number seed to start the algorithm for calculating the random numbers. If a sample needs to be extended, then entering the same seed but with a larger sample size produces the same original selection plus the required additional records.
- Accept the defaults in the **Starting record number to select** and the **Ending record number to Select** boxes.
IDEA sets the defaults as the first and last records; in this case 1 and 999.
- Leave the **Allow duplicate records** check box unselected.
- In the **File name** box, enter **Random Sales**.
- On clicking **Ok** total **10 records** are extracted from active database.



Random Sampling Result

DATE	DESCRIPTION	NAME	AMOUNT	CITY	STATE	ZIP
04-Apr-09	1215	r.kumar	4000	SA	1215	
24-Apr-09	1300	shweta	2000	IND	500	
25-Apr-09	1627	subha	3500	SA	627	
05-May-09	1925	richard	27000	MM	925	
05-May-09	1707	martha	3000	SA	707	
06-May-09	1860	merna	3000	SA	860	
06-Apr-09	1118	shweta	6700	SA	118	
08-Apr-09	1587	laker	1800	SA	587	
23-Apr-09	1363	rubana	13000	RA	363	
08-May-09	1905	karish	36400	AA	905	

Fig. 3.5.7 Random Sampling Result

Exercises:

1. Perform sampling on different sample files available in sample database.
2. Perform stratified sampling using one of the tables in the sample database.

3.6 STRATIFICATION

Learning Objectives

To stratifying the data from the file into bands and gaining the profile of the data. The data can be stratified based using the numeric, date or character field to select a random sample of records for testing.

Function Description

The process of stratification involves creating bands based on ranges of values (normally from the minimum to the maximum values of one or more fields) and accumulating the records from the database into the appropriate bands. By totaling the number of records and value of each band, you can gain a profile of the data in the database. You can then investigate any deviations from expected trends. You may have up to 1,000 stratification bands. The stratification analysis is also useful for determining high and low cut-off values for testing exceptional items.

A numeric stratification analysis can also be created for each unique value or key in a field by selecting that field from the **Group by** drop down list. For example, you could produce a profile of sales for each salesperson. This can potentially create an extremely large volume of output however the maximum number of groups that will be displayed in the result is 80. If there are more than 80 groups, only the first 80 are displayed. Therefore, there is an option to specify low and high cut-off values to restrict output. Only groups whose total value of transactions is between the specified range are output.

To include all items in the stratification analysis, the bands should start less than the minimum value and the upper band greater than the maximum value of all fields.

Date and Character stratification are different than Numeric Stratification in the sense that different fields are totaled to the one used for banding.



Step by Step Procedure for performing Numeric Stratification

Ensure that **Sales Transaction-Sales Trans** is the active database.

Location

- **Analysis > Stratification.**

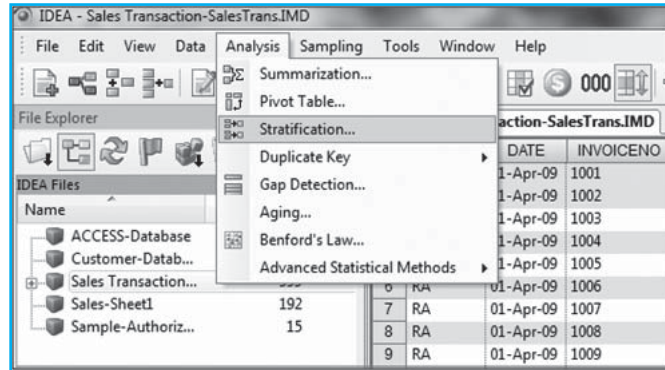


Fig. 3.6.1 Stratify Location

- In the **Field to stratify** box, select **SALES**.
- In the **Fields to total on** box, select **SALES**.
- Group By **USERID**.
- Specify the stratification bands:
 - Change the increment to 10,000.
 - Click in the **< Upper Limit** text box of the first row. Note the text box is filled with the value 10,500.
 - Click the second row of the spreadsheet area. This automatically fills with 10,500 to 20,500
 - Highlight the next three rows of the spreadsheet area to take the range to 50,500.

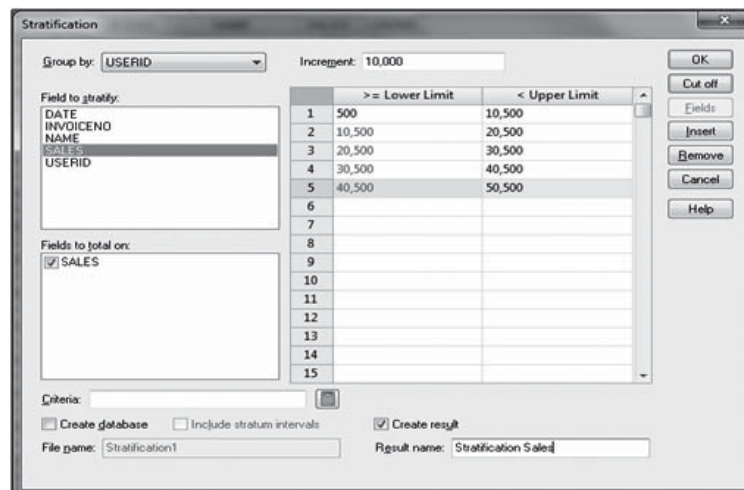


Fig. 3.6.2 Stratification



Ensure the **Create result** check box is selected. In the **Result name** box, enter **Stratification Sales**.

- (e) Click **OK**.
- (f) The **Numeric Stratification** result output for the **Sales Transactions** database becomes active and appears as a link in the **Results** area of the **Properties** window. Note that there are 6 accounts in the first band (≥ 500 and $< 10,500$).

Stratum #	>= L Limit	< U Limit	# Records	(%) # Records	SALES	(%) SALES
1	500	10,500	6	4.88	61,200	3.36
2	10,500	20,500	117	95.12	1,760,700	96.64
3	20,500	30,500	0	0.00	0	0.00
4	30,500	40,500	0	0.00	0	0.00
5	40,500	50,500	0	0.00	0	0.00
		Lower limit exceptions:	0	0.00	0	0.00
		Upper limit exceptions:	0	0.00	0	0.00
		Totals:	123	100.00	1,821,900	100.00

Fig. 3.6.3 Stratification Result

Exercises

Use sample-employees file and perform numeric stratification on salary with various bands.
Use sample-employees and perform character stratification based on name.

3.7 SORTING

Learning Objectives

- To create a new database in which its records are physically sorted in a specified order.
- Ensure that **Sales Transaction-Sales Trans** is the active database.

Location

- **Data>Sort.**

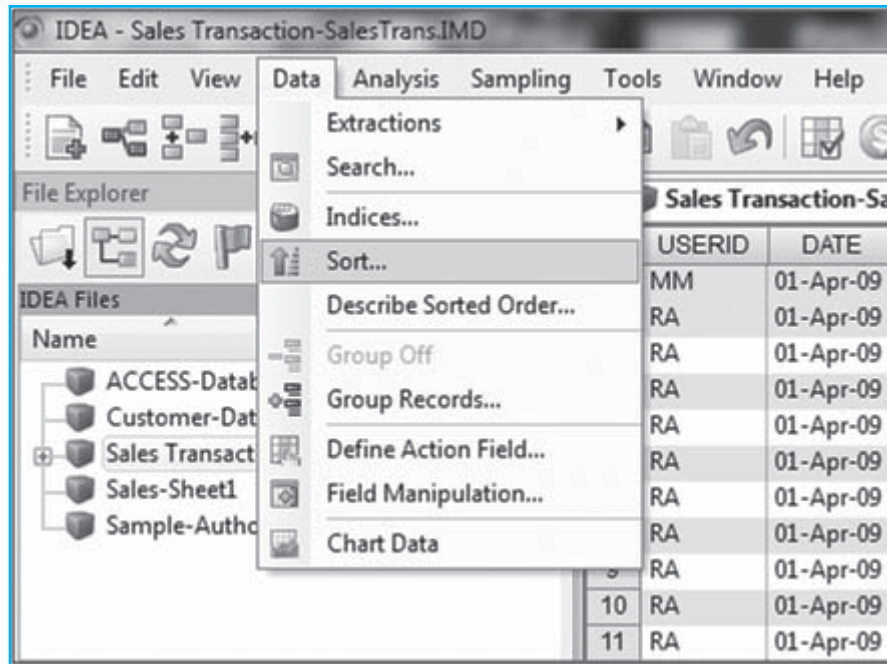


Fig. 3.7.1 Sorting Location

Function Description

The fields you select to sort the records by are known as keys. A sort order may contain up to eight keys. When creating a sort order, the most significant field is selected first (primary key), followed by the next most significant field, and so on down to the least significant field (secondary keys).

With the Sort task, a new database is created with the records in the sequence of the key. This new database is a child database and appears in the File Explorer below the main database. Once you have sorted a database, IDEA displays the records in the database in the sort order and updates the list in the Indices area of the Properties window.

Step by Step Procedure for performing Sorting

Click on the **Field** list button (down arrow) on the **Field** column of the first row of the dialog grid to display a list of all fields in the database. Select the required field.

The **Direction** column displays **Ascending** order for each field selected. To change the order for a field, click the **Direction** column to activate the **Direction** list button.

To add further fields to the sort order, click the next available row in the **Field** column and select the field and its direction as above. A maximum of eight fields may be entered. **Note:** If required, you can delete a key from the sort order by selecting the required row and then clicking **Delete Key**.

Here **DATE** field is selected in descending direction.

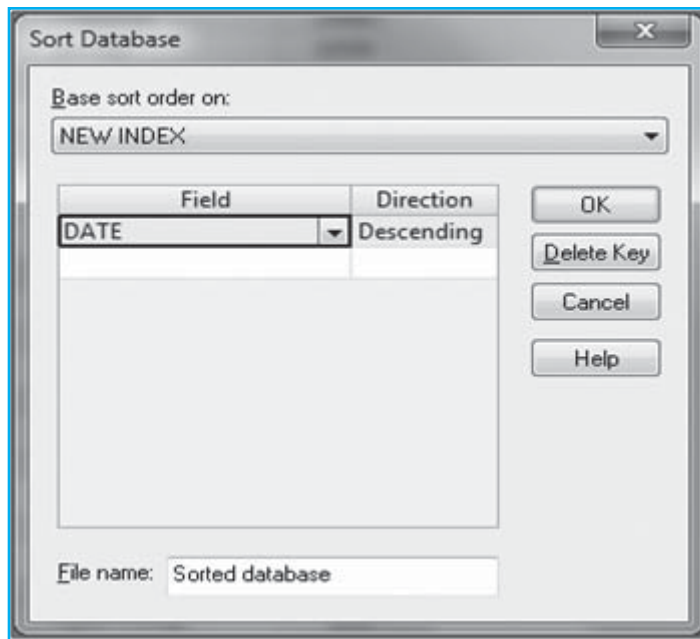


Fig. 3.7.2 Sort Database

- (e) In File name box enter **Sorted database**.
- (f) Click **OK**. Date field is sorted in descending direction as shown in the below figure.

Sorted-Database

	USERID	DATE	INVOICENO	NAME	SALES
1	AA	09-May-09	1999	vivek	44900
2	AA	09-May-09	1998	martin	45150
3	AA	09-May-09	1997	nisha jain	45400
4	AA	09-May-09	1996	ayushmaan	45650
5	AA	09-May-09	1995	siddharth	45900
6	MM	08-May-09	1994	ajmera	28650
7	MM	08-May-09	1993	maullik	28900
8	MM	08-May-09	1992	modi	29150
9	MM	08-May-09	1991	lainy	29400
10	MM	08-May-09	1990	lara	29650
11	MM	08-May-09	1989	dhupia	29900
12	AA	08-May-09	1988	vishvanath	30150
13	AA	08-May-09	1987	maria	30400
14	AA	08-May-09	1986	mallika	30650
15	AA	08-May-09	1985	malayka	30900
16	AA	08-May-09	1984	tanisha	31150
17	AA	08-May-09	1983	dimple	31400
18	AA	08-May-09	1982	khanna	31650
19	AA	08-May-09	1981	tiwary	31900
20	AA	08-May-09	1980	shaily	32150
21	AA	08-May-09	1979	sandra	32400
22	AA	08-May-09	1978	sapna	32650

Fig. 3.7.3 Sorted database



Exercises:

1. Use Sample-Employees and sort on city.
2. Use Sample-Employees and sort on First Name, City and Salary.
3. Duplicate Detection and Gap Detection

3.8 DUPLICATE DETECTION

Learning Objectives

- To test the validity of invoices.
- To test for duplicate invoice numbers.

Function Description

IDEA includes two key functions to identify exceptions, irregularities, anomalies and errors.

These are: Duplicate Detection and Gap Detection

These functions assist the user to sift through large volumes of data and help pin-point specific duplicate entries or specific missing entries. These also help the user obtain an assurance on all the data reviewed by it. The duplicate or missing items identified can be taken up for testing after running the respective duplicate and gap tests within IDEA.

Duplicate Detection and Gap Detection tests are standard passing tests which are run on every database right at the (inception prior to detailed excepting and analytical testing within IDEA. The tests do not require much querying experience and resemble plug-n-play tests. Both tests run largely on formatted sequential data fields like Invoice Number, Purchase Order Number, Cheque Number, etc.

Step by Step Procedure for Duplicate Detection

Ensure that **Sales Transaction-Sales Trans** is the active database.

Location

- **Analysis > Duplicate Key > Detection.**

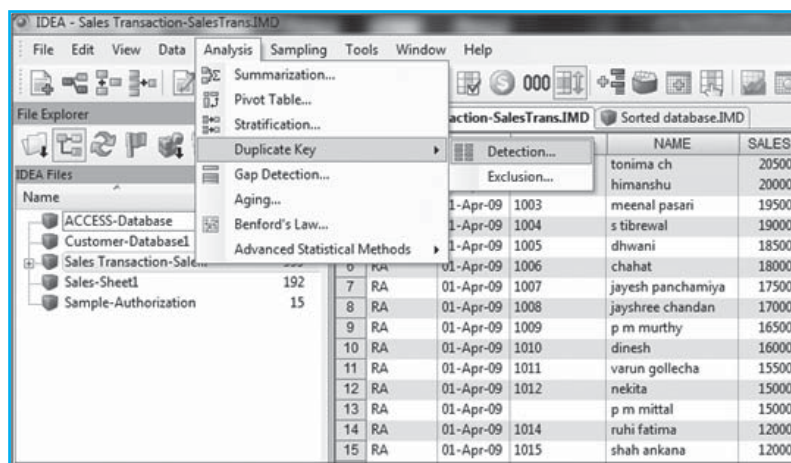
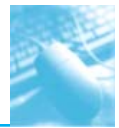


Fig. 3.8.1 Identify Duplicates Location



- (a) The **Duplicate Key Detection** dialog box appears.

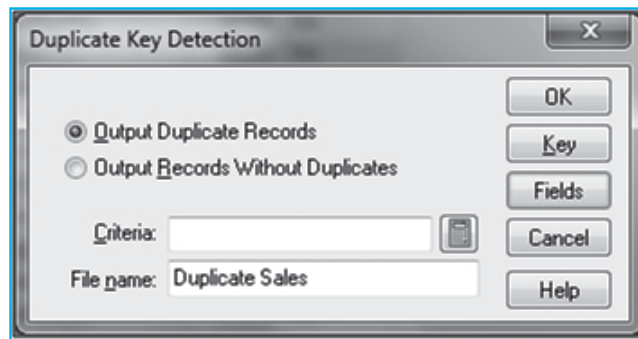


Fig. 3.8.2 Duplicate Key Detection

- (b) Leave the **Output Duplicate Records** option selected.
 (c) Click **Fields** and select **INVOICENO**, **INVDAT** and **USERID**.

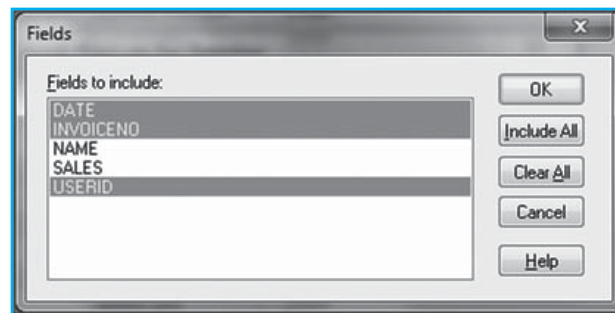


Fig. 3.8.3 Fields

- (d) Click **Key**. The **Define Key** dialog box appears
 (e) .In the **Field** column, select **INVOICENO** and leave the direction as **Ascending**.

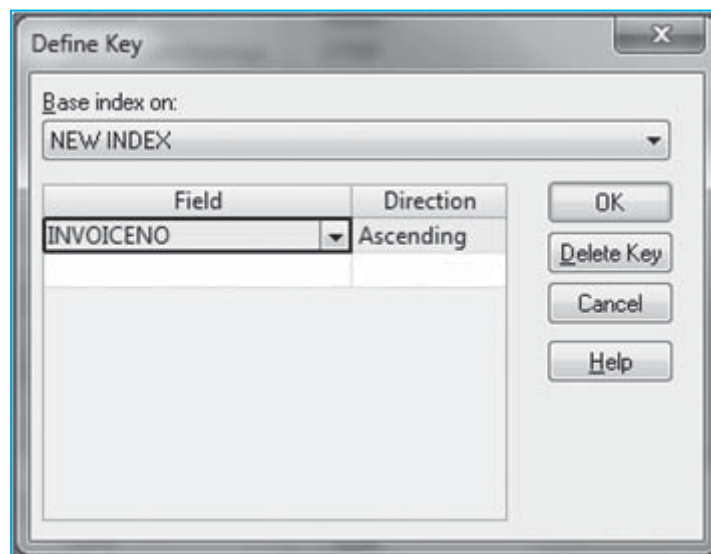


Fig. 3.8.4 Define Key



- (f) Click **OK** to return to the **Duplicate Key Detection** dialog box.
- (g) In the **File name** box, enter **Duplicate**.
- (h) Click **OK** to run the task.

Duplicate Result

- (a) In the resultant database of 8 transactions with DATE, INVOICENO and USERID duplicate values are investigated.
- (b) Duplicate file is opened as current active database.
- (c) The given result is sorted based on INVOICENO field in ascending direction.

	USERID	DATE	INVOICENO
1	RA	01-Apr-09	
2	SF	06-Apr-09	
3	SA	01-Apr-09	1034
4	SA	01-Apr-09	1034
5	AA	18-Apr-09	1454
6	AA	18-Apr-09	1454
7	SF	30-Apr-09	1708
8	SF	30-Apr-09	1708

Fig. 3.8.5 Duplicate Result

Exercises:

1. Use Sample-Employees file and find out duplicates based on name.
2. Use Sample-Employees and identify duplicates based on fields: First Name and Name.
3. Use Sample-Employees file and identify duplicates based on Address.

3.9 GAP DETECTION

Learning Objectives

- To test for completeness.
- To test for gaps in the invoice number sequence.

Ensure that **Sales Transaction** is the active database.

Location

- **Analysis > Gap Detection.**

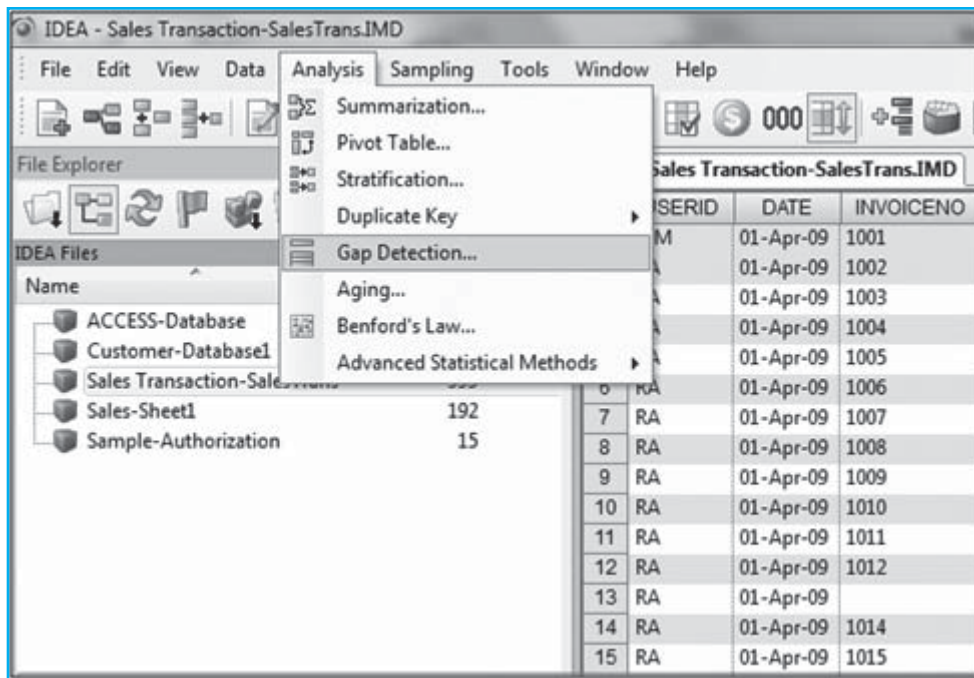


Fig 3.9.1 Gap Detection Location

Step by Step Procedure for Gap Detection

- In the **Field to use** list box, select **INVOICENO**.
- In the **Output** area, ensure the **Create result** check box is selected.
- In the **Result name** box, enter **Gap Detection Sales**.
- On clicking Ok, the result database contains the gaps occurring **From: INVOICENO, To: INVOICE** and **Number** in the active database.

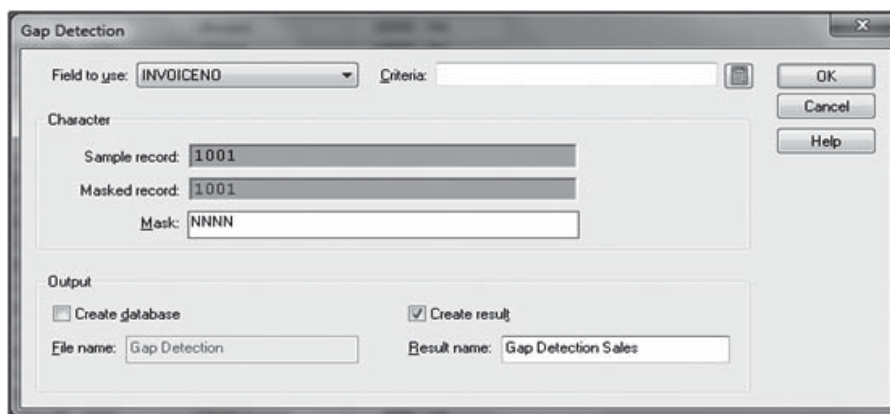


Fig 3.9.2 Gap Detection



From: INVOICENO	To: INVOICENO	Number
0001	1000	1,000
1013	1013	1
1035	1035	1
1158	1158	1
1455	1455	1
1709	1709	1
Total number of items detected		1,005
Total number of gaps detected		6

Fig 3.9.3 Gap Detection Result

Exercise:

1. Use Sample-Bank Transactions file and identify gaps based on date.

3.10 AGING

Learning Objectives

- To age a selected database from a particular date for up to six specified intervals. These intervals can be days, months, or years.
- To age the outstanding debts at the yearend in order to determine provisions required against bad debts.

Function Description

Aging function presents aged summaries of data. This summary may be based on the current date or a specified cutoff date. Use the Aging task to age a selected database from a particular date for up to six specified intervals. These intervals can be days, months, or years. For example, you can age the outstanding debts at the yearend in order to determine provisions required against bad debts.

The most common use of the Aging task is with Accounts Receivable or Debtor Ledgers. However, also consider using Aging on inventory databases (date of last movement) or on short-term loan databases.

The Aging task optionally produces:

- A detailed aging database
- A key summary database
- A Results output

Ensure that **Sales Transaction-Sales Trans** is the active database.



Location

- **Analysis > Aging.**

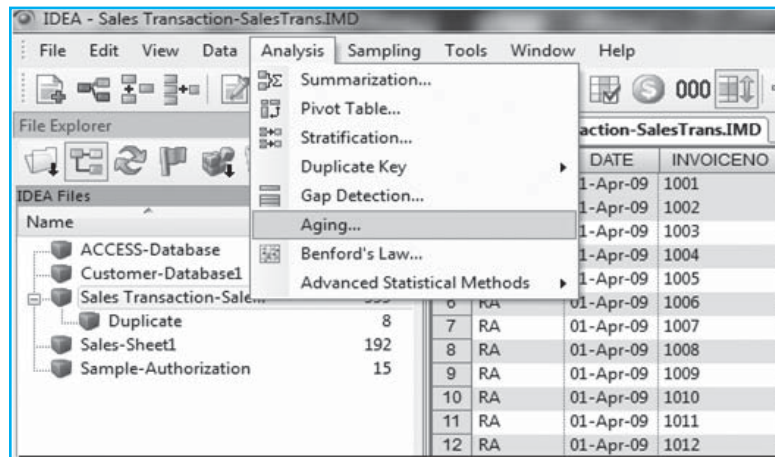


Fig. 3.10.1 Aging Location

Step by Step Procedure for performing Aging:

- Enter the Aging date to 2012/06/27 i.e yyyy/mm/dd format.
- Set the Aging field to use to **DATE**.
- Set the Amount field to total to **SALES**.
- Aging interval in Days. The other options are Months and year.
- The **Aging** task optionally produces:
 - A detailed aging database.
 - A key summary database.
 - A result output.
- Select only Create result option.
- In the Name box enter **Aging Sales**.
- On clicking Ok, the below output is displayed.



Aging

Aging date: 2012/06/27

Criteria:

Aging field to use: DATE

Amount field to total: SALES

Aging interval in: Days

1: 30 3: 90 5: 150

2: 60 4: 120 6: 180

☐ Generate detailed aging database:
File name: Aging Fields

☐ Generate key summary database:
File name: Age Summary Key

☒ Create result:
Name: Aging Sales

OK Cancel Help

Fig. 3.10.2 Aging Location

Aging Result

Int (Days)	# Records	(%) Records	Debits	(%) Debits	Credits	(%) Credits	Net Value	(%) Net Value
0	0	0.00	0	0.00	0	0.00	0	0.00
30	0	0.00	0	0.00	0	0.00	0	0.00
60	0	0.00	0	0.00	0	0.00	0	0.00
90	0	0.00	0	0.00	0	0.00	0	0.00
120	0	0.00	0	0.00	0	0.00	0	0.00
150	0	0.00	0	0.00	0	0.00	0	0.00
180	0	0.00	0	0.00	0	0.00	0	0.00
180+	999	100.00	18,366,960	100.00	0	0.00	18,366,960	100.00
ERR	0	0.00	0	0.00	0	0.00	0	0.00
Totals:	999	100.00	18,366,960	100.00	0	0.00	18,366,960	100.00

Fig. 3.10.3 Aging Result

Exercise:

Use Sample Bank Transactions file and perform aging by entering the aging date as: 2003/11/06.

3.11 DATA EXTRACTION

Learning Objectives

- To perform an extraction to identify accounts where the new credit limit has been exceeded.

Function description

Extract selected data from a file for further investigation for creating a new file of logically selected records. For example: you can use Direct Extraction to perform a single extraction on a database, or up to 50 separate extractions with a single pass through the database.



Step by Step Procedure for Data Extraction

Ensure that **Sales Transaction** is the active database.

Location

- **Data > Extractions > Direct Extraction.**

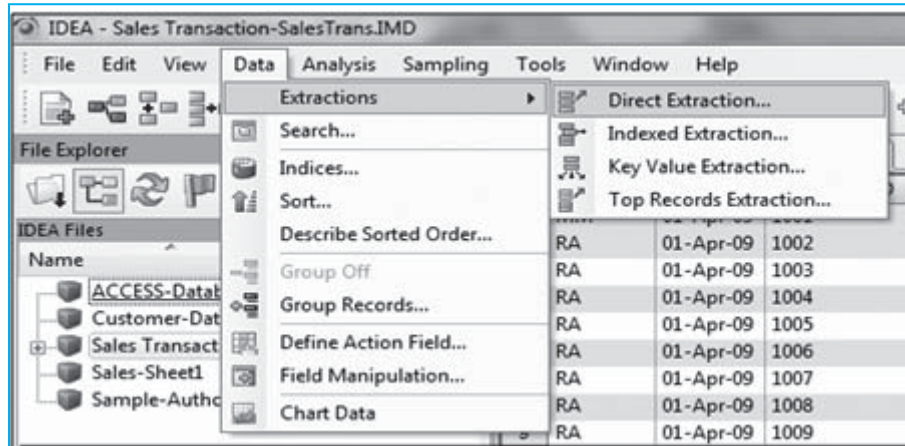


Fig. 3.11.1 Direct Extraction Location

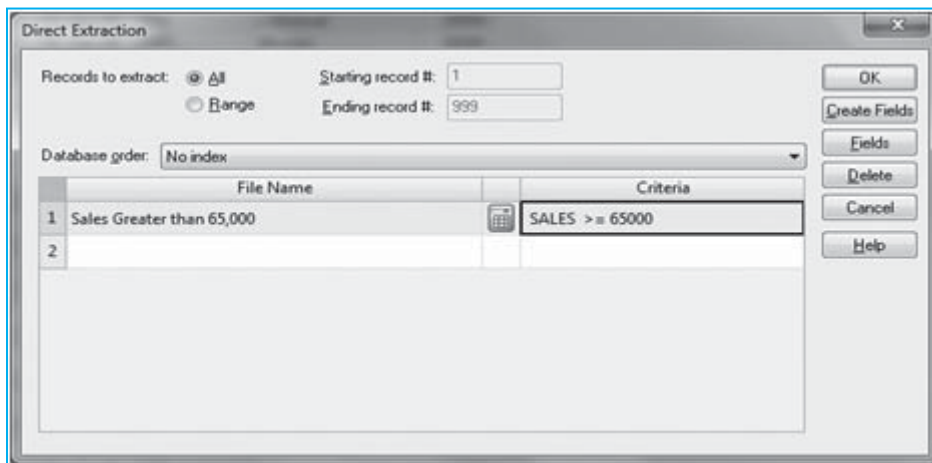


Fig. 3.11.2 Direct Extraction

- In the **File Name** column, replace the default file name with **Sales Greater than 20,000**.
- Click the **Equation Editor** Button, and then enter the equation **SALES >= 20000**.
- Click the **Validate and Exit** button to return to the **Extract to File(s)** dialog box.
- On clicking Ok creates a new child database with name **Sales Greater than 20,000** which contain records where Sales is greater than 20,000.



Record Extraction Result

	USERID	DATE	INVOICENO	NAME	SALES
1	SF	22-Apr-09	1505	karuna	65150
2	SF	23-Apr-09	1539	munshi	69900
3	SF	23-Apr-09	1540	merlyn	69650
4	SF	23-Apr-09	1541	smith	69400
5	SF	23-Apr-09	1542	vienetta	69150
6	SF	23-Apr-09	1543	becker	68900
7	SF	23-Apr-09	1544	jacquillene	68650
8	SF	23-Apr-09	1545	jack	68400
9	SF	23-Apr-09	1546	yohana	68150
10	SF	23-Apr-09	1547	shirley	67900
11	SF	23-Apr-09	1548	tina	67650
12	SF	23-Apr-09	1549	dheeru	67400
13	SF	23-Apr-09	1550	ratan	67150
14	SF	23-Apr-09	1551	jamshedji	66900
15	SF	23-Apr-09	1552	jachson	66650
16	SF	23-Apr-09	1553	micheal	66400
17	SF	23-Apr-09	1554	stephen	66150
18	SF	23-Apr-09	1555	apeksha	65900
19	SF	23-Apr-09	1556	poojashree	65650
20	SF	23-Apr-09	1557	nanjapa	65400

Fig. 3.11.3 Direct Extraction Result

Exercises:

- Use Sample-Suppliers file and extract supplier details where supplier no. is from 30000 to 90000.
- Use Sample-Suppliers file and extract supplier details where country is "Chile".

3.12 BENFORD'S LAW

Learning Objectives

To compare the data with the data pattern predicted by **Benford's Law** analysis.

Function Description

Benford's Law states that digits and digit sequences in a data set follow a predictable pattern. The **Benford's Law** task generates a database, and optionally a **Results** output, that you can analyze to identify possible errors, potential fraud, or other irregularities. If artificial values are present in the selected database, the distribution of the digits may have a different shape, when viewed graphically, than the shape predicted by **Benford's Law**.

A **Benford's Law** analysis is most effective on data:

- Comprised of similar sized values for similar phenomena.
- Without built-in minimum and maximum values.
- Without assigned numbers, such as bank accounts numbers and zip codes.
- With four or more digits.

Step by Step Procedure for using Benford's Law function

Ensure that **Sales Transaction** is the active database.



Location

- Analysis > Benford's Law.

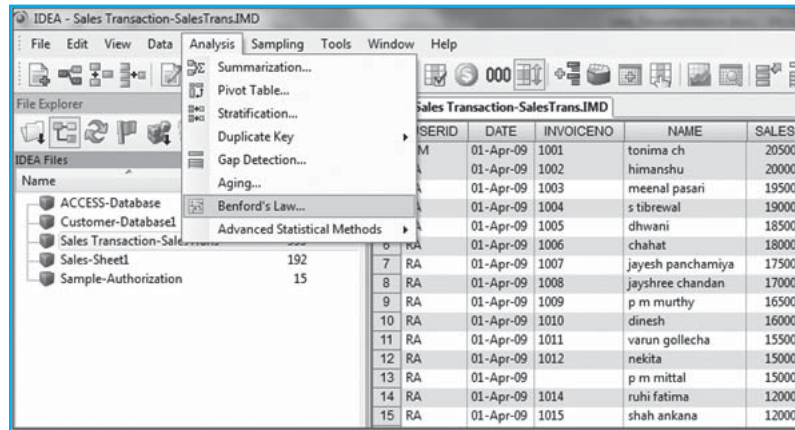


Fig. 3.12.1 Benford's Law Location

The analysis counts digit sequences of values in the database and compares the totals to the predicted result according to **Benford's Law**. Non-zero digits are counted from left to right and values below 10 are ignored.

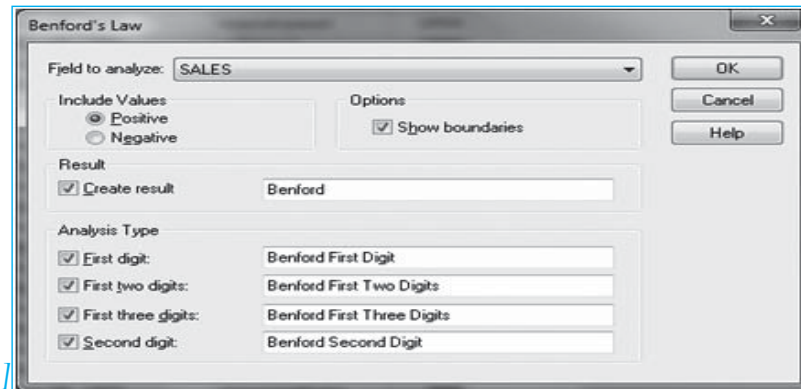


Fig. 3.12.2 Benford's Law

Steps for Benford's Law

- Select the field to analyze. In the **Field to analyze** drop-down list, select the Numeric field for which you want to analyze with Benford's Law.
- Select the number type. In the **Include Values** area, select the check box for the required number type (**Positive** or **Negative**).
- Optionally, specify the upper and lower boundaries. The upper and lower boundaries define the acceptable range of values where the actual result can appear. Select the **Show boundaries** check box to include the boundaries in the **Results** output and resultant database.
- Select the required analysis types. In the **Analysis Type** area, select the required analysis types, and then accept or change the associated database file names.
- Optionally, create a Results output.



- (f) On Clicking Ok, we get results for Benford's First Digit, Second Digit, First Three Digit and First Two Digit.
- (g) In the below image, Benford First Digit result is displayed. To view Second, Third and Fourth Digit result, click on the IDEA files explorer.

DIGITS	EXPECTED	LOWBOUND	HIGHBOUND	ACTUAL	DIFFERENCE
1	300.73	282.57	318.89	142	158.73
2	175.92	160.80	191.03	158	17.92
3	124.81	111.67	137.96	310	-185.19
4	96.81	85.03	108.60	131	-34.19
5	79.10	68.33	89.88	102	-22.90
6	66.88	56.89	76.87	84	-17.12
7	57.93	48.58	67.29	46	11.93
8	51.10	42.27	59.93	12	39.10
9	45.71	37.33	54.09	14	31.71

Fig. 3.12.3 Benford's Law First Digit Result

Exercise: Use Sample-Bank Transactions file and perform Benford's Law function on amount.

3.13 CONSOLIDATION OF DATA

Learning Objectives

- To summarize data and create a report based on many calculations.
- To define how your data is displayed and organized.

Function Description

Consolidation is the process of combining values from several ranges of data. Data can be consolidated by Pivot Table.

Step by Step Procedure for reporting

Ensure that **Sales Transaction** is the active database.

Location

- Analysis>Pivot Table.

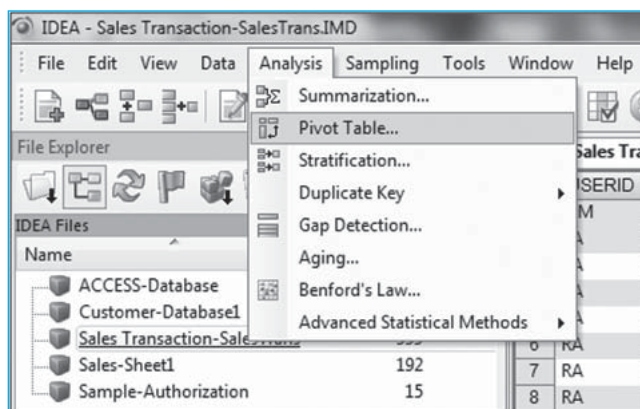


Fig. 3.13.1 Pivot Table Location



In the **Result name** box, enter a name for the **Pivot Table Results** output.

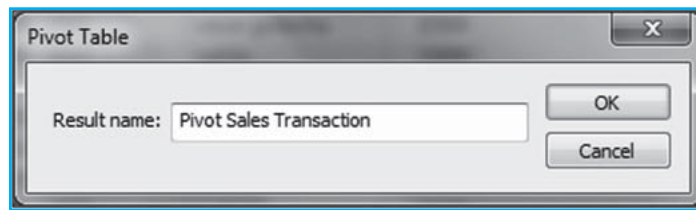


Fig. 3.13.2 Pivot Table

Click **OK**. The **Pivot Table Field List** dialog box appears. It contains the list of available fields in the database, with their field types in adjacent brackets.

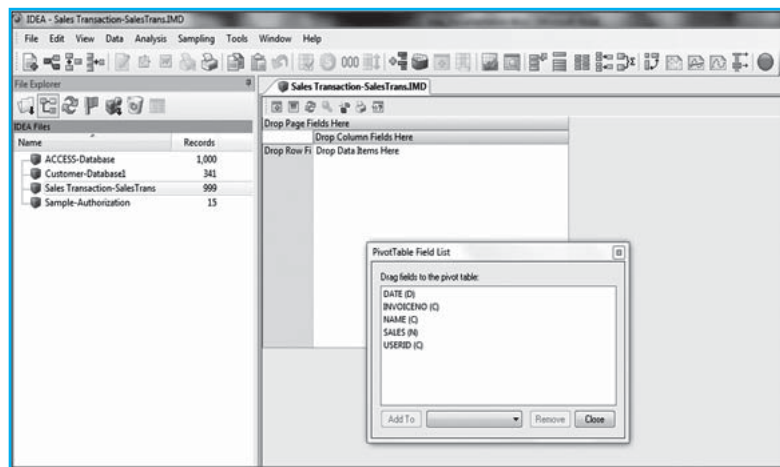


Fig. 3.13.3 Pivot Table Field List

- (a) Create the table by dragging fields to summarize from the **Pivot Table Field List** dialog box to the following areas: **Drop Column Fields Here**, **Drop Row Fields Here**, **Drop Data Items Here** and **Drop Page Fields Here**:
- (b) You can drag the same field more than once into the data area creating a new statistic each time - sum, amount, and so on.
- (c) You can add multiple fields to the Column and/or Row area. When more than one field is added to a column or row area the data in the rightmost header column or lowest header row is grouped by data in the preceding row or column.
- (d) You can also select a field from the **Pivot Table Field List** dialog box, select the area of the pivot table to which you want to add the selected field from the drop-down list, and then click **Add To**. Once a field has been added to the table, it is highlighted in the **Pivot Table Field List** dialog box.
- (e) For every field added to the pivot table, its sort order is added to the **Indices** area of the **Properties** window. You may delete these indices from the **Indices** area without affecting the pivot table.
- (f) From the **Pivot Table Field List** dialog box, click **Close**.



Pivot Table Result

The screenshot shows a PivotTable titled 'Sales Transaction-SalesTrans.IMD'. The data is organized with 'DATE' as the row field and 'USERID' as the column field. The values represent sales amounts. A 'PivotTable Field List' dialog box is open, showing the fields available for the table.

USERID	2009/04/01	2009/04/02	2009/04/03	2009/04/04	2009/04/05	2009/04/06	2009/04/07	2009/04/08	2009/04/09	2009/04/10	2009/04/11	2009/04/12	2009/04/13	20
AA						400,000								
MM	20,500	339,500				125,000								
RA	251,500													
SA	52,100	25,850	93,100	165,750	223,550	61,000	12,460	74,750	116,490	111,360	51,750	250,000	195,300	
SF						216,000	183,000							
Total	326,100	365,350	93,100	165,750	223,550	802,000	195,460	74,750	116,490	111,360	277,170	250,000	195,300	

Fig. 3.13.4 Pivot Table Result

Exercises:

1. Use Sample-Employees file and perform pivot table function with branch as row and salary as column name.
2. Use Pivot table to find out salary as per country/branch and total of salary.

3.14 EQUATION EDITOR

Learning Objectives

- To create formulae and equations in IDEA.

Functions

Use functions to perform more complex calculations and exception testing. You can use them for date arithmetic, text searches, and some statistical operations. They are very similar in style and operation to functions found in other software packages such as Microsoft Excel, Lotus 1-2-3, and dBASE. Each function calculates a result based upon the parameters passed to the function. Parameters are passed in parentheses.

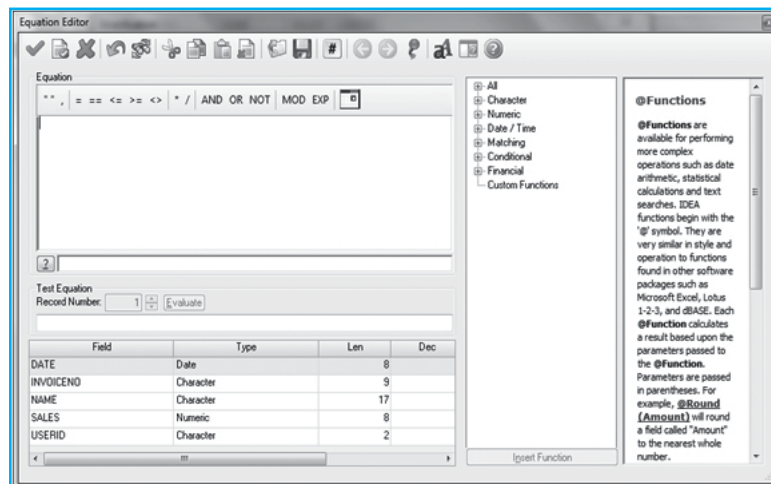
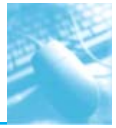


Fig 3.14.1 Equation Editor



Select the type of function you require from the following category list to view the details for the associated functions:

- All - Complete list of all functions.
- Character - Text manipulation or conversion
- Numeric - Calculations and statistics
- Date and Time - Date and time calculations and conversions
- Matching - Matching of multiple and similar items
- Conditional - IF statements to select different items
- Financial - Financial calculations
- Custom - User-defined functions

Entering Functions in Equation Editor

Entering a function involves entering the function name along with any necessary parameters. Functions are entered in the **Equation** area of the **Equation Editor**.

Entering the Function Name

To enter the function name in the **Equation** area, expand the appropriate function category and then double-click the required function name. Alternatively, if you know the name of the function, you can type it directly into the **Equation** area. As you type the function name, the **Equation Editor** provides a list of possible function names.

Entering the Parameters

Parameters may be complete equations with references to other functions, such as nested functions, or simple constants. Parameters are separated by a list separator. The list separator is defined in your Windows Regional Settings and is usually a comma or a semi-colon. Most functions require a specific number of parameters. A syntax error occurs if you provide the wrong type of parameter to a function.

TYPE	EXPLANATIONS	EXAMPLES
String	Represents text or a character expression. A character expression can contain characters or a Character data field.	"Smith" "123456" "Joe" + "Bloggs"
Number	Represents a numeric expression. A numeric expression can contain numeric constants or Numeric data fields.	123.45 ACCNT BAL QTY*COST
Time	Represents a time expression. It is displayed in the grid as HH:MM:SS. A time expression can contain a time constant expressed as a string, a numeric constant, a Time field or a Numeric field. Numeric values are interpreted as the number of seconds.	"23:59:59" TRANS_ TIME
Date	Represents a date expression. A date expression is a character string that is eight characters long and contains a valid date in YYYYMMDD format.	"19960131" TRANS_ DATE



3.15 REPORTING

Learning Objectives

- To generate a report for the current active database.

Function Description

You can use the reporting feature to generate various types of reports from idea.

Step by Step Procedure for reporting

Create a report using the view settings by selecting **File > Print > Create Report**. Alternatively, click the **Create Report** button on the **Operations** toolbar. The **Report Assistant** dialog box appears.

Report Assistant

Accept all defaults and select the **Allow headings to span multiple lines** check box. Click **Next**.

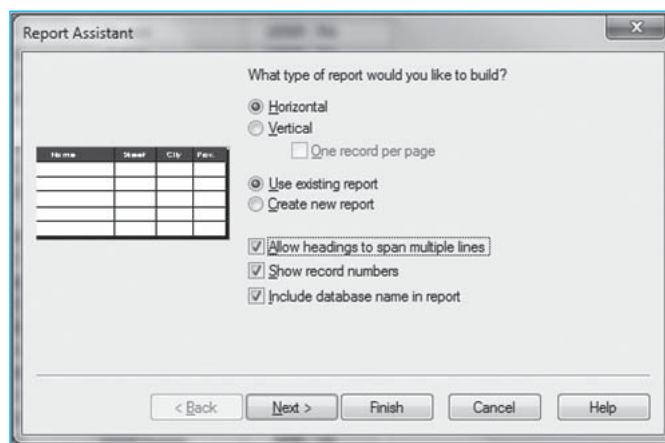


Fig. 3.15.1 Report Assistant

Step 1: Heading Step

Modify the report headings as follows, and then click **Next**:

- Date – Invoice Date
- INVOICENO – Invoice Number
- NAME – User Name
- SALES – Sales
- USERID – User Id

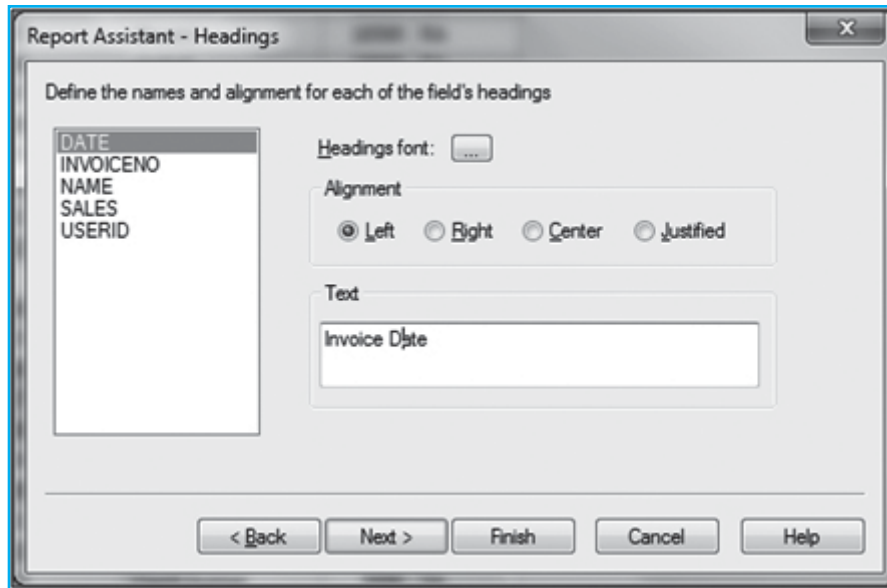


Fig. 3.15.2 Report Assistant- Heading

Step 2: Define Breaks Step

- (a) During this step, define if and where control breaks (required for totals in reports) are required.
- (b) Sequence the database records in the following order:
 - INVOICENO : Ascending

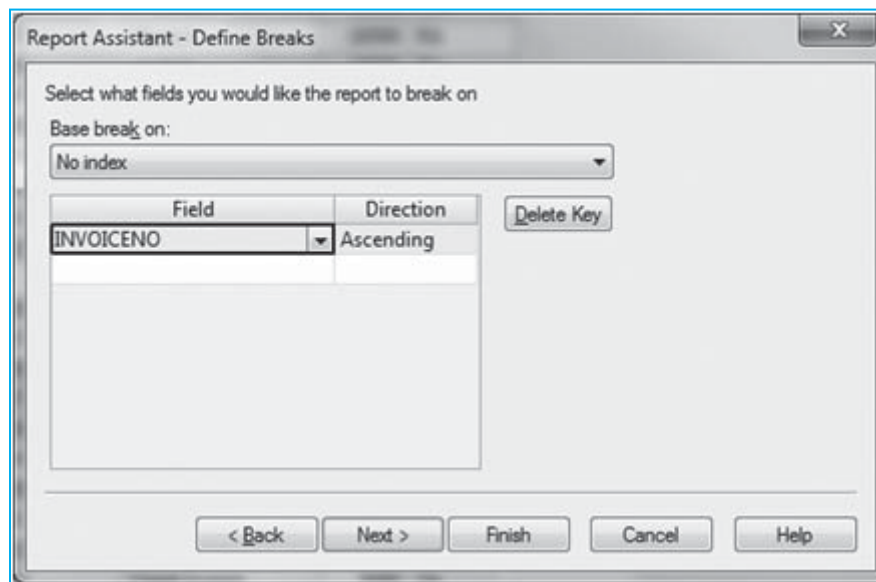


Fig. 3.15.3 Report Assistant - Define Breaks

- (c) Click Next.

Note: IDEA displays the records in the report in the order of the index. IDEA displays the index description in the **Indices** area of the **Properties** window once you have completed the report.



Step 3: Report Breaks Step

Create a break and total the **Sales** field for each **INVOICENO**. Select the options as in the image below, and then click **Next**.

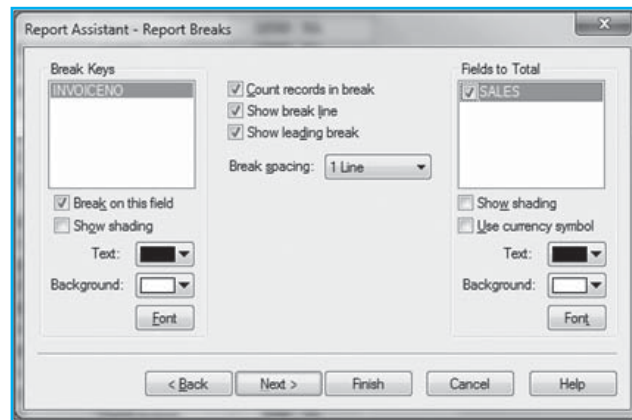


Fig. 3.15.4 Report Assistant - Report Breaks

Step 4: Grand Totals Step

Create grand totals for the **Sales** field only, set the font style to bold, and then click **Next**.

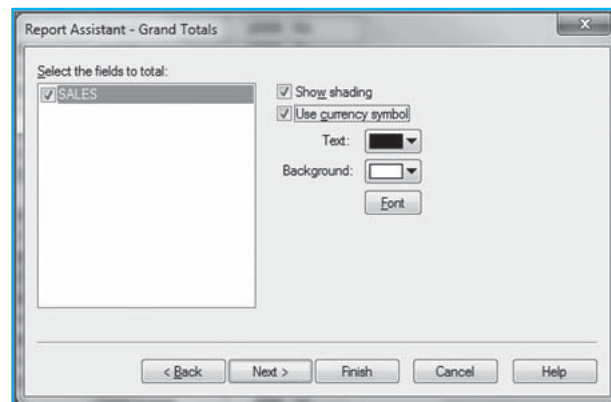


Fig. 3.15.5 Report Assistant -Grand Totals

Step 5: Header/Footer Step

Enter/ select the following information, and then click **Finish**.

- **Print cover page:** Select this check box.
- **Title:** Sales Transactions.
- **Comments:** Ordered by User Id and date.
- **Prepared by:** Enter your name or initials.
- **Header:** Enter the name of your organization.
- **Date/Time:** Accept the defaults unless you have particular preferences.

Note: The options you have selected effect how the report is printed. The name entered into the **Prepared by** field appears on reports accessed via the **Print Preview** of a **Results** output.

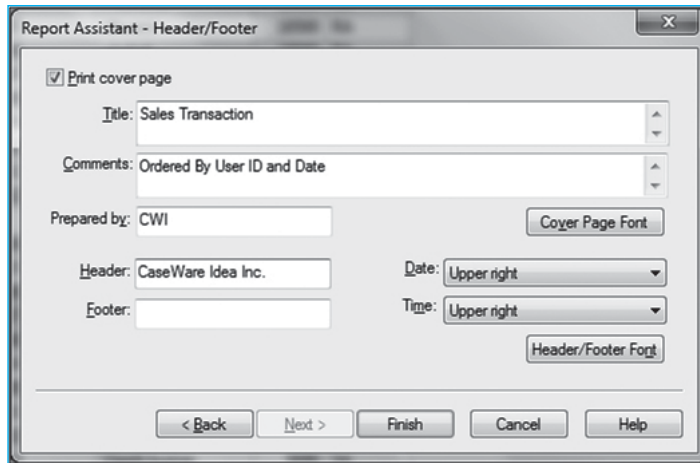


Fig. 3.15.6 Report Assistant – Header/Footer

On clicking finish, you can preview the report generated.

3.16 FIELD MANIPULATION

Learning Objectives

To view field definitions, add or delete fields, change field properties such as field name and type.

Function Description

You can use this to modify the fields as required. Please note that making changes to a field through **Field Manipulation** may cause any output based on that field (results, drill-downs, indices, views, etc) to appear incorrect or become invalid. Results may be made valid again by returning the settings to what they were when the result was created. To avoid this, instead of changing a field definition, append a new field to the database with the required definition. For example, instead of changing the type of a field from Character to Numeric, create a new Virtual Numeric field using @Val.

Select **Data>Field Manipulation**. Field Manipulation Dialog Box is opened.

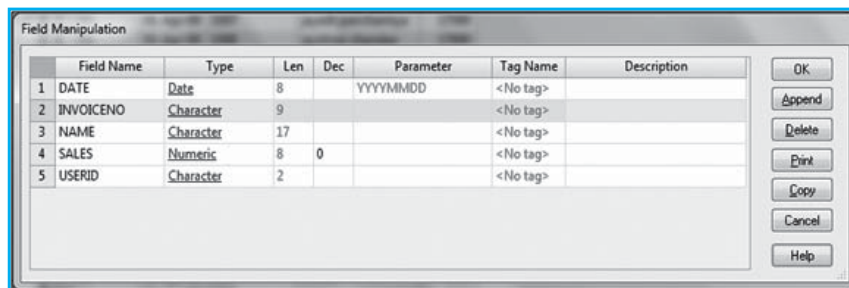


Fig. 3.16.1 Field Manipulation

- Add a field
- Click **Append**.
- Enter the field definition:



Computer Assisted Audit Techniques

- **Field Name:** A unique field name up to 40 characters in length that does not contain spaces or special characters.
- **Type:** Click the **Type** text box to display the type options, and then select the required type.
- **Length:** The total length of the field in characters. IDEA automatically determines the length for Editable Numeric fields.
- **Decimal:** If applicable, enter the number of decimal places. If the decimal is implied, enter 0. The maximum number of decimals places allowed is six.
- **Parameter:** Click the **Parameter** field to invoke the **Equation Editor**.
- **Tag Name:** If you have **Smart Analyzer** installed, click the **<No tag>** link to add a tag.
- **Description** (optional): A brief description of the field. The maximum length of the description is 256 characters.
- Click **Ok**
- Delete a field
- Click in the row corresponding to the field to be deleted.
- Click **Delete**.
- Click **Yes** to confirm the deletion.

Note: As a security feature, by default, native fields cannot be deleted

Change a field type

Click the **Type** text box to display the type options, and then select the required type.

Notes:

- Virtual field types can only be changed to other Virtual field types. For example, a Virtual Character field could be changed to a Virtual Date field.
- Field types cannot be changed for Editable, Boolean or Multistate fields; however the data within this field in the database can be changed.

Change a field name

Click in the **Field Name** cell of the field name to be changed and enter the new name.

Exercise:

Use Sample-employees file and modify different field and understand the impact.



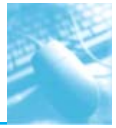
Annexure - Using Audit software: Some Practical Examples

These are samples of analysis which can be performed using audit software for various types of audits/reviews.

Category	Type of Analysis	CAAT Function
Creditors	• Payment terms • Credit Control Policy • Aging of creditors • Discount policy • Authorised suppliers • Authorization • Accounting • Supplier classification on purchases • Analysis of purchases by period	• Extraction, Date difference • Extraction, Date difference, • Aging, date difference • Stratification, Summarization, • Join, Relation, Sort, • Filter, Extract, Summarization • Sort, Total, Count, Summarization • Sort, Relation, Join, Summarization, Sort • Aging, MIS, date difference
Tax Audit	• Identify cash loan\deposits>20000 • Identify cash payment > 10000 • Review of TDS compliance • Analysis of Inventory	• Sort, Filter, Extract, Export, Index, analytical tool Sort, Filter, Extract, Export, analytical tool • Join, Relation, Sort, analytical tool • Aging, MIS, Summarization, Count, Total
Financial audit	• Review of Authorization • Review of discount policy • Compliance with tax rates – sales tax, excise duty, etc • Verification of financial accuracy • Aging of debtors	• Filter, Extract, Summarization • Stratification, Summarization, • Join, relation, filter, extract, sort, count, Total, Compare files • Summarization, Sort, Statistics, Total, Summarization • Aging, MIS, Periodicity check
Internal Audit	• Overall statistical analysis • Identification of exception items • Duplicate payment for invoices • Debtors outstanding > credit period • Age-wise analysis of debtors • Age-wise analysis of inventory	• Statistics, Benford's Law, Summarization • Benford's Law, Filter, Gap detection • Identify duplicates, Sequence, • Join, Relation, Aging, Summarization • Aging, MIS, Summarization, Statistics • Aging, MIS, date difference. total, count



Purchases	• Duplicate payments • Invalid vendors • Duplicate invoices • Invalid purchases • Payments without receipt of goods • Inflated prices • Excess quantities purchased	• Duplicates, Sequence, Relation • Join, Relation, Sort, Summarization, Filter • Duplicates, Sequence, Relation • Join, Relation, Sort, Summarization, Filter • Join, Relation, Compare files, Filter, Exceptions • Filter, Sort, Stratify, Join, Relation • Filter, Sort, Stratify, Join, Relation
Payroll	• Ghost employees • TDS • Duplicate direct credits • Duplicate home addresses • PO Box addresses • Work Phone Nos. • Work Location • Deductions • Vacation and sick leave • Wage level • Terminated employees • Overpayment, overtime	• Join, Relation, Summarization, Sort, Statistics • Re-computation using analytical tool • Identify duplicates, Sequence, Relation • Identify duplicates, Sequence, Relation • Identify duplicates, Sequence, Relation • Identify duplicates, Sequence, Relation • Identify duplicates, Sequence, Relation • Re-computation using analytical tool • Re-computation using analytical tool • Join, Relation, Summarization, Statistics • Join, Relation, Filter, Statistics • Summarization, Statistics, MIS, Join, Relation



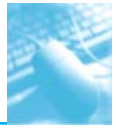
Aging	• Overdue A.R. and A.P. • Favorable credit terms • Inventory turnover rates • Dormant accounts • Records with future, blank or otherwise invalid dates • Items past a cutoff date • Contracts awarded before contract date • Transactions outside of billing period • Length in days of various activities	• Aging, MIS, date difference • Aging, MIS, date difference, • Stratify, Filter, Summarization, • Identify Gaps, date difference • Sort, Filter, Sequence, Identify Gaps, Date difference, Statistics, Count • Date difference, Aging, Filter, • Date difference, Aging, Filter, Summarization, Statistics • Aging, Filter, Summarization, Statistics • Date difference, Aging, Filter, Summarization,....

QUESTIONS

- Computer Assisted Audit Techniques (CAATs) refers to using _____ for increasing the effectiveness and efficiency of auditing.
 - Technology
 - Standards
 - Documentation
 - Systematic Process
- Which of the following statements pertaining to CAAT is true?
 - CAATs are specialist tools designed for use by specialist IT auditors
 - CAATs refer to common techniques which can be easily mastered to audit in a computerized environment.
 - CAATs cannot be used for compliance audit.
 - CAATs can be used for Information systems audit only.
- Which of the following statements pertaining to CAAT is incorrect?
 - CAATs are tools for drawing inferences and gathering relevant and reliable evidence.
 - CAATs provide direct access to electronic information
 - CAATs provide a mechanism to gain access and to analyze data
 - CAATs techniques are available in general audit software only.
- Which of the following is a key reason for using CAATs?
 - Availability of input documents
 - Availability of visible paper trail.



- C. Need to access information from systems having different IT environments.
 - D. Need to perform audit in lesser time.
5. Which of the following is not a benefit of using CAATs?
- A. Increased audit quality and comply with auditing standards.
 - B. Identify materiality, risk and significance in an IT environment.
 - C. Identifying fraud in audit area.
 - D. Ensuring better audit planning and management of audit resources.
6. For effective use of CAATs it is necessary to:
- A. Understand programming language of the software being audited.
 - B. Obtain source code of the software being audited.
 - C. Obtain copy of data in their original format for independent analysis.
 - D. Audit data is retained in the original database format.
7. Which of the following step is important for validating the correctness of data obtained for audit?
- A. Issue a letter for getting the requested data in specified form as per the audit objectives.
 - B. Obtain copies of record layout and definitions of all fields.
 - C. Ensure that auditor has an overall understanding of the data.
 - D. Compare the imported in audit software with control total of key data.
8. File access in CAATs refers to the capability of:
- A. Reading of different record formats and file structures.
 - B. Conversion of data to common formats of data
 - C. Using the import/ODBC function.
 - D. Reviewing access controls of application software.
9. File reorganization feature of CAATs refers to:
- A. Functions provide auditor with an instant view of the data from different perspectives.
 - B. Indexing, sorting, merging, linking with other identified files.
 - C. Using of global filter conditions to select required data based on specified criteria.
 - D. Use of sampling, stratification and frequency analysis.
10. Which of the following statement pertaining precautions in using CAATs is incorrect?
- A. Collect the relevant and correct data files.
 - B. Identify all the important fields that need to be accessed.
 - C. Ensure the data represents audit universe correctly and completely.
 - D. Information provided by CAATs is clear indicator of problems and no further testing is required.



11. Which of the following is the first step in using CAATs?
- A. Identify the sources of data from the enterprise information system/ application software.
 - B. Based on scope and objectives of audit, decide about the need and extent to which CAAT could be used.
 - C. Identify the critical data which is being audited as per audit scope and objectives.
 - D. Identify the relevant personnel responsible for the data and information system.
12. Which of the following is the final step in using CAATs?
- A. Obtain and review documents relating to data/ information systems.
 - B. Decide what techniques of CAATs could be used as relevant to the environment
 - C. Prepare a detailed plan for analyzing the data.
 - D. Perform relevant tests on audit data as required and prepare audit findings and include in audit report/opinion.

ANSWERS

1. A	2. B	3. D	4. C
5. C	6. C	7. D	8. A
9. B	10. D	11. B	12. D

REFERENCES

Below are sample list of references:

www.icaai.org
www.isaca.org
www.auditnet.org
www.caseware-idea.org
www.acl.com
www.theiia.org

LEARNING OBJECTIVES

- Using advance extraction options for performing complex data analytics
- Understanding use of Benford's Law in audit
- Understanding advance @ functions
- Learning Macro and IDEA Script

4.1 EXTRACTING SELECTED RECORDS

IDEA offers various options under "Extract Group" to select and extract records from databases and perform further analysis and/or to save the extracted records as a separate database.

Following options are provided in IDEA to perform extraction under analysis menu:

1. Direct
2. Key Value
3. Top Records
4. Indexed
5. Duplicate Key Detection
6. Gap Detection

4.1.1 DIRECT

Direct function is used to extract records by writing one more criteria's and allows to save result in new database. With direct function we can provide one or more criteria to extract records.

Step by step procedure for using direct function

Open database 'sales register'. Total records in the file are 999 and extract records having INV_AMOUNT more than 10000.

Step 1: Analysis > Direct

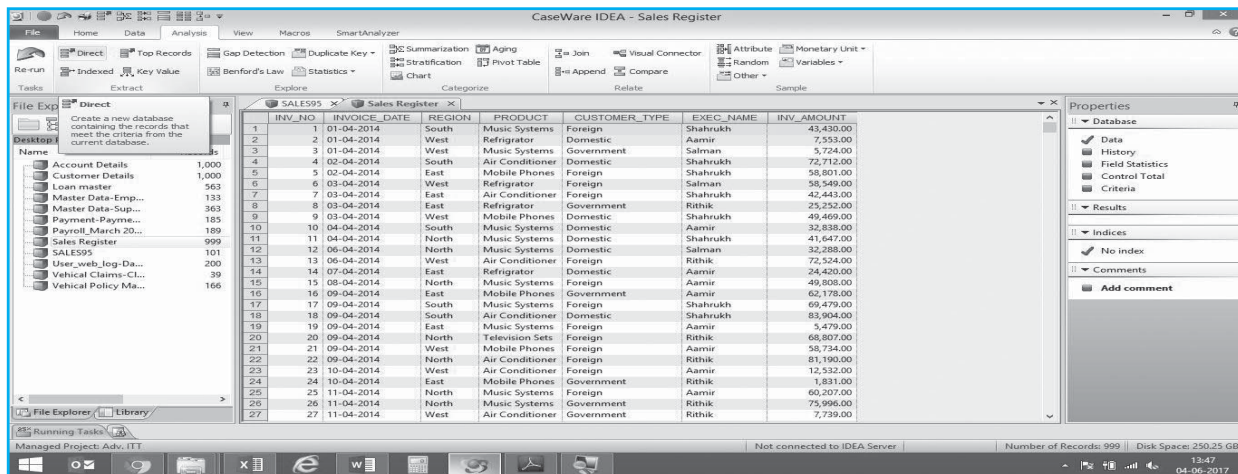


Fig. 4.1.1.1 – Direct option. Number of records 999

Step 1: Analysis > Direct Extract

Step 2: Records to extract:

- All – select this option to apply criteria on entire databases
- Range - select this option to apply criteria on range of records and not on entire database

Step 3: Database order: Criteria can be defined on indexed or sorted database by using this option.

Step 4: File Name: Give new file name

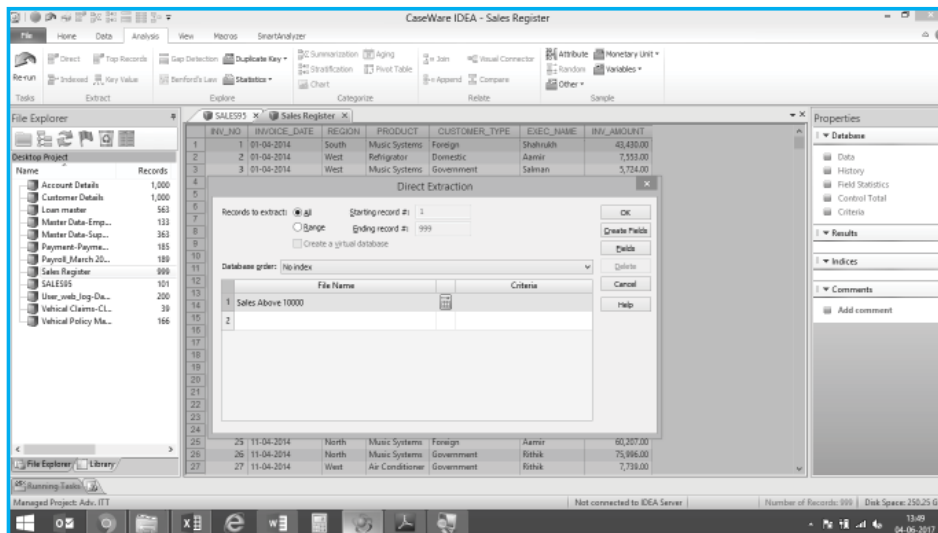


Fig. 4.1.1.2 – Give file name

Step 5: Click on equation editor icon to define the criteria

Step 6: Define the criteria on equation editor screen $INV\_AMOUNT > 10000$ and click on validate and exit option or press Ctrl+U

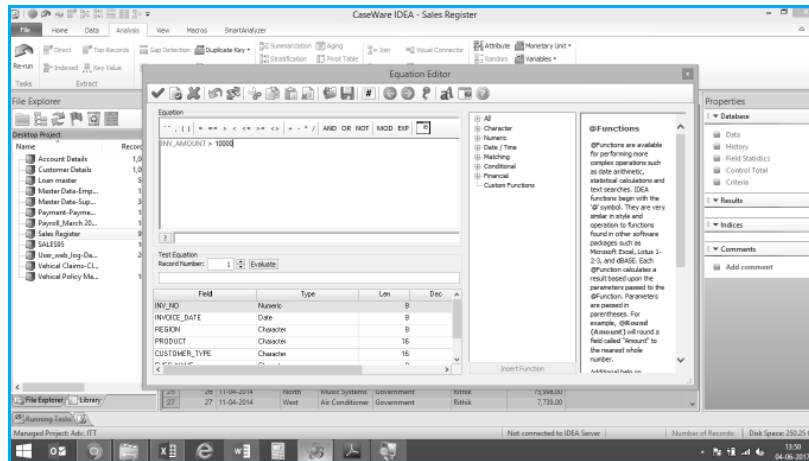


Fig. 4.1.1.3 – Define criteria

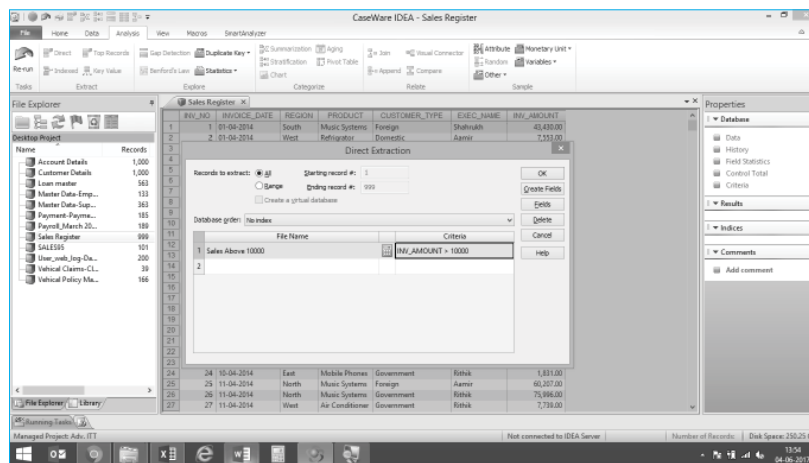


Fig. 4.1.1.4 – Save file

Step 7: Click on OK

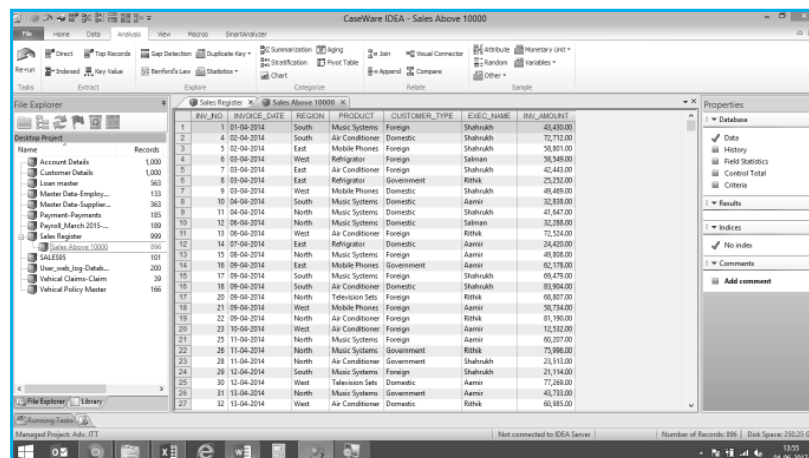


Fig. 4.1.1.5 – Result saved in new database



Step 8: A new file meeting the criteria is created with 896 records out of 999 having invoice amount more than 10000

Note: Any Criteria defined in the equation editor can be saved by using Ctrl+S and it will save in Equations.ILB folder of the active project. Same can be reused as it is or edited for further references.

Exercises: 1. Extract records of sales of more than or equal to 15000 in East region

Exercises: 2. Extract records of mobile phones sold to foreign customer

4.1.2 KEY VALUE

Helps to extract records using values in a key. This function is used to extract records for a key in the entire database in a separate file. Key can be a region, product, zone, customer type, etc.

Step by step procedure for using Key Value function

Open database 'sales register'. Total records in the file are 999.

Extract records based on key being 'Product'

Step 1: Analysis > key Value

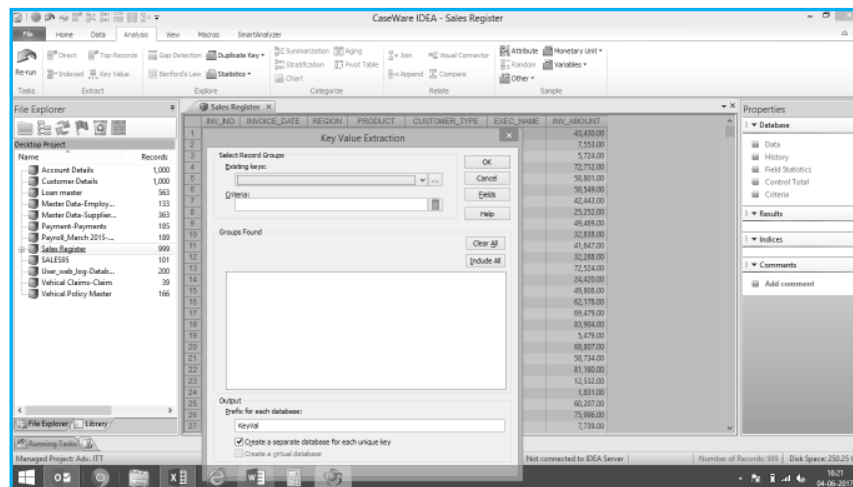


Fig. 4.1.2.1 Using Key Value

Step 2: Click on ... besides 'Existing keys:' option

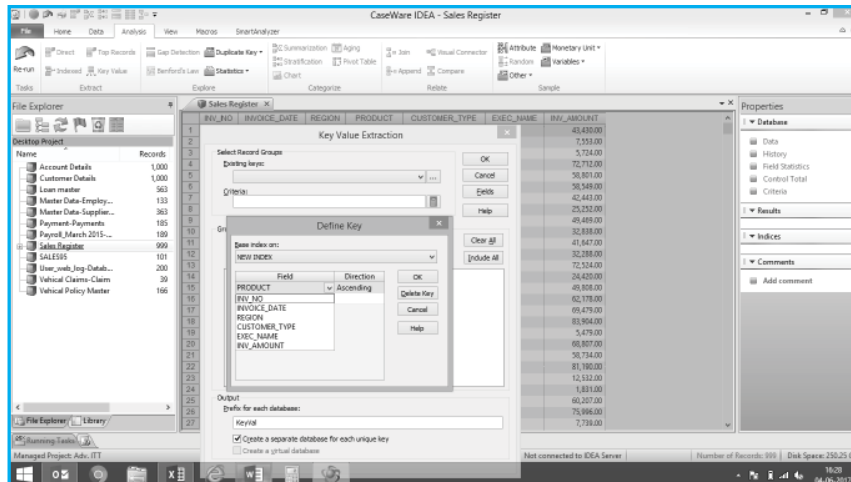


Fig. 4.1.2.2 Existing Keys

Step 3: Select product from the drop down option and click on OK

Step 4: Idea will extract all the key values and will pop up under group found section

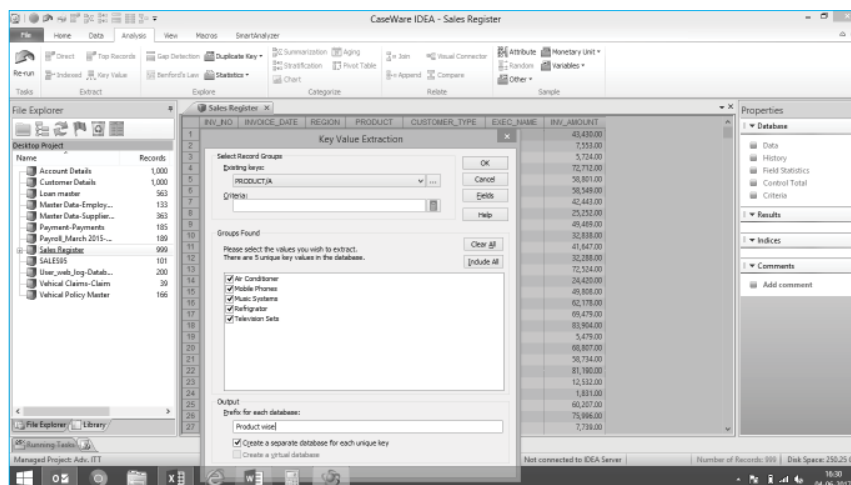


Fig. 4.1.2.3 Key values displayed

Step 5: Under output section, provide file name under 'prefix for each database'

Step 6: Click on create a separate database for each unique key, will extract all the records for each unique key in a separate database

Step 7: Use criteria tab to define condition for extraction of records key wise

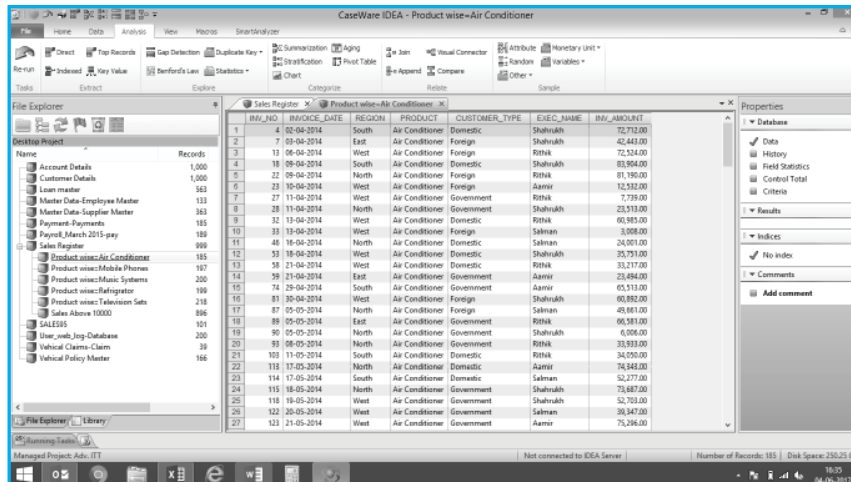


Fig. 4.1.2.4 Key wise databases created

Key value wise databases (product wise in our example) created and saved under master file sales register

Exercises: 1. Extract records based on key value region for south and east region

Exercises: 2. Extract records based on EXEC_NAME for INV_AMOUNT exceeding 25000

4.1.3 TOP RECORDS:

Helps to extract specified number of top or bottom records for each value of key in a separate database.

Step by step procedure for using Top Records function

Open database 'sales register'. Total records in the file are 999.

Extract 3 top records INV_AMOUNT wise for each of the customer type

Step 1: Analysis > Top Records

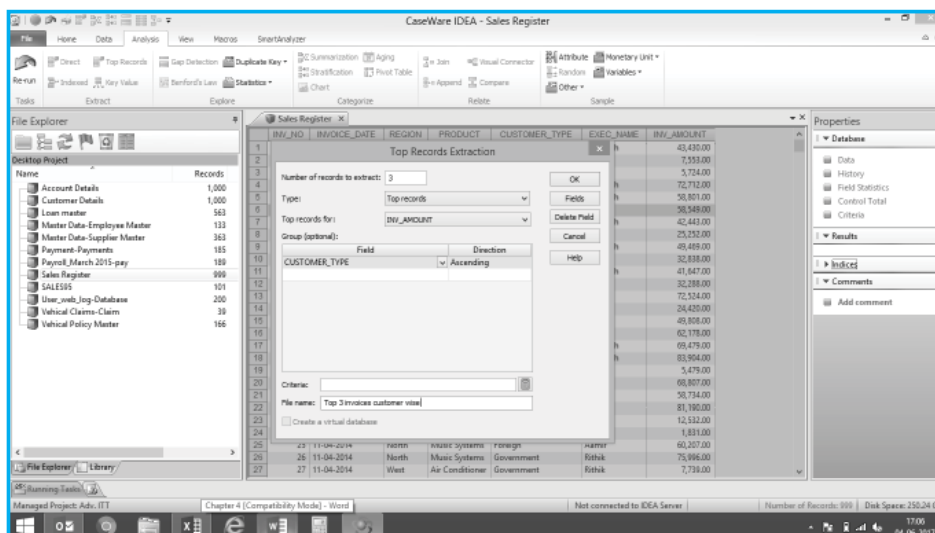


Fig. 4.1.3.1 – Top records Extraction



Step 2: Number of records to extract - type 3

Step 3: Type: select Top records. Selecting bottom records option here will extract bottom records for the given conditions

Step 4: Top Records for: select INV_AMOUNT

Step 5: Under Group (optional): select Customer Type

Step 6: File name – type Top 3 invoices customer wise

Step 6: Enter condition to apply the function on selected type of records

INV_NO	INVOICE_DATE	REGION	PRODUCT	CUSTOMER_TYPE	EXEC_NAME	INV_AMOUNT
319	27-07-2014	West	Music Systems	Domestic	Sahman	84,518.00
718	18-12-2014	South	Music Systems	Domestic	Shahrukh	84,488.00
908	22-02-2015	West	Refrigerator	Domestic	Shahrukh	84,305.00
185	06-06-2014	North	Television Sets	Foreign	Shahrukh	84,383.00
601	28-10-2014	West	Mobile Phones	Foreign	Aamir	84,355.00
883	14-02-2015	East	Music Systems	Foreign	Sahman	83,398.00
193	13-06-2014	West	Air Conditioner	Government	Sahman	84,659.00
684	30-11-2014	North	Mobile Phones	Government	Aamir	84,518.00
445	05-09-2014	West	Mobile Phones	Government	Shahrukh	84,488.00

Fig. 4.1.3.2 – Top records Extraction customer type wise

Exercise 1: extract bottom 5 invoices for each executive

Exercise 2: extract top 3 invoices above Rs15,500/- for each region

4.1.4 INDEXED

Uses an existing index to narrow down the scope of extraction. This function can be used along with criteria to get better results. It combines the capabilities of criteria and range extraction.

Step by step procedure for using indexed function

Open database 'sales register'. Total records in the file are 999.

Extract records of INV_AMOUNT >= 15000 having invoice date between 3rd April to 10th April, 2014

Step 1: Analysis > Indexed

Step 2: Field- select INVOICE_DATE

Step 3: Value is - >= 20140403 (YYYYMMDD)

Step 4: and - <= 20140410

Step 5: Criteria - INV_AMOUNT > 15000

Step 6: File Name - Invoices above 15K between 3 to 10 April. 16 records extracted as an output

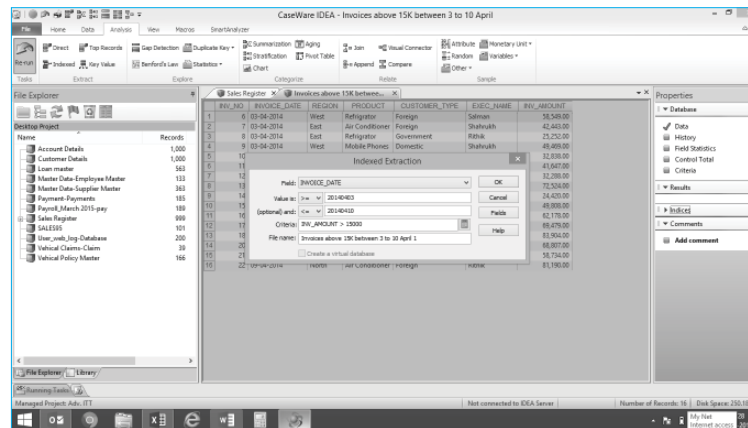


Fig: 4.1.4.1 – Index function options

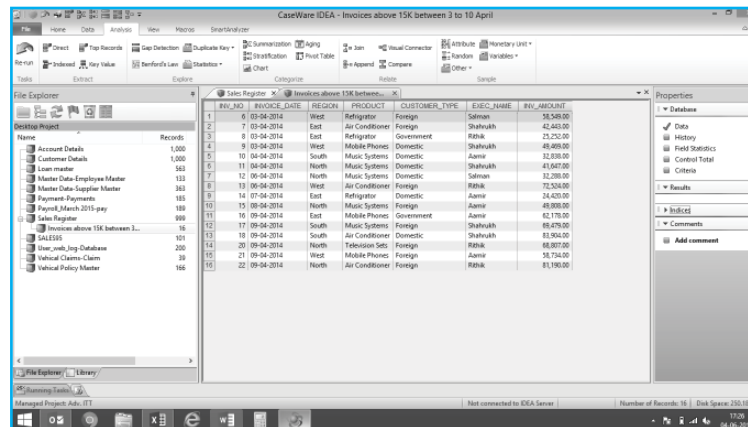


Fig: 4.1.4.2 – Output of indexed function

Exercise 1: Extract invoices for west region having invoice value between 8000 to 48000

Exercise 2: Extract invoices for product refrigerator having invoice date between 21st March to 28th March 2014

4.1.5 DUPLICATE KEY

IDEA includes two tasks for finding duplicate records:

Duplicate Key Detection: Identifies all records where the fields in the key are identical.

Duplicate Key Exclusion: Similar to Duplicate Key Detection, except that an additional field must be different.

The Duplicate Key Detection task is used to identify duplicate items in a database. Duplicate Key Detection can be used to identify duplicates within a single field, such as duplicate invoice numbers, or duplicates in a combination of up to eight fields.

Duplicate Key Detection can also be used to identify non-duplicate keys (unique) by selecting the **Output Records without duplicates** option instead of the default Output Duplicate Records option.



The Duplicate Key Exclusion task is used to identify duplicate items in a database where a further specified field is different, such as duplicate purchase order numbers for different suppliers. Duplicate Key Exclusion can be used to identify duplicates within a single field, such as duplicate invoice numbers, or duplicates on a combination of up to eight fields.

Step by step procedure for Duplicate Key Detection

The director of accounting is worried that several invoices may have been issued on multiple occasions. Verify if there have been any multiple invoices issued.

Step 1: Ensure that **Sales Transactions-Database** is the active database and that the **Data** property is selected in the **Properties** window.

Step 2: On the **Analysis** tab, in the **Explore** group, click **Duplicate Key** and then click **Detection**. Alternatively, from the Quick Access Toolbar, click the **Duplicate Key Detection** button.

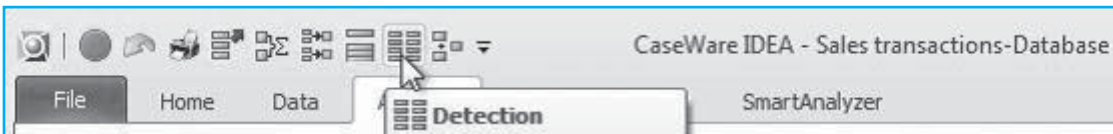


Fig: 4.1.5.1 Duplicate Key Detection dialog box.

Step 3: Click **Key**. The Define Key dialog box appears.

Step 4: Select **INV_DATE** in **Ascending** order and then select **CUSTOMER_NO** in **Ascending** order.

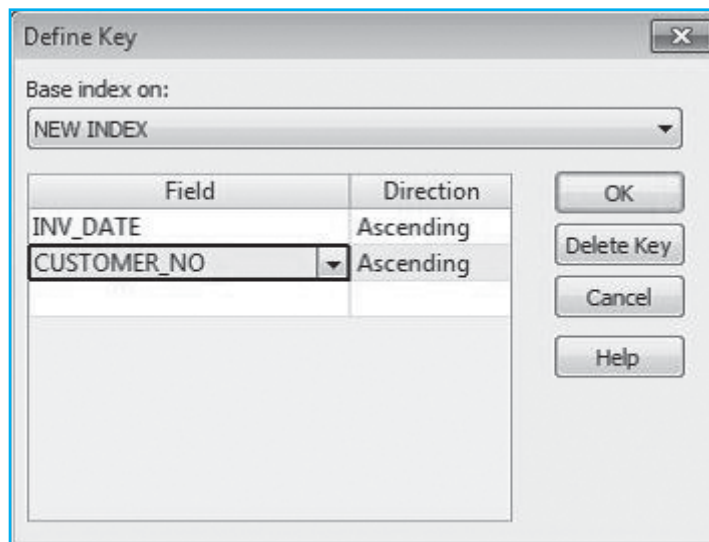


Fig 4.1.5.2 Define Key dialog box.

Step 5: Click **OK**.

Step 6: Accept the default selection of the **Output duplicate records** option.

Step 7: In the **File name** field, enter **Duplicate Customer Sales on Same Day** as in Fig 4.1.5.3.

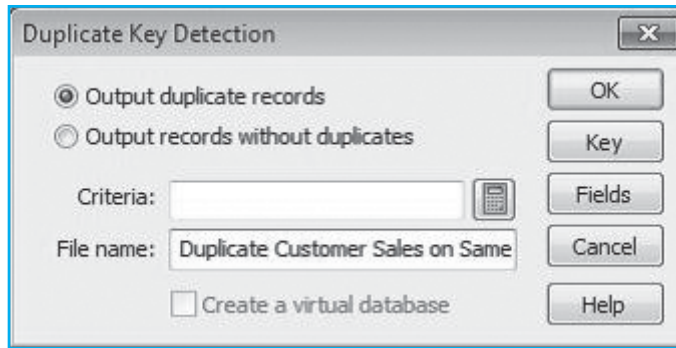


Fig 4.1.5.3

Step 8: Click **OK**.

The new database, containing all transactions with sales to the same customer more than once on the same day, is created and opened in the Database window.

Step 9: Ensure that **Duplicate Customer Sales on Same Day** is the active database and that the **Data** property is selected in the **Properties** window.

Step 10: On the **Analysis** tab, in the **Tasks** groups, click **Re-run**.

Step 11: In the Duplicate Key Detection dialog box, click **Key**.

Step 12: Add **QTY** as the third key.

Step 13: Click **OK**.

Step 14: In the Duplicate Key Detection dialog box, enter **Refined Duplicate List** as the file name.

Step 15: Click **OK**.

The new database of potential duplicates is displayed.

Step by step procedure for searching Non-Duplicate records

While Duplicate Key Detection allows you to search for more than one occurrence of a record, IDEA allows you to extract records that appear only once in the database.

Step 1: Ensure **Sales Transactions-Database** is the active database and that the **Data** property is selected in the **Properties** window.

Step 2: On the **Analysis** tab, in the **Explore** group, click **Duplicate Key** and then click **Detection**. Alternatively, from the Quick Access Toolbar, click the **Detection** button.

Step 3: Select the **Output records without duplicates** option.

Step 4: In the **File name** field, enter **Non-Duplicate Invoices**

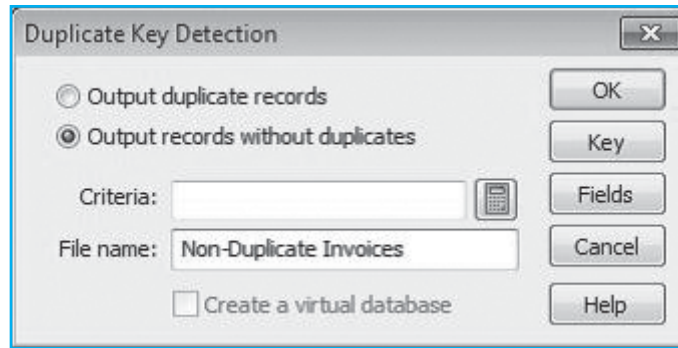


Fig 4.1.5.4 Select Non-Duplicate records

Step 5: Click **Key** and ensure **INV_NO** is selected as your first field in **Ascending** order.

Step 6: Click **OK**.

Step 7: In the Duplicate Key Detection dialog box, click **OK**.

The new Non-Duplicate Invoices database will appear.

4.1.6 Gap Detection

The Gap Detection task identifies “missing” information in a database. The results of the test are displayed in the Results area of the Properties window. The Gap Detection task can be used on a Numeric field to identify gaps in a numerical sequence, such as missing check numbers in a payment database.

The Gap Detection task can be used on a Character field to identify gaps in a numerical sequence that is a sub-set of a Character field. For example, it may be used to identify gaps in an invoice number sequence for each store where the first character of the invoice number identifies the store (for example, A123).

The Gap Detection task can be used on a Date field to identify gaps in a range of dates. It provides the option for excluding weekends and/or holidays, if required. For example, you can identify sales transactions that occurred on non-working days.

Step by step procedure for Gap Detection on Numeric field

Step 1: Ensure that **Sales Transactions-Database** is the active database and that the **Data** property is selected in the **Properties** window.

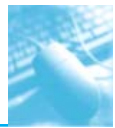
Step 2: On the **Analysis** tab, in the **Explore** group, click **Gap Detection**. Alternatively, on the Quick Access Toolbar, click the **Gap Detection** button.



Fig 4.1.6.1 Gap Detection dialog box

Step 3: From the **Field to use** drop-down list, select **INV_NO**.

Select a range of values to test. By default, all values in the **INV_NO** field are tested and the minimum and maximum values are listed as starting key value and Ending key value. You can also change



the Gap Increment to set a minimum gap to report.

Step 4: Ensure the **Create result** check box is selected.

Step 5: In the **Result name** field, enter **Missing Invoice Sequences**.

Gap Detection

Field to use: INV_NO Criteria:

Numeric

☒ All Starting key value: 1,000,001

☐ Range Ending key value: 1,000,977

Gap increment: 1

Output

☐ Create database ☒ Create result

File name: Gap Detection Result name: Missing Invoice Sequences

Fig 4.1.6.2 Result name.

Step 6: Click **OK**.

The result will display the ranges of invoice numbers that are missing in the database. Note that each row shows a gap. Certain rows may contain more than one missing invoice number.

	From: INV_NO	To: INV_NO	Number
☒	1,000,098	1,000,098	1
☒	1,000,351	1,000,352	2
		Total number of items detected	3
		Total number of gaps detected	2

Fig 4.1.6.3 Result Missing invoice

Step by step procedure for Gap Detection on Date field

Step 1: Ensure that **Sales Transactions-Database** is the active database and that the **Data** property is selected in the **Properties** window.

Step 2: On the **Analysis** tab, in the **Explore** group, click **Gap Detection**.

The Gap Detection dialog box appears.

Step 3: In the **Field to use** drop-down list, select **INV_DATE**.



You can select a range of dates to test. By default, all values in the INV_DATE field are tested and the minimum and maximum values are listed as Starting date value and Ending date value. You can also choose to ignore weekends and holidays that are set by the user.

Step 4: Accept the default option to test all values.

Step 5: Select the **Ignore weekends** check box.

Step 6: Select the **Ignore holidays** check box and click **Set Holidays...**

The Set Holidays dialog box appears.

Step 7: From the Set Holidays toolbar, click the **New** button.

Step 8: Click the **Browse** button to select **December 25** and **December 26** (Fig 4.1.6.4).

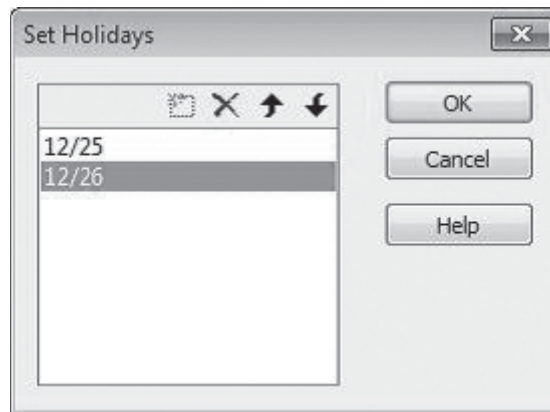


Fig 4.1.6.4

Step 9: Click **OK**.

Step 10: In the Gap Detection dialog box, ensure the **Create result** check box is selected.

Step 11: In the **Result name** field, enter **Missing Dates**.

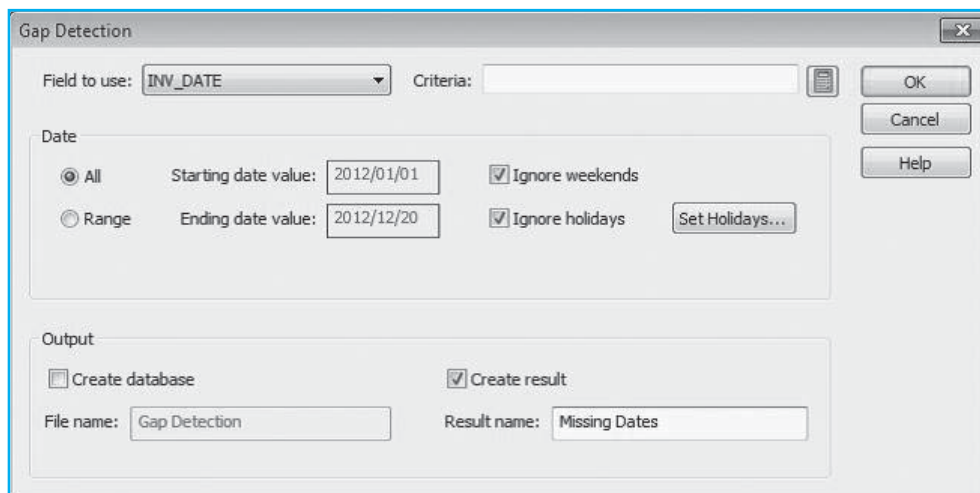


Fig 4.1.6.5 Missing Dates

The result will display the ranges of dates that are missing in the database. Note that each row shows a gap. Certain rows may contain more than one missing date.

	From: INV_DATE	To: INV_DATE	Number
+	10/24/2012	10/26/2012	3
+	11/1/2012	11/2/2012	2
-	11/8/2012	11/9/2012	2
	11/8/2012		
	11/9/2012		
+	11/15/2012	11/23/2012	7
+	11/27/2012	11/27/2012	1
-	11/29/2012	11/30/2012	2
	11/29/2012		
	11/30/2012		
+	12/6/2012	12/7/2012	2
+	12/13/2012	12/19/2012	5
		Total number of items detected	164
		Total number of gaps detected	58

Fig 4.1.6.6 Resulted Data base

Defines a custom action to be executed when the field is selected. It allows looking up for the corresponding values in the linked file. For example, you have two files. Account details file has details such as account number, branch code, status of the account and balance amount in the account. customer details file has details such as account number, customer name, address, etc. this function will allow you to perform a defined task on common fields present in both the files in our case account number and will fetch the data from another file corresponding to the selected field.

Open databases 'Account Details' and 'customer details'

Step 1: Data > Define Action Field

Step 2: Click on column ACCNO heading to select entire column

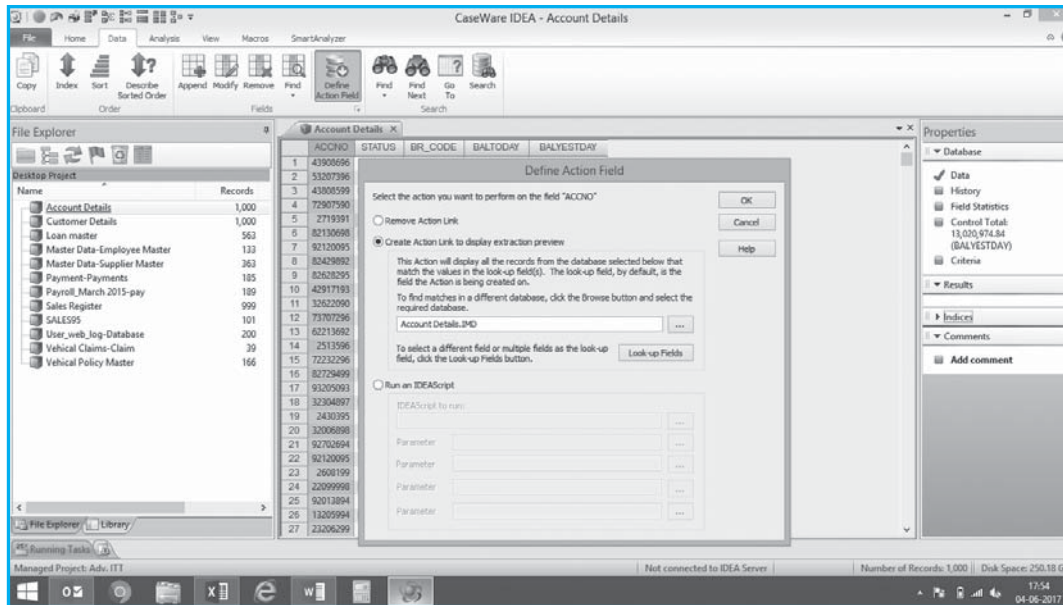


Fig. 4.2.1 – Define Action Field Options

Step 3: Click on ... besides file name 'account details.imd' and select 'customer details.imd' from the list

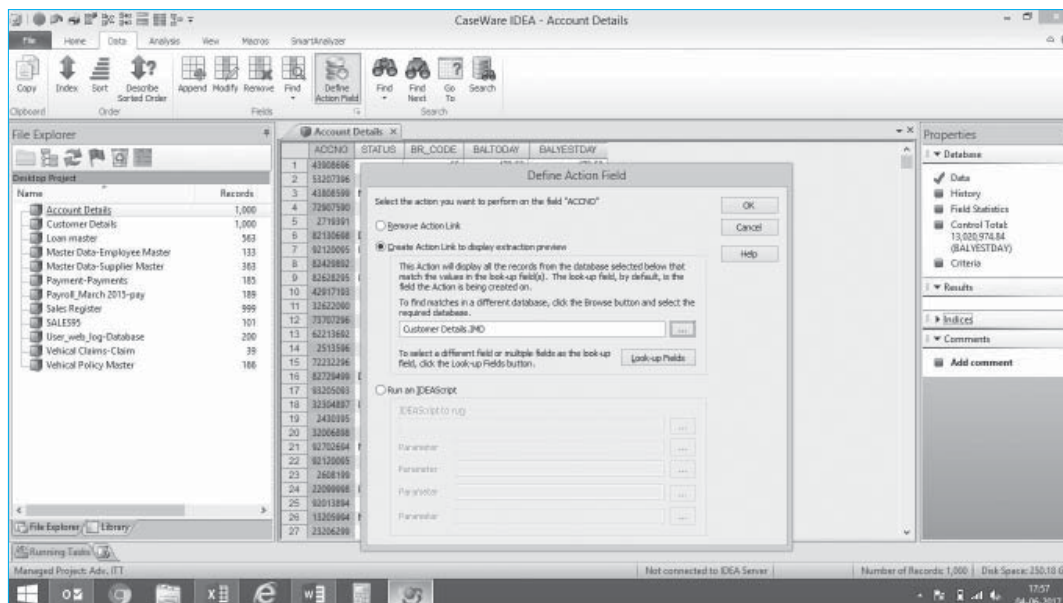


Fig. 4.2.2 – Create Action link

Step 4: Select look up field option and click select field ACCNO and click on OK

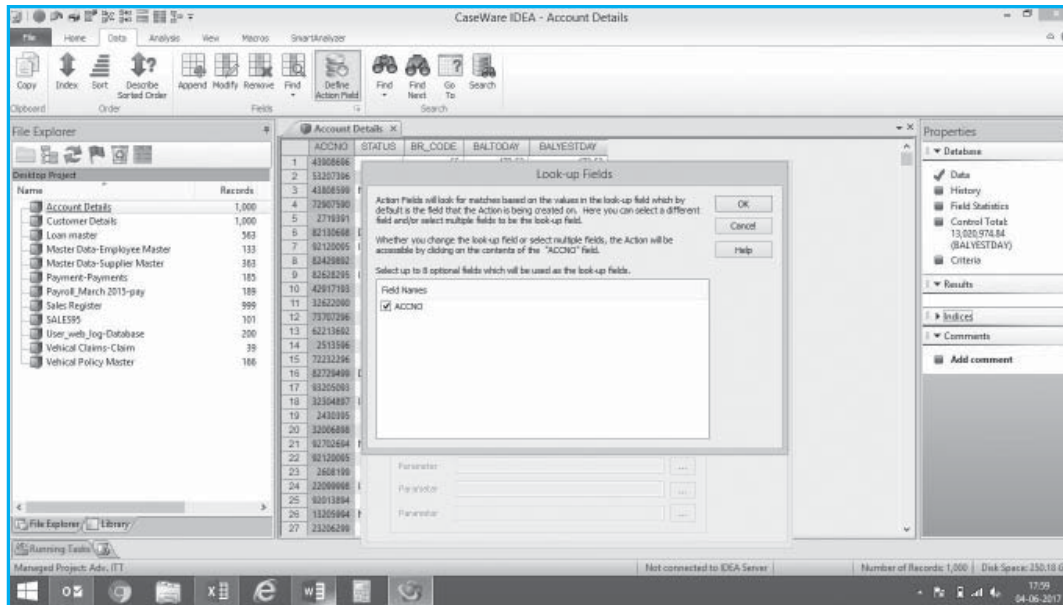


Fig. 4.2.3 – Select Lookup field

Step 5: Click ok on the Define action field dialogue box

Step 6: Observe ACCNO field. Filed converted into a hyperlink type filed.

Step 7: Click on any record in accno field to see the corresponding information available for the selected ACCNO in the customer detail file. Refer Fig. 4.2.4 below for results

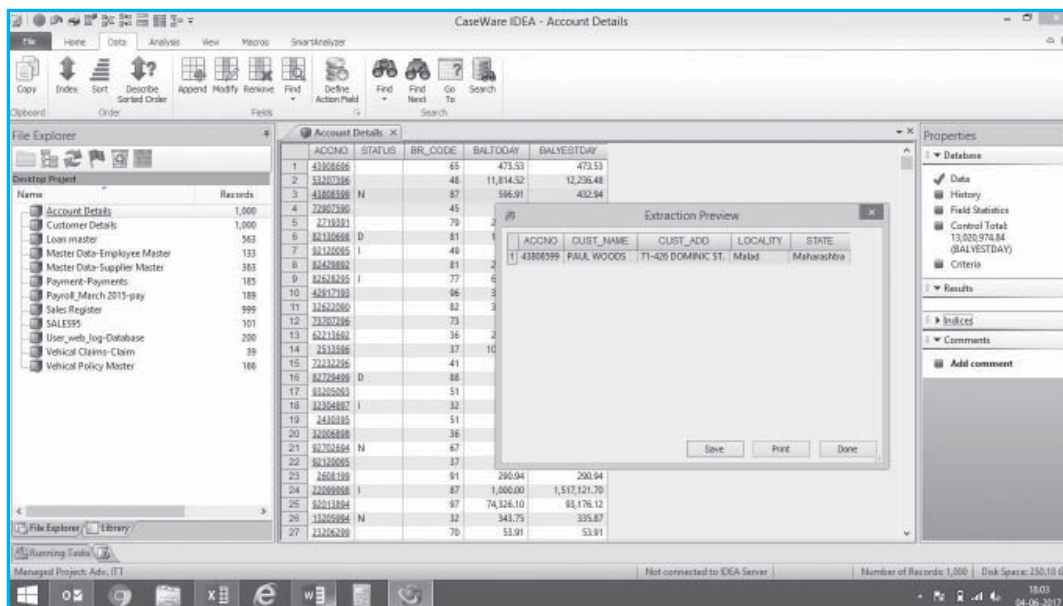


Fig. 4.2.4 – Result of define action field

Step 8: To remove the link created by using define action field, go the option and select remove action link option



4.3 SEARCH

IDEA offers a variety of search options such as character, date, numeric field search. In character based search feature a particular word is searched in multiple databases and within databases in a particular field. This option is mostly used for character intensive databases having multiple character fields. IDEA offers an option of saving the search result in a separate database for future reference.

IDEA offers advanced search features as under:

Boolean Search: *Boolean Search* is a type of search allowing users to combine keywords with operators such as AND, NOT and OR to produce more relevant results.

Wildcard Search: *Wildcard searches* are not simply exact string matches, but are based on character pattern matching between the characters specified in a query and words in documents that contain those character patterns.

Proximity Search: *Proximity search* looks for documents where two or more separately matching term occurrences are within a specified distance, where distance is the number of intermediate words or characters.

Step by step procedure for using search function

Step 1: Data > Search

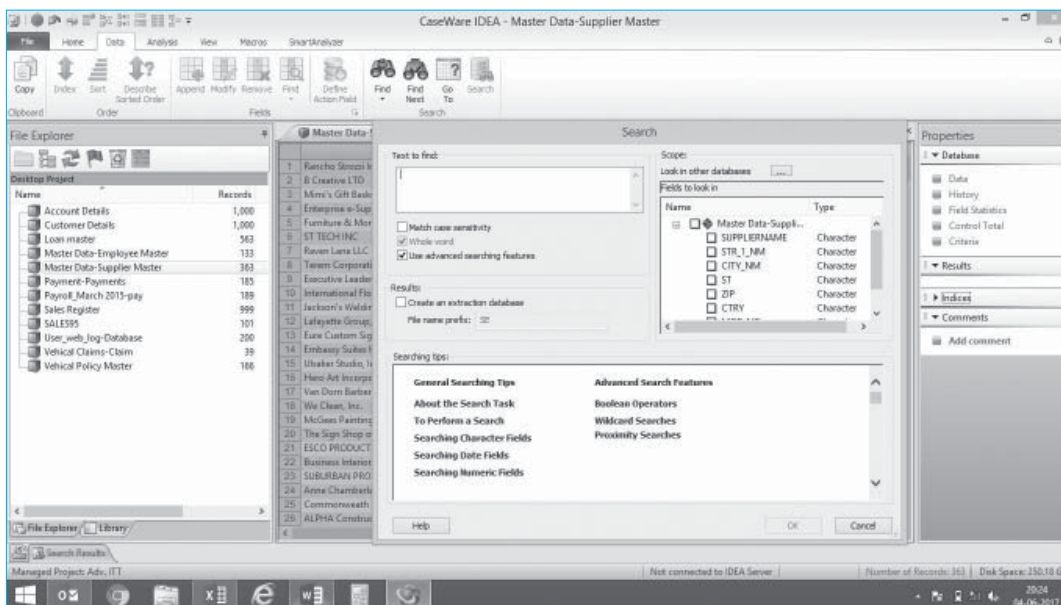


Fig. 4.3.1 Search

Step 2: In 'text to find' - type the word to search

Step 3: Tick case sensitive for more accurate search result

Step 4: Tick 'Create an extraction database' and provide file name to save search result

Step 5: Under scope option select field in which search word will be searched

Step 6: Click on ... besides 'look for other databases' to look for search word in other databases

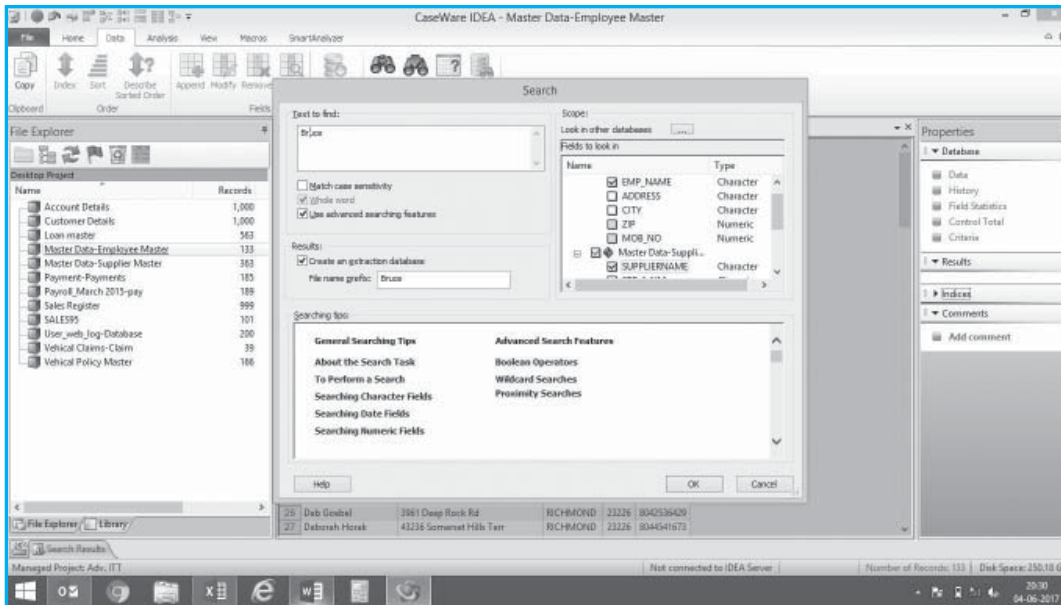


Fig: 4.3.2 Search options

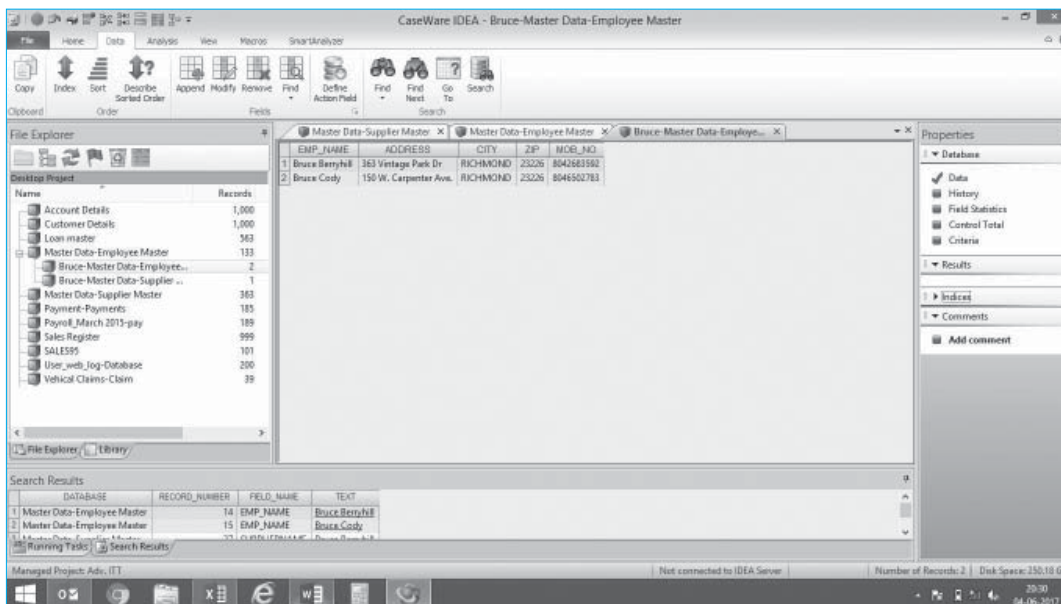


Fig: 4.3.3 Search result

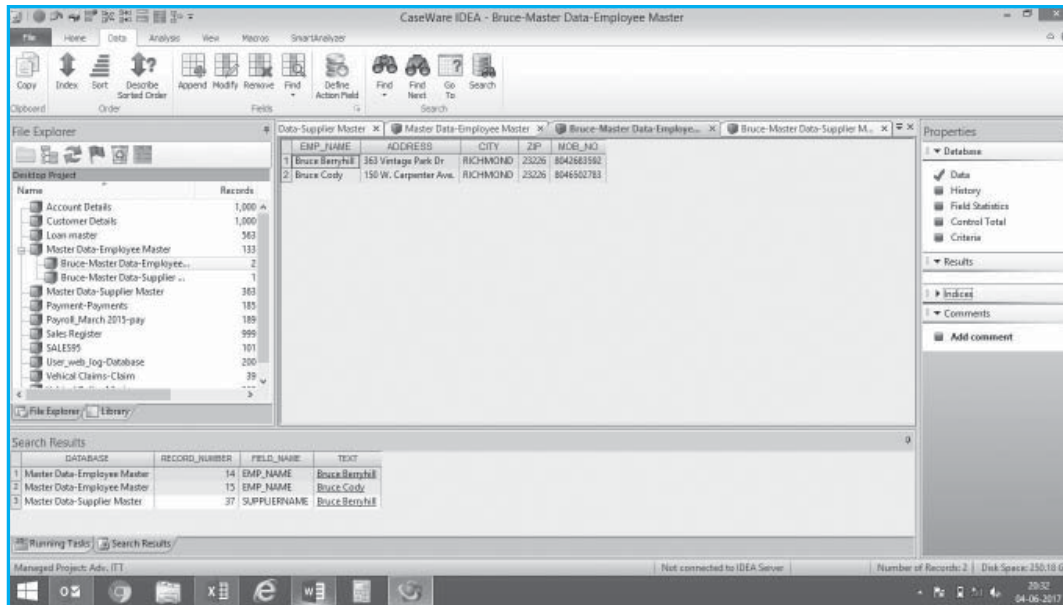


Fig: 4.3.4 Search result

By clicking on the respective record in search window Fig 4.3.4. IDEA opens the database and points the cursor to that record in the database

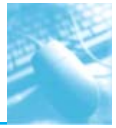
4.4.BENEFORD'S LAW

Benford's Law, also called the first-digit law, was made famous in 1938 by Physicist Frank Benford, who after observing sets of naturally occurring numbers, discovered a surprising pattern in the occurrence frequency of the digits one through nine as the first number in a list. In essence, the law states that in numbered lists providing real-life data (e.g., a journal of cash disbursements and receipts, contract payments, or credit card charges), the leading digit is one almost 33 percent (i.e., one third) of the time. On the other hand, larger numbers occur as the leading digit with less frequency as they grow in magnitude to the point that nine is the first digit less than 5 percent of the time.

In the 1970s, Hal Varian, a professor at the University of California's Berkeley School of Information, suggested that the law could be used to detect possible fraud in lists providing socioeconomic information. Since then, Benford's law has been applied to large numbers of data to detect unusual patterns that are often the result of errors or, worse, fraud. As part of their work, internal auditors often employ tools and scientific methods that enable them to detect instances of fraud.

Benford's law states that if there is a set of non-manipulated, naturally occurring numbers, the occurrence frequency of digits one through nine as the first digit should be expected. As we can see from the numbers in table 1, naturally 30 percent of numbers have one as a leading digit, and nine occurs as a leading digit only one time in twenty. Because most financial and accounting data conform to naturally occurring numbers, by comparing the occurrence frequency of these first digits to Benford's pattern, auditors should be able to determine irregularities and possible manipulations.

In 1938, the research and calculations were performed manually, which was painstaking. Today, with computing power and the ease of accessing big data sets, one can see that Benford's Law of expected numbers is valid. It tests data such as Twitter users by followers' count, most common



iPhone passcodes, population of Indian cities, government spending, and even includes the first 652,066 Fibonacci numbers.

The expected values for any data set of the first leading digit and also for the first two leading digits are outlined in Table 6.1 below. For the first digit test, the first leading digit output is depicted in the graph in Fig 4.4.1. For example, the leading digit 1 appears 30 percent of the time, whereas the leading digit 9 appears 4.6 percent of the time. The bars are the actual data counts and the lines are the lower and upper boundaries along with the expected count. This data set conforms to Benford's Law.

	First Digit Frequency	Second Digit Frequency
0	---	0.11968
1	0.30103	0.11389
2	0.17609	0.10882
3	0.12494	0.10433
4	0.09691	0.10031
5	0.07918	0.09668
6	0.06695	0.09337
7	0.05799	0.09035
8	0.05115	0.08757
9	0.04576	0.08500

Table 4.4.1: Benford's Law First Digit Frequency and First Two Digits Frequency

Following are the assumptions of Benford's Law: The numbers in the data set should describe the same object

There should be no built-in maximum or minimum to the numbers

The numbers should not be assigned, such as telephone numbers, bank account numbers, social insurance, or social security numbers

Does not apply to uniform distributions such as lottery balls where the uniform balls are selected and not the actual numbers

Primary Benford's Law tests are the first digit, first two digits, first three digits, and second digit tests. Advanced Benford's Law tests are summation and second order. Associated tests are last two digits, number duplication, and distortion factor model. All but the last two tests can be automatically executed from within the IDEA software.

The number duplication test identifies specific numbers causing spikes or anomalies in primary and summation tests. Spikes in the primary tests are caused by some specific numbers occurring abnormally too often. Abnormally large numbers in value cause spikes in the summation test.

The distortion factor model shows whether the data has an excess of lower digits or higher digits. It assumes that the true number is changed to a false number in the same range or percentage as the true number.

Most presentations and articles discuss using Benford's Law to detect numbers near their authorization limits. For example, if someone's authorization limit is Rs. 10,000, then many first two



digits in the 99, 98, and 97 areas will be detected using Benford's Law if they are trying to maximize authorizing expenditures.

Another example Bank has the limit upto Rs 50,000/- for cash deposit without PAN. For money laundering transactions one will deposit just below the limit i.e Rs 49,999/- or Rs 49,500/-. Then last two digits in the 99 and 00 will be detected using Benford's law last two digits in IDEA.

Some other practical applications include:

- Accounts payable (expenses) data
- Estimations (accruals) in the general ledger
- Sales
- Purchases
- Non-arm's-length transactions
- Customer refunds
- Bad debts
- Anti-money laundering

BENFORDS'S LAW IN IDEA

The Benford's Law feature in IDEA can provide a valuable reasonableness test for large data sets. IDEA only tests positive numbers 10 and over in the data file. For negative numbers, values greater than minus 10 are excluded (exclude -9, -8, ... -1). These steps eliminate immaterial items from the analysis. Positive and negative numbers are analyzed separately.

The positive and negative numbers are evaluated on their own due to the fact that positive numbers behave very differently from negative numbers. For example, where positive earnings are manipulated for management bonuses, there is motivation to increase the earnings, moving away from zero toward larger numbers. Where there are losses and management wishes to improve stock prices, there is incentive to move the larger negative number to a smaller one toward zero.

IDEA can apply most of the Benford's Law tests and can also display suspicious results in graphical format. Tests provided in IDEA are the first digit, first two digit, first three digits, second digit, last two digits, second order, and summation tests as shown in Fig 4. 4.2

Analysis > Benford's Law

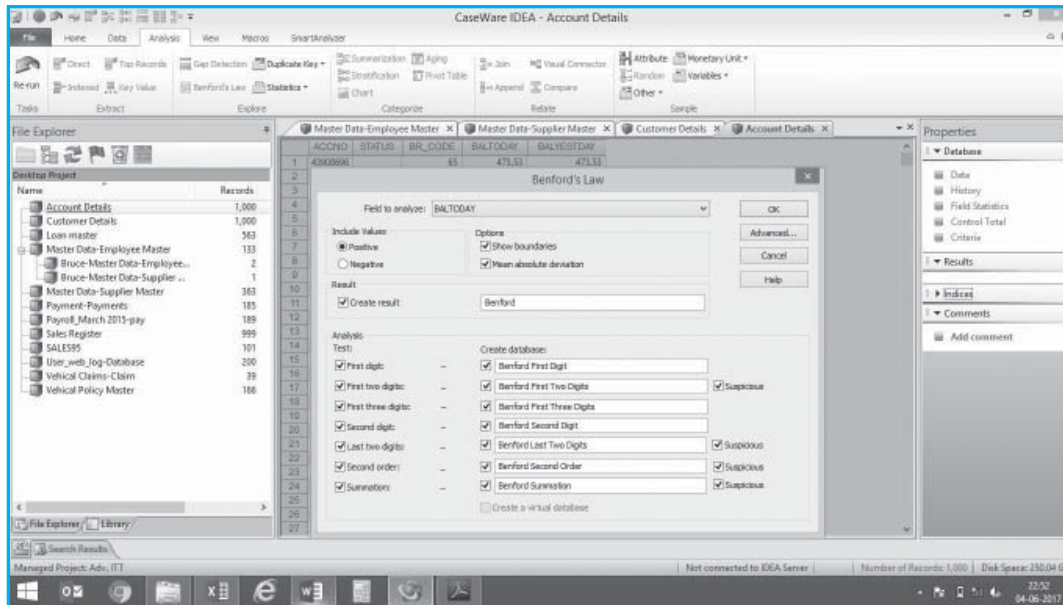


Fig: 4.4.2 Applying Benford's Law feature in IDEA

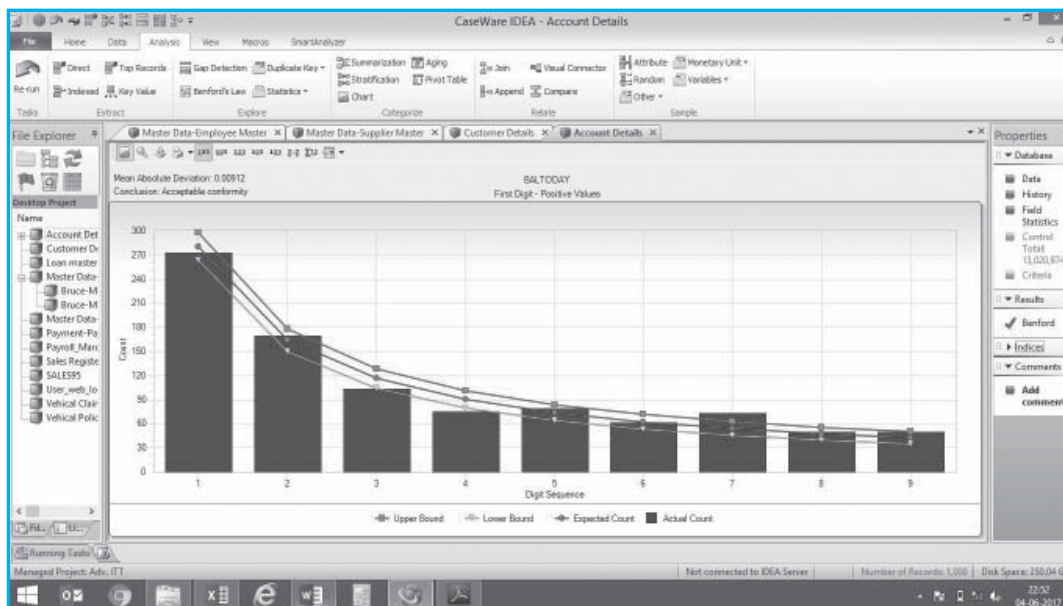


Fig: 4.4.3 Benford's first digit test

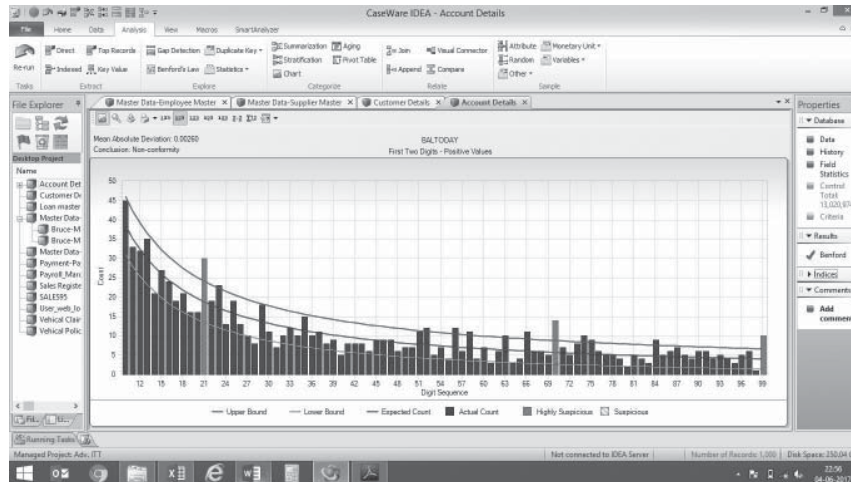


Fig: 4.4.4 Benford's second digit test

This first two-digit primary test output from IDEA indicates that it does not conform in Fig 4.4.4 The graph highlights the three most highly suspicious numbers and the three most suspicious items. By placing the cursor over highly suspicious bar numbers 21, 70, 99, options for extracting or displaying the records are offered. Field statistics may also be displayed.

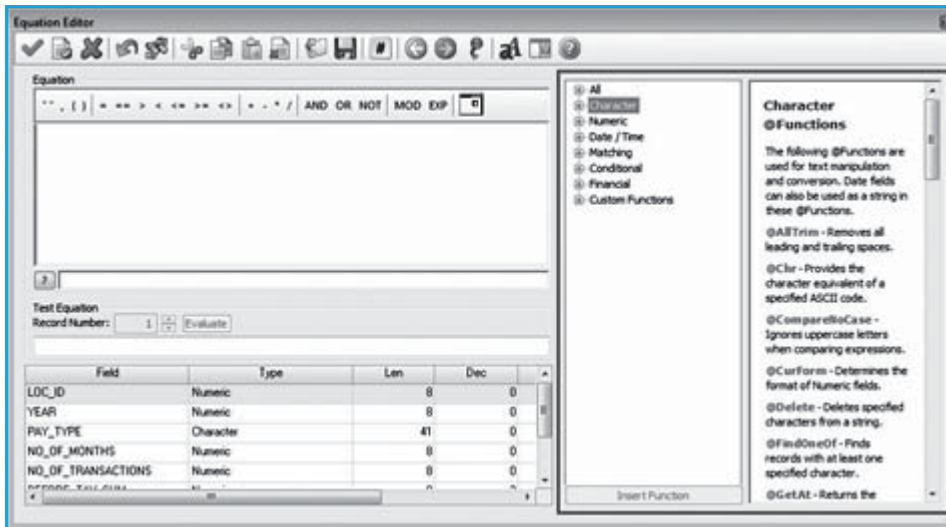
Conclusion

Benford's analysis, when used correctly, is a powerful tool for identifying suspect accounts or amounts for further analysis. Benford's analysis is a tool to complement additional tests/tools. Benford's Law is a wonderful tool for initial risk assessment of the contents of a data set. It provides the auditor or investigator with a good starting point. The user must understand the business and the industry to effectively use this tool. Knowledge of the business can quickly eliminate false positives.

4.5 ADVANCE @ FUNCTIONS

Step by Step procedure for accessing @Functions:

- Open any database
- In the Properties window, click Criteria.
- The Equation Editor is displayed. The right-side of the window displays the list of available @Functions and displays the help page for selected @Functions.



- Expand a category node to display a list of associated @Functions.
- Select a @Function from the list to display its information.

IDEA provides more various @Functions for performing operations such as date arithmetic, financial and statistical calculations as well as text searches.

The @Functions are accessed through the Equation Editor. Quick help including the syntax, a description, and an example of use for each of the @Functions is available when the @Function is highlighted in the list in the Equation Editor window.

Read the definitions below to become familiar with each @Function:

- Numeric expression: Refers to a number or an equation that evaluates to a number.
- String: A series of characters, such as a name or address.

@Function	Description
@Abs	Returns the absolute value of a numeric expression.
@Afternoon	Returns 0 if time is in the AM and 1 if time falls in the PM and -1 for an invalid time.
@Age	Calculates the number of days between two dates.
@AgeDateTime	Returns the number of seconds between two dates and times.
@AgeTime	Returns the number of seconds between two times.
@AllTrim	Removes all leading and trailing spaces.
@Ascii (not in IDEA Unicode)	Provides the ASCII value of a character.
@Between	Determines if a numeric expression falls within a specific range.
@BetweenDate	Returns a number indicating whether a date value falls within a specified range (1) or not (0).



@Function	Description
@BetweenTime	Returns a number indicating whether a time value falls within a specified range (1) or not (0).
@Bit	Identifies a bit value.
@BitAnd	To mask out unwanted bits.
@BitOr	To set required bit.
@Chr (not in IDEA Unicode)	Provides the character equivalent of a specified ASCII code.
@CompareNoCase	Ignores uppercase letters when comparing expressions.
@CompIf	Determines if a record satisfies multiple criteria.
@Ctod	Converts character dates to IDEA Date Format.
@Ctot	Converts character time values to IDEA Time Format.
@CurForm	Converts numeric value into a formatted text.
@CurVal	Converts formatted character fields to numeric fields.
@Date	Returns the present date.
@Day	Returns the day in a date expression.
@DaysToD	Converts a number of days since Jan. 1, 1900 to date format.
@Db	Calculates the fixed declining-balance depreciation for a specified period.
@Ddb	Calculates double declining-balance depreciation.
@Delete	Deletes a specified number of characters from a string.
@Dow	Returns the day of the week.
@Dtoc	Converts date expressions to character.
@DToDays	Reveals the number of days between Jan. 1, 1900 and a specified date.
@Dtoj	Converts dates to Julian format.
@Exp	Calculates the exponent of a numeric expression.
@FieldStatistics	Returns the numeric value for a specified field statistic.
@FindOneOf	Finds the position of the first matching character in 2 strings.
@FinYear	Returns the financial year for a given date based on the year end.
@Format12hourClock	Returns a string representing time formatted as HH:MM:SS TT.
@Fv	Calculates the future value of an investment.
@GetAt	Returns the character that appears in a specified numeric position.
@GetNextValue	Returns the next value in the selected field.
@GetPreviousValue	Returns the previous value in the selected field.
@Hours	Returns the hours portion of a given time.
@If	Allows a choice of two results based on the evaluation of a condition.
@Insert	Inserts a string into an existing string.
@Int	Returns the integer portion of a numeric value.



@Function	Description
@Ipmt	Calculates the interest payment for a given period.
@Irr	Calculates internal rate of return.
@IsBlank	Tests if a character field is blank.
@IsFieldDataValid	Returns a 1 if the data in the field is valid or a 0 if the data is invalid.
@Isin	Returns the starting position of a string within another string (case-sensitive).
@Isini	Returns the starting position of a string within another string (NOT case-sensitive).
@Jtod	Converts Julian dates to IDEA Date Format.
@JustLetters	Returns a string with all the numeric characters removed.
@JustNumbers	Returns all the numbers (leading and trailing).
@JustNumbersLeading	Returns the leading numbers.
@JustNumbersTrailing	Returns the trailing numbers.
@LastDayOfMonth	Returns the last day for any given month and year combination.
@Left	Returns the specified leftmost characters in a string.
@Len	Returns the length of a string, including any trailing spaces.
@List	Determines which criteria in a list of values is met by an expression.
@Log	Calculates natural logarithms.
@Log10	Calculates logarithm 10x.
@Lower	Converts all characters in a string to lower-case.
@Ltrim	Removes leading spaces from a string.
@Match	Determines which criteria in a list of values are met by an expression.
@Max	Returns the greater value of two numeric expressions.
@Mid	Extracts a portion of text from within a string.
@Min	Returns the smallest value of two numeric expressions.
@Minutes	Returns the minutes portion of a given time.
@Mirr	Calculates modified internal rate of return.
@Month	Returns the month in a date expression.
@NoMatch	Determines if an expression meets none of the criteria in a list of values.
@Npv	Calculates the net present value of an investment.
@Ntod	Converts a numeric expression into an IDEA date format.
@Ntot	Converts a numeric expression into an IDEA time format.
@Pmt	Calculates a loan payment.
@Ppmt	Returns the Principal amount of a loan payment.
@Precno	Returns the physical record number.
@Proper	Capitalizes the first letter of each word in a string.
@Pv	Returns the present value of an investment.



@Function	Description
@Qtr	Returns 1-4 representing the quarter a given date falls in based on the specified year end.
@Random	Generates a random number.
@Rate	Calculates the interest rate of an investment/loan.
@Recno	Returns the logical record number (index-sensitive).
@RegExp	Matches character expressions using a complex set of rules.
@Remove	Eliminates all instances of a specified character.
@Repeat	Repeats the first character of a string a specified number of times.
@Replace	Replaces a string or substring with another.
@Reverse	Reverses the order of characters in a string.
@Right	Isolates the specified rightmost characters in a string.
@Round	Rounds to the nearest integer.
@Seconds	Returns the seconds portion of a given time.
@Seed	Sets the random-number seed.
@SimilarPhrase	Measures the similarity between two specified phrases or Character fields.
@SimilarWord	Measures the similarity between two strings (either single words or character expressions) or Character fields.
@SimpleSplit	Extracts a specified occurrence of a segment of a character string that resides between certain characters like hyphens or backslashes.
@Sln	Returns the straight-line depreciation of an asset.
@SpacesToOne	Strips spaces leaving only one space between words in a string.
@SpanExcluding	Returns the characters in a string that appear before any characters in a specified string.
@SpanIncluding	Returns the characters at the beginning of a string that match any character of a specified string.
@Split	Breaks a character string into segments separated by characters, such as spaces or commas, and returns a specified segment.
@Sqrt	Calculates a square root.
@Str	Converts numeric expressions to strings.
@Stratum	Groups records by interval.
@Strip	Removes all spaces, punctuation and control characters.
@StripAccent	Removes an accent from an accented character.
@Syd	Returns the sum-of-years digit depreciation for an asset.
@Time	Returns the present time.
@Trim	Removes trailing spaces.
@Ttoc	Converts a time or number into a string with the HH:MM:SS format.
@Upper	Converts all characters in a string to upper-case.



@Function	Description
@Val	Converts a character expression to numeric.
@Workday	Returns 1 if a given date falls between Monday-Friday and 0 if the date falls on a Saturday or Sunday.
@Year	Returns the year in a date expression.

Examples of @functions:

@Function	Purpose	Example
@age	For creating a new virtual numeric field with difference in days.	To arrive at the difference in days between 'Token Date' and 'Cheque Date' in ANY BILL PAY FILE use @age(Cheque Date, Token Date) through Field Manipulation.
@dow	Identify transactions made on any day of the week.	To capture cheques issued on Sunday use @dow(Cheque Date)=1 through a Direct Extraction. (1 is Sunday in IDEA)
@isblank	Filter out blank character fields	To present blank scheme agency name in GRANTS-IN-AID data use @isblank(Scheme Name) through Criteria.
@isini	Capture specific character strings from a character or alpha-numeric field where the strings are not case sensitive .	To display cheque in favour of field containing 'Shri' for cheques issued inter-se Government use @isini("shri", cheque in favour) through Direct Extraction.
@compif	Conditional function which allows for preparing an expression with multiple conditions and consequent results. Useful for 'If then analysis'	In the Disaster Claim file, to create a new virtual numeric field titled Sanctioned Amount using @compif(Category="0400", 1000000, Category="0104", 100000, "0103", 500000, 1, 0) through field manipulation. This means if the category is 0400 the result in the new virtual numeric field will be Rs. 1000000 and so on so forth.
@strip	Removes all special characters, spaces and punctuation marks from a character or alpha-numeric field.	To check if the same sanction number has been used more than once in the same controller, DDO, PAO, Function Head and Scheme by inserting special characters or spaces to bypass inbuilt system checks. Append a virtual character field with criteria @strip(Sanction Number). Then run a duplicate key detection test on the stripped sanction number field.



@Function	Purpose	Example
@left	Removes the left most occurrences of a character field or alpha-numeric field.	In the Disaster Claim file, every case claim is administered a Unique Case ID of 12 digits. The first 4 digits represent the category of claim i.e. death (0400) etc. can be captured separately by creating a virtual character field using @left(Unique Case ID, 4) through Field Manipulation.
@right	Removes the right most occurrences of a character field or alpha-numeric field.	In the Disaster Claim file, every case claim is administered a Unique Case ID of 12 digits. The last 6 digits represent the claim serial number which can be captured separately by creating a virtual character field using @right(Unique Case ID, 6) through Field Manipulation.
@mid	Removes the central most occurrences of a character field or alpha-numeric field.	In the Disaster Claim, every case claim is administered a Unique Case ID of 12 digits. The 5 th and 6 th digit together represent the case tribunal number which can be captured separately by creating a virtual character field using @mid(Unique Case ID, 5,2) through Field Manipulation.
@year	Derives the year from any date field in IDEA	In Tax collection data via APPLICATION SYSTEM containing nodal scroll date, a new virtual numeric field can be created using @year(nodal scroll date) to derive the year of collection through Field Manipulation.
@month	Derives the month from any date field in IDEA	In Tax collection data via APPLICATION SYSTEM containing nodal scroll date, a new virtual numeric field can be created using @month(nodal scroll date) to derive the month of collection through Field Manipulation.
@day	Derives the day from any date field in IDEA	In Tax collection data via APPLICATION SYSTEM containing nodal scroll date, a new virtual numeric field can be created using @day(nodal scroll date) to derive the day of collection through Field Manipulation.
@DtoDays	Computes the days corresponding to any date field in IDEA	In Gradation List to compute the days for the retirement date add a virtual numeric field with criteria @DtoDays(Retirement Date) through Field Manipulation



@Function	Purpose	Example
@DaystoD	Reverse compute Date from days.	In Gradation List to compute the date from the days add a virtual date field with criteria @DaystoD(Retirement Date Days+30) through Field Manipulation. The +30 is to suggest adding 30 grace-days as an example.
@match	Looks for multiple values in a field of choice through one single equation without the need of having to write multiple equations.	In Pension payments file to filter out basic pension equal to Rs. 3500 or Rs. 40000 (i.e. outliers) @match(Basic, 3500, 40000) can be run through a Direct Extraction. This avoids the need to run two equations like (Basic=3500) .OR. (Basic=40000)

4.6 CUSTOM FUNCTIONS

Custom functions are written using IDEAScript. Custom functions are used just like the included @ Functions within IDEA. The custom functions are accessible in the equation editor in the same area as the @ functions. Custom functions are prefixed with the # symbol instead of the @ symbol as in regular functions and have the file extension .ideafunc. Custom functions should be located under the active IDEA project in the Custom Functions.ILB folder.

Step by Step guide to write custom functions:

Step 1: Click on Criteria under properties section

Step 2: Click on # sign in equation editor

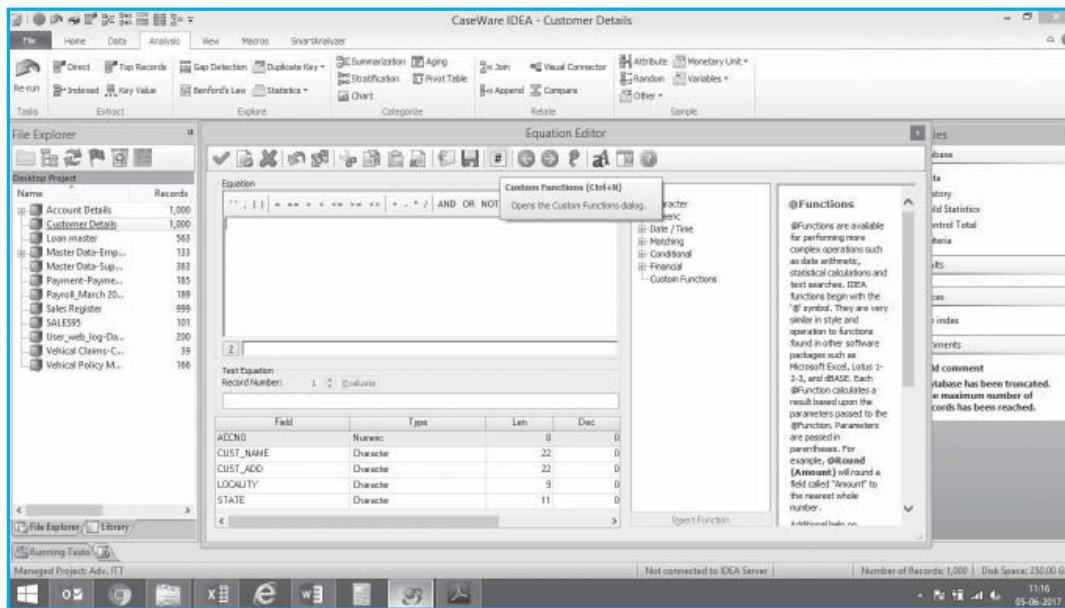


Fig: 4.6.1 Open equation editor

Step 3: Select new to create new custom function and define a short but very effective custom function as shown in Fig. 4.6.2 below.

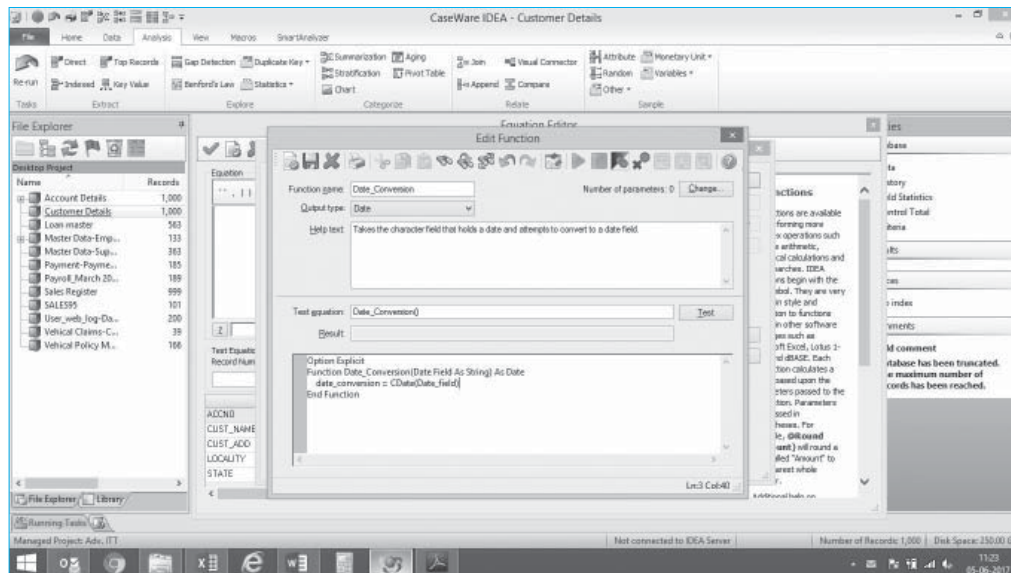


Fig. 4.6.2 Custom Function to Convert a Character Field into a Date Field

The custom function converts a character field containing date information into a date field in IDEA format.

CDate is a Visual Basic function that converts a character date field into an actual date field that is usable by IDEA. For example, the function can convert April 26, 2017, Apr 26/17, or 4/26/17 characters to an IDEA date field in the default format of DD/MM/YYYY.

Step4: Click on OK to save the custom function

The saved custom function is now available for use within equation editor dialogue box under custom function section as shown in Fig. 4.6.3

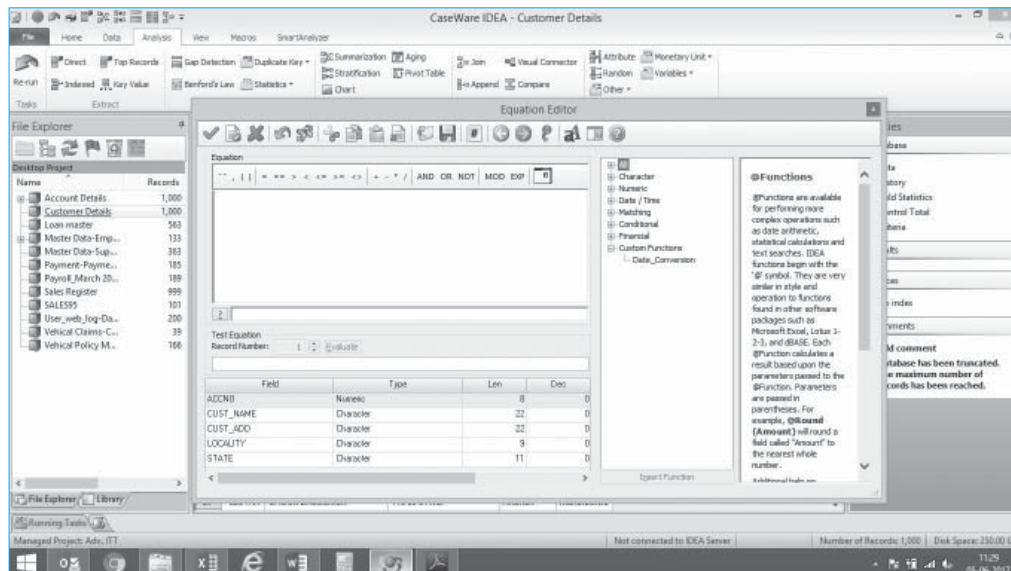


Fig 4.6.3 – Custom function available within equation editor



4.7 ADVANCE SAMPLING

Statistics involves the study of research designs, the collection of the data, describing the data, analyzing the data, and then forming a conclusion. We are interested mainly in the analysis of data that has already been collected by us from various business systems. We hope to be able to arrive at various conclusions after analyzing the data. Understanding some basic statistics allows you to understand the makeup or distribution of your data files. This is especially useful when your data file is large and contains millions of records. There are various types of statistical analysis, but the two major categories are descriptive statistics and inferential statistics.

SAMPLING

The act, process, or technique of selecting a representative part of a population for the purpose of determining parameters or characteristics of the whole population. Simply put, sampling is a process of selecting a subset of the population or a number of records from the data set for the purpose of making inferences or conclusions to the entire population or data set.

Audit sampling is the audit procedure of examining of a portion of items within a class of transactions in order to evaluate one or more characteristics of that entire class. Either statistical or non-statistical sampling methods may be used against a part of the entire data set to make a conclusion regarding the entire data set.

Sampling is effective when the audit procedure or step does not require a 100 percent review of the population of the class, but a decision or conclusion is required and it is not cost effective to audit 100 percent of the transactions.

STATISTICAL SAMPLING

Statistical sampling uses statistical mathematical calculations for selecting and then evaluating a sample from the data set. Statistical sampling outlines in numeric terms the parameters and precision levels associated with the sample conclusion.

One such use of statistical sampling that we are most familiar with are polls used to determine candidate's current standings in upcoming elections or in popularity surveys.

An auditor may be verifying an account balance through statistical sampling and conclude that it is Rs. 100,000 plus or minus 5 percent or Rs. 5,000 each way (Rs. 95,000 to Rs. 105,000), 19 times out of 20. The conclusion would be that given the precision of the sample at 5 percent (plus or minus Rs. 5,000), there is assurance that the balance is correct with a confidence level of 95 percent. In addition, if the materiality was predetermined to be at 7 percent, then it can be concluded that there would no material error based on the precision level.

Confidence level is the remaining factor when the acceptable sampling risk is eliminated. In the example of selecting a 95 percent confidence level, you allow only a 5 percent chance of getting the wrong sample that does not adequately represent the entire population.

Using statistical samples to obtain familiarity with the data set might be useful but if it is not used to reach a conclusion, it cannot be considered as part of the audit procedure. In addition to formulating a conclusion, statistical sampling must use statistical calculations, and the sample must be random.

Proper use of statistical sampling is beneficial because it:

- Requires a scientifically accepted and defined approach.



- Allows the auditor to maintain professional judgment in regard to audit risks and materiality.
- Displays the sample results and conclusion in relation to the selected data set population along with defined judgment selections.

NON- STATISTICAL SAMPLING

Non-statistical sampling does not involve the use of statistical calculations. It relies on the subjective sampling selections by the auditor and has less of a standardized approach. Non-statistical sampling is beneficial where:

- The auditor needs to employ professional subjective judgment.
- There is a unique issue where there is a need for a less rigid standardized approach.
- The auditor should not be restricted to explicit numbers as to materiality or risk.

In order to effectively perform non-statistical sampling, the auditor must have a good knowledge of the data set. Knowing the contents of the data or population allows for a supportable sample selection choice and also supports the conclusion of the results. Sample selection may be based on random sampling or other nonmathematical techniques such as judgmental, haphazard, or block selection.

Judgmental selection is frequently used when the auditor is very experienced and selects samples based on sound judgment. Typically, the auditor will make the selections based on a combination of representativeness of the population, value of the items, and relative risk of the items.

Haphazard selection is where the auditor picks items without basis of any mathematical formula. The auditor believes that the items selected are representative of the population and no intentional bias was applied to any of the included or excluded items.

Block selection is where a contiguous sequence of items is selected as samples. These blocks may be invoice numbers from 1000 to 1100 or a specific type of transactions for the month of March. Block selection effectiveness can be much improved by sampling several blocks.

SAMPLING RISK

The sample selected either through statistical sampling or non-statistical sampling methods might not truly reflect the population even if done with the utmost care. This is the cause for sampling risk, where the auditor's conclusion based on the selected sample may differ from the reality of the conditions of the entire population of the data set. Sampling risk occurs due to limited time and resources that prevent an audit of the entire population.

Alpha or Type I risk is the risk of incorrect rejection. That is, the auditor incorrectly concludes from the sample that the population errors are worse than they actually are.

Beta or Type II risk is the risk of incorrect acceptance. That is, the auditor incorrectly concludes from the sample that the errors in the population are better than they really are.

Auditors are usually more interested in beta (Type II) risks, as they are concerned about the failure to detect material misstatements.

NON-SAMPLING RISK

Auditors may draw incorrect conclusions from using sampling techniques where the wrong inferences are not because of the selected samples themselves, but for other reasons not directly connected with the sample contents.



Non-sampling risk is where the auditor may have selected an appropriate sample but arrived at a wrong conclusion. Examples include employing inappropriate audit procedures, failure to recognize errors present, or misinterpreting the results or evidence.

NON-STATISTICAL SAMPLING METHODS IN IDEA

The non-statistical sampling features built into IDEA are shown in Fig 4.7.1. IDEA has easy-to-use random, systematic, and stratified random sampling built in.

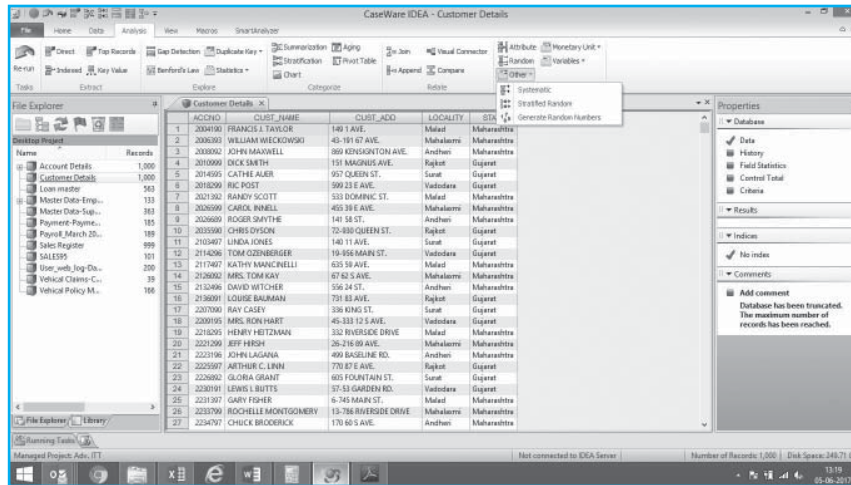


Fig: 4.7.1 Non-statistical Sampling Feature in IDEA

STATISTICAL SAMPLING METHODS

There are three basic types of sampling methods that auditors may use. The choice of methods depends on the main purpose of the sample and substantive test.

MONETARY UNIT SAMPLING (MUS)

Monetary Unit Sampling method is used to estimate the total monetary amount of potential misstatement in a population. While other methods are based on occurrences or number of records, this method is based on rupee values where the higher monetary value transactions have a higher likelihood of being chosen in a sample. MUS is similar to systematic sampling, but where systematic sampling may sample every thousandth record, MUS will sample every thousandth rupees. It is typically used to determine the accuracy of financial accounts, where size is the most important factor, and where errors are expected to be few and far between. MUS provides a substantive assessment of error or misstatement in rupee figures and is specifically designed to predict overall error.

MUS should be used when:

- The process audited is well established and known to be reliable.
- The likelihood of errors (misstatements) is low.
- Obtaining a small sample size is important.
- You want to target larger rupee transactions, and expect to see some spikes in the data.



Step by step procedure to perform MUS sampling:

1. Planning:

- Determine the objectives of the exercise.
- Define the population.
- Define what a misstatement means.
- Determine sample size, using the following:
- **Confidence level** - A percentage value comfort level that the sample will be representative and that you have the capabilities to interpret the results correctly.
- **Tolerable error** - The point of no return past which you would no longer have faith in the process audited, nor the validity of the sample.
- **Expected error** - The amount of errors or misstatements that are reasonably expected in a population.

2. Performing MUS Sampling Procedures

- Select the samples.
- Perform the audit procedures.
- Record and analyze any errors observed.

3. Evaluation

- Create a projected misstatement by summarizing errors and extrapolating these across population.
- Compare ranges of the projected misstatement against the tolerable error limit.
- Draw final conclusions.

As seen in Fig 4.7.2, IDEA will simplify all these steps for you.

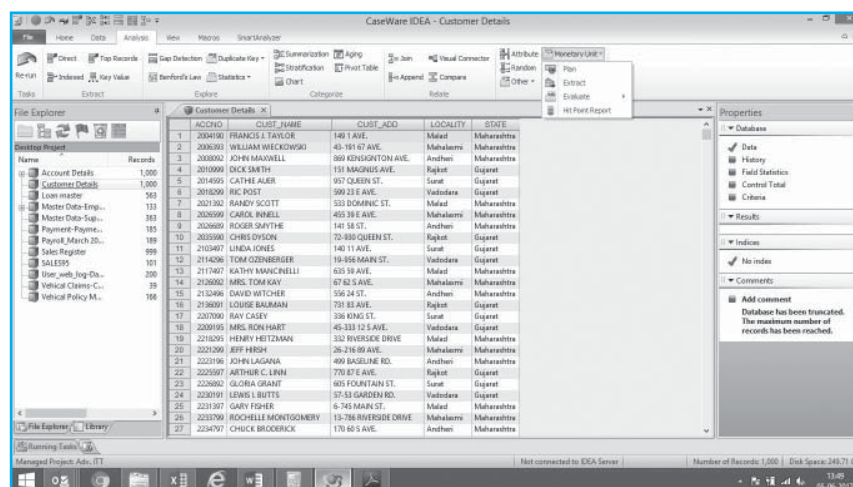
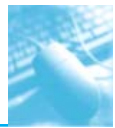


Fig: 4.7.2 Monetary Unit Sampling Feature



In the example of testing sales, seen in Fig 4.7.3, we select absolute values as there are a few credit or refund values that are negative amounts in the Total field. We select a confidence level of 95 percent. Confidence levels below 90 percent are not generally recommended for MUS sampling. It should be recognized that the higher the confidence level, the larger the sample size needed.

The tolerable error amount or percentage must be entered. This is the absolute error limit that can be tolerated. The higher the tolerable error, the more errors you can accept and the lower the sample size needs to be. In this example, with sales in excess of Rs.1.7 million, 1 percent or Rs. 17,000 was decided as the maximum tolerable error. A 1 percent loss would be material enough to take actions such as to initiate an investigation or redesign the sales system. Since MUS is only to be used for processes where there is a high degree of confidence based on actual experience, significant errors may indicate fraud, embezzlement, or untrained or incompetent staff.

The expected error is the anticipated misstatement that is a realistic estimate of likely errors expected to found in the process. It is historical experience that dictates the estimate amount. Both the expected error and tolerable error can be entered either as an amount or percentage. In this example, management estimates that approximately 10 percent or Rs. 1,700 is the expected error.

When the Estimate button is selected, IDEA's MUS calculation determines that in order to be 95 percent confident, it is necessary to set the sample size at 363 records and that there should be no more than 36.25 percent tainting or total percentage of errors found.

Once the Accept button is selected, the Monetary Unit Sampling – Extract screen appears as displayed in Fig 4.7.4

Fig: 4.7.3 Monetary Unit Sampling planning



Monetary Unit Sampling - Plan

Total Value of Sampled Population: 1,702,472.87

☒ Use values from database field: **TOTAL**

☐ Positive values ☐ Negative values ☒ Absolute values

Value of the sampled population: 1,702,472.87

Buttons: Estimate, Accept, Print

Monetary Unit Sampling - Extract

Extraction type: ☒ Fixed interval ☐ Cell selection

High value handling: ☐ High values in sample as aggregate ☒ High values in database

High value file name: High Values

Numeric field to sample: **TOTAL** Sample interval: 4,690.01

Random starting point: 3,209.28 ☐ Change high value amount: 4,690.01

There are 3451 items with a value of 0. Items with a value of 0 will have a 0% chance of being selected.

	Total	Records
☐ Positive values	1,702,470.45	86,526
☐ Negative values	(2.42)	2
☒ Absolute values	1,702,472.87	86,528

File name: Monetary Sample

☐ Create a virtual database

Fig: 4.7.4 Extracting the sample records for Monetary Unit Sampling

Three hundred sixty-three records are then extracted and an AUDIT_AMT field is created as in Fig 4.7.5 The value of this field is equal to the field being audited but can be changed to reflect the proper amount determined during the execution of the audit procedures.

	HD_NETAMOUNT	TOTAL	AUDIT_AMT	MUS_RECNO	MUS_TOTAL	MUS_HIT	MUS_REC_HIT	MUS_EXCESS	REFERENCE
346	21.00	23.7300	23.7300	85151	1,621,270.8600	1,621,262.7300	15.6000	8.1300	
347	10.75	12.1500	12.1500	85441	1,625,956.9500	1,625,952.7400	7.9400	4.2100	
348	31.35	35.4300	35.4300	85681	1,630,655.4800	1,630,642.7500	22.7000	12.7300	
349	16.90	19.1000	19.1000	86008	1,635,334.7700	1,635,332.7600	17.0900	2.0100	
350	7.95	8.9900	8.9900	86298	1,640,023.6600	1,640,022.7700	8.1000	0.8900	
351	13.25	14.9700	14.9700	86555	1,644,718.9200	1,644,712.7800	8.8300	6.1400	
352	10.25	11.5800	11.5800	86837	1,649,406.4700	1,649,402.7900	7.9000	3.6800	
353	36.95	41.7600	41.7600	87122	1,654,119.8300	1,654,092.8000	14.7300	27.0300	
354	22.20	25.0900	25.0900	87429	1,658,795.5700	1,658,782.8100	12.3300	12.7600	
355	11.20	12.6600	12.6600	87711	1,663,475.5100	1,663,472.8200	9.9700	2.6900	
356	28.00	31.6400	31.6400	88028	1,668,191.7500	1,668,162.8300	2.7200	28.9200	
357	7.95	8.9900	8.9900	88289	1,672,856.8400	1,672,852.8400	4.9900	4.0000	
358	7.95	8.9900	8.9900	88576	1,677,545.0200	1,677,542.8500	6.8200	2.1700	
359	8.25	9.3200	9.3200	88818	1,682,236.7800	1,682,232.8600	5.4000	3.9200	
360	7.20	8.1400	8.1400	89117	1,686,925.8800	1,686,922.8700	5.1300	3.0100	
361	6.75	7.6300	7.6300	89362	1,691,619.7100	1,691,612.8800	0.8000	6.8300	
362	57.45	64.9200	64.9200	89629	1,696,311.9100	1,696,302.8900	55.9000	9.0200	
363	48.45	54.7500	54.7500	89895	1,701,008.0500	1,700,992.9000	39.6000	15.1500	

Fig: 4.7.5 Random Record Selection Results for Monetary Unit Sampling

Suppose three discrepancies were found, including the one in record number 250 where the actual amount was Rs. 60.00 instead of the Rs. 55.32 recorded in the sales system as shown in Fig 4.7.6. To evaluate the MUS sample, select the Single Sample option.

	TOTAL	AUDIT_AMT	MUS_RECNO	MUS_TOTAL	MUS_HIT	MUS_REC_HIT	MUS_EXCESS	REFERENCE
249	51.6500	51.6500	61230	1,166,364.4900	1,166,331.7600	18.9200	32.7300	
250	55.3200	60.0000	61483	1,171,024.9600	1,171,021.7700	52.1300	3.1900	
251	26.2700	26.2700	61733	1,175,718.5000	1,175,711.7800	19.5500	6.7200	
252	18.6500	18.6500	61978	1,180,402.7400	1,180,401.7900	17.7000	0.9500	
253	70.2900	70.2900	62232	1,185,135.5600	1,185,091.8000	26.5300	43.7600	
254	8.9900	8.9900	62491	1,189,790.3400	1,189,781.8100	0.4600	8.5300	
255	24.2400	24.2400	62743	1,194,493.0500	1,194,471.8200	3.0100	21.2300	
256	17.9700	17.9700	62996	1,199,162.6600	1,199,161.8300	17.1400	0.8300	
257	59.3800	59.3800	63233	1,203,881.6600	1,203,851.8400	29.5600	29.8200	
258	61.3600	61.3600	63489	1,208,554.9700	1,208,541.8500	48.2400	13.1200	
259	7.3500	7.3500	63747	1,213,233.7900	1,213,231.8600	5.4200	1.9300	
260	40.5100	40.5100	63977	1,217,950.3000	1,217,921.8700	12.0800	28.4300	
261	47.8600	47.8600	64237	1,222,652.6800	1,222,611.8800	7.0600	40.8000	
262	37.2400	37.2400	64486	1,227,337.9000	1,227,301.8900	1.2300	36.0100	
263	49.2100	49.2100	64737	1,232,025.9800	1,231,991.9000	15.1300	34.0800	
264	41.3000	41.3000	65003	1,236,713.4100	1,236,681.9100	9.8000	31.5000	
265	31.5300	31.5300	65236	1,241,385.9000	1,241,371.9200	17.5500	13.9800	
266	54.1900	54.1900	65476	1,246,088.4100	1,246,061.9300	27.7100	26.4800	
267	5.5100	5.5100	65718	1,250,755.2000	1,250,751.9400	2.2500	3.2600	

Fig: 4.7.6 Audit Results of the Sampled Records

The screen in Fig 4.7.7 appears

Monetary Unit Sampling - Evaluate Single Sample

Method: ☒ Low error rate ☐ High error rate (classical)

Fields:

- Book value field: TOTAL
- Audited value field: AUDIT_AMT
- Reference (optional): REFERENCE

Sample settings:

- Confidence level (%): 95.00
- Value of the sampled population: 1,702,472.87
- Sample size: 363
- ☐ Change basic precision pricing from 100%: 100.00

High value handling:

- ☒ High value items are in a file. Select high values file: C:\Users\G\Documents\My IDEA Documents\IDE
- Book value field: TOTAL
- Audited value field: AUDIT_AMT
- Reference (optional): REFERENCE

Precision limits:

- ☒ Upper ☐ Upper and lower

Result name: Monetary Unit Sampling - Evaluate Single Sample

Fig: 4.7.7 Evaluating Single Sample Results in Monetary Unit Sampling

Once OK is selected, the summary shown in Fig 4.7.8 appears displaying:

- Zero overstatements were discovered.
- Three understatements were discovered.



- The net most likely error is Rs. 1,512.47.
- Both the gross and net upper error limits are less than materiality (tolerable error) of Rs. 17,000.

The conclusion is that with 95 percent certainty the projected total errors based on errors found in the sample is within the accepted range and will not exceed the tolerable error of Rs. 17,000. That is, you are 95 percent assured that the sample is representative of the population and that no actions to investigate or redesign the sales system are needed.

Header Sales.IMD x Monetary Sample.IMD x

MUS – Low Error Rate
Summary

Confidence Level 95.00 Sampling Interval 4,690.01
High Value 4,690.01 Basic Precision Pricing 100.00
Value of the sampled population excluding high values 1,702,472.87
Total value of high value items 0.00
Value of the sampled population including high values 1,702,472.87

Results Excluding High Value Items	Overstatements	Understatements
Sample Size	363	363
Number of errors	0	3
Gross most likely error	0.00	1,512.47
Net most likely error	-1,512.47	1,512.47
Total Precision	13,990.00	13,990.00
Gross upper error limit	13,990.00	15,502.47
Net upper error limit	12,477.53	15,502.47
Results for High Value Items		
Number of high value items	0	0
Number of errors	0	0
Value of errors	0.00	0.00
Results Including High Value Items		
Total number of items examined	363	363
Number of errors	0	3
Gross most likely error	0.00	1,512.47
Net most likely error	-1,512.47	1,512.47
Gross upper error limit	13,990.00	15,502.47
Net upper error limit	12,477.53	15,502.47

Conclusion:
Based on this sample, the most likely total overstatement in the population is 0.00, and the most likely total understatement is 1,512.47. You can infer with a confidence of 95.00% that the total overstatement in the population does not exceed 13,990.00, and that the total understatement in the population does not exceed 15,502.47

Fig: 4.7.8 Summary and Conclusion of Audit Results of MUS

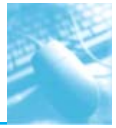
ATTRIBUTE SAMPLING

Attribute sampling is a statistical sampling technique often used to test internal controls; it evaluates the individual attributes of a record to be either true or false. Examples include:

- Having two required signatures for check authorizations over certain amounts.
- Whether account receivables are overdue.
- If travel expense claims are valid or not.

Attribute sampling should be used when:

- There is a need for a statistical sampling solution and judgmental sampling will not suffice.
- The objective of the review is to test compliance to internal controls.
- The compliance testing should evaluate to a true or false result.
- A random selection process will meet the objectives of your review.



Step by step procedure to perform attribute sampling:

1. Planning

- Determine the objectives of the exercise.
- Define the population.
- Define what a misstatement means.
- Determine sample size, using the following:
- **Confidence level:** A percentage-value comfort level that the sample will be representative and that you have the capabilities to interpret the results correctly.
- **Tolerable error:** The point of no return past which you would no longer have faith in the process audited, nor the validity of the sample.
- **Expected error:** The amount of errors or misstatements that are reasonably expected in a population.

2. Performing Attribute Sampling Procedures

- Select the sample.
- Perform the audit procedures.
- Record and analyze any errors observed.

3. Evaluation

- Create a projected misstatement by summarizing errors and extrapolating these across the population.
- Compare ranges of the projected misstatements against the tolerable error limit.
- Draw final conclusions.

Similar to MUS sampling, attribute sampling requires a user to set certain boundaries and tolerances for the calculations to be performed.

- **Tolerable deviation rate as a percentage:** Also known as tolerable error rate, this is the absolute maximum percentage of transactions in error (i.e., not in compliance) that is acceptable as a cost of doing business. If you have more errors than the tolerable error rate, this internal control is not working and must be redesigned. The higher the tolerable error, the more errors you can tolerate, and the lower the sample size needs to be.
- **Expected deviation rate as a percentage:** Also known as expected error rate, this is the percentage of errors (i.e., noncompliance) you would reasonably expect to see, based on experience. As a rule, the lower the expected error, the lower the sample size.
- **Confidence level as a percentage:** This is the likelihood that the sample records chosen are indeed representative of the population at large, and that you will correctly interpret the results. The more confident you need to be; the more samples you require.

In the example in Fig 4.7.9, management decided that the maximum percentage tolerable deviation rate is 10 percent. Anything above 10 percent would suggest that the control is not working and may need to be redesigned. Based on previous history, management expects a deviation rate of 3 percent.



Computer Assisted Audit Techniques

Management is happy to accept a confidence level of 90 percent that the sample is representative of the population or data set. The population size or number of records is 89,979.

The population size, percentage tolerable deviation rate, percentage expected deviation rate, and the confidence level must be entered into the Planning tab of the Attribute Sampling box.

Deviations	% Deviations	Achieved Confidence (Beta Risk Control)

Fig: 4.7.9 Planning for Attribute Sampling

Once the compute button is clicked, based on the information entered, IDEA informs you that you would need a sample size of 52 and that there must not be more than two deviations or errors in the sample to achieve a 90 percent confidence level that deviation level of the population is not more than 10 percent. Refer to Fig 4. 7.10

Deviations	% Deviations	Achieved Confidence (Beta Risk Control)
0	0.00	99.58
1	1.92	97.17
2	3.85	90.34
3	5.77	77.69
4	7.69	60.46
5	9.62	42.08
6	11.54	26.09
7	13.46	14.41
8	15.38	7.11

Conclusion: If no more than 2 deviations are observed in a sample of size 52, you can be at least 90.00% confident that the population deviation rate is not more than 10.00%.

Fig: 4.7.10 Conclusion to achieve attributes sampling objectives



The random record sampling feature in Fig 4.7.11 can be used to randomly select the 52 required records. A detailed audit of the 52 selected records determines whether the control was met. The number of deviations is noted.

The 'Random Record Sampling' dialog box contains the following fields and controls:

- Number of records to select: 52
- Random number seed: 17194
- Starting record number to select: 1
- Ending record number to select: 89979
- Allow duplicate records: ☐
- Create a virtual database: ☐
- File name: 52 Random for Attribute Sampling
- Buttons: OK, Fields, Cancel, Help

Fig: 4.7.11 Obtaining sample for attribute sampling

In the Sample Evaluation tab of the Attribute Sampling box, entries for the population size, sample size, and percentage of desired confidence level are made again. The number of deviations (five) discovered during the audit of the 52 samples must also be included, as noted in Fig 4.7.12.

Since five deviations are more than the critical number of deviations (two) in the sample calculated in the planning stage, the conclusion is that there is 90 percent certainty that the number of deviations could be significantly higher in the overall population than the 10 percent tolerable percentage. It is 90 percent certain that there could be as many as 17.11 percent of errors if the entire population was audited. As such, this sample cannot be considered as representative and it is likely the control must be redesigned.

The 'Attribute Sampling' dialog box, 'Sample Evaluation' tab, displays the following information:

- Population size: 89979
- Sample size: 52
- Number of deviations in sample: 5
- % Desired confidence level: 90.00
- Sample deviation rate: 9.62% (5 / 52)

1-Sided Upper Limit	2-Sided Lower Limit	2-Sided Upper Limit
17.11	3.87	19.16

Conclusion: For an observed number of 5 deviations in a sample of size 52, you can be 90.00% confident that the population deviation rate is no more than 17.11%. Alternatively, you can be 90.00% confident that the population deviation rate is between 3.87% and 19.16%.

Buttons: Print, Close, Compute, Help

Fig: 4.7.12 Conclusion from the audit results of attribute sampling



4.8 USING ADVANCED STATISTICAL METHODS

4.8.1 - CORRELATION

A correlation is a relationship between two things or mathematical variables that tend to vary or move together. The data is represented by the letters x and y where x is the independent variable and y is the dependent variable. The independent variable x is usually described first. There is usually some logical connection between the two variables.

Many studies have been done on income levels of high school graduates, college, and university graduates and those with post-graduate degrees. The question in those studies is whether there is a connection or correlation between educational levels and income levels. Educational level would be x , the independent variable that would influence the income level variable of y , the dependent variable.

How much does the independent variable have influence over the dependent variable can be determined by calculating the correlation coefficient and is designated as r . A perfect linear correlation would have r equaling to 1 and a perfect negative correlation would have r equaling -1 . The closer r is to 1 or -1 , the stronger the correlation. Where there is no correlation, r would equal to 0.

There are three basic formulas for calculating r . The correlation coefficient can be calculated for the population, the sample, or the product moment.

The most common one is the product-moment correlation coefficient as shown below.

$$r = \sum(xy) / \sqrt{(\sum x^2)(\sum y^2)}$$

Σ denotes the summation symbol, so the formula for the top part or numerator is to multiply the x variables by the y variables and then take the sum of those numbers. For the denominator, you square the x variables and take the sum of them. Do the same for the y variables and then multiple the resulting two sums. Apply the square root to the results and then divide the final results of the numerator by the final results of the denominator to obtain the correlation coefficient.

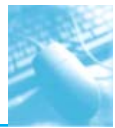
Since we already know how to calculate the Z-scores (or have IDEA calculate it for us), a simpler method of obtaining r would be to multiply the Z-scores of the x variables by the Z-scores of the y variables and then total up all the results. Take the total of the results and divide by the number of records less one.

The formula would be $r = \Sigma(Z_x * Z_y) / (n - 1)$ where Z_x is the Z-score for the x variable and Z_y is the Z-score for the y variable. The letter n in the formula represents the number of records.

In general, the correlation coefficient, whether negative or positive, can be interpreted as:

.0 to .2	No correlation
.2 to .4	Weak correlation
.4 to .6	Moderate correlation
.6 to .8	Strong correlation
.8 to 1.0	Very strong correlation

The calculations of the correlation coefficients were shown for a better understanding of correlation. The auditor does not need to perform the calculations using the formulas, as IDEA has a built-in correlation feature that provides the correlation coefficient and you merely have to interpret the



results.

Using a summarized monthly sales file from a POS system, we select correlation from the statistics area of IDEA. For demonstration purposes, the fields we correlate will be the HD_NETAMOUNT_SUM field, which is the sales amount before taxes, and the PAYAMOUNT_SUM_SUM_SUM field, which are amounts paid that include taxes. We will also include payments of cash only and payments of debit cards only for the correlation calculation as shown in Fig 4.8.1.1. In addition to the results being displayed, which can be exported to various file formats, you may optionally create an IDEA database of these results.

As expected, there is a perfect positive correlation of 1.000 between sales before taxes and payments. As sales go up or down, the sales tax moves accordingly, so the total payment by customers' correlates to sales net of taxes.

There is a strong correlation between both the cash tender and the debit cards tender to the payment amounts of 0.710 and 0.792, respectively. There is no correlation between cash and debit cards payments as the correlation coefficient is 0.189. See Fig 4.8.1.2.

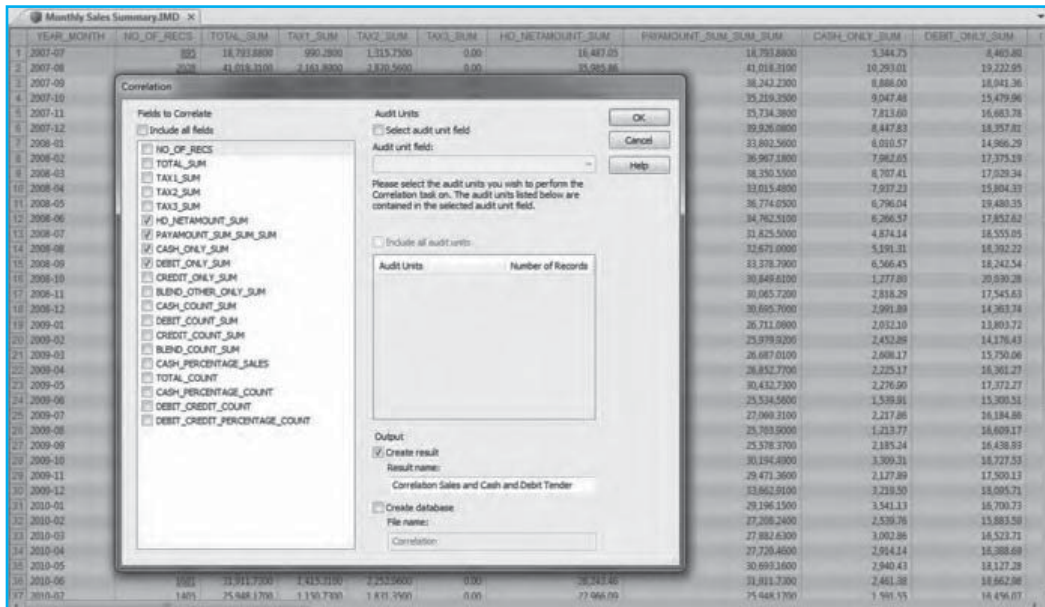


Fig: 4.8.1.1 Applying the Advanced Statistical Analysis Correlation Feature of IDEA

Fields: HD_NETAMOUNT_SUM, PAYAMOUNT_SUM_SUM_SUM, CASH_ONLY_SUM, DEBIT_ONLY_SUM			
	HD_NETAMOUNT_SUM	PAYAMOUNT_SUM_SUM_SUM	CASH_ONLY_SUM
PAYAMOUNT_SUM_SUM_SUM	1.000		
CASH_ONLY_SUM	0.706	0.710	
DEBIT_ONLY_SUM	0.796	0.792	0.189

Fig: 4.8.1.2 Correlation coefficient results



While IDEA does not calculate the coefficient of determination, it can be done simply by squaring the correlation coefficient that is already calculated for you. The coefficient of determination, or r^2 , tells us how much of the variation in one variable can be attributed to the variation of the other variable. This calculation when multiplied by 100 will be expressed in a percentage.

In our example of the correlation between cash tender and the payment amount of 0.710, 50.41 percent ($0.710 \times 0.710 \times 100$) of the variation can be attributed to the other variable.

One has to be mindful that even if the variables are calculated to have a strong correlation, there may not be a cause-and-effect relationship.

Are there direct cause-and-effect relations? That is, does x cause y or, in our previous example, does the level of education cause the income level? Maybe it is a reverse cause and effect where y causes x . That is, income levels determine your education level.

Possibly there is a third variable or a combination of several other variables that caused the relationship, such as networking relationships while in school that resulted in higher paying jobs. Maybe the whole relationship between the two variables was just a coincidence?

4.8.2 TREND ANALYSIS

Trend analysis is based on regression analysis. Regression analysis produces a line of best fit and predictions can be made based on the line. It is also known as the least square line, because the line passes through the distribution where the distance squared from the line is minimized.

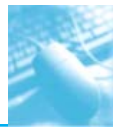
Similar to that of correlation, the x variable can estimate or predict the y variable. That is, if x changes, then how much y changes can be estimated. For two numeric variables, you can predict y from the x variable if the correlation coefficient is strong and there is a linear pattern for the variables. Normally you would want the r correlation coefficient to be better than plus or minus 0.60.

Unless there is perfect correlation, the prediction for the value of y , given x , is merely a prediction. It is a guess but an educated guess with some sound scientific basis. The prediction will be subject to some amount of error. The standard error of the estimate measures how much the predicted values deviate from the actual y values. IDEA uses the mean absolute percent error (MAPE) to calculate the accuracy of predictions. MAPE is the average of the percentage errors, is expressed in percentage terms, and works best with positive amounts. The MAPE number is the predicted line on the average that is away from the actual line in percentages. Low MAPE values mean that the past data has a good fit to the regression line and you can have more confidence in the data and prediction.

To use trend analysis in IDEA, the database needs at least one numeric field, and the field where trend analysis is to be applied cannot contain any bad data. The audit unit field cannot be the same field as the trend analysis field. In addition, the database should not contain seasonal data. If it contains seasonal data, then time series analysis should be selected over trend analysis. Time series works similarly to trend analysis.

In our data file, we will perform trend analysis on the 12-month data from the debit card payments field of DEBIT_2010_2011 and generate 3 months of forecasts. It is not necessary to provide a reference field or audit units. Refer to Fig 4.8.2.1.

For debit card payments, it is trending slightly downward, and it is predicted that at the end of the three months, debit payments would drop to approximately Rs. 18,000 for that month as seen in Fig 4.8.2.2.



The MAPE is 5.36 percent, which provides high confidence as the reliability of the predictions.

In contrast to the debit card payments, cash payments are trending upward when we select CASH_2010_2011 as the field to trend.

There is less reliability in the prediction as the MAPE percentage is 23.17. It is predicted that at the end of the three months, cash payments would increase to approximately Rs. 14,500, as displayed in Fig 4.8.2.3.

We will perform a trend analysis showing a reference field and audit units. There are five branches and we will include all of them as audit units. The reference field of GLOBAL_AVERAGE_SALES is the average sales for the five stores broken down by months. We have eight years of data so each store would have 96 records (8 years $\times$ 12 months). We will generate forecasts for three months as shown in Fig 4.8.2.4.

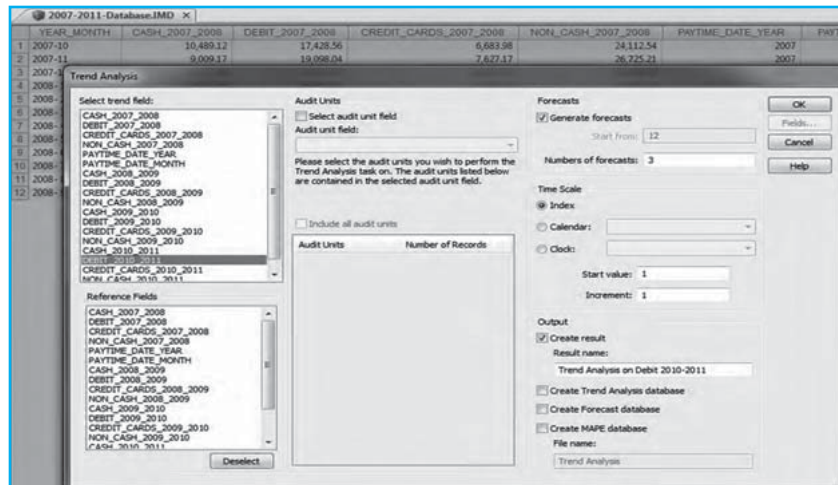


Fig. 4.8.2.1 Trend analysis in IDEA

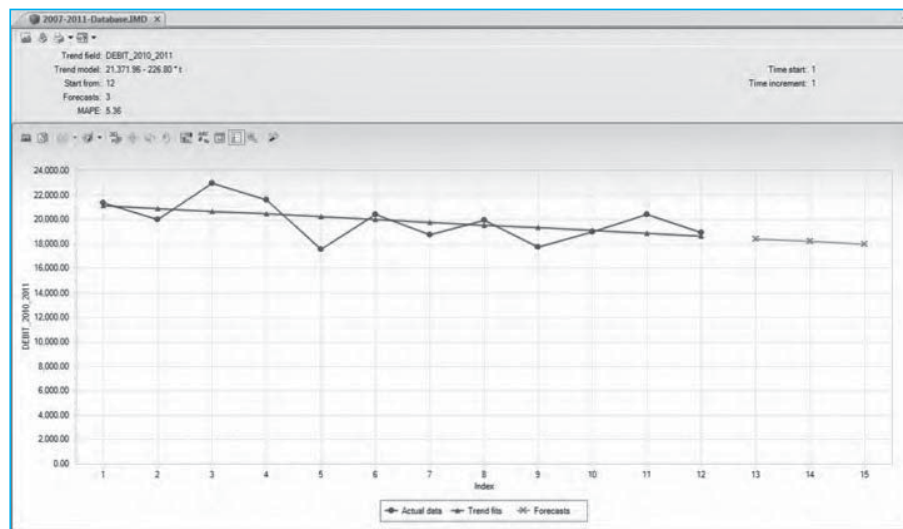


Fig. 4.8.2.2 Trend analysis results of debit card payments with forecast of three months

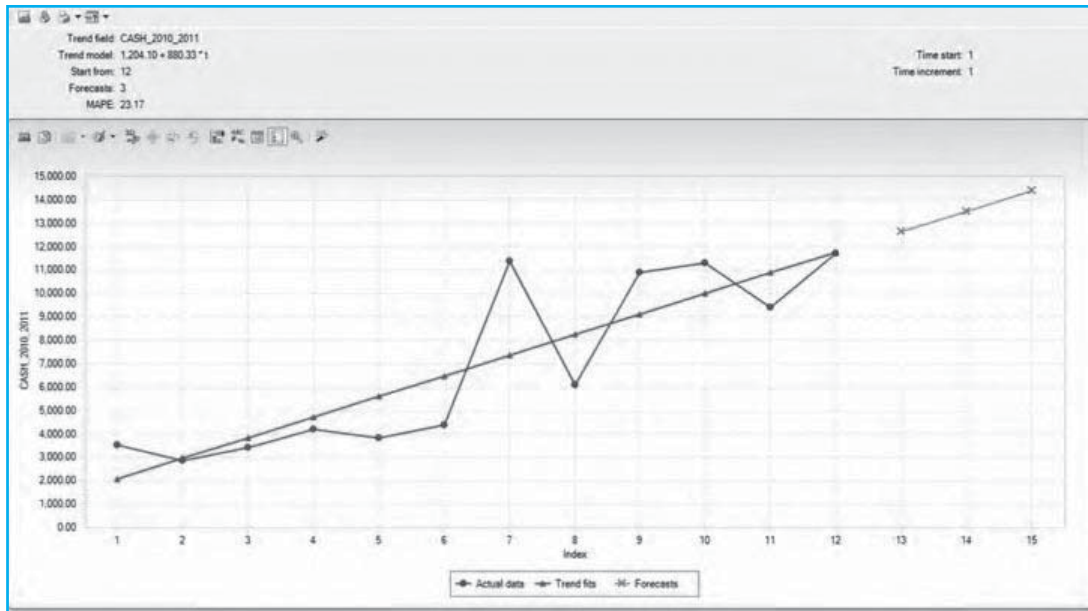


Fig. 4.8.2.3 Trend analysis results of cash payments with forecast of three months

Sales - Global Sales.IMD

MONTH	BRANCH	SALES	GLOBAL_AVERAGE_SALES	
1	2000-01	A	1,300,123.34	672,363.64
2	2000-01	B	609,786.34	672,363.64
3	2000-01	C	987,243.46	672,363.64

Trend Analysis

Select trend field: GLOBAL_AVERAGE_SALES

Audit Units: ☒ Select audit unit field
Audit unit field: BRANCH

There are 5 audit units for the selected audit unit field. Select the audit units you wish to perform the Trend Analysis task on.

☒ Include all audit units

Audit Units	Number of Records
☒ A	96
☒ B	96
☒ C	96
☒ D	96
☒ E	96

Reference Fields: SALES, GLOBAL_AVERAGE_SALES

Forecasts: ☒ Generate forecasts
Start from: 96
Numbers of forecasts: 3

Time Scale: ☒ Index
☐ Calendar:
☐ Clock:

Start value: 1
Increment: 1

Output: ☒ Create result
Result name: Trend Analysis Sales
☐ Create Trend Analysis database
☐ Create Forecast database
☐ Create MAPE database
File name: Trend Analysis

Buttons: OK, Fields..., Cancel, Help

Fig. 4.8.2.4 Applying trend analysis of sales referencing global average sales for each branch

Branch A outperformed the average of the five branches. The actual data is above the reference data line and shows good promise of trending upward in Fig 4.8.2.5. The prediction is sound as the MAPE is 5.26 percent.



By selecting all five branches as the audit unit, we can display other branches by choosing from the Audit unit pull-down menu. We will look at one more by selecting

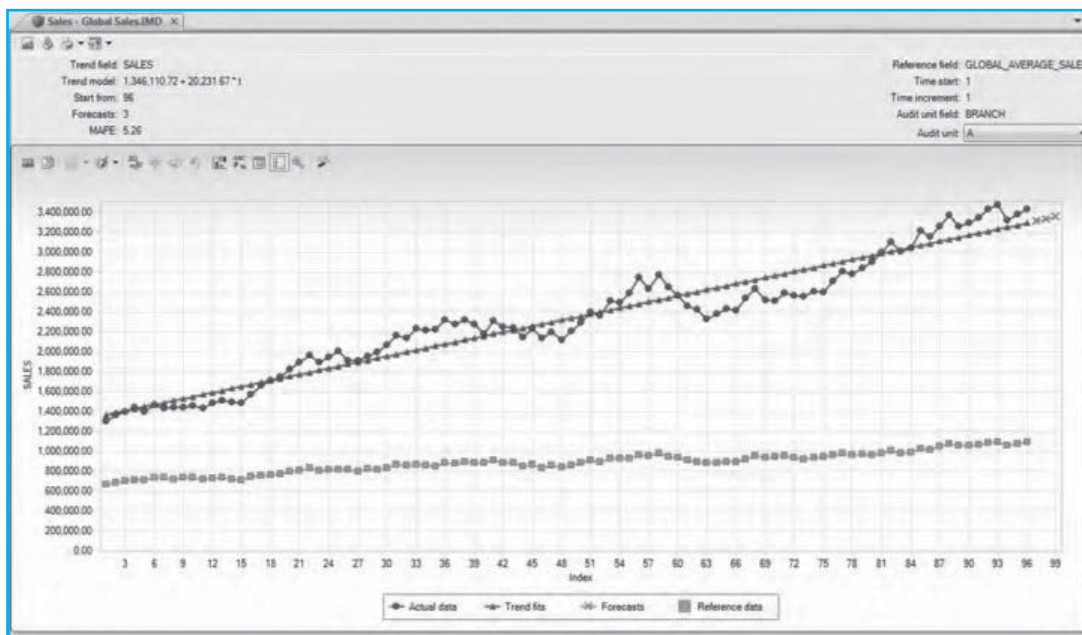


Fig: 4.8.2.5. Result of branch A's trend analysis with three month's forecast

Branch B see Fig 4.8.2.6 fits right in around the global average sales and is also trending up.

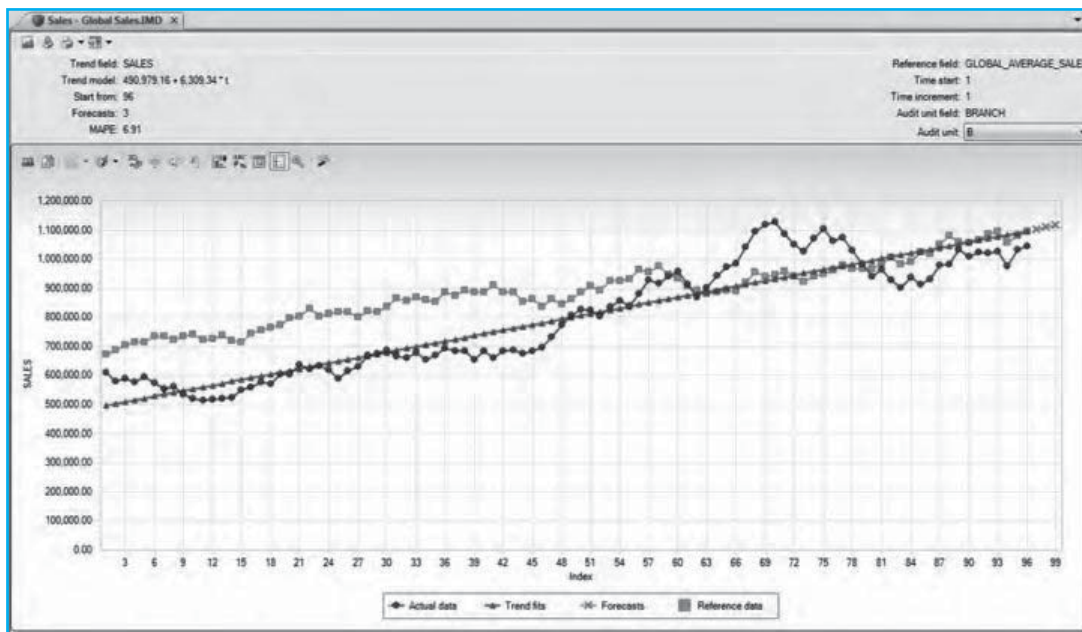


Fig: 4.8.2.6. Result of branch B's trend analysis with three month's forecast



4.8.3 TIME SERIES

For data with seasonal values where there are higher values in certain months (or any other time units) and lower values in other months, the time series analysis option is more appropriate. In our example in Fig 4.8.3.1, we will use gas-heating costs as the field for the time series and all five branches as the audit units. We ensure that we input the correct season length of 12 as our records are broken down by months. We will generate 12 months of forecasts.

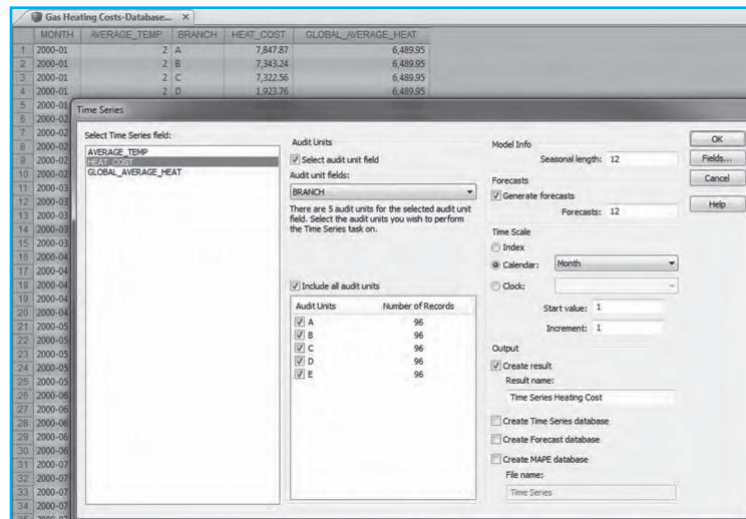


Fig. 4.8.3.1. Applying Time Series Trend Analysis of Heating Costs for Each Branch with 12□Month Forecast

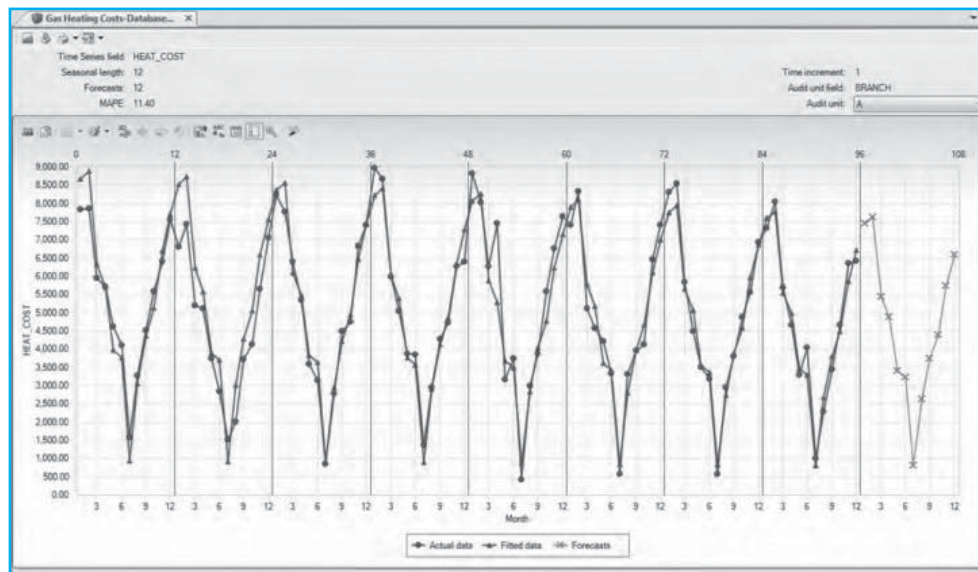


Fig. 4.8.3.2 Result of branch A's time series analysis with 12 months' forecast

From the Fig 4.8.3.2, you can see that heating costs are higher in the winter months and lower in the summer months for branch A. The mean absolute percentage error of 11.40% is fairly reliable in terms of the forecast. You can also view the other branches by using the pull-down menus from



the Audit unit area.

Trend analysis using IDEA is simple and the auditor need not be concerned with the complex formulas to calculate the regression line and the mean average percentage error.

4.9 IDEA SCRIPT

IDEA Script is a programming tool in IDEA that allows for combining numerous steps into a single procedure. The programming language is similar to that of Microsoft's Visual Basic for Applications. IDEA Script files are also known as macro files. It is a file that performs a series of actions when executed. IDEA Script can record actions for editing and modification to make the macro good for general use. Any user can apply the script to any suitable data files. IDEA Script is a powerful tool that speeds up repetitive procedures.

The tools built into IDEA eliminated the need to enter your computer codes from scratch. The record macro task can be used to record a sequence of steps that will be the framework for your application or macro. The Dialog Editor will help you design customized dialog boxes that you can use to control the flow of your application and to prompt the users for required input. However, IDEAScript cannot always anticipate all of the details you may want to incorporate in your macro so you will still have to write or edit some of the code.

IDEA Script can be used for:

- **Automating repetitive tasks:** Regular tasks, such as monthly data that needs to be analyzed, can use IDEA Script to run and repeat the required procedures automatically. IDEA Script can be efficiently used when certain procedures are required to be applied in multiple locations such as departments, divisions, and branches. Another frequent repetitive task is to import files. This can be automated to select the input files, specify the output names, perform the imports, and perform required data cleanup or scrubbing.
- **Creating an automated analysis system:** A set of tests or procedures can be integrated into an IDEA Script where the user may select particular tests to apply.
- **Controlling other software packages:** Using Microsoft's object linking and embedding (OLE) technology, other OLE-enabled software can be controlled from within IDEA. One example is that of sending IDEA data into an Excel spreadsheet. IDEA Script performs analysis tasks such as summarization, sends the summarized data into an Excel spreadsheet, and then the IDEA Script instructs Excel to chart the summarized data into bar graphs.
- **Creating custom tests:** IDEA Script can be used to create specific tests based on the user's or the organization's needs. Typically, these would be performing calculations that involve comparisons and equations.

In using IDEA Script, work will be performed faster and the results will contain fewer errors. The analyses are done more consistently and can be undertaken by other staff members. Standards are adhered to by all users.

Consideration for Automation

The following steps should be considered when planning to create an IDEA Script.

- Identify those tasks that are frequently repeated.
- Select those procedures that are well defined and well understood.



- Plan the macros carefully to ensure the results are those expected.
- Include user-input dialog boxes so that others can use the IDEA Script.
- Make the script as flexible as possible so it is useful to other users.
- Test IDEA Script on other computers with different versions of IDEA for compatibility and to ensure that the script works as expected.

Visual Script versus IDEA Script

Visual Script can create and edit macros in IDEA. Visual Script is a visual representation of batch processing that allows for simple dragging (or double clicks) of desired action choices from the left side of the window to the right side for project steps of the Visual Script screen, as shown in Fig 4. 9.1.

Visual Script, like IDEA Script, allows for automation of repetitive tasks. However, the automation can be performed without the complexity of knowing any programming and writing code. There are limitations, such as not being able to create message boxes, nor will Visual Script run in the IDEA Server environment. Visual Scripts have the .vscript filename extension and are saved to the default Macros .ILB folder under the active project folder.

Visual Scripts can be later converted to IDEA Scripts, through an option in the Visual Script Editor. Because of the easy conversion to IDEA Script, you can start the steps for your macro in Visual Script, convert it to IDEA Script, and then code additional functionalities within the IDEA Script editor. Visual Script has the ability to include IDEA Scripts into it. This makes it simple to group together a number of IDEA Scripts and have Visual Script run them all. Visual Script is an excellent personal tool.

IDEA Script can use dialog boxes, control other software applications, and interact with the operating system. An example of the IDEA Script editor window with a sample script is shown in Fig 4.9.2.

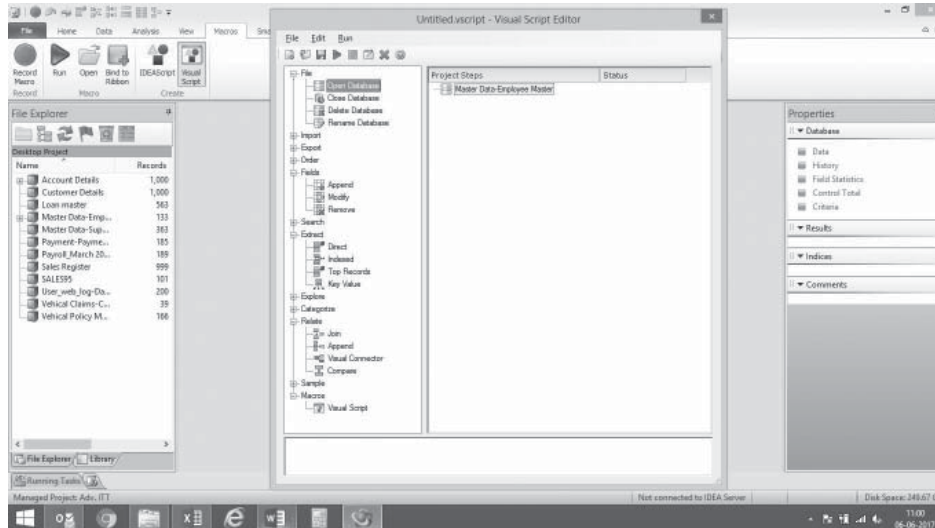


Fig 4.9.1: Visual script Editor Window

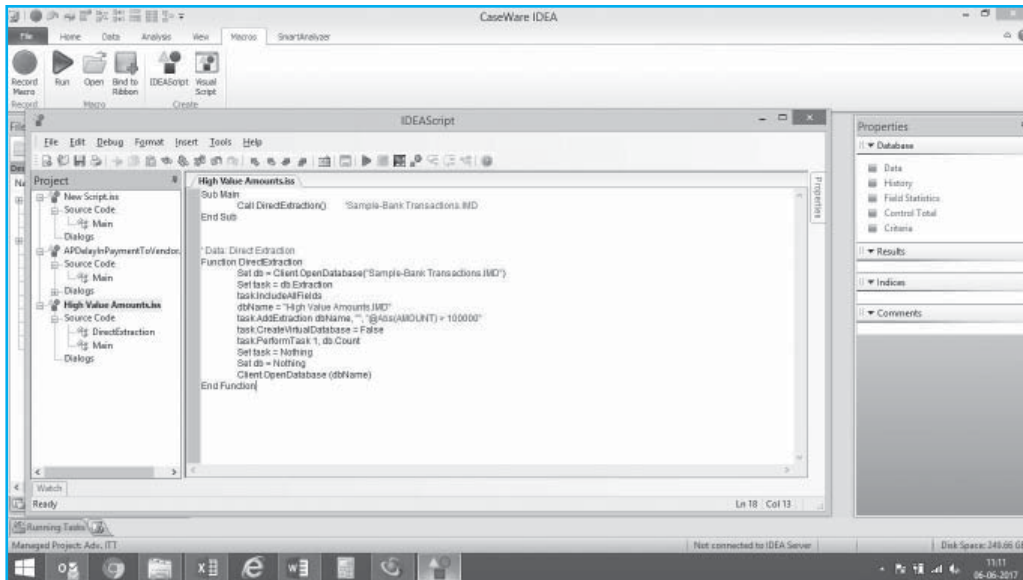


Fig 4.9.2: IDEA Script Editor Window

Creating IDEA Scripts:

The script in Fig 4.9.3 is an example of interacting with the Windows operating system function of renaming a file in a folder. This script does not include dialog windows to allow a user to select the folder and file to be renamed. It is hard-coded into the script that the "text.txt" file must be in the C:\data folder. It can only be renamed to "text_renamed.txt." The "CreateObject" function allows IDEA Script in IDEA to access Windows file-system functions and other application functions, such as in Microsoft Excel.

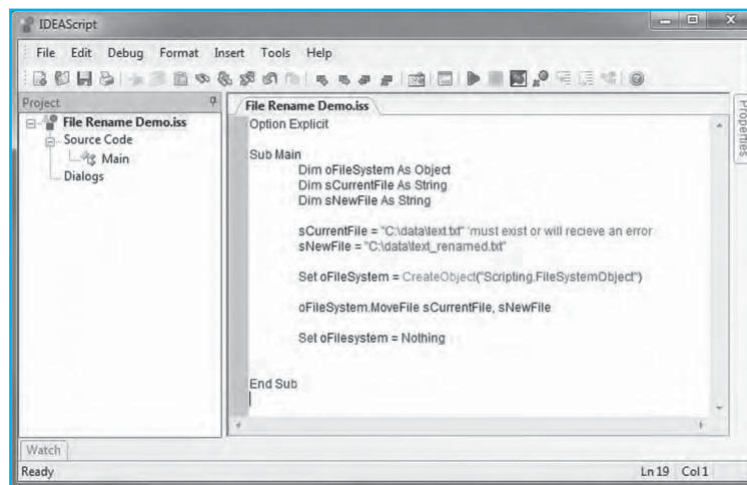


Fig: 4.9.3 IDEA Script to rename a file

An example of a dialog box is shown in Fig 4.9.4. The IDEA Script extracts transactions with even thousand amounts from the active file in IDEA. The script takes all numeric fields within the file and allows the user to select the field to apply the test on. In this case, the AMOUNT field is the appropriate one to select from the pull-down selection box.



Fig: 4.9.4 Dialog Box for Extracting Records with Even Thousand Amounts

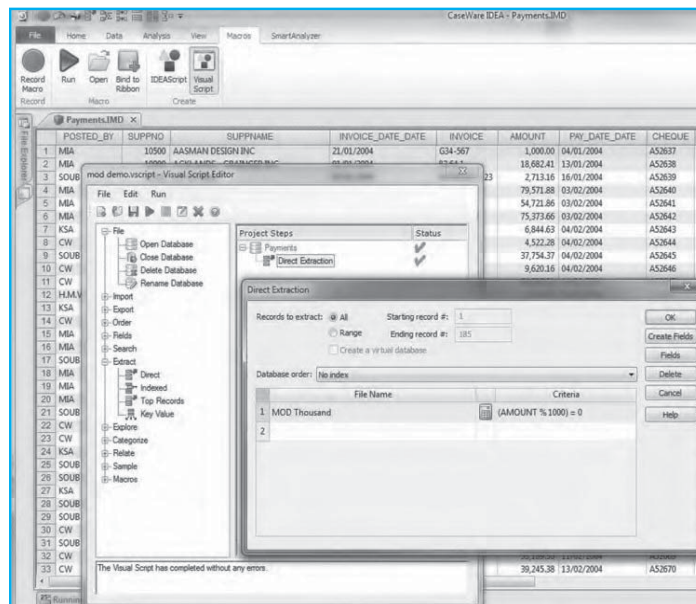


Fig: 4.9.5 Visual Script for Extracting Records with Even Thousand Amounts

In contrast, when using Visual Script, as shown in Fig 4.9.5, the procedure is:

- Under File, select Open Database. All databases in the current project are offered for selection. Choose the file to open.
- Under Extract, select Direct. The direct extraction option opens up. Enter in the File Name area MOD Thousand. Enter the equation of $(\text{AMOUNT} \% 1000) = 0$ in the Criteria area or Equation editor.
- By double clicking on the "Payments" filename under the Project Steps, all databases in the current project are offered again.
- By double clicking on Direct Extraction under the Project Steps, the Direct Extraction option opens up where you can modify the output filename and change the equation.



CREATING MACRO:

Visual Scripts are simpler to create but the user needs some knowledge to apply, such as being able to understand the equation and modify it. IDEA Scripts are more complex for the programmer but easier for the user. They are also more accurate if error checking is built in. Creating simple IDEA Scripts can be as easy as recording the steps that you are taking to accomplish a task. Fig 4.9.6 shows how you can start and stop recording a macro.

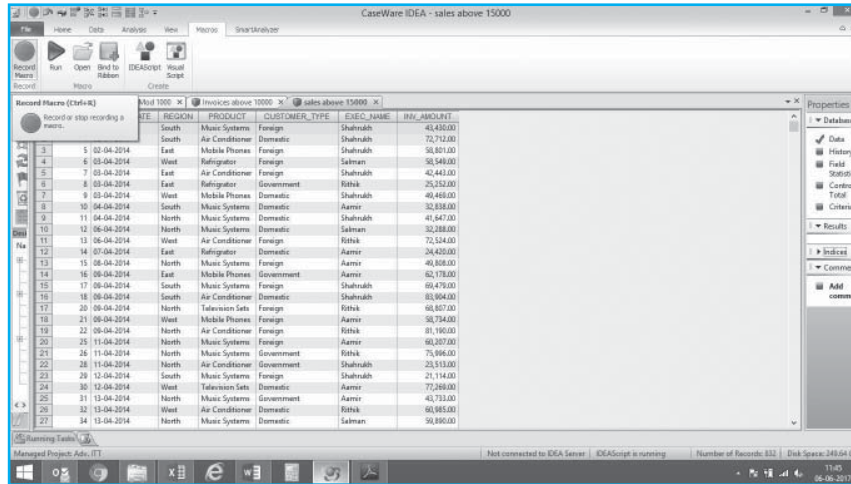


Fig: 4.9.6 Recording Macro

Start recording the macro. Perform the procedures and then stop recording the macro. A window will then pop up as shown in Fig 4.9.7.

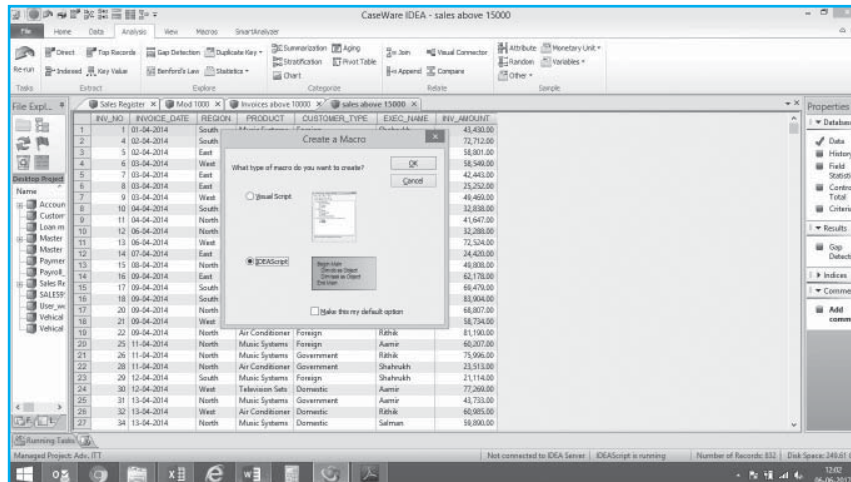


Fig: 4.9.7 Macro option after ending recording of macro

You can select either Visual Script or IDEA Script. Selecting either one will open the appropriate editor window and automatically paste the actions or codes in. When procedures are performed in IDEA, they are logged in the history found under the Properties window. You can copy all the procedures into IDEA Script or selected tasks. In our example in Fig 4.9.8, we select the “Copy the IDEA Script for the selected task(s)” option since we right-clicked on the record extraction area to



bring up the selection. Once the selection is made, the IDEA Script editor opens and the script is automatically created for you.

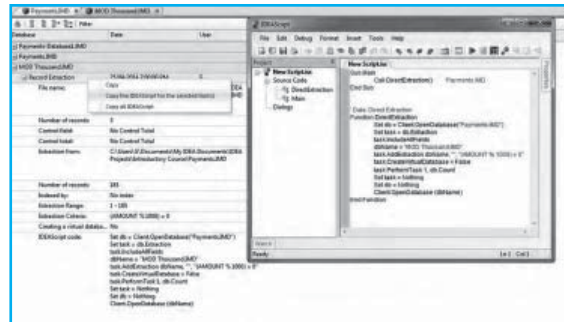


Fig: 4.9.8 Creating Macro from file History

You can make changes to both the source and output filenames along with the equation from within the IDEA Script editor to suit you. Alternatively, you can add dialog boxes and coding to allow for user input. The dialog box shown in Fig 4.9.4 was created in the IDEA Script editor's dialogs area, displayed in Fig 4.9.9.

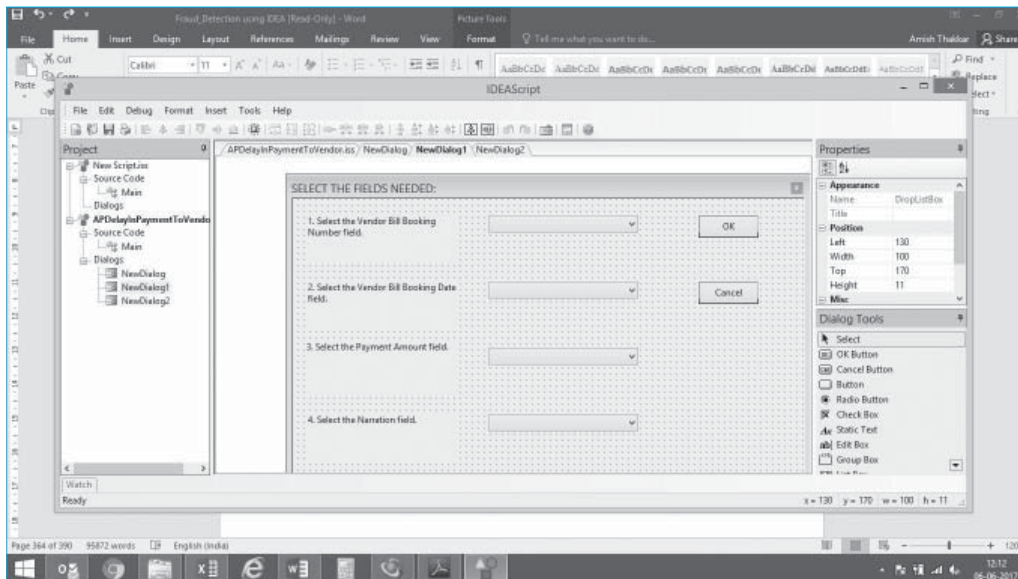
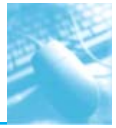


Fig: 4.9.9 Dialogue Editor

4.10 IMPORTING FILES WITH REPORT READER

The information you want to audit is usually available as a printout. In most cases, the printout can be routed or "spooled" to disc, and then transferred to the auditor's personal computer. Occasionally, it may be necessary to use a print file interceptor, which will redirect the print file being sent to the printer to a file on disc.

The differences between an ASCII file and a Print Report file are mostly in the header and footer, and in the extra lines and totals that you have to include or remove in order to import the file into IDEA.



Report Reader extracts data from plain text reports saved to file or some Adobe Acrobat PDF files and translates it into the specialized file formats of IDEA.

Step-by-step procedure to import file with Report Reader:

1. Access the print report or .PDF file.
2. Create the Base Layer.

Report Reader uses a set of layers to define the data to be imported into IDEA. The first layer defined is the Base Layer. The Base Layer tells Report Reader to write a record for each occurrence of the information defined by the layer. The Base Layer must be defined at the detail line, or transaction level. A detail line is the line or lines that contain the information to be identified as a single transaction or record in the resulting IDEA database. The detail line can be a single or multi-line entry in the report.

IDEA will be prompt to:

- **Create a standard layer:** Select this option when the report is in columnar format.
- **Create a floating layer:** Select this option if the data is not displayed in columns.
- **Exclude it from the output:** This option is only available after the Base Layer is created. This option allows you to exclude lines that contain data not required for import.

3. Create an Append Layer.

An Append Layer captures information that is associated with the Base Layer and that may be shared by more than one record. Data defined in the Append Layer will be appended to the records defined in the Base Layer. For example, in a report with transactions categorized by account number, it is possible to have one account number associated with a group of transactions. The individual transaction data is captured in the Base Layer and the Append Layer captures the account number that applies to the group of transactions.

If the information in the Append Layer is located before the transactions in the Base Layer, it is called a Pre-Append Layer. If the information in the Append Layer is located after the transaction in the Base Layer, it is called a Post-Append Layer. For example, in the following report, if the first entry (12-5-2017, Raj Malhotra) was selected as a sample for the Base Layer, the sample for the Append Layer should be Account 1023 and it will be a Pre-Append Layer because it is located before the sample line for the Base Layer

Account 1023		
12-5-2017	Raj Malhotra	539.00
12-5-2017	Arun Dubey	235.00
Account 1024		
3-5-2017	Praveen Jain	326.75
4-5-2017	Rahul Gupta	434.50

4. Preview the resulting database.
5. Scan the file for errors.
6. Import the file into IDEA.



Exercise: Import Print file into IDEA

Step 1: On the Home tab, in the Import group, click Desktop to begin the import process.

Step 2: In order to import reports into IDEA, select Print Report and Adobe PDF, then select the samplefile.txt file.

Step 3: Click Next. The Report Reader opens and displays the contents of the samplefile.txt file. The report will be displayed as in the following Fig 4.10.1

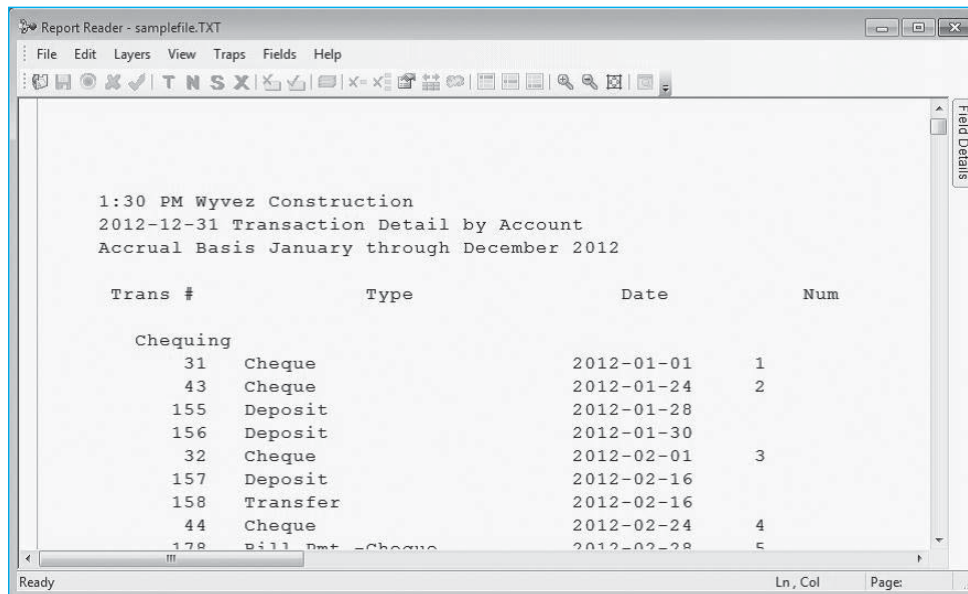


Fig. 4.10.1 Report reader Screen

Step 4: Scroll through the report and note the formatting within the report, including:

- General information (company name, report name)
- Report headings (range of accounts and period)
- Account information (number description)
- Detail information

Step 5: Creating a Base Layer

- Any detail line of the report can be used as a Base Layer 1.
- Drag your cursor across any detail line in the report to define it as your sample line.
- A message box appears, prompting you to create a standard layer or a floating layer
- Accept the default of Create a standard layer and then click Yes. Refer Fig 4.10.2
- The selected line is now copied to a section at the top of the page that is referred to as the Field Editor. Refer Fig 4.10.3.

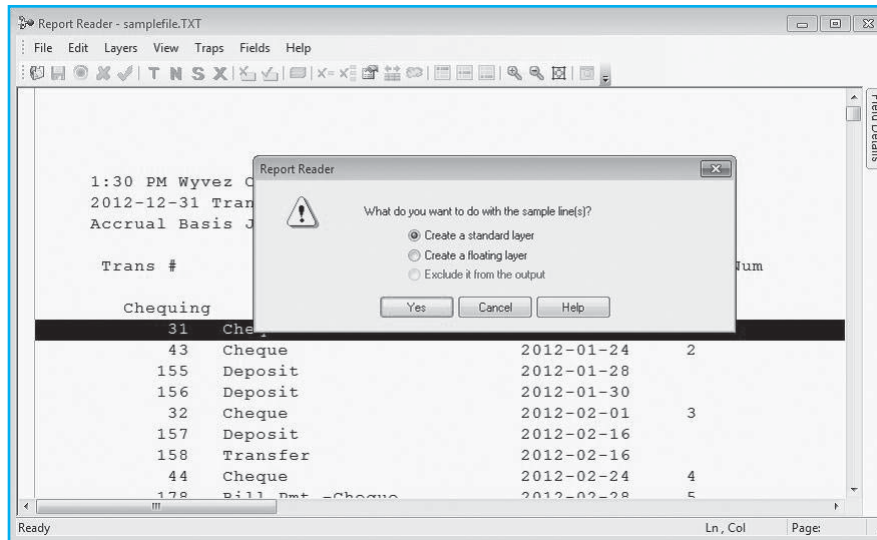


Fig. 4.10.2. Selection of Layer Type

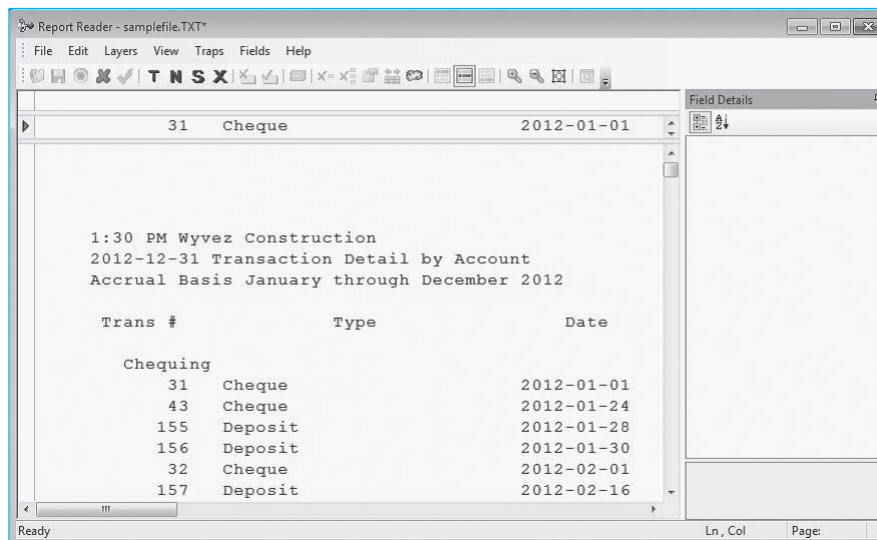


Fig. 4.10.3. Field Editor in Yellow

- The Field editor is the section between the two yellow lines with a red arrow in the left margin. In a multi-line entry, one of the lines must be the Anchor Line. The Anchor Line is highlighted with a red arrow in the left margin. By default, it is the first line, but a different line can be selected by clicking in the left margin of the line required to be the Anchor Line.
- The Field Details window also slides out from the right. When you define a field, this window will display the properties and attributes of the field.

Step 6: Define Trap:

- You must at this point define what distinguishes this detail line from the other lines in the report. It can be specific text, a combination of numbers, or a date. In Report Reader, these formats are



called Traps. For this report, you can see that the third field or column in the report is a Date field and it appears to be formatted the same way throughout the entire report (NNNN-NN-NN). Using this information, a trap can be defined in the Anchor Editor section (the line above the Field Editor).

- Place your cursor in the Anchor Editor directly above the first character of the date, just above the number 2. Since you want to import all the transactions (any entry with a date), click four times on the Numeric Trap button followed by a hyphen (-). Refer Fig 4.10.4.

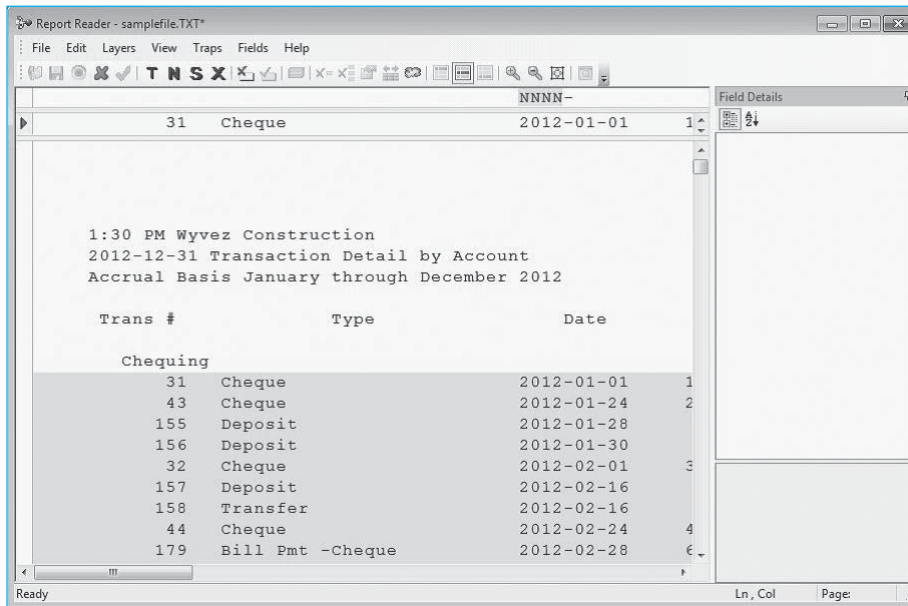


Fig. 4.10.4. Anchor Editor

- Note that all the lines in the report that meet the criteria or follow the pattern are highlighted in blue. If you were to leave out the hyphen (-) you would end up trapping the header line above the field name row (Accrual Basis January through December 2012) because the 2012 lines up with your NNNN trap.
- The other options available to trap information are:
 - Text Trap
 - Space Trap
 - Non-Blank Trap
- You can browse through the report to ensure that all the detail lines and only the detail lines are highlighted. When satisfied that the required lines are selected, you must define the information you want to import into IDEA from the detail lines. This information will be brought into IDEA as separate fields.

Step 7: Define Fields:

- In the Field Editor (the row with the red arrow), highlight the Trans # information.
- The colour of the selected field will be orange and all the corresponding records of the detail lines in the report will be highlighted. Scroll through the report to verify that the field width



is sufficient to capture records with larger amounts of data and adjust the field width in the Field Editor if required. Refer Fig 4.10.5.

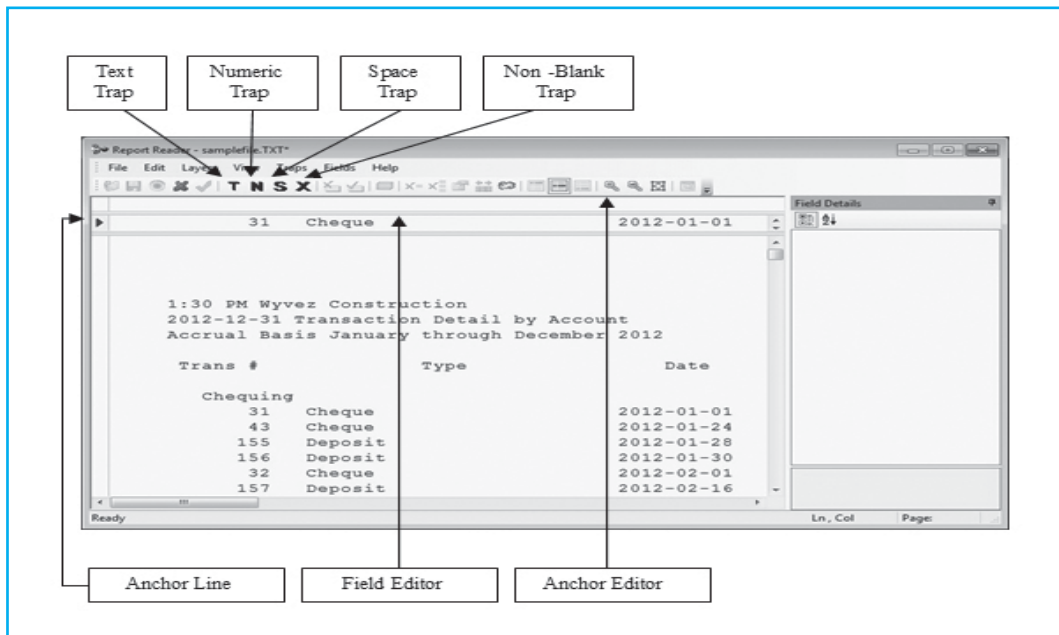


Fig. 4.10.5. Define Fields

- In the Field Details window, enter the following details:
 - ☐ Name: TRANSNO
 - ☐ Type: Numeric
 - ☐ Decimals: 0
- In the Field Editor, highlight the Type information, leaving enough room for the larger data.
- In the Field Details window, enter the following details:
 - ☐ Name: TYPE
 - ☐ Type: Character
- In the Field Editor, highlight the Date information.
- In the Field Details window, enter the following details:
 - ☐ Name: DATE
 - ☐ Type: Date
 - ☐ Mask: YYYY-MM-DD
- In the Field Editor, highlight the Num information, leaving enough room for the larger data.
- In the Field Details window, enter the following details:
 - ☐ Name: NUM
- Type: Character (Note mix of numbers and character data, hence the Character type)



- In the Field Editor, highlight the Name information, leaving enough room for the larger data.
- In the Field Details window, enter the following details:
 - ☐ Name: NAME
 - ☐ Type: Character
- In the Field Editor, highlight the Memo information, leaving enough room for the larger data.
- In the Field Details window, enter the following details:
 - ☐ Name: MEMO
 - ☐ Type: Character
- In the Field Editor, highlight the Debit information, leaving enough room for a bigger number.
- In the Field Details window, enter the following details:
 - ☐ Name: DEBIT
 - ☐ Type: Numeric
 - ☐ Decimals: 2
- In the Field Editor, highlight the Credit information, leaving enough room for a bigger number.
- In the Field Details window, enter the following details:
 - ☐ Name: CREDIT
 - ☐ Type: Numeric
 - ☐ Decimals: 2

When you are done the fields should match the following table

<i>Field Name</i>	<i>Type</i>	<i>Parameter</i>
TRANSNO	Numeric	Decimal :0
TYPE	Character	
DATE	Date	Mask: YYYY-MM-DD
NUM	Character	
NAME	Character	
MEMO	Character	
DEBIT	Numeric	Decimal :2
CREDIT	Numeric	Decimal :2

- Click the Save Layer button

Step 7: Creating an append layer

You now have to create an Append Layer to ensure you have an account name attributed to the correct detailed transaction information. In this report, you will be creating a Pre-Append Layer because the account name is located before the transactions of the Base Layer.

- Highlight the line under the report column titles that contains the account name, and then create a new standard layer. In the Anchor Editor, you need to make use of the Space Trap and



Text Trap buttons. The account names are indented a specified amount of spaces in this report so if you trap all the spaces up to when the text begins to identify the account name, you will eliminate any detail information you already pickup and header information in the report.

- Place your cursor in the Anchor Editor at the far left and click the Space Trap button to add spaces up to the start of the account names.
- Click the Text Trap button.

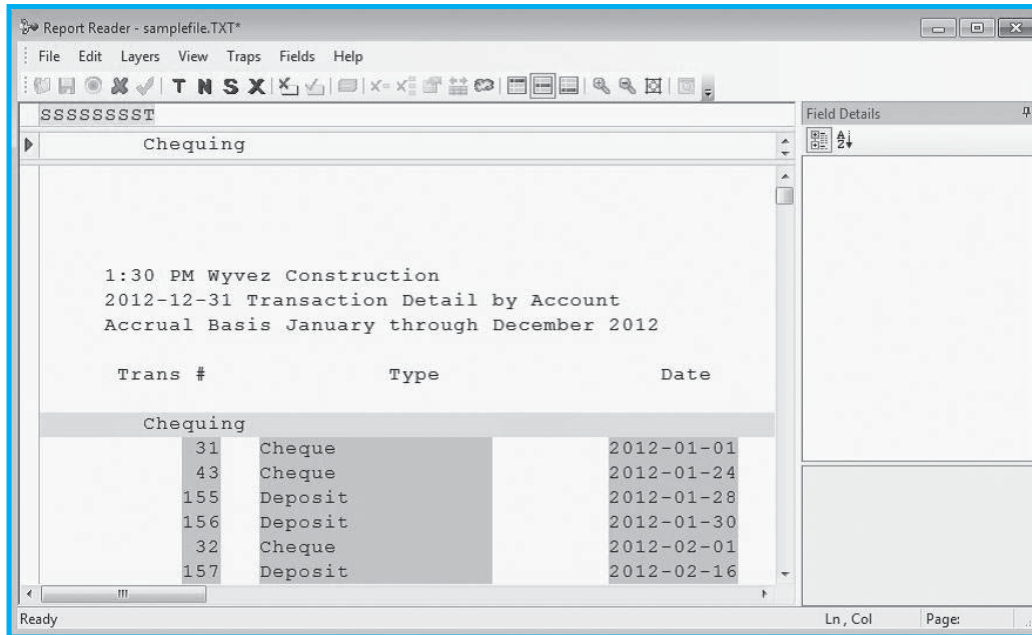


Fig. 4.10.6

- In the Field Editor, highlight the account name information.
- In the Field Details window, enter the following details:
 - ☐ Name: ACCTNAME
 - ☐ Type: Character
- Blank Cells: Use value from previous record.
- The field you just defined is located in the header which means that you would like to repeat the information it contains for each record (detail line) below it. To indicate to Report Reader that you want to repeat that information, the Use value from previous record option is selected in the Blank Cells box in the Attributes section of the Field Details window. Refer Fig 4.10.7
- Click save layer  button.

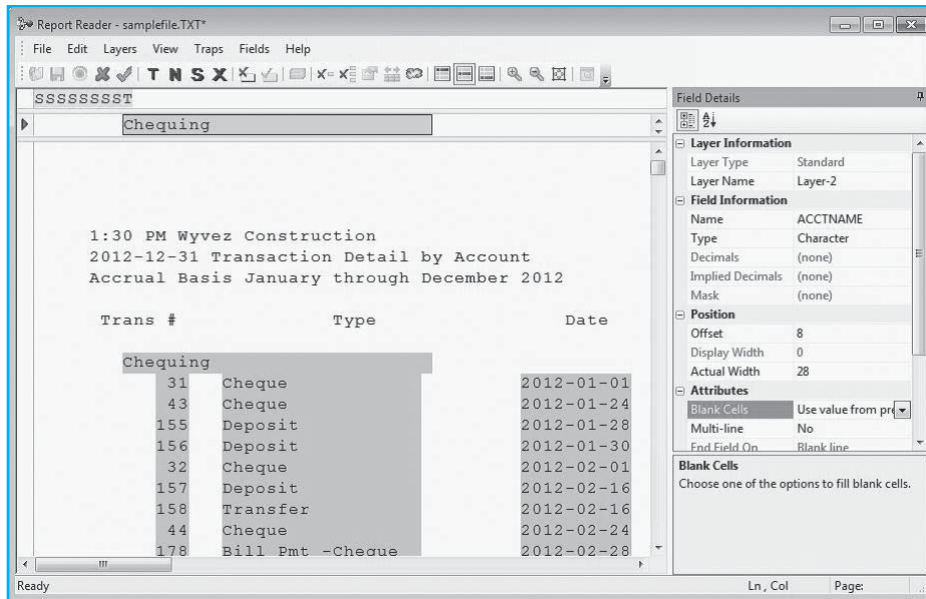


Fig. 4.10.7 Attribute Section on right hand side

Step 8: Previewing the resulting database



- On the Report Reader toolbar, click the Preview Database button. The entire report will be displayed in a Preview Data Window.

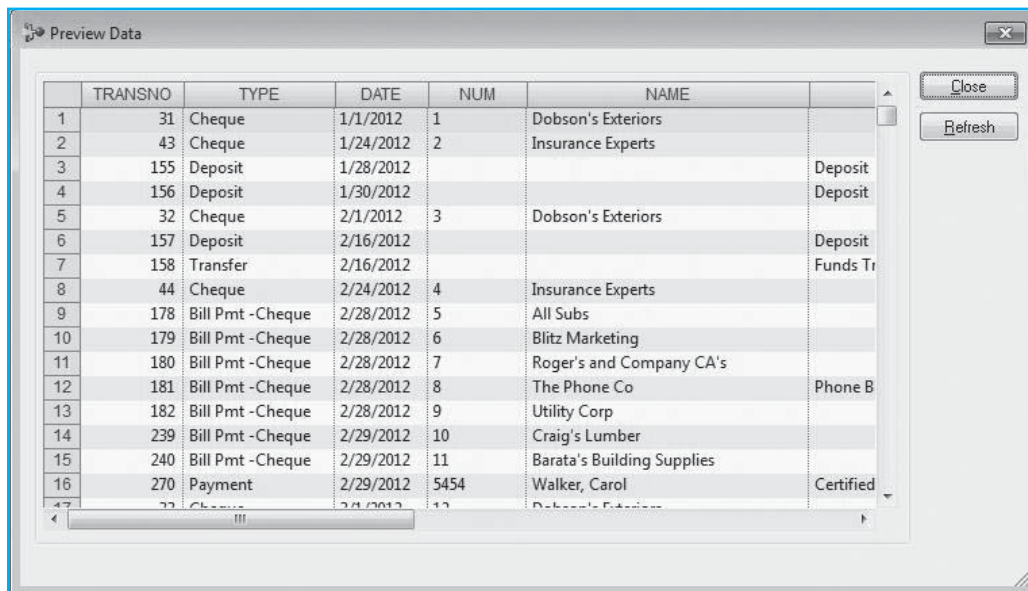


Fig. 4.10.8 Database Preview

- Click close to exit preview data window
- If you need to change information for a field, click on the field and make any necessary changes through the Field Details window. Changes can also be made by re-opening the layer for editing



through the Layer Manager.

- To access the Layer Manager, select Layers > Layer Manager. From the Layer Manager, you can edit, copy, or delete a layer. For more information on the Layer Manager refer to the Report Reader Help system

Step 9: Importing into IDEA

- You are now ready to import the file into IDEA. Click the import button
- When prompted to proceed with the import, click Yes.
- Report Reader prompts you to save the template. Click OK.
- The Save As dialog box appears. You are prompted to save your template file .jpm in your current project folder. The template is similar to a record definition. It contains all the information you defined in Report Reader. You can reuse the template to import a similar report or you can open the template and make changes to it.
- In the File name field, enter sample file and click Save.
- The last import screen allows you to enter the name of the generated IDEA database.
- In the Database name field, enter name and click Finish
- Final output in IDEA format. Refer Fig 4.10.9.

	TRANSNO	TYPE	DATE	NUM	NAME	MEMO
1	31	Cheque	1/1/2012	1	Dobson's Exteriors	
2	43	Cheque	1/24/2012	2	Insurance Experts	
3	155	Deposit	1/28/2012			Deposit
4	156	Deposit	1/30/2012			Deposit
5	32	Cheque	2/1/2012	3	Dobson's Exteriors	
6	157	Deposit	2/16/2012			Deposit
7	158	Transfer	2/16/2012			Funds Transfer
8	44	Cheque	2/24/2012	4	Insurance Experts	
9	178	Bill Pmt - Cheque	2/28/2012	5	All Subs	
10	179	Bill Pmt - Cheque	2/28/2012	6	Blitz Marketing	
11	180	Bill Pmt - Cheque	2/28/2012	7	Roger's and Company CA's	
12	181	Bill Pmt - Cheque	2/28/2012	8	The Phone Co	Phone Bill
13	182	Bill Pmt - Cheque	2/28/2012	9	Utility Corp	
14	239	Bill Pmt - Cheque	2/29/2012	10	Craig's Lumber	
15	240	Bill Pmt - Cheque	2/29/2012	11	Barata's Building Supplies	
16	270	Payment	2/29/2012	5454	Walker, Carol	Certified
17	33	Cheque	3/1/2012	12	Dobson's Exteriors	
18	167	Payment	3/1/2012	112	Bentley, Karen:Roof and Attic	Certified
19	261	Cheque	3/17/2012	13	Bank of Royals	
20	183	Bill Pmt - Cheque	3/18/2012	14	All Subs	

Fig. 4.10.9 Converted database

Reconciliation of data Imported

Once the data has been defined and imported into IDEA, and before commencing audit testing, it is imperative that the data be reconciled back to the host system. There are several potential errors that may be made during the import process, such as:

- Requesting the wrong data
- Being supplied with the wrong data and/or for the wrong period
- Errors on the extraction of the data from the host system



- Problems with the media while transferring the data
- Errors when importing the data

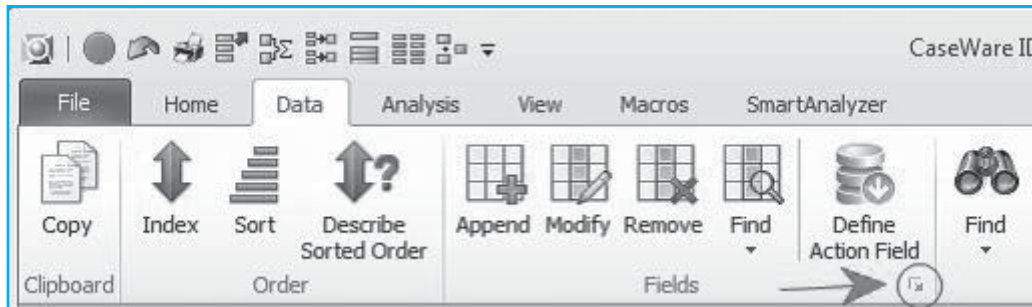
The data can be reconciled back to the host system by reviewing Numeric field totals, the record count, or a sample of records compared to a print from the host system. It is important that reconciliation reports and control totals are requested along with the data and that they are filed with the documentation from the download/import process.

There are different ways to reconcile the data. Certain IDEA tasks are particularly useful for reconciling data. First, it might be useful to browse the IDEA database. Use the Field Statistics and the Control Total properties, accessible from the Properties window, to reconcile totals and to ensure that the dates match the data you requested and do not include transactions from another period.

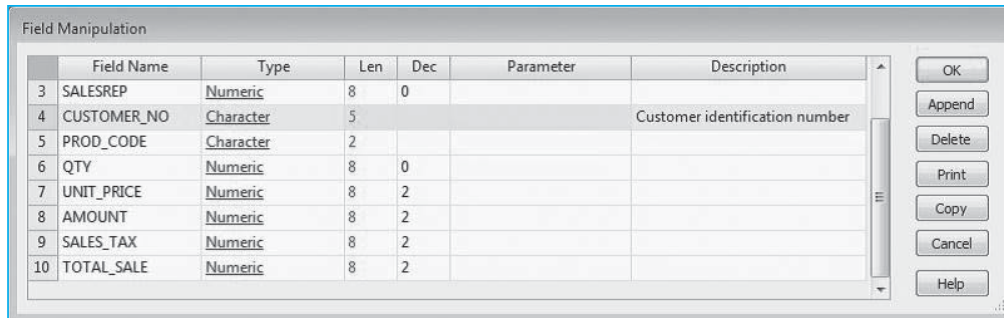
4.11 FILED MANIPULATION

The Field Manipulation task is used to modify the layout of the fields in a database. There are two ways to access Field Manipulation:

- On the Data tab, in the Fields group, click the arrow in the bottom right corner

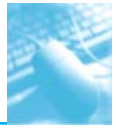


- Double-click any value in the Database window. The Field Manipulation dialog box appears.



MODIFYING FIELDS

To rename a field double-click the field's name in the Field Name column. Any changes made to the field name will be recorded in the History. The information in the Type column is initially entered by IDEA during import. Four general types of fields: Character, Numeric, Date, Time and three special types of fields: Virtual, Editable and Multistate are available. You cannot change the length of a field or the number of decimals unless you have modified the information in the Type column. You can double-click in the Description column to change field descriptions



EXERCISE 1

Make the following changes to the Sales Transactions-Database.

- Ensure that Sales Transactions-Database is the active database and that the Data property is selected in the Properties window.
- Double-click any record in the Database window.
- The Field Manipulation dialog box appears.
- Rename the CUSTOMER_NO field to CLIENT_NO.
- In the Description column for the SALES_TAX field, enter 8%.
- In the Description column for the INV_NO field, enter Invoice number.
- Click OK.
- Click Yes to make the changes to the fields in the database.

APPENDING FIELDS

IDEA maintains data integrity upon import. The data cannot be changed. Instead, IDEA allows the creation of Virtual and Editable fields. For example, you can add a Virtual or Editable field that contains a calculation performed on an original data field

Virtual fields compute results “on the fly”. The results are not stored in the database. However, any database created from a database with a Virtual field contains that field as a calculated value. Virtual fields can be Character, Numeric, Date, or Time fields.

Editable fields and regular fields are stored in the database and require some processing time in order to be physically added to the IDEA database.

EXERCISE 2: APPENDING VIRTUAL FIELDS

Adding new fields might be useful when proving or verifying calculations, when creating a new field with calculated values, or when transforming existing data.

In this exercise, you will create a Virtual field called AMOUNT_CHECK in the Sales Transactions-Database. By creating a calculation, you will determine if the amount in the AMOUNT field is correct.

- Ensure that Sales Transactions-Database is the active database and that the Data property is selected in the Properties window.
- Double-click any record in the Database window.
- The Field Manipulation dialog box appears.
- Click Append.
- A new line is added to the Field Manipulation dialog box.
- Enter the following details for the new field:
 - ☐ Field Name: AMOUNT_CHECK
 - ☐ Type: Virtual Numeric
 - ☐ Length: n/a



- ❑ Decimals: 2
- ❑ Parameter: QTY * UNIT_PRICE
- ❑ Description: Calculated amount
- ❑ Click OK.
- ❑ If prompted, click Yes to make the changes to the database.

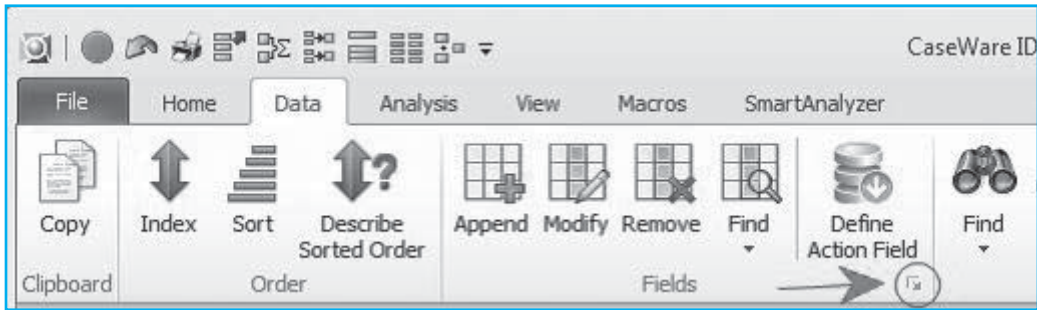


Fig 4.11.1: Appending virtual field

Sales Transactions-Database				
	SALES_TAX	TOTAL_SALE	AMOUNT_CHECK	NUM_AMOUNT_CHECK
1	23.96	263.56	307.20	307.20
2	1,105.82	12,164.00	11,058.18	11,058.18
3	9,175.98	100,935.78	91,759.80	91,759.80
4	508.31	5,591.40	5,083.09	5,083.09
5	457.80	5,035.80	4,578.00	4,578.00
6	83.26	915.87	1,063.35	1,063.35
7	1,000.00	11,000.00	10,000.00	10,000.00

Fig 4.11.2: Virtual field AMOUNT_CHECK

Note the colour of the data in the AMOUNT_CHECK field, which indicates that this is a virtual field not part of original data but field appended by auditor

EXERCISE 3: APPENDING REGULAR FIELDS

In IDEA, you can also add regular Numeric, Character, Date, and Time fields through Field Manipulation. These fields will appear as if they were added during import. They will retain the same colour as the other fields and will not have any parameters displayed. As with Virtual fields, any additions or changes made to these fields will be recorded in the History. The parameter of a regular field cannot be changed.

In this exercise, you will create a Numeric field that is identical to the AMOUNT_CHECK Numeric field.

- Ensure that Sales Transactions-Database is the active database and that the Data property is selected in the Properties window.



- Double-click any record in the Database window.
- The Field Manipulation dialog box appears.
- Click Append.
- Enter the following details for the new field:
 - ❑ Field Name: NUM_AMOUNT_CHECK
 - ❑ Type: Numeric
 - ❑ Length: n/a (by default it will become 8)
 - ❑ Decimals: 2
- Parameter: AMOUNT_CHECK
- Description: Calculated amount
- Click OK.
- Click Yes to make the changes to the database

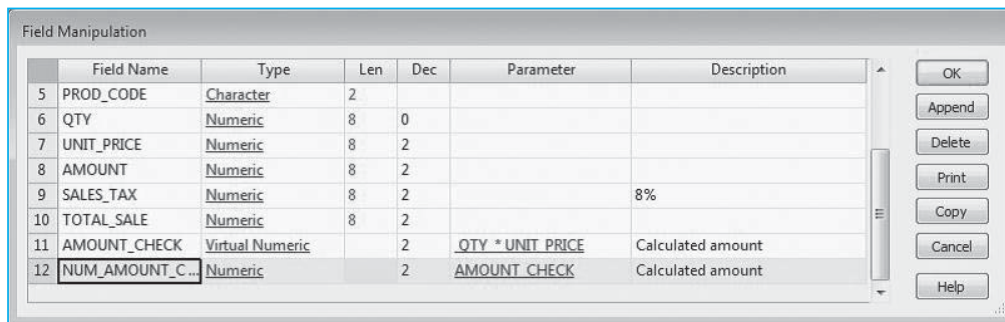
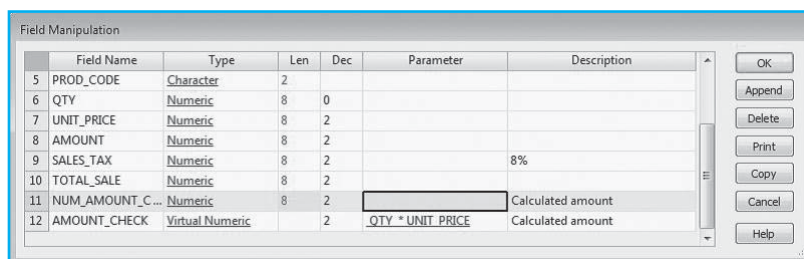


Fig 4.11.3: Regular field NUM_AMOUNT_CHECK

Note the colour of the data in the NUM_AMOUNT_CHECK field, which indicates that this is a regular protected field.

- Re-open the Field Manipulation dialog box.



Note that the parameter is not displayed for the NUM_AMOUNT_CHECK field.

- Click OK to return to the database.

EXERCISE 4: APPENDING EDITABLE FIELDS

IDEA also allows for the creation of Editable fields. These fields will allow you to create a notation, or manually enter a value to add to a database. The creation and editing of these Editable fields is recorded in the History. Editable fields are also displayed as a different colour to distinguish them



Computer Assisted Audit Techniques

from Virtual and Regular fields.

- With Sales Transactions-Database as the active database, append an Editable Character field to the database in order to add notes.
- You will need to add an empty value (represented by double quotes) in the Parameter column so IDEA knows you want to enter characters into the field at a later time.
- Enter the following details for the new Editable field:
 - ❑ Field Name: NOTES
 - ❑ Type: Editable Character
 - ❑ Length: 50
 - ❑ Decimal: n/a
 - ❑ Parameter:
 - ❑ Description: Notes on line items

Note that the Editable field created will wrap the text within the field as you type in order to display everything in the current column width.

EXERCISE 5: APPENDING SPECIAL FIELDS

IDEA further allows for the creation of special fields. These fields are termed as Boolean and Multistate fields. They are used generally by auditor to provide remarks in sample file in a symbolic way. Refer Fig 4.11.4 to see types of fields options provided by IDEA

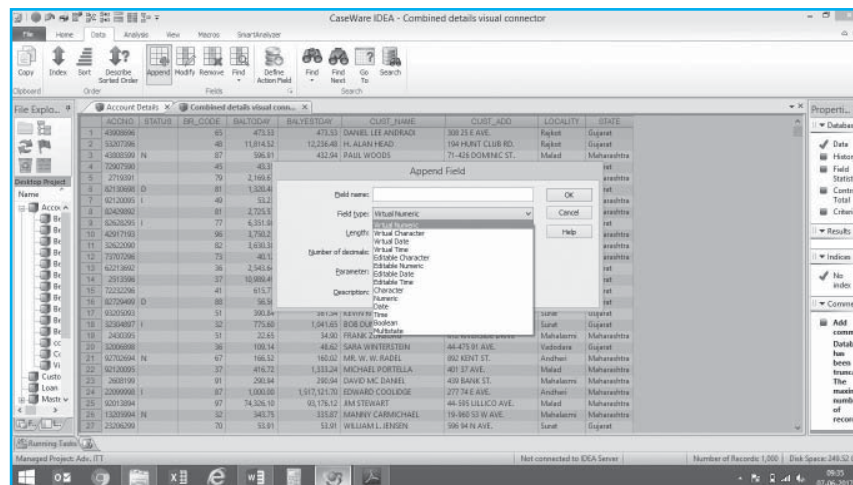


Fig. 4.11.4 – Types of fields

Boolean fields offer two options to user whereas multistate field offers three options. Refer Fig 4.11.5 below.

	INVOICE_DATE	REGION	PRODUCT	CUSTOMER_TYPE	EXEC_NAME	INV_AMOUNT	BOOLEAN	MULTISTATE
1	01-04-2014	South	Music Systems	Foreign	Shahrulh	43,410.00	✓	?
2	01-04-2014	West	Refrigerator	Domestic	Aamer	7,553.00	✓	?
3	01-04-2014	West	Music Systems	Government	Salman	5,724.00	✓	?
4	02-04-2014	South	Air Conditioner	Domestic	Shahrulh	72,712.00	✓	?
5	02-04-2014	East	Mobile Phones	Foreign	Shahrulh	58,801.00	✓	?
6	03-04-2014	West	Refrigerator	Foreign	Salman	58,549.00	✓	?
7	03-04-2014	East	Air Conditioner	Foreign	Shahrulh	42,443.00	✓	?
8	03-04-2014	East	Refrigerator	Government	Rithik	25,752.00	✓	?
9	03-04-2014	West	Mobile Phones	Domestic	Shahrulh	49,469.00	✓	?
10	04-04-2014	South	Music Systems	Domestic	Aamer	32,838.00	✓	?
11	04-04-2014	North	Music Systems	Domestic	Shahrulh	41,647.00	✓	?
12	04-04-2014	North	Music Systems	Domestic	Salman	32,288.00	✓	?
13	04-04-2014	West	Air Conditioner	Foreign	Rithik	72,524.00	✓	?
14	07-04-2014	East	Refrigerator	Domestic	Aamer	24,400.00	✓	?
15	08-04-2014	North	Music Systems	Foreign	Aamer	48,868.00	✓	?
16	08-04-2014	East	Mobile Phones	Government	Aamer	62,178.00	✓	?
17	08-04-2014	South	Music Systems	Foreign	Shahrulh	69,479.00	✓	?
18	08-04-2014	South	Air Conditioner	Domestic	Shahrulh	83,804.00	✓	?
19	09-04-2014	East	Music Systems	Foreign	Aamer	5,479.00	✓	?
20	09-04-2014	North	Television Sets	Foreign	Rithik	68,807.00	✓	?
21	09-04-2014	West	Mobile Phones	Foreign	Aamer	58,734.00	✓	?
22	09-04-2014	North	Air Conditioner	Foreign	Rithik	81,186.00	✓	?

Fig. 4.11.5 – Boolean and multistate fields

4.12 JOIN DATABASES AND VISUAL CONNECTOR

IDEA has two main methods of joining databases together based on a key field:

- Join Databases
- Visual Connector

JOIN DATABASES:

Data required for auditing is often spread across several files and perhaps across different computer systems. In order to carry out most audit tests and analyses, the data must be contained within a single file. IDEA provides a Join Databases task, which can be used to:

Combine fields from two databases into a single database for testing. For example, to carry out an inventory valuation, data is required from both the inventory master and pricing information databases.

Test for data, which matches or does not match across systems. For example, match the monthly payroll transactions database with the master payroll database to ensure there are no “ghost” employees, or that all former employees have been removed from the payroll.

Databases can be joined or matched if they contain a common link (referred to as the “key”), such as an employee number field.

Join Databases can perform a host of different join option on two databases, including all records in primary database, matches only, records with no secondary match, records with no primary match, as well as all records in both databases.

Join Databases Precautions

- Only two databases can be joined at one time. If more than two databases must be joined, you must combine two databases, then join a third to the resultant database, and so on. You should also consider the Visual Connector task if you need to join more than two databases.
- The common fields (the “key”) do not need to have the same name, but they must be of identical field type.



- The databases must be in the same location. For example, a database in the Samples project cannot be joined to a database in the test project.
- When using the Join Databases task, care must be taken to select the primary and secondary databases in the correct order as the secondary database is joined to the primary database. Transaction file should be the Primary file and Master file should be the secondary file. There should be Many to one relationship.

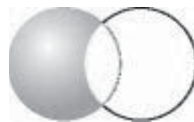
IDEA provides five join options:

Matches only



In this option, IDEA processes each record in the primary database (in “key” order), cross matching with the secondary database on the key. If there is a match on the key, a record is written to the output database. If there is no match, the next primary database record is processed. Matches only will search for the keys in the secondary database for matches against each record.

Records with no secondary match



In this option, IDEA processes each record in the primary database in turn, cross matching with the secondary database on the key. It writes a record to the output database if the key exists in the primary database only.

Records with no primary match



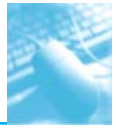
IDEA processes each record in the secondary database in turn, cross matching the key with the primary database. IDEA writes a record to the output database if any key exists in the secondary database only.

All records in primary file

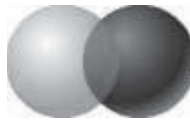


IDEA processes each record in the primary database (in “key” order) in turn, cross matching with the secondary database on the key.

Each record in the primary database is written to the resultant output database including the selected fields from the secondary database if the key exists.



All records in both files



In this option, IDEA processes the database in key order, writing a record to the output database for every record in each database where there is a key match.

If there is more than one record for a particular key in both the primary and secondary databases, each of the primary database records are matched against the first record for the key in the secondary database as in the options Matches only and All records in primary file. However, all additional records for the key in the secondary database are also written to the output database but all primary fields will be blank for Character fields, 0000/00/00 for Date fields and zero for Numeric fields.

JOIN Vs VISUAL CONNECTOR

Join Databases has two important limitations:

- It can only join two databases at a time.
- The Matches only option is similar to Visual Connector but has the following limitations:
 - ❑ When a many-to-many relationship exists, only the first matched record from the secondary database is included in the result.
 - ❑ The resulting joined database does not exceed the number of records in the primary database, regardless of the matching ability of the key fields. In other words, there is only one primary match for every secondary match. With the exception of matching types such as all records in secondary database and all records from both files that can and will, respectively, have more records than the primary database.
- On the other hand, Visual Connector is an easy-to-use, visual method of connecting two or more databases together by drawing lines between key fields on a canvas, and does not have any limitations on how many records are joined.
- Visual connector can join more than two files at a time
- Visual connector unlike Join option which has five different options has only two options – matches only and all records in primary file

EXERCISE:1 – Join Customer details.imd with account details.imd

Account details file has fields – ACCNO, STATUS, BR_CODE, BALToday, BALYESTDAY

Customer details file has fields – ACCNO, CUST_NAME, CUST_ADD, LOCALITY, STATE

Join both the file using common field ACCNO

Step 1: Open primary file account details and ensure it is active file in IDEA

Step 2: Go to analysis tab and click on join button

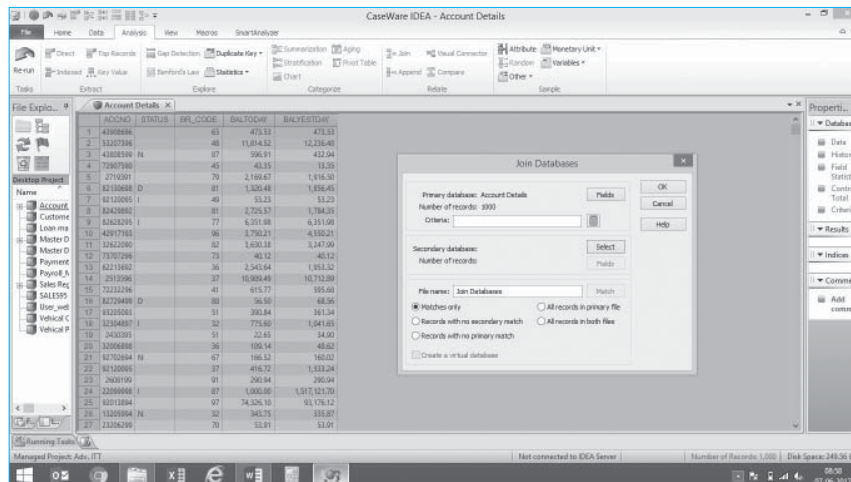


Fig. 4.12.1 – Join options

Step 3: Primary database automatically selected is Account Details. Select Secondary database customer details

Step 4: Select option 'All records in both the files' since we want to join both the files

Step 5: Provide file name as 'combined customer details'. Refer Fig 4.12.2

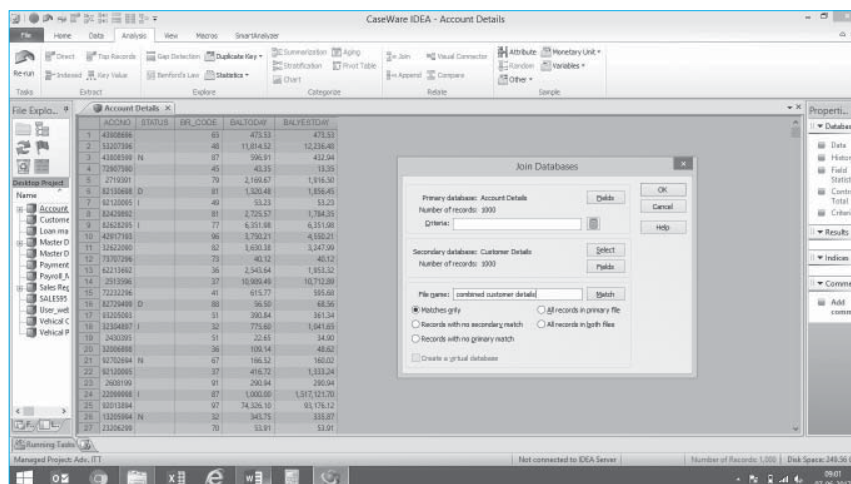


Fig. 4.12.2 – User Input to join options

Step 6: Click on Match option

Step 7: Provide primary and secondary key which is common in both the files ACCNO. Refer Fig 4.12.3

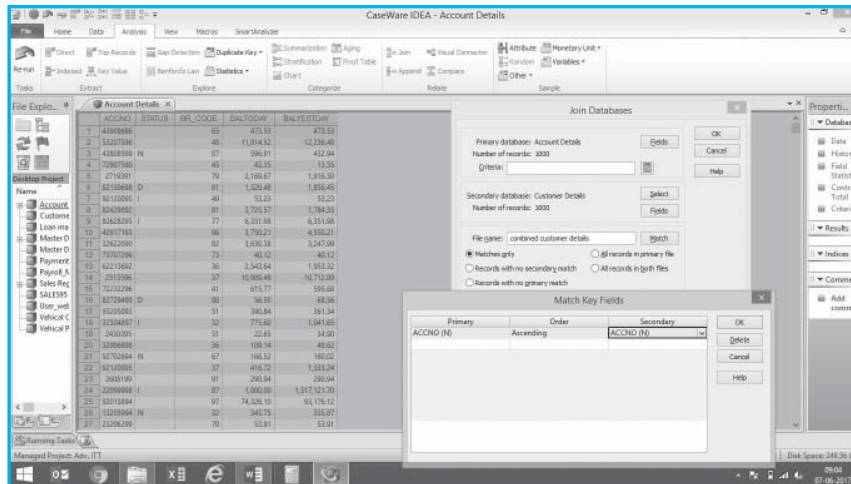
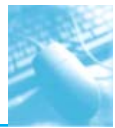


Fig. 4.12.3 – User Input to match option

Step 8: Click on OK

Step 9: See the output in combined customer details file. Refer Fig 4.12.4. you would observe that joined file contains all the fields from customer details and account details files

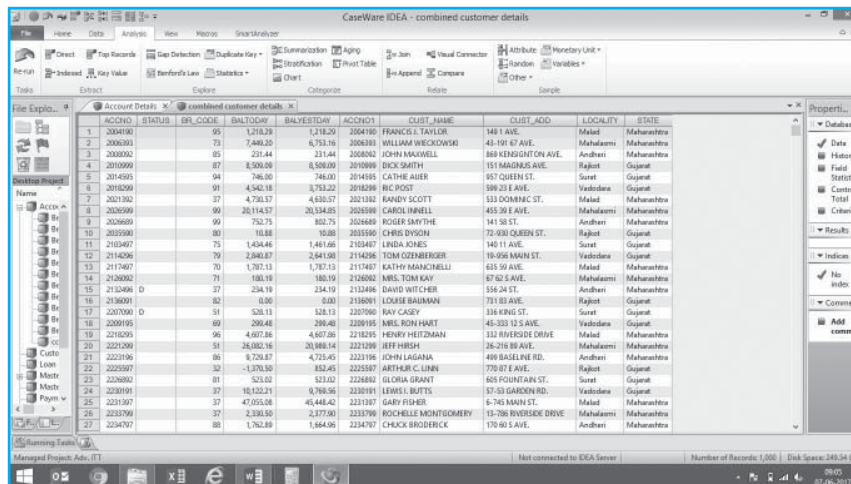


Fig. 4.12.4 – Joined database using join function

EXERCISE: 2 – Join using visual connector option - Customer details.imd with account details.imd

Account details file has fields – ACCNO, STATUS, BR_CODE, BAL_TODAY, BAL_YESTDAY
Customer details file has fields – ACCNO, CUST_NAME, CUST_ADD, LOCALITY, STATE
Join both the file using common field ACCNO

Step 1: Open primary file account details and ensure it is active file in IDEA

Step 2: Go to analysis tab and click on visual connector button. Refer Fig 4.12.5

Step 3: From the list of databases on the left panel, select file customer details



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Step 4: Create a link between both the files by dragging the mouse starting from ACCNO field in account details file and dropping at ACCNO field at customer details file. This will establish a connection between two files. Refer Fig 4.12.6

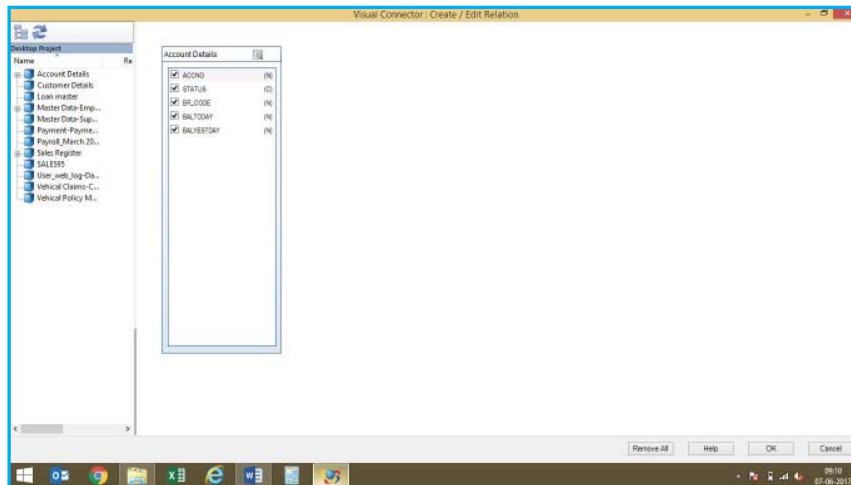


Fig: 4.12.5 – Visual Connector Options

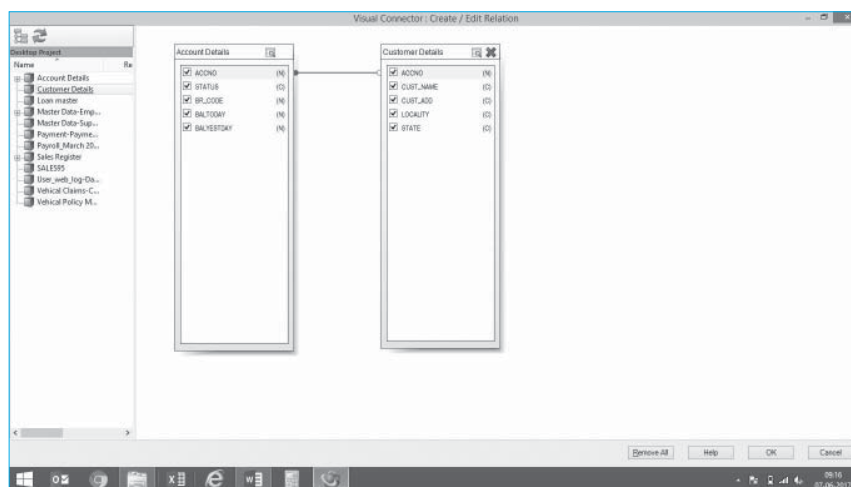


Fig: 4.12.6 – Establishing connection using key field

Step 5: Click on Ok and select appropriate option. In this case your objective is to join the file, select option “all records in primary file, all matches”. Refer Fig 4.12.7

Step 6: Provide file name – combined details visual connector and click on OK. Refer Fig 4.12.7

Step 7: Observe the output in combined file created using visual connector option. Refer Fig 4.12.8

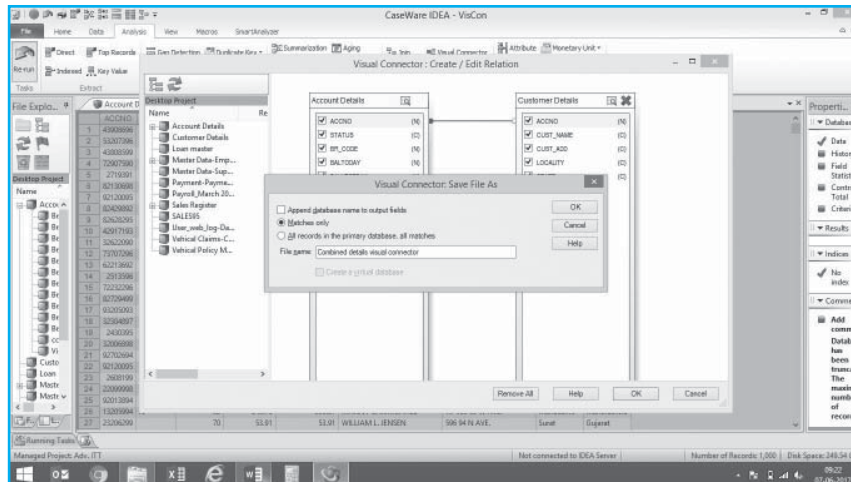


Fig. 4.12.7 – visual connection option

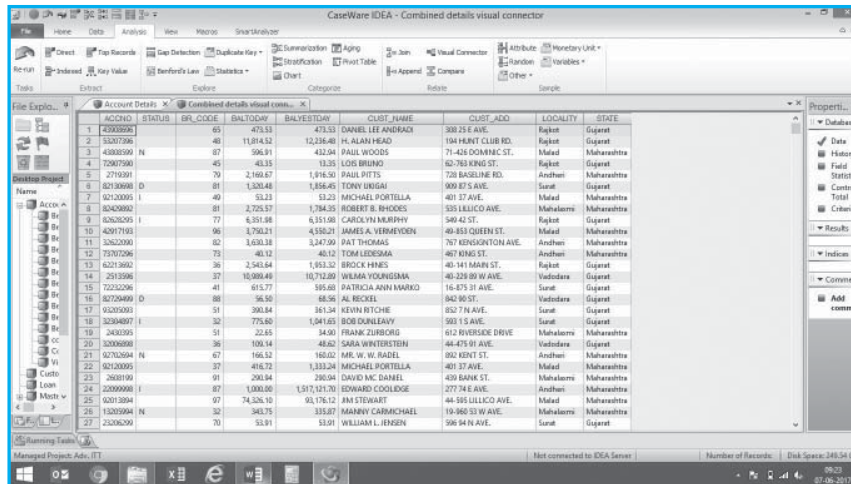


Fig. 4.12.8 – Joined database using visual connection option

4.13 COMPARE DATABASES

IDEA can compare the financials from one year to the next, and it's called Compare Databases. This task requires two databases to be defined, a field in each database to be designated the "total" field, and a field in each database designated as key fields (match fields). The function generates the number of records in the primary database (P_NRECS), the number of records in the secondary database (S_NRECS), the sum of the total field defined in the primary database (P_TOTAL), the sum of the total field defined in the secondary database (S_TOTAL), and a DIFFERENCE column which subtracts the TOTAL fields from each other.

EXERCISE: Compare two purchase databases

- Open the Purchases-L4-2010 database.
- You need to add a Virtual Numeric field with two decimal places called TOTAL_GROSS. The field must use a criterion that calculates the sum of all the gross monthly purchases for the year (JAN_GROSS + FEB_GROSS...etc.)



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- Open the Purchases-L4-2011 database.
- You need to add a Virtual Numeric field with two decimal places called TOTAL_GROSS. The field must use a criterion that calculates the sum of all the gross monthly purchases for the year (JAN_GROSS + FEB_GROSS...etc.)
- On the Analysis tab, in the Relate group, click Compare.
- The Compare Databases dialog box appears.
- Click Select and select the Purchases-L4-2010 database as the secondary database.
- Click Match to select key fields that are common between both databases.
- Select SUPPNO for both and click OK.
- From the Total field drop-down list for both databases, select TOTAL_GROSS.
- In the File name field, enter Purchases 2011 vs 2010 for L4.
- Click OK.

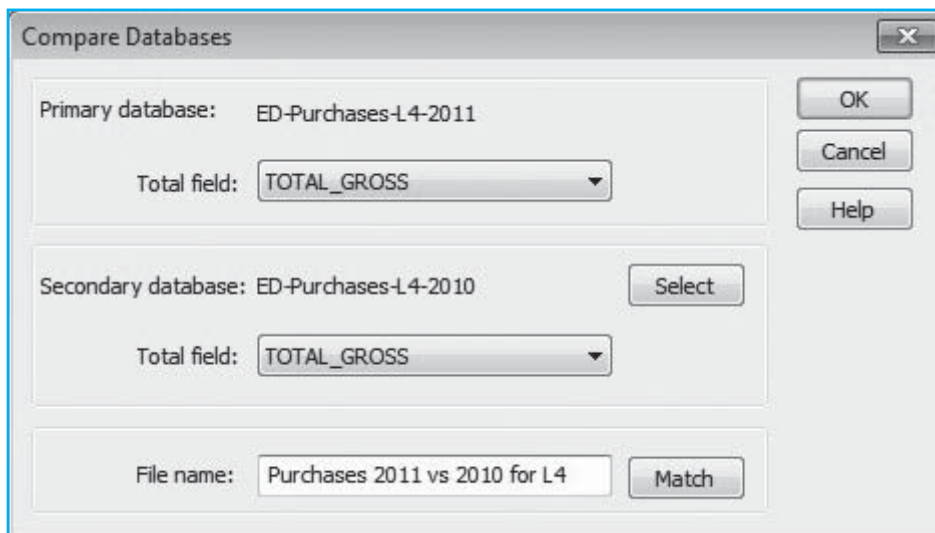
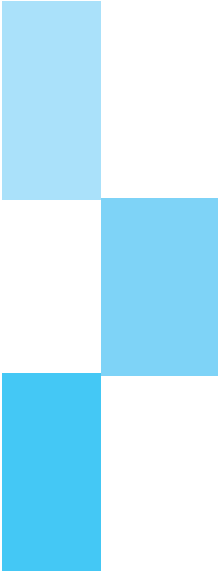


Fig. 4.13.1 – Compare database options



Unit – 6

Accounting Package

PRINCIPLES OF ACCOUNTING

1.1 INTRODUCTION TO ACCOUNTING

1.1.1 What is Accounting ?

Accounting, in simplest terms, is keeping track of our Income, Expenses, Assets and Liabilities. This is true for a business, for a household or for an individual.

In the case of a business Accounting can be defined as:

"... the art of systematic recording, classifying, summarising in a significant manner and in terms of money, transactions and events which are, in part at least, of financial character, and interpreting the results thereof."

From the above definition, we note the following features of accounting :

Only financial aspects are considered in Accounting. A financial transaction is one which brings some change in the financial position of a business. For example, we buy raw material or sell our goods. Thereby, we spend money and earn money. These are financial transactions. But when we place an order to a supplier for a particular machinery, it does not alter the financial position of the business. Thus, it is not a financial transaction and cannot be included in Accounts Books.

The transactions are to be recorded primarily in some documents. Later they are to be grouped and summarised. This leads to different steps in Accounts Compilation.

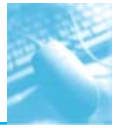
The process at different steps in the Compilation of Accounts should be performed on some basic rules, which are common for all business organisations, be it Manufacturing, Trading or the Service Industry.

The entire organised, grouped and summarised data should reveal some information for executives at different levels in the organisation. We prepare reports of standard formats for interpretation purposes.

1.1.2 Process of Financial Accounting System

The basic documents used in the Financial Accounting System are :

Voucher	where transactions are entered first
Journal	where transactions are entered chronologically and denote which accounts will be affected.
Ledger	where the transactions of particular account are segregated and balanced for each account.



Using the above documents, the main reports prepared in the Financial Accounting System are as stated below:

- (a) **Trial Balance :** It gives the consolidated list of various Accounts and their balances. Brings out any error, procedural or arithmetical, in Journalising or Posting of transactions. This is the source point for preparing other reports.
- (b) **Profit & Loss Report :** This statement is prepared to find the operating profit in the business for a given period. The net profit is the basis of calculating the tax. The final net profit will be transferred to the Balance Sheet. The P & L statement shows the efficiency of performing operations in the business for a given period.
- (c) **Balance Sheet :** The Balance Sheet shows the financial status of the business as at a particular date. The effectiveness of managing the business is depicted here.

The P & L Account and the Balance Sheet together form the basis for different analysis. The results of such analysis will be used by different groups of people such as the Income Tax Department, Banks for providing Working Capital Loans, existing and potential investors for investing in the business, and so on.

1.2 DOUBLE ENTRY SYSTEM OF ACCOUNTING

1.2.1 What is Double Entry System of Book-keeping ?

Every financial transaction in an organisation has two aspects. There will always be inflow of cash or kind on one side and outflow on the other. For example, purchase material from the supplier on credit. Our stocks of material increase. At the same time our liability towards the supplier (which is outflow of cash) also increases.

The double entry system of Book-keeping allows us to keep track of both these aspects. Thus, as per this system, at least two accounts are affected when a transaction is recorded.

In the example above, the accounts affected are the Material Purchase account and the supplier account.

1.2.2 Debit and Credit Entries in the Double Entry System

How do we account for the two sides of a transaction ?

The respective accounts, which get changed by a transaction, get any of the two entries - Debit or Credit. In other words, one account will be debited and the other account will be credited.

Passing of the Debit and Credit entries is the basic, but crucial process in Accounting. Any error in this process will have a ripple effect and will affect the final reports.

1.3 ACCOUNTS AND RULES FOR ACCOUNTING

1.3.1 Account Type: Accounts can be any of four types :

Asset	What the business owns and what is due to the business
Liability	What the business owes to others
Expense	A source of expenditure for running the business pertaining to a period
Income	A source of earning money in the business pertaining to a period.



Exercise :	Identify the following types of Accounts :
Debentures	Bank of India
Factory Shed	Furniture and Fittings
Taxes Payable	Interest Received
Sales	Electricity Charges

1.3.2 Rules for Recording Transactions

Classification of Accounts by the Nature of Account and the Golden Rules of Accounting :

(i) Personal Account

All accounts which are in the name of any Individual, Firm or Company such as Ram & Co., Shyam Gupta, Metro Transport, and so on.

Rule : Debit the Receiver and
Credit the Giver

(ii) Real Accounts

Accounts which relate to the Assets or Liabilities of the Business, Such as Cash A/c, Goods A/c, Furniture A/c, and so on.

Rule : Debit what comes in and
Credit what goes out

(iii) Revenue or Nominal Accounts

Accounts which relate to Income or Expense, such as Purchase, Sales, Interest Received, Salary & Wages, and so on.

Rule : Debit all Expenses and
Credit all Income

Let us suppose we have a transaction

"Purchase of goods worth Rs. 7000/- on Credit from Mahesh Traders"

What accounts will be affected by this transaction ?

Which account will be Debited and which will be credited ?

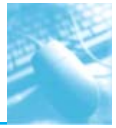
To find answers for the above questions, take the help of some basic rules of recording transactions. The rules are given below.

Account Type	Debit	Credit
Personal	Receiver	Giver
Asset/liability/Capital (Real)	What comes in (in cash or kind)	What goes out (in cash or kind)
Revenue (Income and Expenses)	Expenses and Losses	Income or Gains

Table 1.3.1

Also known as Nominal

Let us understand the rules with some examples. Consider the same transaction :



(a) Purchase of goods worth Rs. 7000/- on Credit from Mahesh Traders

Accounts affected	Purchase	Mahesh Traders
Type	Expense	Personal
Status	Money paid/ to be paid	Giver
Rule	Debit Expenses	Credit the Giver
Entry	Debit Purchase A/c	Credit Mahesh Traders A/c
Amount	7000/- ∴ Purchase A/c Dr. 7000/- (Debit all Expenses) To Mahesh Traders A/c Cr. 7000/- (Credit the Giver)	7000/-

Table 1.3.2

(b) Cash drawn from United Bank Rs. 5500/-

Accounts affected	Cash	United Bank
Type	Asset	Asset
Status	Money comes in	Money goes out
Rule	Debit what comes in	Credit what goes out
Entry	Debit Cash A/c	Credit United Bank A/c
Amount	5500/- ∴ Cash A/c Dr. 5500/- (Debit what comes in) To United Bank A/c Cr. 5500/- (Debit what goes out)	5500/-

Table 1.3.3

1.4 ACCOUNTS COMPILATION & REPORTS

1.4.1 Basic steps in Accounts Compilations, documents used and report

In this section, let us learn how to go through the different steps of Accounts compilation and see what document is used and created/ updated at each stage.

The steps are as indicated below :

- Step 1 Recording
- Step 2 Classifying
- Step 3 Summarising
- Step 4 Interpreting (by preparing reports)

The sequence is best represented in the flow diagram below:

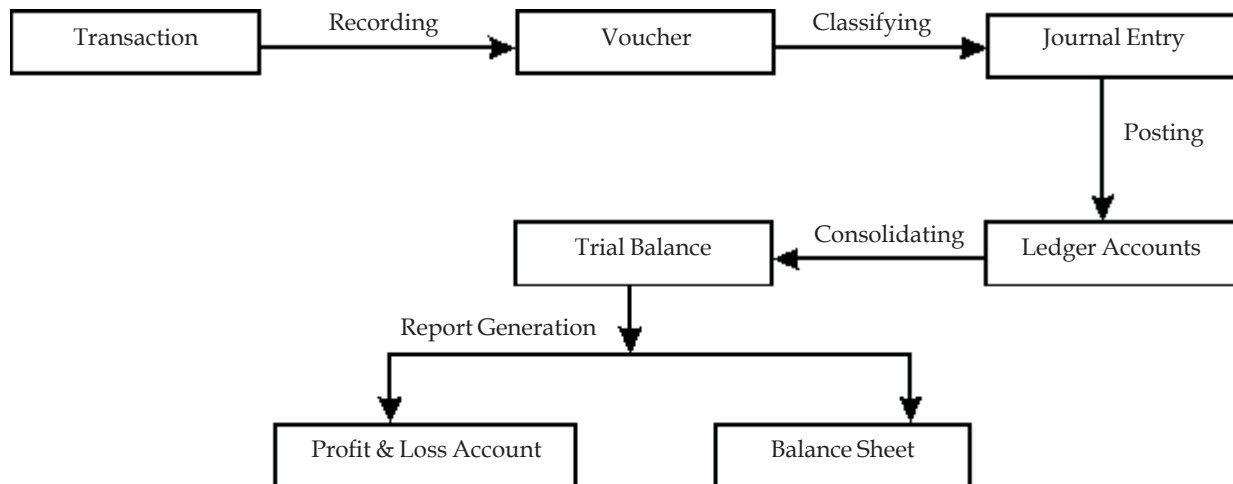


Fig. 1.4.1: Basic Steps in Accounting

Let us start with a payment transaction for example :

Paid cash Rs. 700 for Local Conveyance

(i) Voucher or Entry Document: The first document where the transaction is entered is called a Voucher. A voucher can exist in the form of an Expense Bill, Sales Bill, Receipt, Payment, and so on.

(ii) Journal Entry: The second step is the stage where we classify the transaction that is, to find out which are the accounts to be debited or credited. The transaction is now entered in the form of a journal entry in a book called a Journal Proper. A paper journal entry has a typical format. Given below is the journal entry for the Cash payment transaction above :

25.04.02	Electricity Charges	Dr.	1000	
		To Cash A/c		1000

The process of passing a journal entry such as the one above is based on the rules for recording transactions, discussed in the earlier section.

(iii) Ledger Posting and Balancing: Ledger posting and balancing is done to find out the payments receipt, income or expense through any Account.

For example, in the above case the Electricity Charges are posted to the Debit side of Electricity Charges ledger and the Cash A/c is Credited.

Thus the process of Posting is transfer of individual transaction amounts from the journal to the debit or credit side in a given Account.

A sample Cash Account is shown in next page with posting entries.



CASH ACCOUNT					
RECEIPTS			PAYMENTS		
DATE	PARTICULARS	AMOUNT	DATE	PARTICULARS	AMOUNT
01.03.02	To Bal B/d	2500	02.03.02	By Electricity Charges	50
05.03.02	To Bank A/c	500	04.03.02	By Printing A/c	35
26.03.02	To Tour Advance A/c	1500	06.03.02	By Stationery A/c	55
	(Amount Refunded)		07.03.02	By Tour Advance A/c	460
			05.03.02	By Other Expenses A/c	100
			31.03.02	By Bal C/F	4400
31.03.02	Total	5000	31.03.02	Total	5000

Table 1.4.1

From the above we see that the total of payments (credit total, omitting the last entry) is different from the total of receipts on the left side. But in the manual system the total of both sides are matched. To get them matched, a new entry is passed on the right side (if the Debit Total is more than the credit total) or on the debit side (if the debit total is less than the credit side). This new entry is known as balancing entry and it will have the difference between the totals in the amount column. In the above cash account, the balancing entry is "By Balance Carried Forward" and the balance amount is 4400. This is the actual cash availability as at the end of March 2002. In other words, it is the closing balance as on March 31, 2002. The ledger accounts are usually posted every month.

(iv) Consolidating in Trial Balance: Once we get the closing balance of all accounts for the last month of the fiscal year (March), we are ready to prepare the reports. But first we get the consolidated list of such balances. The list is called the Trial Balance. The Trial Balance has three columns, namely Account Name, Debit Column and Credit Column. When an account has debit Balance (that is Debit Total more than Credit Total in Ledger), the amount appears in the debit column, otherwise in the credit column. A sample Trial Balance is shown below:

ACCOUNT NAME	DR	CR	Type of Account
Capital		500000	Liability
General Reserve		150000	Liability
Surplus in P&L Account		132500	Liability
Tax Deducted at source		21000	Liability
Expenses Payable		49000	Liability
Sales Tax Payable		10000	Liability
Furniture	227500		Asset
Land & Building	242500		Asset
Plant & Machinery	355000		Asset
State Bank of India	413000		Asset



Cash in Hand	3500		Asset
Fixed Deposits	250000		Asset
Opening Stock	140000		Expense
Material Purchased	382500		Expense
Stores Consumed	55500		Expense
Labour Charges	6300		Expense
Factory Electricity	11750		Expense
Salary & Wages	55000		Expense
Travelling Expenses	131500		Expense
Other Expenses	211500		Expense
Sales		1417500	Income
Interest Received		43000	Income
Other Income		126000	Income
Accounts Payable		322050	Liability
Accounts Receivable	285500		Asset
Total	2771050	2771050	

Table 1.4.2

The Trial Balance is a source for preparing the reports. As per double entry system, every transaction has debit and credit entries of equal sum in different accounts. Hence, the total of debit balances and credit balances should be equal in the trial balance. Preparation of this consolidated report reveals any manual or procedural errors in the earlier steps of accounts compilation.

There is one more input required before we go for preparing the P&L report and the balance sheet. That is the closing entry. Closing entry is given for stock value at the end of the year.

Closing stock is the value of stock available at the end of the year. The closing stock can be valued by any method such as LIFO, FIFO, Weighted Average and Moving Average.

The value of stock is shown as a current asset in the Balance Sheet.

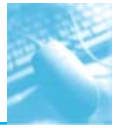
The closing stock of finished goods is treated as an income in the Profit & Loss (P & L) statement.

1.5 PREPARING FINAL REPORTS

1.5.1 Profit & Loss Statement

This report depicts the operating profit/loss for a given period. In many organisations, this report is prepared in two steps - Trading Account and P & L Account.

The trading account is a list of all direct production-related expenses on one side and the direct source of income (usually income through sales and services) on the other side. The difference between their total is the Gross Profit or Gross Loss. Given below is a sample Trading Account showing the balances in the Trial balance above.



The closing stock of Finished goods is assumed as Rs. 25000 and the depreciation for the year is assumed as Rs. 37000.

Trading Account of ABC Company for the year ending 31 March, 2001

Expenses		Income	
Opening Stock	140000	Sales Turnover	1417500
Add Material Purchased	382500	Closing Stock	25000
	1045000		
Labour charges	6300		
Factory Power	11750		
Gross profit transferred to P & L Account	901950		
Total	1442500	Total	1442500

Table 1.5.1

The P & L Account is prepared by listing all other expenses, which were not included in the Trading Account, on one side and all other incomes on the other. Additionally, the Depreciation is included in the expense list. The first entry on the income side is the Gross profit taken from the Trading Account.

The Profit & Loss Account using the balances from the Trial Balance and the Closing Entries above is given below.

Profit & Loss Statement for ABC Co. For the year ending 31 March, 2001

Expenses	AMOUNT	Income	AMOUNT
Stores Consumed	55500	Gross Profit from trading A/c	901950
Salary & wages	55000	Interest earned of fixed Deposits	43000
Travelling Expenses	131500	Other Income	126000
Other Expenses	211500		
Depreciation for the year	37000		
Net Operating Profit	580450		
Total	1070950	Total	1070950

Table 1.5.2

1.5.2 Balance Sheet

The P & L statement depicts the operating profit earned or loss suffered by doing the business for the last one year. But the Balance sheet provides information about the financial status of the company as on a particular date. The balance sheet is prepared taking the asset and liability type accounts from the Trial Balance.

The balance Sheet of ABC Co. as at March 31, 2002 is given in next page. The values are taken from the Trial Balance and the Closing entries for Depreciation and Closing Stock.



Liabilities		Assets	
Share Capital	500000	Furniture	227500
General Reserve	150000	Land & Building	242500
Surplus in P&L Account	132500	Plant & Machinery	355000
Tax Deducted at Source	21000		
Expenses payable	49000		
Sales Tax Payable	10000	Less Depreciation	37000
Accounts Payable	322050		
Net profit from P&L A/c	580450	Net Fixed Assets	788000
		Bank Balance	413000
		Cash in Hand	3500
		Fixed Deposits	250000
		Accounts Receivable	285500
		Closing Stock	25000
Total Liabilities	1765000	Total Assets	1765000

Table 1.5.3

1.6 USE OF DAY BOOKS IN ACCOUNTING

We learnt that all the transactions are entered from vouchers to the Journal in a chronological order. Using this method, the Journal becomes a voluminous book and extracting entries for posting in Ledgers becomes a time-consuming job. Moreover, the debit and credit entries are written in the Journal and Ledger. This is a duplication of effort.

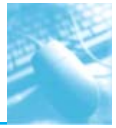
To avoid these disadvantages, the day books are used. Day books are specialised books, where transactions relating to a particular type, say Sales or Purchase, are entered directly from the voucher. They are not written into the journal. At intervals, say every month, the totals from these books are carried forward and used for posting in the Ledger. When the ledger is posted from the day books, there is only one entry written.

Thereby, we can get the details such as total sales or total purchase at a glance from the Ledger. If we want to know the details, we have to refer to the Day books using a reference number usually the folio number of the respective Day book. These books are also called Books of Original Entry.

1.7 ACCOUNTS RECEIVABLE AND ACCOUNTS PAYABLE

Accounts Receivable, also known as Bills Receivable, gives the details of the dues from the Customers. The details are maintained in a sub-ledger (called Debtors Ledger or Sundry Debtors). As the sum due from customers is our money blocked, we have to monitor the receivable closely. This also helps us keep a watch on our customers' credit worthiness and reliability. Many statements are prepared to monitor the Accounts receivable. Some of them are Analysis Statement, Ageing analysis Statement, Business Summary (month-wise or item-wise) and so on.

Account Payable, also known as Bills Payable, gives details of your dues to suppliers. The details are maintained in a sub ledger (called Creditors Ledger or Sundry Creditors). A close monitoring of Accounts Payable is also essential, because it helps us in our cash flow planning and knowing the Cash requirement at any time. Further, our credit worthiness toward our suppliers is also enhanced, which is again important.



1.8 BANK RECONCILIATION STATEMENT

When we maintain a bank account, we prepare a bank book. The bank gives us one book, which is called the pass book. The entries in the bank book are made by us. The Pass book entries are made by the bank authorities.

At any point of time, the final balance shown as per the Bank book and the Pass book should be the same. But most of the times it will not be so. This happens because of the following reasons :

When we make a cheque payment, we make the Bank book posting immediately, whereas our account will be adjusted only when the cheque is presented and honoured.

When we deposit a cheque from the customer, we post the same in our bank book. But our account with the bank is actually adjusted only when the amount is realised.

For any outstation cheque receipts or for overdrafts, the bank will deduct the service charges. This will be automatically debited to our account. But we will get the statement only after some time.

But to be sure that everything goes fine and no errors are committed, a statement is regularly prepared. This statement is called the Bank Reconciliation Statement.

Suppose we have the following entries in our Bank Book and Pass Book for one month ending 30.9.02.

Bank Book	Dr.	Cr.	Pass Book	Dr.	Cr.
Opening balance	20000		Opening balance	20000	
Payment By Cheque No. 489882		1500	Withdrawal as per Cheque No.2482		1500
Cheque deposited No. 2345	3500		Cheque presented and realised Cheque No. 48945	3500	
Arvind by Cheque No. 22328		3200	Purchase of Demand Draft by Cheque No. 22343		3200
Cheque Deposited No. 2434	3000		Service Charges		100
Total	26500	4700	Total	23500	
Balance as on 30.9.02	21800		Balance as on 30.9.02	18700	4800

Table 1.8.1

Now comparing the entries in both of the books, we prepare a Bank Reconciliation Statement which looks like the one below :

Bank Reconciliation Statement as on 30.9.02

	Dr.	Cr.
Balance as per Bank Book	21800	
Add Cheques issued but not presented	0	
Less Cheques Deposited but not presented Cheque No. 2434. Amount - Rs.3000		3000
Service Charges		100
Total	21800	3100
Balance as per pass Book (Bank Statement)		18700 Dr.

Table 1.8.2

LEARNING OBJECTIVES

- Understanding the concepts of computerized accounting
- Understanding ERP software
- Understanding the rules for efficient use of accounting software.

2.1 INTRODUCTION

With the advent of computers in India, people started developing software for various needs. Accounting activity was one of the most important activities which desperately needed automation for following reasons.

- ❑ Minimum accuracy level required is 100%
- ❑ Accounting activity consumes lot of time and energy.
- ❑ Timely delivery of Financial Statements and Reports
- ❑ Ratio Analysis

Accounting software is basically aimed at ensuring 100% arithmetical accuracy saving time and energy to a great extent and ensuring timely delivery of Financial Statements and Reports.

2.1.1 What is accounting software?

It is a system that automatically carries out “Mechanical Activities” in accounting process. Accounting being the back bone of any business, accounting software becomes the most important part of office automation activities.

Accounting process includes following seven activities.

Understanding the transaction

(Details of transaction)

Journal / Voucher Entry

(Debiting and Crediting of Accounts)

Ledger Posting

(Posting entries into individual ledgers)

Balancing of Ledger Accounts

(DR & CR Balances in the accounts)



Trial Balance

(List of DR & CR Balances for checking arithmetical accuracy & cursory glance)

Profit & Loss Account

(Income reduced by Expenses)

Balance Sheet

(Statement of Assets and Liabilities)

In case of manual accounting, all the seven activities are carried out by human beings, i.e. accountants. But in case of accounting software, out of the above seven activities, following two activities only are performed by human beings, i.e.

- ☐ Understanding the Transactions
- ☐ Voucher Entry

Remaining five activities, i.e.

- ☐ Posting,
- ☐ Balancing,
- ☐ Trial Balance
- ☐ Profit & Loss Account
- ☐ Balance Sheet

are performed by software automatically. In some special cases, even Voucher Entry job can also be assigned to software without any human intervention.

E.g. interest calculation and application in banks is carried out by software on a specific assigned date, automatically.

2.1.2 Advantages of using accounting software :

Following are the major advantages of accounting software over manual accounting.

- ☐ Arithmetical accuracy
- ☐ Time saving
- ☐ Multiple reports on timely basis.

Apart from these advantages, there are many other advantages also. But at the same time, there are some disadvantages also.

It is very easy to create data in electronic format, but it is *extremely* easy to loose the data stored in electronic format !

This must be kept in mind while using accounting software. As compared to manual accounting, unless and until proper controls are in place, it is extremely easy to loose ,the complete accounting data besides, tampering and fabrication of the data..

2.1.3 Accounting Structure for Accounting Software

As per any accounting software, there are only two types of ledger accounts, a. Accounts having debit balance, b. Accounts having credit balances. Zero balance ledgers are not considered in reporting hence ignored. If a ledger is having debit balance, it can be an Expense ledger or an Asset ledger. If a ledger is having a credit balance, it can be an Income ledger or a liability ledger. All income and expense ledger balances are taken to Profit & Loss Account. All Asset and Liability



ledger balances are taken to Balance Sheet and the difference between income and expenses is also taken to balance sheet. So ultimately, everything goes to Balance Sheet. Balance Sheet is the end point in accounting a mirror showing true and fair position of a concern.

Accounting is done keeping in mind two basic reports.

- ☐ Profit & Loss Account
- ☐ Balance Sheet

Accounting software is able to generate many other reports, but above two reports are the most important reports.

2.2 DATA STORAGE

2.2.1 How data is stored in Accounting Software ?

Accounting software stored (stores) data in two parts as under.

- ☐ Master Data
- ☐ Non Master Data

Master data is that data which is not expected to change frequently, which remain relatively permanent. E.g. Ledger heads, groups, names of stock items, stock groups, etc.

Non master data is the data expected to change frequently. E.g. Voucher recorded is the non master data.

Master data is stored independently, but storage of non master data requires link to master data.

2.2.2 Type of Master Data

As shown in chart above, there are four types of master data. There can be many other sub types under each category.

Accounting Master Data : ■ Ledgers ■ Groups ■ Cost Centres ■ Budgets ■ Scenarios ■ Voucher Types	Payroll Master Data : ■ Employees ■ Employee Groups ■ Unit (Work) ■ Attendance / Production Types ■ Pay Heads ■ Salary Details ■ Voucher Types
Inventory Master Data : ■ Stock Items ■ Stock Groups ■ Units of measure ■ Godowns ■ Categories ■ Reorder Levels ■ Voucher Types	Statutory Master Data : ■ VAT Classifications ■ Service Categories ■ TDS Nature of Payments ■ Deductee Types ■ Income Tax Classifications ■ Income Tax Slabs



2.2.3 Voucher Types :

One of the very important master data is Voucher Type. Voucher type typically means type of voucher. “Voucher” in manual accounting is the documentary proof of transaction. “Voucher” in computerized accounting means a place where transactions are recorded, a format used for inputting the data. Voucher types are used to enter variety of non master data, .i.e. transaction data. In Tally.ERP 9, there are different formats, e.g. voucher types for inputting the transaction data.

Sr. No.	Name of Voucher Type	Use
1	Attendance	For recording of employee attendance
2	Contra	For recording of four types of transactions as under. ■ Cash deposited in bank ■ Cash withdrawn from bank ■ Cash transferred from one location to another ■ Fund transfer from one bank account to another.
3	Credit Note	For issuing credit note to a party.
4	Debit Note	For issuing debit note to a party.
5	Delivery Note	For recording delivery of goods after sales order.
6	Job Work In Order	For recording of inward of job work order along with inventory.
7	Job Work Out Order	For recording of outward of job work order along with inventory.
8	Journal	For recording of non cash / bank financial transactions.
9	Material In	For recording of inward of stock items without financial impact.
10	Material Out	For recording of outward of stock items without financial impact.
11	Memorandum	For recording of financial transactions not affecting trial balance.
12	Payment	For recording of all types of payments, cash and bank.
13	Physical Stock	For recording of physical stock.
14	Payroll	For calculation of employee salary and recording of other salary related transactions.
15	Purchase	For recording of all types of trading purchases including cash purchases and credit purchases.
16	Purchase Order	For recording of all types purchase orders issued to suppliers.
17	Receipt	For recording of all types of financial receipts, cash and bank.
18	Receipt Note	For recording of inward of inventory after sales order.
19	Rejections In	For recording of inward of stock items after rejection from customer.
20	Rejections Out	For recording of outward of stock items after rejection.
21	Reversing Journal	For recording of temporary vouchers which will have effect till a particular date only. They will be automatically reversed after a particular date.
22	Sales	For recording of all types of trading sales transactions, including cash and credit sales.
23	Sales Order	For recording of any type of sales order for trading goods.
24	Stock Journal	For recording of movement of stock without any financial impact.

**2.2.4 Type of Non Master Data :**

As shown in chart above, there are four types of non master data. All types of transactions are recorded in any of the four types shown above only.

Following table shows division of various vouchers under the above categories.

Accounting Voucher : ■ Contra ■ Credit Note ■ Debit Note ■ Journal ■ Memorandum ■ Payment ■ Purchases ■ Receipt ■ Reversing Journals ■ Sales	Inventory Vouchers : ■ Delivery Note ■ Material In ■ Material Out ■ Physical Stock ■ Receipt Note ■ Rejections In ■ Rejections Out ■ Stock Journal
Order Vouchers : ■ Purchase Order ■ Sales Order ■ Job Work In order ■ Job Work Out Order	Payroll Vouchers : ■ Attendance ■ Payroll

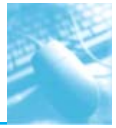
By default there are twenty four voucher types in Tally.ERP 9. These voucher types are the formats used for recording of various types of transaction. Different voucher types are used for two purposes.

- ☐ Simplicity for user to input the data.
- ☐ Prevention of errors during data entry.

E.g.

- ☐ Debit ledger field in receipt voucher will accept ledgers grouped under Cash in hand, Bank Accounts or Bank OD/OCC only. As a receipt can be either in cash or through bank only, the debit ledger in receipt voucher must be either cash or bank only.
- ☐ Credit ledger field in payment voucher will accept ledgers grouped under Cash in hand, Bank Accounts or Bank OD/OCC only. As a payment can be either in cash or through bank only, the credit ledger in payment voucher must be either cash or bank only.
- ☐ In case of purchase transaction, credit ledger can be Cash, bank or a Party Ledger only.
- ☐ In case of sales transaction, debit ledger can be Cash, Bank or a Party Ledger only.

These types of controls can be placed by using different voucher types only.



2.3 ERP SOFTWARE

2.3.1 What is ERP Software ?

ERP stands for Enterprise Resource Planning. Every business entity uses various types of resources to achieve its business objectives. Money, Material, Manpower, Machines, etc. are the resources generally used by any business entity. Managing these resources effectively is the major challenge before any organization. ERP software is the most effective tool to manage these resources for the utmost benefit of organization.

2.3.2 Basics Characteristics of ERP software :

Central database :

- ❑ There may be multiple users from multiple departments, located at multiple physical locations. All the users from all the departments use the same data. There is only one set of data for all the users.
- ❑ This system is used to avoid duplication of efforts in recording transactions and to save resources.

Inter and intra document connectivity :

- ❑ Inter document connectivity is the system of linking one document with another. E.g. Sales order processing where sales order is recorded first, then on the basis of Sales Order, Delivery Note is recorded and finally on the basis of Delivery Note, Sales Invoice is recorded.
- ❑ Data from sales order is automatically captured in delivery note and data from delivery note is automatically captured in sales invoice.
- ❑ Intra document connectivity is the system of linking of all the steps performed to generate a single document. E.g. for generation of a sales order, there may be steps as shown below.
 - Maintaining prospective list of buyers.
 - Sending quotations
 - Discussions
 - Price negotiations
 - Getting final order.
 - Maintaining database of orders procured by salesman for disbursement of commission/incentive at a later date.

All the above steps are recorded internally till generation of a sales order.

Real time updation of data :

- ❑ Real time updation of data means updating the data immediately after recording of any transaction or change in master data.
- ❑ Due to single set of data as central database, it is possible to update all the data for all the departments on real time basis.

Standardization for all the departments.

- ❑ Same software and same interface is used for all the modules of software.
- ❑ Standard software procedures are used across all the departments in an organization.

Basic issue with ERP software is handling of large size data on real time basis. An ERP software is supposed to cater to the needs of multiple users from multiple departments with different types of needs, data size goes on increasing everyday. Data size in a big organization may go to even



100 crore vouchers per year. Hence data handling capacity becomes a primary area of concern for any type of ERP software.

ERP software are designed and sold in modules. There are different departments in any business and ERP software is also designed according to the departments in business.

Following chart depicts a typical ERP scenario.

Let us discuss each aspect in brief.

Financial Accounting

This is basic activity that is expected to be handled by any accounting software. ERP software is also used as accounting software. All types of financial transactions like sales, purchase, receipt, payment, contra, journal, etc. are recorded to prepare Profit & Loss and Balance Sheet and many other accounting and MIS reports.

Inventory Accounting

This is an extension to financial accounting where recording of all types of inward and outward of stock items is done to calculate closing stock in quantity. This closing stock in quantity is multiplied with a rate factor to arrive at closing stock in value. Closing stock value is used to prepare trading account and balance sheet. Correctness of financial statements is largely dependant upon correct value of closing stock. Due large number of transactions, it is almost impossible to calculate correct value of closing stock in most of the cases. There is a direct co-relation between financial accounting and inventory accounting. Transactions like purchase, sales, purchase return, sales return are mixed transactions where financial and inventory accounting both are affected. There may be certain pure inventory transactions, i.e. transactions which affect inventory accounting only and does not affect financial accounting. E.g. transfer of goods from one godown to another, conversion of raw material in WIP, inward / outward of goods for temporary reasons like repair, etc.

Production Accounting

This is an extension to inventory accounting. Here all the transactions relating to manufacture activity are recorded. This may include steps as under.

- ☐ Submission of plan of production and requirement of material
- ☐ Issue of material from stores to shop floor
- ☐ Quality control and assurance
- ☐ Conversion of raw material into WIP
- ☐ Conversion of WIP into Finished Goods.
- ☐ Accounting for Cost control and analysis at each stage of production.

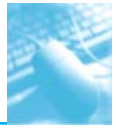
Human Resource Accounting

Human resource is a big resource and has to be managed very carefully. ERP software is also used to record all the transactions relating to human resource also. This may include.

- ☐ Recording of employee master data
- ☐ Recording of employee related transactions like leave, attendance advances, salary calculations, deductions,
- ☐ Employee job profile, working location, work allotment, etc.

Supply Chain Management

This is a concept introduced by ERP software to effectively utilize resources which may be lying



outside the organization. Process of supply chain management starts right from procurement of goods from supplier and ends on delivery of finished products at customer's place. Logistics management is the major part of supply chain management.

Project Management

Execution of big size projects may consume huge resources. ERP software is used to manage the execution of projects effectively at minimum possible cost.

Customer Relationship Management

This includes handling of all type data of all the customers, communication with them, their preferences, choices, likes and dislikes, purchase patterns, and many other things. Customer relationship management has got importance in recent past just because a satisfied customer is the sign of goodwill of the organization.

2.3.3 Installing Tally.ERP 9:

As compared to other ERP installation, installing Tally.ERP 9 is comparatively very easy. Following are the simple steps that can be used to install Tally.ERP 9 software.

Downloading the installable software :

Go to www.tallysolutions.com and download the latest available release of Tally.ERP 9. Tally offers two options for downloading of Tally.ERP 9.

- ☐ Tally.ERP 9 for 32 bit operating system
- ☐ Tally.ERP 9 for 64 bit operating system

Any of the option can be selected for download as per need, with or without help file as shown in Fig. 2.3.1.

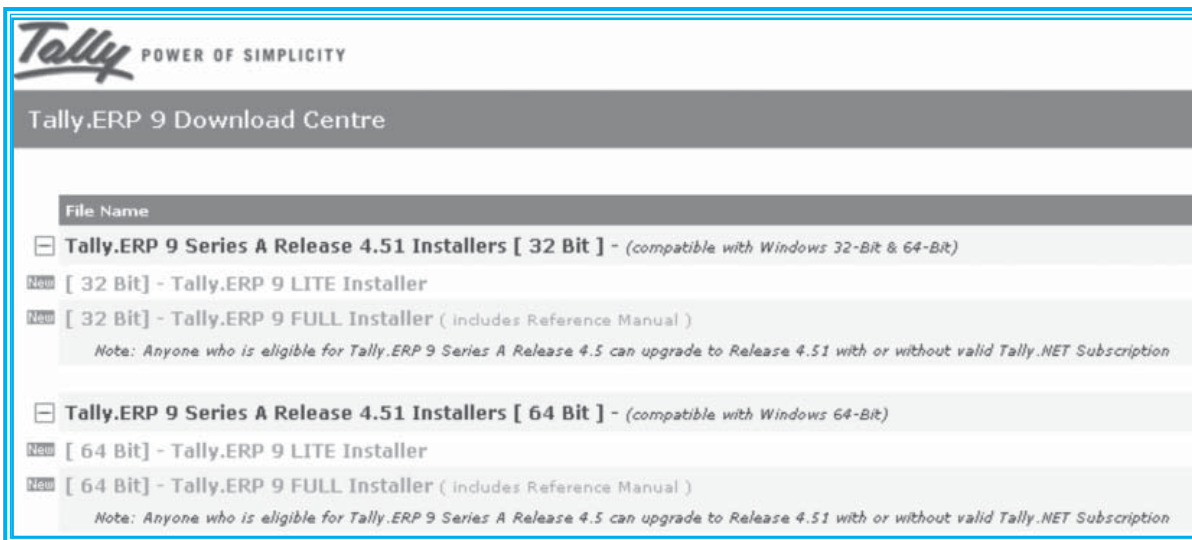


Fig 2.3.1 : Tally.ERP 9 Download Centre screen

Lite installer stands for installer file without help file and full installer stands for installer file with help file. At present, disc space for lite installer is around 30 MB and for full installer it is around 120 MB.



Anybody can freely download Tally.ERP 9 without any license key and use it for learning purpose.

Installing Tally.ERP 9 :

Tally.ERP 9 installation process can be started just by double clicking the installer file. During installation process, following options need to be selected.

- ☐ Edition : Tally.ERP 9 can be installed as a single user or multiuser software. Single user stands for installing tally license on one computer only. In case of multiuser tally, license can be installed on any number of computers.
- ☐ Application Directory : It is the location where tally installation files are stored. This can be any location on your hard disc.
- ☐ Data Directory : It the location where you want to save data. It is suggested not to store Tally Data on the drive where operating system is stored. This will help to get the data back in case of problem in operating system.
- ☐ Configuration Directory : It is the location where configuration files are saved. It can be same as that of application directory.
- ☐ Language Directory : It is the location where language setting files are saved.
- ☐ License Directory : It is the location where Tally license is stored as shown in Fig. 2.3.2.

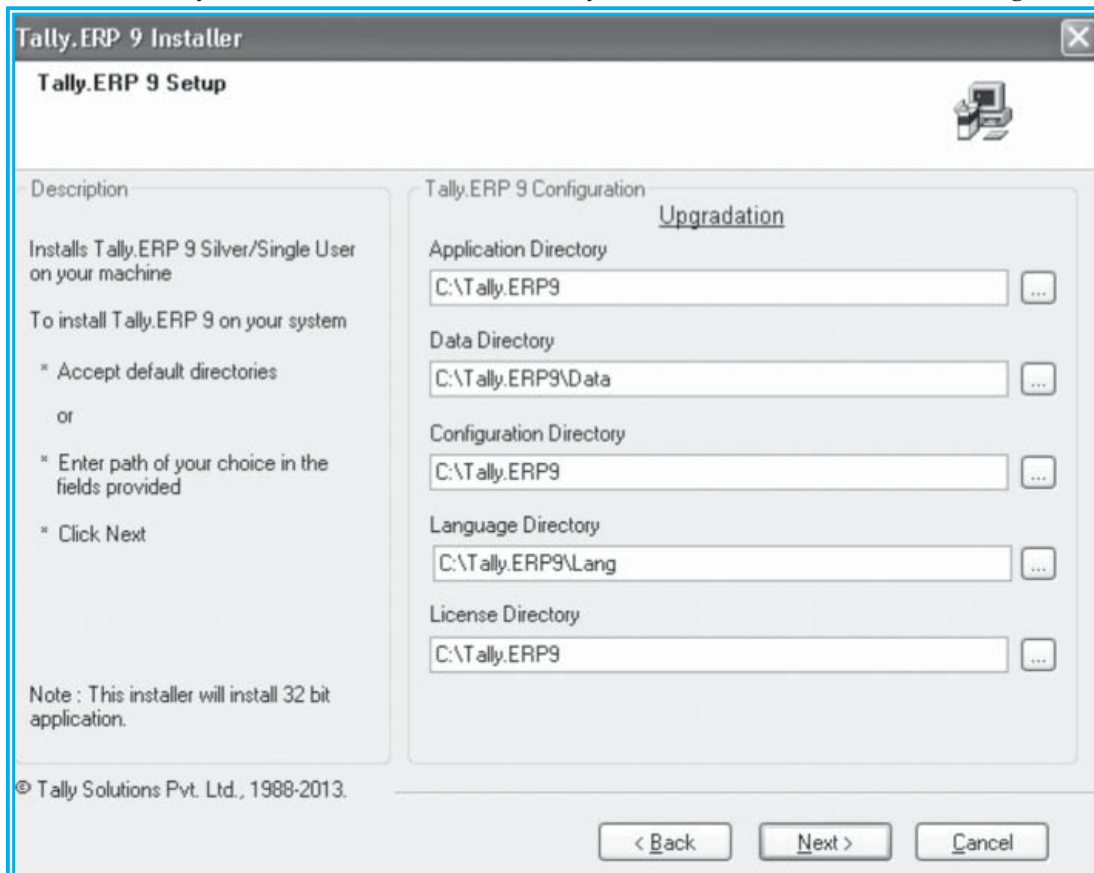


Fig 2.3.2 : Tally.ERP Installer screen



Note : Tally.ERP 9 is a Multilanguage software offering a choice of 15 languages. To use it as a Multilanguage software, it is necessary to install Windows Regional Language Pack. This pack has to be installed from windows CD. This pack has to be installed only once. If it is already installed on the computer, it need not be installed again. This pack has to be installed on each computer separately. Without this pack, Multilanguage feature cannot be used.

Types of licenses

- ❑ **Silver (Single User) :** This license can be installed and used on a single computer only and costs Rs. 18,000 per license.
- ❑ **Gold (Multiuser) :** This license can be installed on a single computer and can be used on any number of computers connected in a single local area network. This license costs Rs. 54,000.
- ❑ **Auditor (Multiuser) :** This is a special facility given to firm of chartered accountants where Tally.ERP 9 Gold software is sold at 80% discount. This is multiuser software and can be used on any number of computers connected in a single local area network. This license costs Rs. 10,800.

After starting Tally.ERP 9 for the first time, the following “Startup” screen shall appear as shown in Fig. 2.3.3.

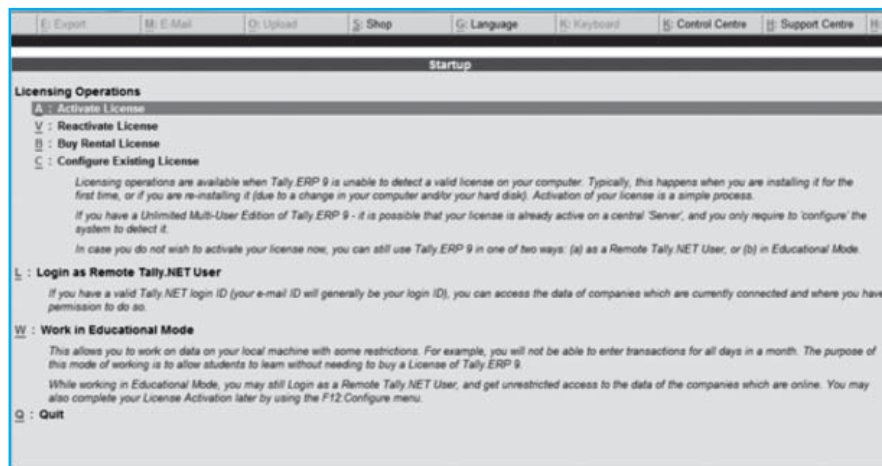


Fig 2.3.3 : Licensing Startup screen

Let us understand meaning of each menu option.

A : Activate License : This option has to be selected in case of activating Tally.ERP 9 for the first time after buying.

V : Reactivate License : This option has to be used in case of activating Tally.ERP 9 for reactivating, i.e. activating for anytime after first time. This is needed incase of shifting of tally license from one computer to another or incase of activating tally license on the same computer once again.

B : Buy Rental License : Tally.ERP 9 is available on rent also. Full functional Tally.ERP 9 can be used by paying monthly rental as Rs. 600 per month for single user and Rs. 1,800 per month for multiuser license. Select this option for hiring tally on rent. Rent has to be paid in advance. It can be paid by credit card, debit card or by using tally currency.



C : Configure Existing License : Use this if you want to configure existing license. License may be installed on some other computer and you may want to use it on a network computer. Tally will search license availability in network and will get connected to that particular license.

L : Login as Remote Tally.Net User : Use this option to get connected to the data stored on a remote location. Remote login in tally can be used without license also. Valid Tall.Net ID and permission is required to get access to the remote data.

W : Work in Educational Mode : This is a demo mode of tally. This option can be selected in case you want to use tally without license. This can be very well used for learning purpose. There are very few restrictions in Educational Mode. One of the major restrictions in education mode is date restriction. User is allowed to use only 1st, 2nd and 31st date of any of the month for recording a voucher or viewing a report. So in all out of 365 dates in a year, only 31 dates are be available for use in education mode of tally. Barring a very few other restriction, this is almost full functional software for educational purpose.

Q : Quit : This option is meant for quitting tally software.

2.3.4 Understanding Tally Screen :

After starting tally software, either in activated or in educational mode, following screen shall appear as shown in Fig. 2.3.4.

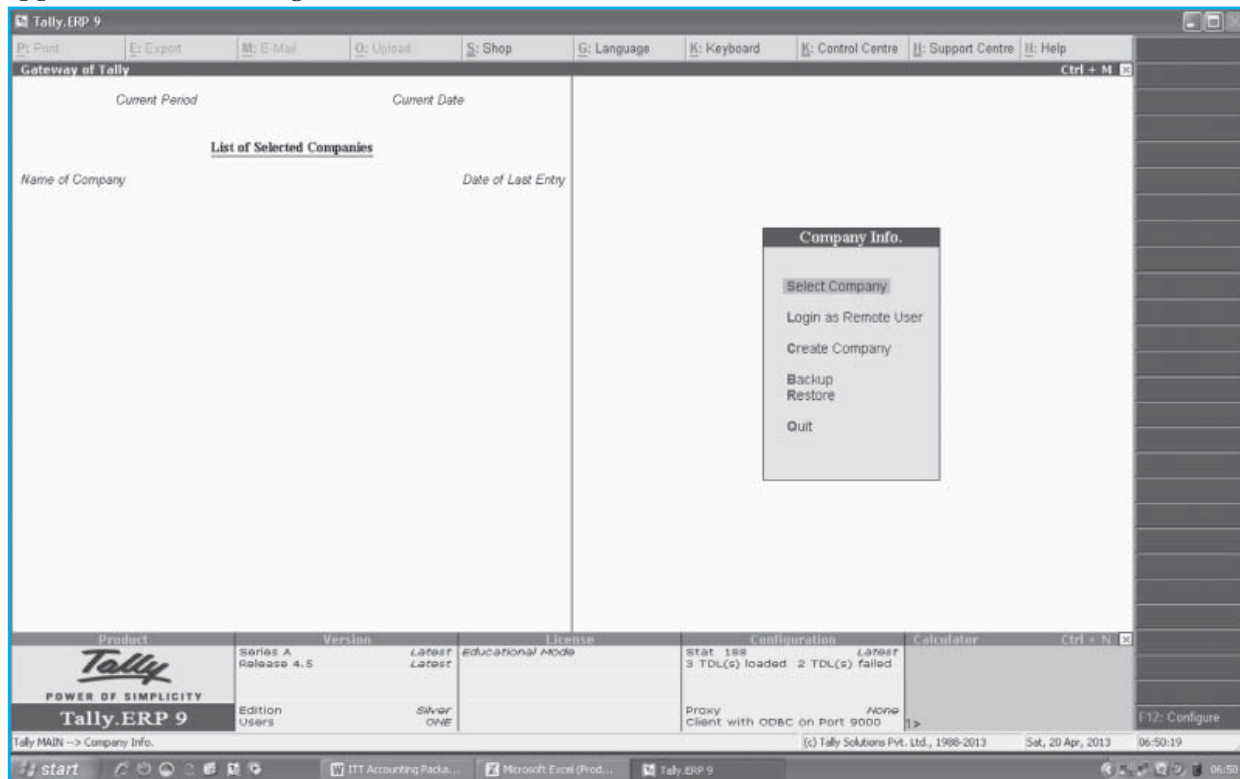


Fig 2.3.4 : Company info. screen

Contents of Tally Screen can be classified as under.

- **Horizontal Button Bar :** This button bar contains ten stationary buttons. These buttons will remain as it is through out all the tally screens. As shown in above figure, these buttons are :



Fig 2.3.5 : Horizontal Button Bar screen

- **Print** - To take printout of any report
 - **Export** - To export any report in six different formats, e.g. ASCII, Excel, HTML, JPEG, PDF and XML.
 - **Email** - To email any report directly from tally.
 - **Upload** - To upload any tally report directly on a website.
 - **Shop** - To purchase various add on packages available on tally shop
 - **Language** - To select the language for accounting out of fifteen available languages.
 - **Keyboard** - To select the keyboard layout out of seventeen available layouts according to languages.
 - **Control Centre** - To manage admin and licensing issues about the software
 - **Support Centre** - To obtain online support from Tally, to check status of your query.
 - **Help** - To get help on tally software or tally add on packages.
- ❑ **Vertical Button Bar** : Button bar placed at right most part of tally screen is called as vertical button bar. Buttons on vertical button bar keeps on changing according to the screen / report you are viewing. Some buttons like “F2 : Date”, are common in most of the screens and reports. User may keep a close watch on right hand side vertical button bar to understand tally functionality in better and quicker way.
- ❑ **Info Panel** : This is area at the bottom of the first screen. Info panel is divided in to five parts as under.

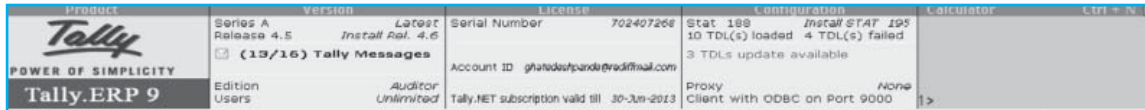


Fig 2.3.6 : Info Panel screen

- **Product** - This box is used to display the name of the software product, i.e. Tally.ERP 9. User can go to www.tallysolutions.com just by clicking on this box.
 - **Version** - This box is used to display software details like version, release, edition that is being used currently. Latest available release is also displayed here.
 - **License** - Information about software serial number, registered email ID with Tally, i.e. account ID and validity of Tally.Net Subscription is displayed in this box.
 - **Configuration** - Software technical details like Statutory Master file version, TDLs, Proxy is displayed in this box.
 - **Calculator** - Calculator can be used in Tally just by pressing “Ctrl + N” in any screen. Calculator box is also used for display many other type of information, e.g. import of data, query shooting, connectivity with Tally server at Bengaluru, etc.
- ❑ **Menu Area** : This area is used to display menu options in Tally. This area is located in the middle of screen as shown in Fig.2.3.7.

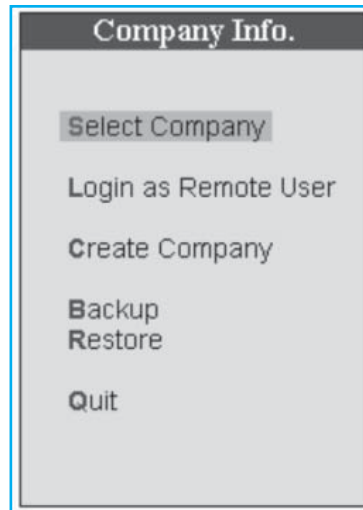


Fig 2.3.7 : Tally Menu option screen

- Select Company – To select the already created company.
- Login as Remote User – To access the data stored on a remote computer.
- Create Company – To create a new company
- Backup – To take data backup
- Restore – To restore the data backup to any specified location.
- Quit – To exit from tally software.

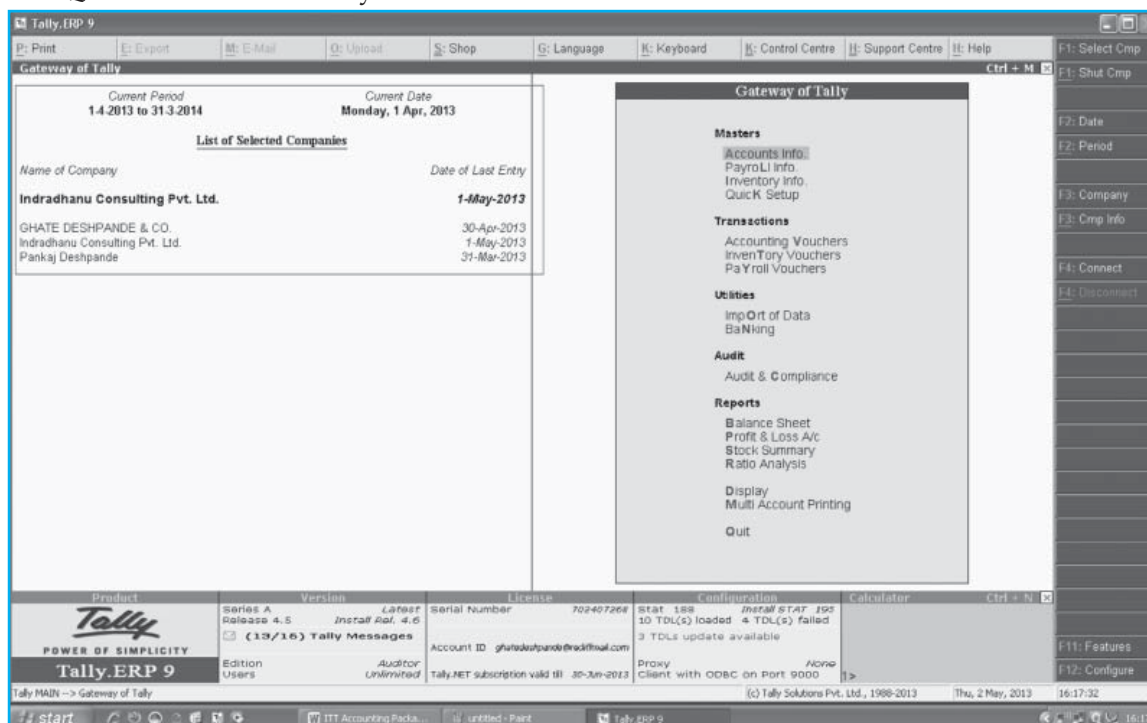


Fig 2.3.8 : Tally's first screen



Some other information is also displayed on Tally's first screen, which is explained below.

- ❑ **Current Period** : Currently set accounting period is displayed here. It can be anything from one day to multiple years. Current period can be changed by pressing Alt + F2.
- ❑ **Current Date** : It is the current accounting date, i.e. if a user records a transaction in any type of voucher without setting any date, it shall be recorded in current date.
- ❑ **Name of Company** : Name of currently selected and active company is displayed here. More than once companies can be opened. But only one company will be active at any point of time.
- ❑ **Date of Last Entry** : Date of last transaction is displayed here. Vouchers with post dated stamp are not considered here. Also, number of days for back dated voucher creation / alteration are calculated from this date.

2.4 SETTING UP A NEW COMPANY

2.4.1 Introduction

Company in Tally means any accounting unit. It may be a sole proprietorship, partnership firm, a limited company, a trust, society, etc. Creation of a company is the first step in using any accounting software. Company creation in Tally is very simple, but configuration of tally as ERP software takes some extra time. For creation of company, select "Create Company" menu on first screen of tally. Following screen shall appear as shown in Fig. 2.4.1.

Fig 2.4.1 : Company Creation screen

Let us understand meaning and use of all the fields one by one.

- ❑ **Directory** : The location where user wants to save the company data. It can be internal hard disc drive of local computer or a network computer or any external drive also.
- ❑ **Name** : The name which you want to use for display on screen.



- ☐ Mailing Name : The name which a user wants to print in reports. It can be same as that of Name or can be a different name also.
- ☐ Address : The full address of the company should be written here. This will be used in all the reports while printing.
- ☐ Statutory compliance for : Tally.ERP 9, release 4.5 offers choice of 41 countries here. Any option can be selected as per requirement. Tally will apply all the statutory features for the selected country only.
- ☐ State : State option is available only if India is selected as a country. State selection is important for VAT compliance. VAT feature in tally will not work correctly if incorrect state is selected.
- ☐ Telephone No. : Type the landline telephone number here.
- ☐ Mobile No. : Type the mobile number here.
- ☐ E-mail : Type email address here.
- ☐ Enable Auto Backup : This option shall be no by default. If this option is made “Yes”, tally will automatically take the backup of company data at the time of loading the company. The backup shall be stored at the same location and same folder where original data files are stored. The name of the auto backup file shall be “ABK.900”. Auto backup feature may be of great help in case of loss of data, but please note :
 - Auto back up will consume heavy disc space. Sixty different copies of auto back up for sixty days shall be kept by Tally as backup. This will increase disc space consumption to a very big extent. File size of ABK.900 file may be more than 100 times of original data size.
 - Tally will create backup at the time of loading the company and not at the time of shutting the company.
- ☐ Currency Symbol : New rupee symbol has be introduced by Tally. This will be displayed with amount in many reports.
- ☐ Maintain : Two options are available. 1. Accounts only, 2. Accounts with Inventory. Any option can be selected as per need.
- ☐ Financial Year from : This is the starting date from which a user wants to start accounting year.
- ☐ Books beginning from : This is the starting date from which a user wants to start recording transactions.

Note : Alteration in Financial Year from and Books beginning from may result in total loss of data. As far as possible, do not try to change these dates.

- ☐ Tally Vault Password : Tally vault is the highest level of security provided by tally. It is a system of encrypting data. Tally vault password can be set while creation of company or it can be set later on also.
- ☐ Use Security Control : Set this option to “Yes” to enable the security and access control feature in a particular company. Multiple users IDs with different access rights can be created and used using this feature. Setting this option to “Yes” will prompt five new field in the same screen.
- ☐ Name of Administrator : Administrator is the user responsible to administer tally company. Administrator will be having total rights over all the facilities and features in the particular company. Other users rights can be controlled through administrator ID only.



- ❑ Password : Set the password for administrator here. Maximum allowed password length is 51 characters. It is suggested to use a password with alphabets, numbers and special characters.
- ❑ Use Tally Audit Features : Tally has got two types of audit features. One is quantitative audit and other is qualitative audit. Set this option to “Yes” to start quantitative audit feature. Here a user can track the changes made in vouchers and masters.
- ❑ Disallow opening in Educational mode : Setting this option to “Yes” will prevent a user from opening the company in educational mode. Company will get opened with licensed Tally only.
- ❑ Base Currency Information : This may be set as per need.

At the end, accept the screen by pressing “Enter” key or “Y” key to create the company.

After creation of Company, following screen shall appear.

2.4.2 Gateway of Tally Screen

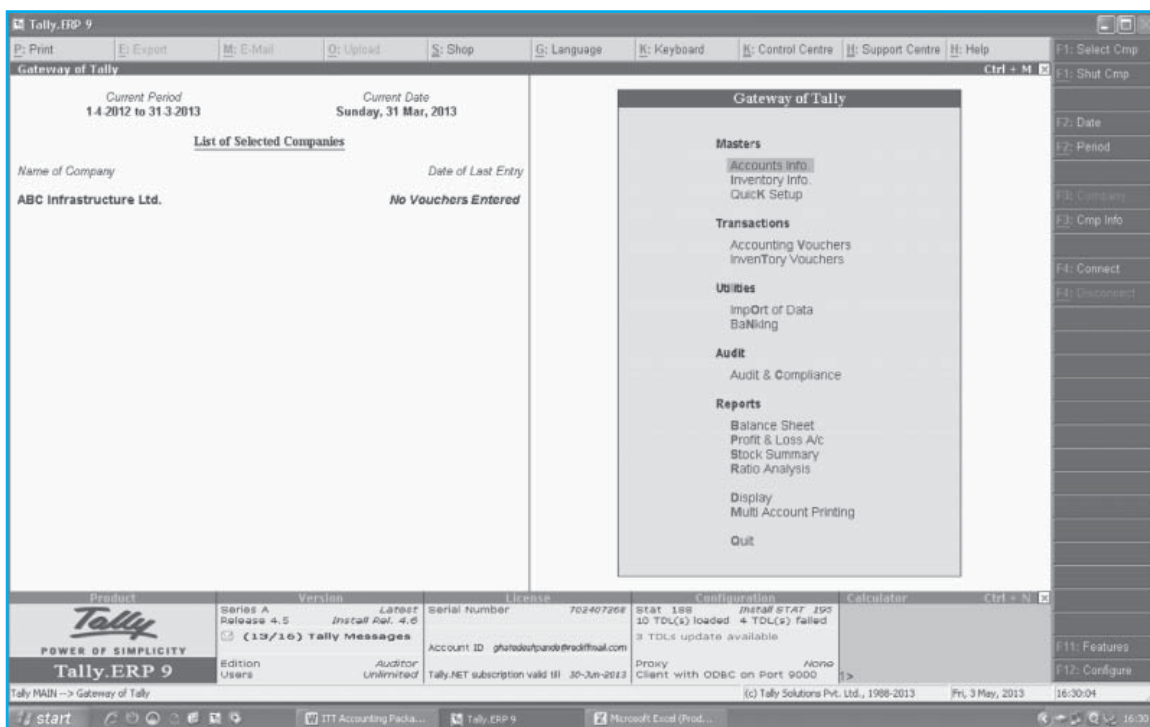


Fig 2.4.2 : Gateway of Tally screen

This screen is called as “Gateway of Tally”. Let us try to understand menu options in this screen. There are five menu headings and relevant sub menus under each heading.

Masters :

- ❑ Accounts Info – To create/alter financial accounting masters like Ledger, Group, Voucher Type, etc.
- ❑ Inventory Info – To create/alter inventory accounting masters like Stock Item, Stock Group, Godowns, etc.
- ❑ Quick Setup – To quickly setup taxation and Tally.Net features.



Transactions :

- ☐ Accounting Voucher – To create financial transactions which affect trial balance
- ☐ Inventory Vouchers – To create pure inventory transactions that does not affect trial balance, e.g. transfer of stock from one location to another.

Utilities :

- ☐ Import of Data – To import data from another tally company
- ☐ Banking – To perform banking related activities like bank reconciliation, cheque printing and view bank transaction reports.

Audit :

- ☐ To analyze the data using various audit tools. Till release 3.6, this feature was available in Auditor Edition of Tally only. But from Release 3.6 onwards, this feature is made available to all the users.

Reports :

- ☐ Balance Sheet – To view balance sheet as on any particular date.
- ☐ Profit & Loss Account – To view Profit & Loss Account for any particular period.
- ☐ Stock Summary – To view stock position as on any particular date.
- ☐ Ratio Analysis – To view various ratio calculations.
- ☐ Multi Account Printing – To take printout of books of accounts in different ways. This option shall be available only if Tally is activated. This will not be available in educational mode.

Statutory Reports:

- ☐ Vat Reports
- ☐ Service Tax Reports
- ☐ TDS Reports

2.4.3 Setting of Features in New Company

Every newly created company needs to be configured according to the users needs. By default only financial accounting module is set to ON in tally. All other modules need to be ON and configured as per needs of every business.

There are two buttons on right hand side bottom corner.

F11 : Features – To set various features ON / OFF

F12 : Configure – To configure tally screens / reports

Note : Changes made by pressing “F11” are applicable to a particular company only, irrespective of individual computer settings. These changes shall be applicable no matter which computer is used to open the company and even in remote login also.

Changes made by pressing “F12” are applicable for all the companies opened on a particular computer. These changes shall not be applicable if computer is changed.

F11 changes are company specific, F12 changes are computer specific.



F11: Features button offers following options as shown in Fig. 2.4.3 :

- ☐ Accounting Features
- ☐ Inventory Features
- ☐ Statutory & Taxation
- ☐ Audit Features
- ☐ Tally.Net Features
- ☐ Add On Features

Accounting Features Screen

Company: INDRADHANU CONSULTING PVT. LTD.			
Accounting Features			
General		Invoicing	
Integrate Accounts and Inventory	? Yes	Allow Invoicing	? Yes
Income/Expense Statement instead of P & L	? No	Enter Purchases in Invoice Format	? No
Allow Multi-Currency	? No	Use Debit/Credit Notes	? No
		Use Invoice mode for Credit Notes	? No
		Use Invoice mode for Debit Notes	? No
Outstandings Management		Budgets & Scenario Management	
Maintain Bill-wise Details (for Non-Trading A/cs also)	? Yes	Maintain Budgets and Controls	? Yes
Activate Interest Calculation (use advanced parameters)	? No	Use Reversing Journals & Optional Vouchers	? Yes
	? No		
Cost/Profit Centres Management		Other Features	
Maintain Payroll	? Yes	Enable Cheque Printing	? Yes
Maintain Cost Centres	? Yes	(Use Banking Configuration in Bank Ledger Master for Cheque Printing Configuration)	
Use Cost Centre for Job Costing	? No	Allow Zero valued entries	? No
More than ONE Payroll / Cost Category	? No	Maintain Multiple Mailing Details for Company & Ledgers	? No
Use Pre-defined Cost Centre Allocations during Entry	? No	Set/Alter Company Mailing Details	? No
Show Opening Balance for Revenue Items in Reports	? No	Enable Company Logo	? No

F1: Accounts F2: Inventory F3: Statutory F4: Tally.NET F5: Audit F6: Add-Ons

Fig 2.4.3 : Accounting Features screen



Inventory Features Screen

Company: **INDRADHANU CONSULTING PVT. LTD.**

Inventory Features

General		Invoicing	
Integrate Accounts and Inventory	? Yes	Allow Invoicing	? Yes
Allow Zero valued entries	? No	Enter Purchases in Invoice Format	? No
Storage & Classification		Use Debit/Credit Notes	? No
Maintain Multiple Godowns	? No	Use Invoice mode for Credit Notes	? No
Maintain Stock Categories	? No	Use Invoice mode for Debit Notes	? No
Maintain Batch-wise Details (set Expiry Dates for Batches)	? Yes	Separate Discount column on Invoices	? No
Use different Actual & Billed Qty	? No	Purchase Management	
Order Processing		Track additional costs of Purchase	? No
Allow Purchase Order Processing	? No	Sales Management	
Allow Sales Order Processing	? No	Use Multiple Price Levels	? No
Allow Job Order Processing (Note : Enables Maintain Multiple Godowns and Use Material In/Out)	? No	Other Features	
		Use Tracking Numbers (Delivery/Receipt Notes)	? No
		Use Rejection Inward/Outward Notes	? No
		Use Material In/Out	? No
		Use Cost Tracking for Stock Item	? No

F1: Accounts F2: Inventory F3: Statutory F4: Tally.NET F5: Audit F6: Add-Ons

Fig 2.4.4 : Inventory Features screen



Statutory & Taxation Feature Screen

Company: **INDRADHANU CONSULTING PVT. LTD.**

Statutory & Taxation

Enable Excise	? No	Enable Tax Deducted at Source (TDS)	? Yes
Set/Alter Excise Details	? No	Set/Alter TDS Details	? No
(Note : 'Enable Maintain Multiple Godowns' for Multiple Excise Units)		Enable Tax Collected at Source (TCS)	? No
Follow Excise rules for Invoicing	? No	Set/Alter TCS Details	? No
Enable Value Added Tax (VAT)	? Yes	Enable Fringe Benefit Tax (FBT)	? No
Set/Alter VAT Details	? No	Set/Alter FBT Details	? No
Enable Service Tax	? Yes	Enable Payroll Statutory	? Yes
Set/Alter Service Tax Details	? No	Set/Alter Payroll Statutory Details	? No
		Enable MCA Reports	? No

Tax Information

VAT TIN (Composition) :
 VAT TIN (Regular) : **27654378090V**
 Local Sales Tax Number :
 Inter-state Sales Tax Number : **27654378090C**
 PAN / Income - Tax No. : **AAEFG7654C**

F1: Accounts F2: Inventory F3: Statutory F4: Tally.NET F5: Audit F6: Add-Ons

Fig 2.4.5 : Statutory & Taxation Features screen



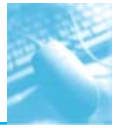
Audit Features Screen

Company: **INDRADHANU CONSULTING PVT. LTD.**

<u>Tax Audit Rules</u>		<u>Statutory Audit</u>	
<u>Inadmissible Cash Payments U/s 40A (3)</u>		<u>Audit Documentation</u>	
Show Aggregate for the Day	? No	Enable Audit Working Paper	? No
Show Aggregate Amounting more than :	0	Enable Audit Priorities and Categories	? No
Ignore Vouchers having Amount less than :	0		
<u>Statutory Payment Due Dates</u>			
<u>Value Added Tax & Central Sales Tax</u>		<u>Tax Deducted at Source & Tax Collected at Source</u>	
Value Added Tax	: 15 of next Months	Tax Deducted at Source	: 7 of next Months
Central Sales Tax	: 15 of next Months	Tax Collected at Source	: 7 of next Months
<u>Service Tax</u>		<u>Payroll</u>	
Payment Period	: 5 of next Months	Provident Fund	: 15 of next Months
<u>Fringe Benefit Tax</u>		Employee State Insurance	: 21 of next Months
Each Quarter	: 15 of last Months	Professional Tax	: 25 of next Months

F1: Accounts F2: Inventory F3: Statutory F4: Tally.NET F5: Audit F6: Add-Ons

Fig 2.4.6 : Audit Features screen



Tally.Net Features Screen :

Company: INDRADHANU CONSULTING PVT. LTD.	
Tally.NET Features	
Connection Details	
Connect Name	: INDRADHANU CONSULTING PVT. LTD.
Contact Person Name	: Amit Shriwas
Contact Number	: 9890690445
Connect for Remote Access	
Allow to Connect Company	? Yes
Connect on Load	? No
SMS Access Details	
Enable SMS Access	? Yes
SMS Company Name	: Indradhanu
F1: Accounts F2: Inventory F3: Statutory F4: Tally.NET F5: Audit F6: Add-Ons	

Fig 2.4.7 : Tally.Net Features screen

Tally Add On Features screen may vary according to the add on used.

2.5 USER ADMIN & MANAGEMENT

2.5.1 Introduction

In ERP environment, there shall be multiple users of software. Hence, every user shall have his/her own user ID and password. Before we start using the software, it is necessary to create users with respective access rights.

Tally.ERP 9 data can be accessed using two ways.

- ☐ Local Data – Accessing data stored on local computer or using Local Area Network
- ☐ Remote Data – Accessing data stored on a remote location using internet.

Hence tally users can be classified in two categories as

- ☐ Local Users
- ☐ Remote Users

There can be two more types of classification of users as –

- ☐ Admin User – person having total rights over software
- ☐ Non Admin User – any user other than admin user.



2.5.2 Creating Admin User

Admin user can be created during creation of company itself. If not created while creating the company, it can be created later on also. Go to company alteration screen of particular company by following the path as under as shown in Fig. 2.5.1.

Gateway of Tally > Alt + F3 > Alter > Enter

Fig 2.5.1 : Creating Admin User screen

2.5.3 Creating non admin users

Administrator shall have total rights over software, but for other users, it is necessary to define their respective rights in Tally. It is suggested to create a chart of users along with access rights on a paper first and then to define it in software.

Step 1 : Define security levels

Step 2 : Create users with respective security levels.

Step 1 : Define security levels

Path : Gateway of Tally > Alt+F3 > Security Control > Types of Security

Following screen shall appear as shown in Fig. 2.5.2.

Fig 2.5.2 : Security Levels screen

By default, there are only three security levels, e.g. Data Entry, Tally.Net User and Tally.Net Auditor, are created in a tally company. Any number of security levels can be created as per requirement.

Let us set a security level for Accountant.



Path : Gateway of Tally > Alt+F3 > Security Control > Types of Security >

- ❑ **Use Basic Facilities of :** Appropriate security level should be selected here from the list of available security levels. This is the upper limit of facilities allowed to this particular security level.
- ❑ **Days allowed for Back Dated vouchers :** Days allowed for backdated voucher entry for the particular security level can be set in this field. Tally will calculate back days from the date of last entry (Date of last entry is displayed on Gateway of Tally Screen). Post dated vouchers are ignored while considering date of last entry.
- ❑ **Cut-off date for Back Dated vouchers :** This date is the date beyond which a user will be allowed to create / alter any voucher irrespective of back dated voucher access.
 E.g. User 1 is an accountant with back dated access for 30 days
 Date of last entry in tally company is 15.05.2013
 Cut-off date for back dated vouchers is 30.04.2013
 Question : Can User1 record a transaction on 29.04.2013 because he is having 30 days back dated access ?
 Answer : No. As the cut-off date for back dated vouchers is 30.04.13, User1 will not be able to record a voucher on 29.04.13 even is he/she is having backdated access for 30 days.
 "Cut-off date for back dated vouchers" can be effectively used where there is a system of finalizing books of accounts on periodic basis. This field has an overriding effect on "Days allowed for Back Dated vouchers"
- ❑ **Set/Alter rules for Print Before Save :** This field can be used to allow or disallow facilities like print / export / email / upload of every individual voucher of a particular voucher type, before it is saved. Normally, no voucher shall be allowed to be printed / exported / emailed / uploaded before it is saved in system. Any voucher type can be selected here for allowing / disallowing.
- ❑ **Allow to Connect Company :** This option is used for allowing / disallowing a user to connect a particular company to Tally server at Bangalore. This is necessary for using remote login feature. Remote login can be used only if a tally company is connected with Tally server.
- ❑ **Use Tally.Net Authentication :** Setting this option to "Yes" allows the security level for remote login use. If this option is set to "No" security level shall be useful for local data only.
- ❑ **Disallow the following Facilities :** This section is used for disallowing certain reports / facilities. There are two parts in this section.
 - **Type of Access :** There are seven different types of access available here as under.
 - Alter – Alteration shall be disallowed
 - Create – Create shall be disallowed
 - Create / Alter – Both shall be disallowed
 - Display – Display shall be disallowed
 - Display / Print – Both shall be disallowed
 - Full Access – None of the above shall be allowed
 - Print – Print shall be disallowed.
 Any option may be selected as per choice.
 - **List of Reports :** In Tally.ERP9 release 4.5, there are in all 124 options available here for controlling the access. Multiple permutations and combinations are possible with these



reports and facilities. Type of access selected for a particular report shall be disallowed here. E.g. Display/Print – Balance Sheet can be disallowed for accountants.

- ❑ **Allow the following Facilities :** Opposite to disallow, here the required facilities can be allowed to a group of users. Here also the system is similar to disallowing the facilities.

Tally.ERP 9

P: Print E: Export M: E-Mail O: Upload S: Shop G: Language

Security Levels ABC Infrastructure Ltd.

Name of Security Level : **Accountant**

Use Basic Facilities of : **Owner**

Days allowed for Back Dated vouchers : **7**

Cut-off date for Back Dated vouchers : **31-Mar-2013**

Set/Alter rules for Print Before Save ? **No**
(also applicable for Export/E-Mail/Upload)

Allow to Connect Company ? **Yes**

Use Tally.NET Authentication ? **No**

Disallow the following Facilities (others will be allowed)		Allow the following Facilities (to re-enable disallowed facilities)	
Alter	Accounts Masters	Create	Vouchers
Create/Alter	Inventory Masters		
Full Access	Payroll Masters		
Create/Alter	Back Dated Vouchers		
Display	Balance Sheet		
Display/Print	Profit & Loss A/c		

Fig 2.5.3 : Allow Facilities to User screen

Creation of Users and allocation of security level

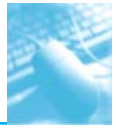
Path : Gateway of Tally > Alt + F3 > Security Control > Users & Password

Here, two types of users can be created.

- ❑ **Local User** – For creation of a local user, security level selected must contain “Use Tally.Net Authentication – No”. Any security level can be selected as per need.
- ❑ **Remote User** – For creation of remote user, two security levels are available by default. Any number of additional security levels can be created as per requirement.

Let us understand the fields for creation of user and allocation of security level.

- ❑ **Security Level** : Select the existing security level from the list. If not created earlier, it can be created from “Types of Securities” menu.
- ❑ **Name of User** : For local user creation, any name can be typed here as per convenience. It is suggested to keep it as short as possible. For remote user, the user name must be a valid and operational email ID only. It cannot be anything else.
- ❑ **Password (if any)** : Password can be set here for local user creation only. For remote users, cursor will not stop here as password shall be created by tally and sent to respective user through email. Password is optional for local user.
- ❑ **Allow Remote Access** : This has to be set to “Yes” to enable a remote user to access data remotely.



- ❑ **Allow Local TDL :** Tally Definition Language (TDL) is the language used for Tally programming. Additional add on packages can be developed and attached with original software to enhance its functionality. These additional add on packages can be stored on web or on local computer. Even a remote user can use the TDL stored on local computer by setting “Allow Local TDL” to “Yes”
- ❑ **Allow SMS Access :** Data stored in Tally can be accessed through SMS also. E.g. If a user who is not in office, wants to know current cash balance, he/she can send the request using his/her mobile phone to the designated number as “cash balance”. This request shall be processed by Tally server and a reply containing the required information shall be sent to the same mobile number within few seconds. Some settings need to be done to start using SMS facility. Setting “Allow SMS Access” to “Yes” is one of the parts of SMS settings.

Note : Allow Remote Access, Allow Local TDL and Allow SMS Access, these three options are available only if the security level selected is a remote security level. These options are not available to local users.

List of Users for Company					
Name: ABC Infrastructure Ltd.					
Security Level	Name of User	Password (if any)	Allow Remote Access	Allow Local TDL	Allow SMS Access
Data Entry	amit	*****	No	No	No
Accountant	raj	*****	No	No	No
Owner	swapnil	*****	No	No	No
Tally.NET User	pankajpd@rediffmail.com		Yes	Yes	No
Tally.NET Auditor	ghatedeshpande@gmail.com		Yes	Yes	Yes

Accept ?

Yes or No

Fig 2.5.4 : Display list of Users for Company

2.5.4 Password Policy :

This feature has been introduced by tally from release 3.6, where some additional features about password can be set conveniently.

Path : Gateway of Tally > Alt+F3 > Security Control > Password Policy

Following screen gives us the idea about features available in password policy. Using password policy enhances the security control in software as shown in Fig. 2.5.5.



Password Policy for Company

Name: **ABC Infrastructure Ltd.**

Activate Password Policy : **Yes**

Password Strength

Minimum Password Length : **8**

Specify ADVANCED Password Strength : **Yes**

Minimum No. of Alphabets : **4**

Minimum No. of Numerals : **2**

Minimum No. of Special Characters : **2**

Password Expiry

Password Expires after : **90** Day(s)
(Set '0' to disable Password Expiry)

Notify users before password expires ? **Yes**
Notify before : **7** Day(s)

Restrict the use of old passwords ? **Yes**
No. of old passwords to be restricted : **3**

Other Options

Change password on first login ? **Yes**

Allow users to change password ? **No**

Yes / No

No

Yes

Fig 2.5.5 : Password Policy for Company screen

2.5.5 Creating/ altering Remote Users using Tally website :

Remote users can be created using tally website as under.

- ❑ Log on to www.tally.solutions.com
- ❑ Enter your account ID and password.
- ❑ Click on User Management link on left side panel
- ❑ Click on “List of Users” to view / alter existing users or click on “Create Users” to create a new one. List of existing users will be shown as under as shown in Fig. 2.5.6.

2.5.6 User Maintenance from Control Centre

Remote users can be created from Tally website also. At the time of registration / activation of tally software for the first time, one email ID needs to be given, which acts as account ID, which is considered as unique identification for each tally serial number. This account ID is displayed on tally info panel under the heading “License”.

“Control Centre” button on horizontal button bar can be pressed to open control centre.

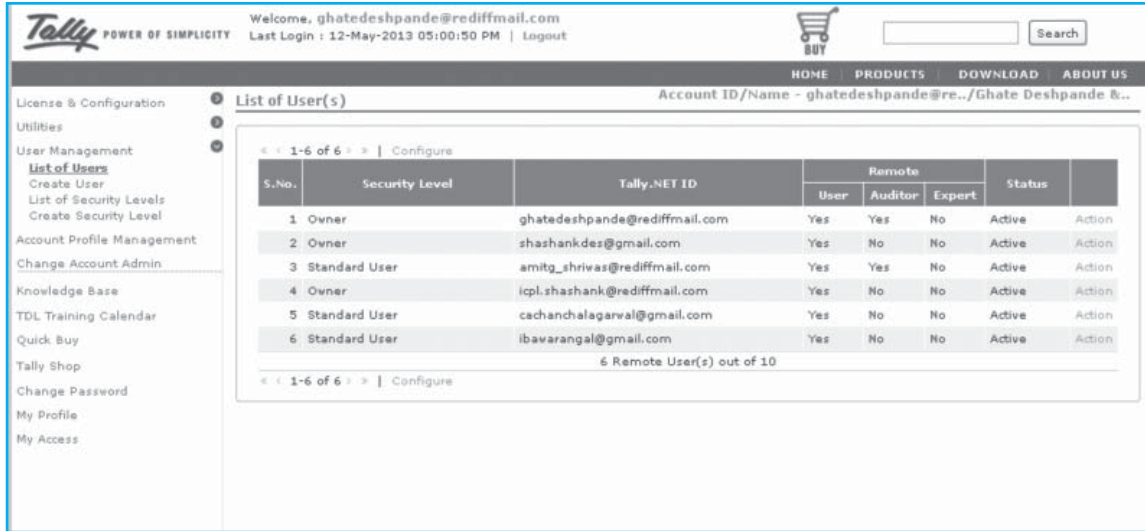


Fig 2.5.7 : Show Control Centre

Entry into control centre requires valid User ID and Password. Account ID registered with Tally shall be entered as user ID along with Tally.Net password. Internet must be connected to enter into Control Centre.

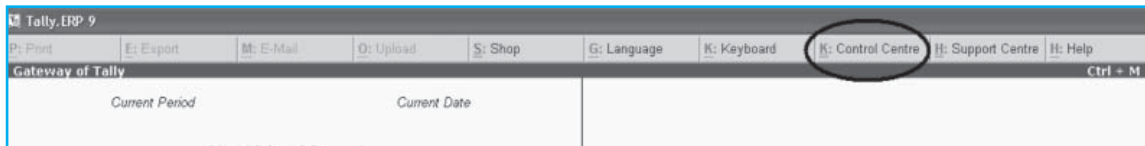


Fig 2.5.8 : Login As Remote Tally.Net User screen

After successful login, following screen shall appear as shown in Fig. 2.5.9.

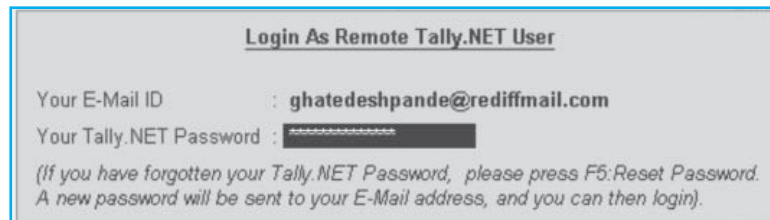


Fig 2.5.9 : Screen after successful login

Press Alt + U to go to user management menu. Remote users can be created using this menu. Access control for handling facilities at Control Centre can also set by pressing F8 button.

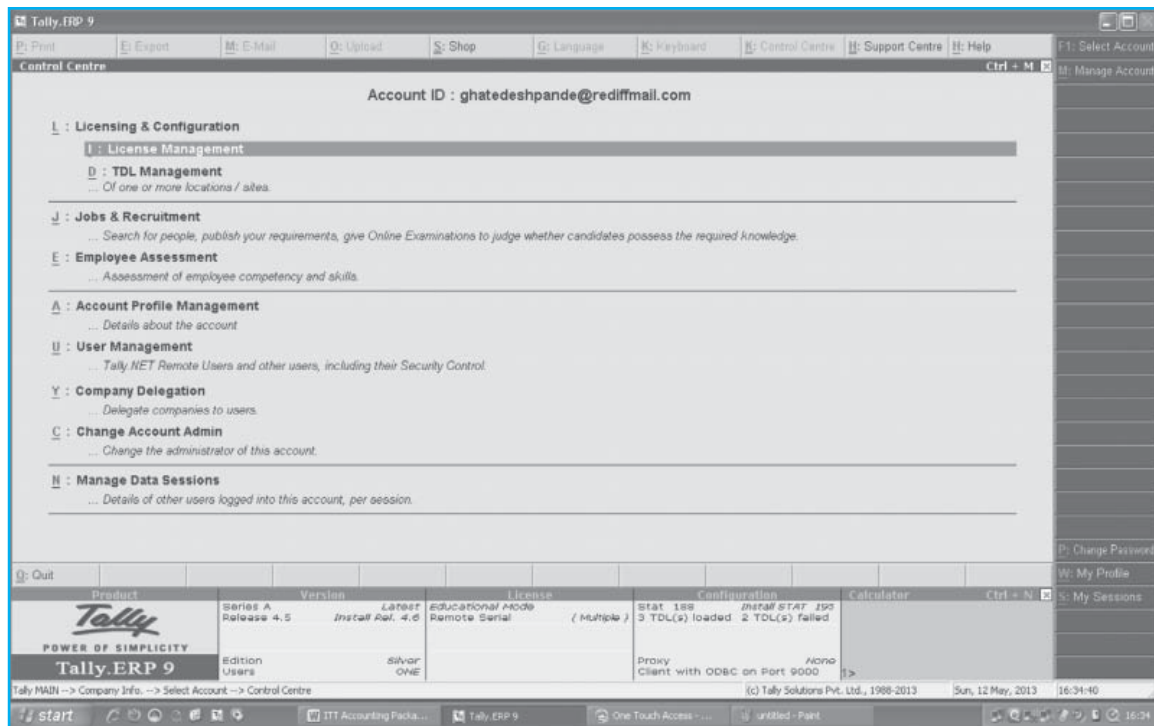


Fig 2.5.10 : User Management menu screen

Access Control Screen for Standard User as shown in Fig. 2.5.11 :

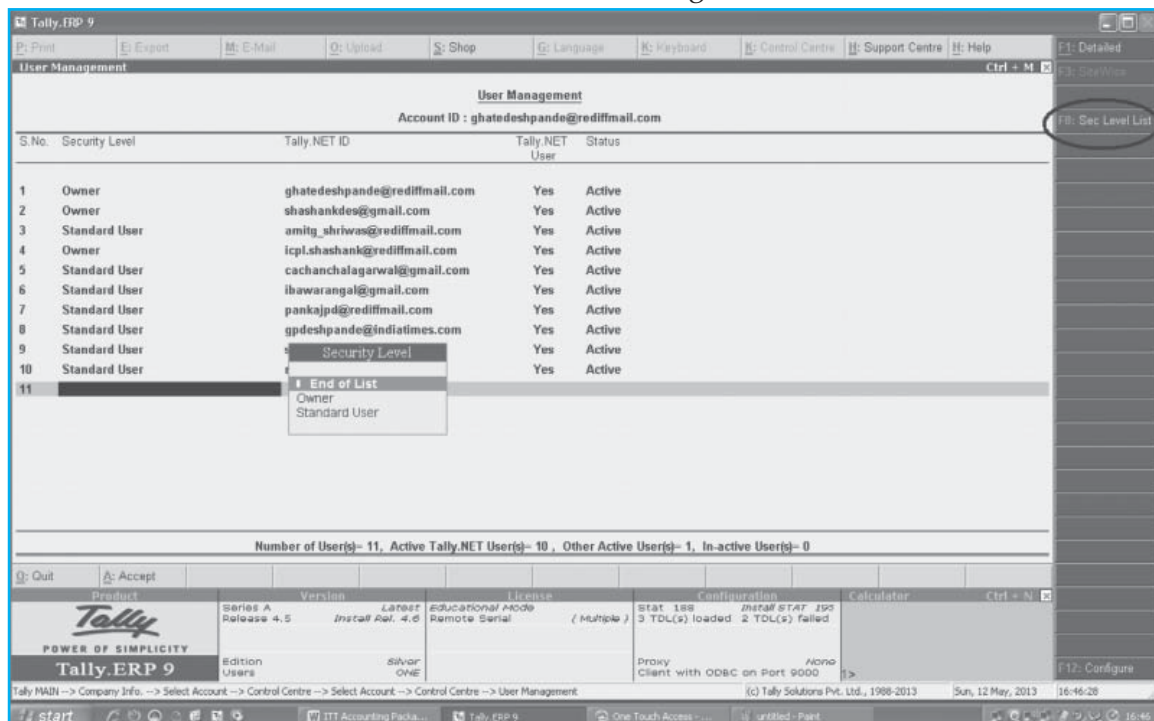


Fig 2.5.11 : Access Control screen

Tally.ERP 9 allows us to record all business transactions through the appropriate Vouchers available in Tally.ERP 9. To configure Voucher entry, press F12: Configure and enable the required options.

3.1 VOUCHER TYPES IN TALLY.ERP 9

Tally.ERP 9 comprises of the following predefined Vouchers, to suit different business requirements for recording various transactions. Tally.ERP 9 also allows us to create user-defined Vouchers (Voucher Types) as per your requirements.

3.1.1 Predefined Vouchers in Tally.ERP 9

Tally.ERP 9 comprises of the following predefined Accounting Vouchers:

- ☐ Contra Voucher
- ☐ Payment Voucher
- ☐ Receipt Voucher
- ☐ Journal voucher
- ☐ Sales Voucher/Invoice
- ☐ Debit Note Voucher
- ☐ Credit Note Voucher
- ☐ Purchase Voucher/Invoice

3.1.2 Creating Voucher Type

Tally.ERP 9 allows us to create different types of vouchers and record, classify and segregate vouchers as per our requirements. For example, we can further classify payment vouchers by creating voucher types with the names **Bank Payment** and **Cash Payment**.

To create a new Voucher Type:

- (i) Go to **Gateway of Tally > Accounts Info. > Voucher Type > Create**.
- (ii) **Enter** the Voucher name.
- (iii) Specify the **Type of Voucher**.
- (iv) Specify the **Method of Voucher Numbering**.
- (v) Activate or deactivate other functions as required.



Voucher Type Creation		Universal Enterprises		Ctrl + M
Name : Bank Payment (alias) :				
General		Printing		Name of Class
Type of Voucher : Payment		Print after saving Voucher ? No		
Abbr. : Pymt				
Method of Voucher Numbering ? Automatic				
Use Advance Configuration ? No				
Use EFFECTIVE Dates for Vouchers ? No				
Make 'Optional' as default ? No				
Use Common Narration ? Yes				
Narrations for each entry ? No				
				Accept ? Yes or No

Fig. 3.1.1: Voucher Type Creation

(vi) Press **Enter** and save.

3.2 ENTERING TRANSACTIONS IN TALLY.ERP 9

3.2.1 Purchase Voucher

In Tally.ERP 9, the **Purchase voucher** can be passed in **Voucher mode** or the **Invoice mode** where the calculations can be automated and expedite voucher entry.

To create a **Purchase Voucher**

- Go to **Gateway of Tally > Accounting Vouchers**.
- Press **F9** or select **F9: Purchase** on the Button bar.
- Select the **Party's A/c Name**.
- Select the **Stock Items, Qty** and **Rate** details.
- Select the **Tax Ledger** and the tax amount is automatically computed.



Accounting Voucher Creation		Universal Enterprises		Ctrl + M
Purchase No. 80		Date :		5-Jan-2009 Monday
Supplier Invoice No. :				
Particulars	Debit	Credit		
To NextGen Systems		5,46,000.00		
Cur Bal: 1,26,620.00 Cr				
New Ref NG/1352 30 Days 5,46,000.00 Cr				
(4-Feb-2009)				
By Purchase @ 4%	5,25,000.00			
Cur Bal: 1,07,30,880.00 Dr				
HCL Celeron 15 Nos 14,000.00 Nos 2,10,000.00				
HCL PIV 15 Nos 21,000.00 Nos 3,15,000.00				
By Input VAT @ 4%	21,000.00			
Cur Bal: 1,13,813.00 Dr				
Narration:		5,46,000.00	5,46,000.00	
Purchased 10nos HCL Celeron & HCL PIV Computers each.				
		Accept ?		
		Yes or No		

Fig. 3.2.1: Purchase Voucher

(vi) Enter all other required details.

(vii) Press **Enter** and save.

During Voucher Entry, we can pre-fill the voucher narration for a specific ledger/ voucher entry, by pressing

- (i) **Alt+R**, to recall the last narration saved for the first ledger in the voucher, irrespective of the voucher type.
- (ii) **Ctrl+R**, to recall the last narration saved for a specific voucher type, irrespective of the ledger.

3.2.2 Sales Voucher

In Tally.ERP 9, the **Sales Voucher** can be passed in **Voucher Mode** or the **Invoice Mode** where, the calculations can be automated and expedite voucher entry.

To create a **Sales Voucher**:

- (i) Go to *Gateway of Tally > Accounting Vouchers*.
- (ii) Press **F8** or select **F8:Sales** on the Button bar.
- (iii) Select the **Party Name** in the **By** field and specify the amount.
- (iv) Select the **Sales Ledger** in the **To** field and specify the amount.
- (v) Select the **Tax Ledger** in the **To** field and specify the amount.



Accounting Voucher Creation		Universal Enterprises	Ctrl + M
Sales No. 85		6-Dec-2008 Saturday	
Ref.:			
Particulars	Debit	Credit	
By Fortune Computer Services Cur Bal: 34,240.00 Dr New Ref 41 30 Days 1,35,000.00 Dr (5-Jan-2009)	1,35,000.00		
To Sales @ 12.5% Cur Bal: 1,68,64,325.00 Cr		1,20,000.00	
IP Laserjet 1100 Sales 10 Nos 12,000.00 Nos 1,20,000.00			
To Output VAT @ 12.5% Cur Bal: 0.00 Cr		15,000.00	
Narration: Being Laser Printers sold.		1,35,000.00	1,35,000.00
		Accept ? Yes or No	

Fig. 3.2.2(A): Sales Voucher

(vi) Press **Enter** and save.

Sales Invoice

To create **Sales Invoice** in Tally.ERP 9:

- Press **F11: Inventory Features** and set **Allow Invoicing** to **Yes**.
- In the **Sales entry** screen, click **Ctrl+V (As Invoice)** button.
- Select the **Party's A/c Name**.
- Select the **Stock Items, Qty** and **Rate** details.
- Select the **Tax Ledger** and the tax amount is automatically computed.



Accounting Voucher Creation		Universal Enterprises		Ctrl + M	
Sales		No. 85		6 Dec 2008 Saturday	
Ref. :					
Party's A/c Name : Fortune Computer Services		Price Level :			
Current Balance : 34,240.00 Dr Credit Limit: 12,00,000.00 Dr					
Name of Item	Quantity	Rate per	Amount		
HP Laserjet 1010 Series	10 Nos	12,000.00 Nos	1,20,000.00		
Output VAT @ 12.5%		12.50 %	15,000.00		
Narration: Being Laser Printers sold.			10 Nos	1,35,000.00	

Fig. 3.2.2(B): Sales Invoice

(vi) Enter all other required details.

(vii) Press **Enter** and save.

3.2.3 Receipt Voucher

In **Tally.ERP 9**, we can record any money received from debtors against sales Invoices or on Account and for all transactions where money is received, using the **Receipt Voucher**.

To create the **Receipt Voucher**,

- (i) Go to **Gateway of Tally > Accounting Vouchers**.
- (ii) Press **F6** or select **F6: Receipt** from the button bar.
- (iii) Select the **Party Name** in the **To** field and specify the amount.
- (iv) Select the **Bill references** in the **Bill Wise Details** for screen.
- (v) Select the **Bank Ledger** in the **By** field and press **Enter** to accept the amount.



Accounting Voucher Creation Universal Enterprises Ctrl + M

Receipt No. 89 31-Dec-2008 Wednesday

Particulars	Debit	Credit
To Silverplus Computers Cur Bal: 12,86,800.00 Dr Agst Ref 47 45 Days 2,00,000.00 Cr (24-Nov-2008)		2,00,000.00
By HDFC Bank Cur Bal: 83,919.56 Cr	2,00,000.00	

Narration:
Ch. No. : 128553 Being Amount paid.

2,00,000.00 2,00,000.00

Accept ?
Yes or No

Fig. 3.2.3: Receipt Voucher

(vi) Press **Enter** and save.

We can also pass the above **Receipt Voucher** in **Single Entry Mode**, by pressing **F12: Configure** and setting **Use Single Entry mode for Pymt/Rcpt/Contra** to **Yes**.

3.2.4 Payment Voucher

In Tally.ERP 9, we can pass the payment voucher in **Single Entry** or **Double Entry** mode.

To create **Payment Voucher**:

- Go to **Gateway of Tally > Accounting Vouchers**.
- Press **F5** or select **F5: Payment** from the button bar.
- Select the **Party Name** in the **By** field and specify the amount.
- Select the **Bill references** in the **Bill Wise Details** for screen.
- Select the **Bank Ledger** in the **To** field and press **Enter** to accept the amount.

Accounting Voucher Creation		Universal Enterprises		Ctrl + M	
Payment No. 270				31-Dec-2008 Wednesday	
Particulars		Debit	Credit		
By Sai Infotech (P) Ltd., Cur Bal: 2,53,034.00 Cr		2,00,000.00			
Agst Ref SIPL/49		1,51,517.00 Dr			
Agst Ref SIPL/85		48,483.00 Dr			
To HDFC Bank Cur Bal: 83,919.56 Cr			2,00,000.00		
Narration:		2,00,000.00	2,00,000.00		
Ch. No. : 1000188 Being Amount paid to Sai Infotech (P) Ltd.,					
		Accept ? Yes or No			

Fig. 3.2.4: Payment Voucher

(vi) Press **Enter** and save.

We can also pass the above **Payment Voucher** in **Single Entry Mode**, by pressing **F12: Configure** and setting **Use Single Entry mode for Pymt/Rcpt/Contra** to **Yes**.

3.2.5 Contra Voucher

In **Tally.ERP 9**, we can pass the **Contra Voucher** in **Single Entry** or **Double Entry** mode.

To create **Contra Voucher**:

- (i) Go to *Gateway of Tally > Accounting Vouchers*.
- (ii) Press **F4** or Select **F4: Contra** on the Button bar.
- (iii) Select the **Cash/Bank** ledger in **To** and **By** fields, as required.



Accounting Voucher Creation		Universal Enterprises	Ctrl + M
Contra No. 23		16-Dec-2008 Tuesday	
Particulars	Debit	Credit	
To Cash Cur Bal: 10,19,901.25 Dr		1,00,000.00	
By HDFC Bank Cur Bal: 83,919.56 Cr	1,00,000.00		
Narration: Ch. No.: 1000182 Being Cash deposited into Bank		1,00,000.00	1,00,000.00
		Accept ? Yes or No	

Fig. 3.2.5: Contra Voucher screen

(iv) Press **Enter** and save.

3.2.6 Journal Voucher

In Tally.ERP 9, we can create Journal Vouchers for adjustments with respect to debit and credit amounts without involving the cash or bank accounts.

To create **Journal Voucher**:

- Go to **Gateway of Tally > Accounting Vouchers**.
- Press **F7** or select **F7: Journal** on the Button Bar.
- Enter the required details.

Accounting Voucher Creation		Universal Enterprises	Ctrl + M
Journal No. 71		12-Feb-2009 Thursday	
Particulars	Debit	Credit	
By Vehicle Repairs & Maintenance Cur Bal: 23,540.00 Dr	6,545.00		
To Maruti Udyog Service Centre Cur Bal: 0.00 Cr New Ref 2654		6,545.00	
	6,545.00 Cr		
Narration: Being Vehicle overhauling & servicing expenses.		6,545.00	6,545.00
		Accept ? Yes or No	

Fig. 3.2.6: Journal Voucher screen

(iv) Press **Enter** and save.

3.2.7 Debit Note Voucher

In **Tally.ERP 9**, we can pass **Debit Note** for any kind of Purchase Returns, Escalation/ De-escalation in price or any other expenses incurred by us on behalf of the party, etc.

To enable Debit Notes, press **F11: Inventory Features** and set **Use Debit/ Credit Notes** to **Yes**.

To create **Debit Note Entry**:

- (i) Go to **Gateway of Tally > Accounting Vouchers**.
- (ii) Press **Ctrl+F9** or select **Ctrl+F9: Debit Note** on the Button Bar.
- (iii) Enter the required details.



Accounting Voucher Creation Universal Enterprises Ctrl + M

Debit Note No. 3 12-Jan-2009
Ref. : NBT/CN/005 Monday

Party's A/c Name : New Buzz Traders
Current Balance : Credit Limit: 5,00,000.00 Cr

Name of Item	Quantity	Rate per	Amount
Wireless Keyboard			250.00
Input VAT @ 4%		4 %	10.00

Show Statutory Details ? Yes
Narration:
Being rate difference due to quality for item Wireless key board 5 No's @ 50/- wide Vendor's credit note no. NBT/CN/005

Accept ?
Yes or No

Fig. 3.2.7: Debit Note Voucher

(iv) Press **Enter** and save.

We can enter the above entry in Invoice mode, by enabling **Use Invoice Mode for Debit Notes** to **Yes** and entering the transaction in **Invoice Mode (Ctrl+V)**.

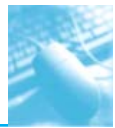
3.2.8 Credit Note Voucher

In **Tally.ERP 9**, we can pass **Credit Note** for any kind of Sales Returns, Escalation/ De-escalation in price, etc.

To enable Credit Notes, press **F11: Inventory Features** and set **Use Debit/Credit Notes** to **Yes**.

To create **Credit Note Entry**:

- Go to **Gateway of Tally > Accounting Vouchers**.
- Press **Ctrl+F8** or Select the button **Ctrl+F8: Credit Note** on the Button Bar.
- Enter the required details.



Accounting Voucher Alteration (Secondary)		Universal Enterprises		Ctrl + M
Credit Note No. 3				1-Aug-2008 Friday
Ref : 24		Used for: Others		
Party's A/c Name : Computer Junction		Price Level :		
Current Balance : 93,660.00 Dr Credit Limit: 5,00,000.00 Dr				
Name of Item	Quantity	Rate per	Amount	
IBM PIV			500.00	
CST Tax @ 4%		4 %	20.00	
Form to Receive : ☐ Not Applicable				
Narration:			Accept ?	
Being the competitors offered at low price the Computer Junction issued a credit note and rate was reduced by Rs.500			Yes or No	

Fig. 3.2.8: Credit Note Voucher

(iv) Press **Enter** and save.

We can enter the above entry in Invoice mode, by enabling **Use Invoice Mode for Credit Notes** to **Yes** and entering the transaction in **Invoice Mode (Ctrl+V)**.

3.2.9 Stock Journal

In **Tally.ERP 9**, we can pass **Stock Journals** for all types of **Stock Adjustments** viz., Inter-Godown Transfer, Manufacturing Process and so on.

To create **Stock Journal Voucher**:

- (i) Go to *Gateway of Tally > Inventory Vouchers*.
- (ii) Press **Alt + F7** or select the button **F7: Stk Jrnl** from the button bar.
- (iii) Specify the **Stock Items, Godown, Qty** details in the **Source** section.
- (iv) Specify the **Stock Items, Godown, Qty** details in the **consumption** section.

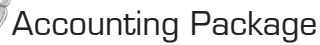
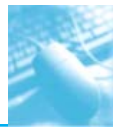


Fig. 3.2.9: Stock Journal

3.2.10 Physical Stock Journal

To create **Physical Stock Voucher**:

- (i) Go to **Gateway of Tally > Inventory Vouchers**.
- (ii) Press **Alt+F10** or select the button **F10: Phys Stk** on the Button Bar.
- (iii) Enter the **Physical counts** (Quantity) of the **Stock Items**.



Inventory Voucher Creation Universal Enterprises Ctrl + M

Physical Stock No. 1 31-Mar-2009
Tuesday

Physical Stock Verification

Name of Item	Godown	Batch / Lot No.	Mfg. Dt.	Expiry Date	Quantity	Amount
Floppy Disk	Stores				3.0 Box	
CDROM Jackets	Stores				5.0 Box	
Dust Covers	Stores				70 Nos	

Accept ?
Yes or No

Narration: The Physical Stock recorded on Stock taking accounted for.

Fig. 3.2.10: Physical Stock Voucher

(iv) Press **Enter** and save.

4

GENERATING REPORTS IN TALLY.ERP 9

4.1 INTRODUCTION

Tally.ERP 9 provides us the capability to generate various financial statements and Management Information system reports, thereby facilitating better management, effective control and well-informed decisions.

Following are some of the broad categories of reports available in Tally.ERP 9

- ❑ Financial Statements
- ❑ Books & Registers
- ❑ Statement of Accounts

4.2 FINANCIAL STATEMENTS

Financial Statements summarise the individual transactions to show totals, ratios and statistics required by the users to analyze the company's financial data in a wide variety of ways.

Broadly, the financial statements are classified into three major statements, which form part of the statutory requirements in most countries:

- ❑ Balance Sheet
- ❑ Profit & Loss A/c
- ❑ Trial Balance

4.2.1 Balance Sheet

A **Balance Sheet** is a financial statement that reports a firm's financial position at a specific time. It shows a balance between the assets and liabilities of a firm and the owner's funds (i.e., $\text{Assets} = \text{Liabilities} + \text{Owner's Equity}$).

To view **Balance Sheet**:

- ❑ Go to *Gateway of Tally > Balance Sheet*.

Balance Sheet		Universal Enterprises		Ctrl + M	
Universal Enterprises		Universal Enterprises		Universal Enterprises	
as at 31-Mar-2009		as at 31-Mar-2009		as at 31-Mar-2009	
Liabilities		Assets			
Capital Account		Fixed Assets		34,62,489.68	
55,00,000.00		Accumulated Depreciation on Fixed Assets		(16,02,622.20)	
Balesubramanian's Share Capital A/c		Land & Building		14,00,000.00	
7,13,000.00		Plant & Machinery		18,26,000.00	
Kavitha's Share Capital A/c		Airconditioner		21,500.00	
2,76,500.00		Computers & Peripherals		90,460.00	
Mohan's Share Capital A/c		Furniture & Fixtures		1,22,420.00	
15,00,000.00		Motor Car - Hyundai GLX		9,05,737.88	
Priya Ganesh's Share Capital A/c		Investments		5,00,000.00	
5,00,000.00		Investments		5,00,000.00	
Sathish's Share Capital A/c		NSC			
4,78,500.00		Current Assets		1,36,79,562.33	
Vijayakumar's Share Capital A/c		Closing Stock		13,58,831.73	
5,68,500.00		Loans & Advances (Asset)		15,99,000.00	
Loans (Liability)		Sundry Debtors		66,16,336.68	
4,43,316.03		Cash-in-hand		10,19,901.25	
HDFC Silver Credit Card		Bank Accounts		29,36,492.67	
79,000.00		Advance Tax		2,50,000.00	
Current Liabilities					
54,41,348.51					
Duties & Taxes					
66,706.54					
Provisions					
91,618.38					
Sundry Creditors					
50,76,720.00					
EQU Admin Charges @ 0.01%					
EQU Contribution @ 0.5%					
Employee's ESI Contribution @ 1.70%					
Employee's PF Contribution @ 12%					
ESI Payable					
210.00					
Interest on Car Loan A/c					
1,56,275.59					
PF Admin Charges @ 1.10%					
PF Payable					
Professional Tax					
Salary Payable					
49,810.00					
Profit & Loss A/c					
Opening Balance					
62,37,491.52					
Total		Total		1,76,42,062.01	
1,76,42,062.01					

Fig. 4.2.1: Balance Sheet screen

Select **F1: Detailed/Condensed** to explode the summarized information. Press **F12: Configuration** and set the required parameters to display the Balance Sheet according to our preferences.

4.2.2 Profit & Loss A/c

Profit and Loss Account or Income Statement is a periodic statement, which shows the net result of business operations for a specified period. In Tally.ERP 9, Profit and Loss account displays the information based on the default primary groups and is updated instantly with every transaction/ voucher that is entered and saved.

To view **Profit & Loss Account**:

- ❑ Go to **Gateway of Tally > Profit & Loss A/c**
- ❑ Click **F1: Detailed**, to view the **Profit & Loss Account** in detailed format.

Profit & Loss A/c		Universal Enterprises		Ctrl + M	
Universal Enterprises		Universal Enterprises		Universal Enterprises	
1-Apr-2008 to 31-Mar-2009		1-Apr-2008 to 31-Mar-2009		1-Apr-2008 to 31-Mar-2009	
Particulars		Particulars			
Opening Stock		Sales Accounts		3,15,70,847.50	
Accessories		CST Sales	60,30,125.00		
Components		Local Sales	2,46,85,830.00		
Defective Items		Sales @ 20%	2,88,000.00		
Dot Matrix Printers		Sales - Advertising Services	66,550.00		
Laser Jet Printers		Sales AMC for Computers	66,000.00		
IMFL		Sales - Exports	70,342.50		
Timber		Sales Bills to Make	3,75,000.00		
Timber - OTFL		Closing Stock		13,58,831.73	
Purchase Accounts	2,42,00,197.50	Accessories	15,792.76		
GST 4% on Purchases		Components	2,573.22		
Purchase @ 12.5%	1,31,95,812.50	Defective Items	600.00		
Purchase @ 20%	2,00,000.00	Dot Matrix Printers	14,000.00		
Purchase @ 4%	1,07,30,880.00	Laser Jet Printers	17,400.00		
Purchase - Courier Charges	18,170.00	IMFL	8,000.00		
Purchase - Interstate	40,560.00	Timber	12,72,965.75		
Purchase - Telephone Services	14,775.00	Timber - OTFL	27,500.00		
TCS @ 2.5% on Purchases					
Purchase Bills to Come					
Direct Expenses	33,240.00				
Assembling Charges	18,240.00				
Carriage Inwards	15,000.00				
Gross Profit c/o	86,96,241.73				
	3,29,29,679.23			3,29,29,679.23	
Indirect Expenses	24,58,749.81	Gross Profit b/f		86,96,241.73	
Depreciation on Fixed Assets	6,02,622.20	Indirect Incomes			
Interest & Finance Charges	55,519.37				
Total	86,96,241.73	Total		86,96,241.73	

Fig. 4.2.2: Profit & Loss A/c screen



Press **F2: Period** to change the period as required. Press **F12: Configuration** and set the required parameters to display the Profit & Loss A/c according to our preferences.

4.2.3 Trial Balance

A Trial Balance is a summary of all ledger balances to check whether the figures are correct and balanced. In Tally.ERP 9, all the ledgers appear with their ledger balances.

To view the **Trial Balance**:

- ❑ Go to *Gateway of Tally > Display > Trial Balance*.

Trial Balance		Universal Enterprises		Ctrl + M	
Particulars		Universal Enterprises		1-Apr-2008 to 31-Mar-2009	
		Closing Balance			
		Debit	Credit		
Capital Account			55,00,000.00		
Loans (Liability)			4,63,216.03		
Current Liabilities		1,34,269.86	55,75,610.37		
Fixed Assets		40,65,111.88	6,02,622.20		
Investments		5,00,000.00			
Current Assets		1,24,09,735.66	89,005.06		
Sales Accounts			3,15,70,847.50		
Purchase Accounts		2,42,00,197.50			
Direct Expenses		33,240.00			
Indirect Expenses		24,62,249.81	3,500.00		
Unadjusted Forex Gain/Loss			3.55		
Grand Total		4,38,04,804.71	4,38,04,804.71		

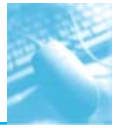
Fig. 4.2.3: Trial Balance screen

Tally.ERP 9 shows group wise Trial Balance. Press **Shift+Enter** to view details of all groups, except for groups behaving like sub-ledgers. Press **F1: Detailed** to detail the grouped information for further detail. Press **F5: Led-wise** to list all ledgers and their closing balances.

4.3 BOOKS & REGISTERS

Tally.ERP 9 provides us capability to generate various books and registers for any specific period viz., month, date, and year and as on date. In Tally.ERP 9, once voucher entry is made, the transactions are automatically & immediately posted in the Day Book and other Books of Accounts without any additional effort. Tally.ERP 9 allows us to maintain and generate all primary books of accounts and registers like

- ❑ Cash Book
- ❑ Bank Book
- ❑ Purchase Register
- ❑ Sales Register
- ❑ Journal Register



- ❑ Debit Note Register
- ❑ Credit Note Register

4.3.1 Cash Book

To generate **Cash Book**:

Go to *Gateway of Tally > Display > Account Books > Cash/Bank Book(s)*.

- ❑ Select the required **Cash** Ledger Account.
- ❑ Press **Enter** on the required month to view Cash transactions for a month.

Ledger Vouchers		Universal Enterprises		Ctrl + M	
Ledger: Cash		1-Feb-2009 to 28-Feb-2009			
Date	Particulars	Vch Type	Vch No.	Debit	Credit
2-2-2009	Step-in Computers	Receipt	102	15,000.00	
5-2-2009	Travelling & Conveyance	Payment	312		2,103.00
6-2-2009	Staff Welfare Expenses	Payment	314		620.00
15-2-2009	Repairs & Maintenance - Guest Accomd.	Payment	320		300.00
21-2-2009	Janata Timbers	Receipt	105	30,000.00	
23-2-2009	Repairs & Maintenance - Guest Accomd.	Payment	326		3,110.00
26-2-2009	Subscriptions	Payment	329		420.00
27-2-2009	Canara Bank	Contra	28	1,00,000.00	
28-2-2009	Postage & Telegraph	Payment	330		350.00

Fig. 4.3.1: Cash Book screen

4.3.2 Bank Book

To generate **Bank Book**:

- ❑ Go to *Gateway of Tally > Display > Account Books > Cash/Bank Book(s)*.
- ❑ Select the required **Bank** Account.
- ❑ Press **Enter** on the required month to view **Bank transactions** for a month.



Ledger Vouchers		Universal Enterprises		Ctrl + M	
Ledger: HDFC Bank		1-Jul-2008 to 31-Jul-2008			
Date	Particulars	Vch Type	Vch No.	Debit	Credit
2-7-2008	Challenger Systems	Payment	83		1,00,000.00
6-7-2008	HDFC Silver Credit Card	Payment	86		10,770.00
8-7-2008	Jet Roadways (P) Ltd.,	Payment	89		5,000.00
12-7-2008	Jain Realtors	Payment	91		2,00,000.00
15-7-2008	Worldwide Computers	Receipt	30	1,00,000.00	
17-7-2008	Computer Point	Payment	95		90,460.00
17-7-2008	Soft Stop	Receipt	32	50,000.00	
18-7-2008	Investments	Payment	97		5,00,000.00
23-7-2008	Arvind Kumar	Receipt	33	3,920.00	
25-7-2008	(as per details)	Payment	101		19,603.66
	Chelamandalam Auto Finance Corp., 17,621.27 Dr				
	Interest on Car Loan A/c 1,982.39 Dr				
27-7-2008	Canara Bank	Contra	8		3,00,000.00
27-7-2008	Fast Couriers	Payment	102		1,179.78
28-7-2008	Infinite Infosolutions	Payment	103		1,10,000.00
28-7-2008	Modern Advertisers	Receipt	35	7,865.20	
29-7-2008	Canara Bank	Contra	9		1,80,000.00
30-7-2008	TVS Electronics (I) Ltd.,	Payment	106		2,00,000.00
30-7-2008	Step-in Computers	Receipt	36	25,000.00	
30-7-2008	Telephone Link Ltd.,	Payment	107		1,460.68
31-7-2008	NextGen Systems	Payment	108		25,500.00
31-7-2008	Sai Infotech (P) Ltd.,	Payment	109		50,000.00
31-7-2008	Assembling Charges	Payment	111		1,520.00
31-7-2008	Bank Charges	Payment	112		310.00
31-7-2008	Silverplus Computers	Receipt	37	10,00,000.00	
31-7-2008	(as per details)	Payment	114		1,377.00
	ESI Payable 1,005.00 Dr				
				9 more ...	
				Opening Balance :	26,11,264.33
				Current Total :	11,86,785.20
					19,17,040.22
				Closing Balance :	18,81,009.31

Fig. 4.3.2: Bank Book screen

4.3.3 Purchase Register

To generate **Purchase Register**:

- ❑ Go to **Gateway of Tally > Display > Account Books > Purchase Register**.
- ❑ Press **Enter** on the required month to view **Purchase Transactions** for a month.

Voucher Register		Universal Enterprises		Ctrl + M	
List of All Purchase Vouchers				1-Apr-2008 to 30-Apr-2008	
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount
2-4-2008	NextGen Systems	Purchase	1		98,800.00
2-4-2008	Simco Machinery Co.,	Purchase	2		10,40,000.00
2-4-2008	Cash	Purchase	3		832.00
3-4-2008	Cash	Purchase	4		12,480.00
3-4-2008	HP India Ltd.,	Purchase	5		1,03,500.00
5-4-2008	NextGen Systems	Purchase	6		72,800.00
6-4-2008	Chandra Timbers	Purchase	7		12,10,781.00
7-4-2008	Vinayaga Trading Corporation	Purchase	8		2,05,785.00
10-4-2008	New Era Computers	Purchase	9		10,920.00
12-4-2008	NextGen Systems	Purchase	10		4,680.00
16-4-2008	Fast Couriers	Purchase	11		1,683.60
17-4-2008	New Buzz Traders	Purchase	12		9,360.00
17-4-2008	Magnum Breweries	Purchase	13		2,40,000.00
20-4-2008	TVS Electronics (I) Ltd.,	Purchase	14		7,87,500.00
21-4-2008	Top Computers	Purchase	15		3,80,474.00
24-4-2008	N.C.Jain	Purchase	16		468.00
24-4-2008	Navin Traders	Purchase	17		2,153.00
25-4-2008	Telephone Link Ltd.,	Purchase	18		1,346.88
26-4-2008	New Era Computers	Purchase	19		4,680.00
Total:					41,88,243.48

Fig. 4.3.3: Purchase Register screen



4.3.4 Sales Register

To generate **Sales Register**:

- ❑ Go to *Gateway of Tally > Display > Account Books > Sales Register*.
- ❑ Press **Enter** on the required month to view **Sales Transactions** for a month.

Voucher Register		Universal Enterprises		Ctrl + M	
List of All Sales Vouchers			1-Nov-2008 to 30-Nov-2008		
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount
5-11-2008	Manjunath Systems	Sales	72	28,080.00	
6-11-2008	Nirmaan Timbers	Sales	73	11,58,298.88	
10-11-2008	Worldwide Computers	Sales	74	3,45,700.00	
12-11-2008	AVT Computers	Sales	75	4,888.00	
16-11-2008	Bright Traders	Sales	76	3,47,640.00	
22-11-2008	AVT Computers	Sales	77	1,03,500.00	
25-11-2008	Hindustan Timbers	Sales	78	5,66,865.00	
26-11-2008	Global Traders	Sales	79	1,56,000.00	
26-11-2008	Silverplus Computers	Sales	80	5,22,500.00	
27-11-2008	Futura Systems	Sales	81	67,500.00	
30-11-2008	Modern Advertisers	Sales	82	7,303.40	
Total:				33,08,275.28	

Fig. 4.3.4: Sales Register screen

4.3.5 Journal Register

To generate **Journal Register**:

- ❑ Go to *Gateway of Tally > Display > Account Books > Journal Register > Journal Register*.
- ❑ Press **Enter** on the required month to view Journal Entries for a month.

Voucher Register		Universal Enterprises		Ctrl + M X	
List of All Journal Vouchers				1-Feb-2009 to 28-Feb-2009	
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount
12-2-2009	Vehicle Repairs & Maintenance	Journal	71	6,545.00	
15-2-2009	Commission Paid	Journal	72	15,000.00	
18-2-2009	Fuzitsy Systems	Journal	73		1,283.75
18-2-2009	Training & Orientation Expenses	Journal	74	9,300.00	
25-2-2009	Miscellaneous Expenses	Journal	75	2,580.00	
28-2-2009	Petrol Expenses	Journal	76	2,670.00	
28-2-2009	Carriage Inwards	Journal	77	1,250.00	
28-2-2009	Transportation & Packaging	Journal	78	5,000.00	
28-2-2009	Output VAT @ 12.5%	Journal	79	2,44,227.25	
28-2-2009	PF Admin Expense	Journal	80	331.90	
28-2-2009	VAT Adjustment A/c	Journal	81	72,071.25	

Fig. 4.3.5: Journal Register screen



4.3.6 Debit Note Register

To generate **Debit Note Register**:

- Go to *Gateway of Tally > Display > Account Books > Journal Register > Debit Note Register*.
- Press **Enter** on the required month to view Debit Notes for a month.

Voucher Register		Universal Enterprises		Ctrl + M	
List of All Debit Note Vouchers				1-Jan-2009 to 31-Jan-2009	
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount
12-1-2009	New Buzz Traders	Debit Note	3	260.00	
14-1-2009	Top Computers	Debit Note	4	364.00	

Fig. 4.3.6: Debit Note Register screen

4.3.7 Credit Note Register

To generate **Credit Note Register**:

- Go to *Gateway of Tally > Display > Account Books > Journal Register > Credit Note Register*.
- Press **Enter** on the required month to view **Credit Notes** for a month or press **F2** and specify the period.

Voucher Register		Universal Enterprises		Ctrl + M	
List of All Credit Note Vouchers				1-Apr-2008 to 31-Mar-2009	
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount
30-4-2008	Global Traders	Credit Note	1		624.00
3-5-2008	Computer Junction	Credit Note	2		24,960.00
1-8-2008	Computer Junction	Credit Note	3		520.00

Fig. 4.3.7: Credit Note Register screen

4.3.8 Day Book

To generate **Day Book**:

- Go to *Gateway of Tally > Display > Day Book*.
- Specify the required period to view transactions entered for that particular day, week and year or for any specified period.

Universal Enterprises						Ctrl + M
Day Book						1-Apr-2008 to 31-Mar-2009
Date	Particulars	Vch Type	Vch No.	Debit Amount	Credit Amount	
				Inwards Qty	Outwards Qty	
24-08-2008	HDFC Bank	Contra	1		20,000.00	
24-08-2008	Computer Junction	Receipt	1		50,440.00	
24-08-2008	Mohan's Share Capital A/c	Receipt	2		15,00,000.00	
24-08-2008	Computer Junction	Sales	1	51,420.00		
24-08-2008	InfoSoft Solutions	Sales	2	32,937.60		
24-08-2008	NextGen Systems	Purchase	1		98,800.00	
24-08-2008	Simco Machinery Co.,	Purchase	2		10,40,000.00	
24-08-2008	Cash	Purchase	3		832.00	
34-08-2008	Computer Junction	Receipt	3		49,920.00	
34-08-2008	Cash	Purchase	4		12,480.00	
34-08-2008	HP India Ltd.,	Purchase	5		1,03,500.00	
54-08-2008	HDFC Bank	Contra	2		50,000.00	
54-08-2008	InfoSoft Solutions	Receipt	4		32,937.60	
54-08-2008	Computer Junction	Sales	3	14,560.00		
54-08-2008	NextGen Systems	Purchase	6		72,800.00	
54-08-2008	Vinayaga Trading Corporation	Purchase Order	1		1,97,870.00	
64-08-2008	Travelling & Conveyance	Payment	1	1,500.00		
64-08-2008	Chandra Timbers	Purchase	7		12,10,781.00	
74-08-2008	Vinayaga Trading Corporation	Purchase	8		2,05,785.00	
74-08-2008	Wireless Mouse	Receipt Note	1		10 Nos	
84-08-2008	Janata Timbers	Sales	4	4,90,437.00		
94-08-2008	NextGen Systems	Payment	2	28,000.00		
94-08-2008	Arvind Kumar	Receipt	5		15,000.00	
94-08-2008	Arvind Kumar	Sales	5	26,000.00		
94-08-2008	Assembled PIV	Delivery Note	5		10 Nos	
94-08-2008	Assembled PIV	Mfg Journal	1		10 Nos	
104-08-2008	New Era Computers	Payment	3	2,920.00		
104-08-2008	Universal Systems	Sales	6	2,31,300.00		
104-08-2008	New Era Computers	Purchase	9		10,920.00	
124-08-2008	Arvind Kumar	Receipt	6		10,000.00	

Fig. 4.3.8: Day Book screen

4.3.9 Stock Summary

To view **Stock Summary**:

- Go to **Gateway of Tally > Stock Summary**.
- Press **F12: Configure**, set **Show Opening balance, Goods Inwards, Goods Outwards and Closing Balance** to **Yes**.

Universal Enterprises							Ctrl + M
Stock Summary							1-Apr-2008 to 31-Mar-2009
Particulars	Opening Balance		Inwards		Outwards		Closing Balance
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity Value
Accessories			9,600 Nos	67,370.00	8,805 Nos	87,252.00	795 Nos 15,792.76
CDROM Disks 100s	20 Box	9,000.00			15 Box	10,500.00	5 Box 2,250.00
CDROM Disks 10s	49 Box	7,940.00			46 Box	9,765.00	3 Box 231.25
CDROM Jackets	500 Box	7,500.00			495 Box	10,995.00	5 Box 75.00
Dust Covers	615 Nos	22,733.00			540 Nos	35,930.90	75 Nos 2,772.32
Flppy Disk	10 Box	1,000.00			6 Box	750.00	4 Box 400.00
Keyboard	10 Nos	5,500.00					10 Nos 5,500.00
Mouse	10 Nos	4,000.00					10 Nos 4,000.00
Mouse Pad	1,375 Nos	9,697.00			1,295 Nos	19,311.10	80 Nos 564.19
Components			79,01,690.00		80,03,602.10		2,573.22
USB Pen Drives 64 MB	442 Nos	6,73,920.00			441 Nos	6,72,273.50	1 Nos 1,524.71
Wireless Keyboard	534 Nos	3,69,770.00			533 Nos	4,26,194.65	1 Nos 692.45
Wireless Mouse	619 Nos	2,20,400.00			618 Nos	2,87,187.20	1 Nos 356.06
Computers			532 Nos 95,28,493.70		531 Nos 1,21,75,500.00		1 Nos
IBM	13 Nos	2,24,000.00			12 Nos	2,99,500.00	1 Nos
Defective Items			600.00				600.00
CDROM Disks 10s - Defective	5 Box	600.00					5 Box 600.00
Dot Matrix Printers			5,38,000.00		7,16,200.00		14,000.00
TVS MSP 245 132 Col Printer	30 Nos	2,43,000.00			29 Nos	3,29,000.00	1 Nos 8,100.00
TVS MSP 245 90 Col Printer	50 Nos	2,95,000.00			49 Nos	3,87,200.00	1 Nos 5,900.00
Laser Jet Printers			8,80,000.00		10,91,500.00		17,400.00
HP Laserjet 1010 Series	60 Nos	5,52,000.00			59 Nos	7,05,000.00	1 Nos 9,200.00
Samsung Laserjet 1500	40 Nos	3,28,000.00			39 Nos	3,86,500.00	1 Nos 8,200.00
IMFL	500 Lts	2,00,000.00			480 Lts	2,88,000.00	20 Lts 8,000.00
Main Location	500 Lts	2,00,000.00			480 Lts	2,88,000.00	20 Lts 8,000.00
Grand Total			3,12,81,966.20		3,85,07,054.10		13,58,831.73

Fig. 4.3.9: Stock Summary screen

4.4 STATEMENTS OF ACCOUNTS

Tally.ERP 9 provides us the capability to generate, print, mail or upload various statements and reports viz., Receivables, Payable statements, Ageing Analysis Report and so on.



4.4.1 Receivables and Payables

Accounts Receivables refer to amounts to be received from the sundry debtors while Accounts Payables are the amounts to be paid to sundry creditors. Tally.ERP 9 provides complete bill-wise information of amounts receivable as well as payable on party wise, group wise or Bill-wise.

To view **Outstandings**:

- ❑ Set **Maintain Bill-wise Details** to **Yes** in **F11: Accounting Features**.
- ❑ Create a **Party (Ledger A/c)** under **Sundry Debtors / Sundry Creditors** group.
- ❑ Set **Maintain balances bill by bill** to **Yes** for the parties during ledger creation.
- ❑ Go to **Gateway of Tally > Accounting Vouchers > Sales (F8) or Purchase (F9)** accordingly and enter the transaction by specifying a **Bill reference No.** along with **due dates** for the amount to be received or paid in the **Bill Allocations** for screen.

To view **Receivables / Payables Reports**:

- ❑ Go to **Gateway of Tally > Display > Statement of Accounts > Outstandings > Receivables**.

Bills Outstanding		Universal Enterprises		Ctrl + M	
Bills Receivable			1-Apr-2008 to 31-Mar-2009		
Date	Ref. No.	Partys' Name	Pending Amount	Due on	Overdue by days
5-Apr-2008	2	Computer Junction	14,560.00	4-Jun-2008	300
24-Apr-2008	071	Global Traders	1,50,356.00	1-May-2008	333
25-Apr-2008	8	Amar Computer Peripherals	15,000.00	25-Apr-2008	34
30-Apr-2008	9	Supreme Computers Peripherals	12,656.25	15-May-2008	32
1-May-2008	8	Horizon Systems	42,736.00	31-May-2008	30
5-May-2008	1254	Advview Consultants	12,000.00	5-May-2008	33
5-May-2008	10	Arvind Kumar	14,852.00	4-Jun-2008	30
5-May-2008	9	Computer Junction	52,000.00	4-Jun-2008	30
25-May-2008	20	Hindustan Timbers	5,97,724.88	25-May-2008	31
5-Jun-2008	23	Janata Timbers	5,76,061.00	5-Jun-2008	29
26-Jun-2008	32	S.V.S Computers	89,437.50	26-Jun-2008	27
2-Jul-2008	24	Computer Junction	79,040.00	1-Aug-2008	24
7-Jul-2008	22	Prism Softlinks	16,875.00	6-Aug-2008	23
19-Jul-2008	23	Venkateshwara Softwares	59,725.00	19-Jul-2008	25
26-Jul-2008	25	Step-in Computers	32,500.00	26-Jul-2008	24
27-Aug-2008	27	Sterling Business Solutions	14,062.50	27-Aug-2008	21
3-Sep-2008	29	Futura Systems	90.00	3-Sep-2008	20
5-Sep-2008	NEC/INV/0043	New Era Computers	707.00	5-Oct-2008	17
15-Sep-2008	30	Amar Computer Peripherals	4,680.00	15-Sep-2008	19
21-Sep-2008	31	Office Automation Systems	79,750.00	21-Sep-2008	19
8-Oct-2008	33	Gaitonde Traders	53,125.00	8-Oct-2008	17
18-Oct-2008	1397	Advview Consultants	3,000.00	18-Oct-2008	16
25-Oct-2008	35	Prism Softlinks	9,659.50	25-Oct-2008	15
25-Oct-2008	51	Universal Systems	2,600.00	9-Dec-2008	11
6-Nov-2008	70	Nirmaan Timbers	11,58,298.88	6-Nov-2008	14
22-Nov-2008	52	AVT Computers	58,388.00	22-Nov-2008	12
25-Nov-2008	74	Hindustan Timbers	5,66,865.00	25-Nov-2008	12
27-Nov-2008	38	Futura Systems	67,500.00	27-Nov-2008	12
			19 more ...		
			93,18,106.02		

Fig. 4.4.1: Bills Outstanding Report - Bills Receivables screen

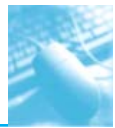
The report displays bill-by-bill outstanding for all the parties with the pending amount along with the due date.

To view amounts payable by the company, select **Payables** in the **Outstandings** menu. We can also toggle between **Payables** or **Receivables** reports, by clicking **F4**.

4.4.2 Ledgerwise outstanding

To view individual Party wise outstanding:

- ❑ Go to **Gateway of Tally > Display > Statement of Accounts > Outstandings > Ledger**.



Ledger Outstandings		Universal Enterprises		Ctrl + M	
Ledger : Zen Enterprises		1-Apr-2008 to 31-Mar-2009			
Date	Ref. No.	Opening Amount	Pending Amount	Due on	Overdue by days
12-Jun-2008	ZE/3571b	5,200.00 Cr	4,144.00 Cr	27-Jul-2008	247
21-Jun-2008	ZE/542	3,640.00 Cr	3,640.00 Cr	5-Aug-2008	238
21-Jan-2009	13	3,744.00 Dr	3,744.00 Dr	7-Mar-2009	24
		5,096.00 Cr	4,040.00 Cr		

Fig. 4.4.2: Ledger Outstandings Report screen

Tally.ERP 9 provides a report displaying bill-by-bill details of all outstanding for the selected party ledger with the total outstanding amount. To view details of cleared bills, press **F12: Configure** and enable the required options.

4.4.3 Groupwise Outstanding

To view **Group Outstanding Reports**:

- Select **Group** in the **Outstandings** menu and then select the specific **group** or **sub group**.

Group Outstandings		Universal Enterprises		Ctrl + M	
		South Debtors			
		Universal Enterprises			
		1-Apr-2008 to 31-Mar-2009			
		Pending Bills			
		Debit	Credit		
All India Computer Institute		25,320.00			
Amar Computer Peripherals		19,680.00			
Anind Kumar		40,852.00	41,360.00		
AVT Computers		58,388.00			
Computer Junction		1,45,600.00	51,940.00		
Fortune Computer Services		34,240.00			
Futura Systems		67,590.00			
Gaitonde Traders		53,125.00			
Global Traders		3,17,918.00			
Horizon Systems		42,736.00			
Office Automation Systems		79,750.00			
Prism Softlinks		26,534.50			
Silverplus Computers		12,86,800.00			
Step-in Computers		32,500.00			
Sterling Business Solutions		14,062.50			
Supreme Computers Peripherals		12,666.25			
S.V.S Computers		89,437.50	93,015.00		
Venkateshwara Softwares		59,725.00			
		24,06,914.75	1,86,315.00		

Fig. 4.4.3: Group Outstandings Report



4.4.4 Ageing Analysis Report

Tally.ERP 9 facilitates generation of **Ageing Analysis** reports for Outstandings. We can define various range of periods and view outstanding across the specified periods viz., we can specify 0 to 30 days, 30 to 45 days and 45 to 75 days and so on.

To view **Ageing Analysis Report**:

- ❑ Go to *Gateway of Tally > Display > Outstandings > Receivables or Payables*.
- ❑ Select **F6 (Age wise)**.
- ❑ Specify **Ageing Methods** and the **Periods**.

Bills Outstanding		Universal Enterprises		Clerk & Co.				
Bills Receivable				1-Apr-2008 to 31-Mar-2009				
Date	Ref. No.	Party's Name	Pending	0 to 30 days	30 to 60 days	60 to 90 days	90 to 120 days	120 days & above
			Amount					
2-Apr-2008	2	Computer Junction	14,560.00					14,560.00
20-Apr-2008	101	Global Traders	1,50,386.00					1,50,386.00
25-Apr-2008	8	Am Computer Polymark	15,000.00					15,000.00
30-Apr-2008	9	Sigma Computer Polymark	12,656.25					12,656.25
1-May-2008	8	Horizon Systems	42,736.00					42,736.00
5-May-2008	1254	Adiwe Consultants	12,000.00					12,000.00
5-May-2008	10	Arvind Kumar	14,852.00					14,852.00
5-May-2008	9	Computer Junction	52,000.00					52,000.00
25-May-2008	20	Hindustan Timbers	5,97,724.00					5,97,724.00
5-Jun-2008	23	Janata Timbers	5,76,061.00					5,76,061.00
20-Jun-2008	32	S.V.S. Computers	89,437.50					89,437.50
2-Jul-2008	24	Computer Junction	79,040.00					79,040.00
7-Jul-2008	22	Priam Softlinks	96,875.00					96,875.00
19-Jul-2008	23	Undersha Software	95,725.00					95,725.00
26-Jul-2008	25	Step-In Computers	32,500.00					32,500.00
27-Aug-2008	27	Stella Business Solutions	14,062.50					14,062.50
1-Sep-2008	29	Future Systems	90.00					90.00
5-Sep-2008	NEEDVED043	New Era Computers	787.00					787.00
19-Sep-2008	20	Am Computer Polymark	4,600.00					4,600.00
21-Sep-2008	31	Office Automation Systems	79,750.00					79,750.00
8-Oct-2008	33	Gallonde Traders	53,125.00					53,125.00
15-Oct-2008	1387	Adiwe Consultants	3,000.00					3,000.00
25-Oct-2008	35	Priam Softlinks	9,659.50					9,659.50
25-Oct-2008	51	Universal Systems	2,600.00					2,600.00
6-Nov-2008	70	Hindustan Timbers	11,29,258.00					11,29,258.00
22-Nov-2008	52	AVT Computers	98,388.00					98,388.00
25-Nov-2008	74	Hindustan Timbers	5,66,065.00					5,66,065.00
27-Nov-2008	38	Future Systems	67,500.00					67,500.00
								19 more
			91,08,166.82	39,84,118.13	6,41,870.30	9,07,040.00	37,84,245.51	

Fig. 4.4.4: Ageing Analysis Report

We may also view the **Ageing Analysis** report by **due date** or by **bill date**.

5.1 INTRODUCTION

Tally.ERP 9 provides us the capability to generate numerous advanced and critical Management Information System Reports and analytical tools, thereby facilitating better management, effective control and well-informed decisions.

Following are the some of analytical reports in Tally.ERP 9:

- ❑ Cash Flow Statement
- ❑ Fund Flow Statement
- ❑ Ratio Analysis
- ❑ Budgeting & Controls
- ❑ Bank Reconciliation Statement

5.2 CASH FLOW STATEMENT

Tally.ERP 9 facilitates generation of Cash flow statement, which displays the movement of cash flow viz., cash inflows and cash outflows (both, cash and bank) for a given period. The report also displays the net flow for any period.

To view **Cash Flow Summary**:

- ❑ Go to *Gateway of Tally > Display > Cash/Funds Flow > Cash Flow*.
- ❑ Select a **month** and press **Enter**.

Cash Flow Summary		Universal Enterprises		Ctrl + M	
Inflow	Universal Enterprises 1-Jan-2009 to 31-Jan-2009	Outflow	Universal Enterprises 1-Jan-2009 to 31-Jan-2009		
Loans (Liability)	30,000.00	Loans (Liability)	17,621.27		
Unsecured Loans	30,000.00	Unsecured Loans	17,621.27		
Current Liabilities	496.00	Current Liabilities	9,12,435.90		
Duties & Taxes	496.00	Duties & Taxes	88,000.00		
Current Assets	41,83,548.81	Sundry Creditors	7,07,052.61		
Sundry Debtors	41,83,548.81	EDLI Admin Charges @ 0.01%	2.90		
Sales Accounts	12,400.00	EDLI Contribution @ 0.5%	70.00		
Local Sales	12,400.00	Employee's ESI Contribution @ 1.75%	258.00		
		Employee's PF Contribution @ 12%	3,480.00		
		ESI Payable	600.00		
		Interest on Car Loan A/c	1,882.39		
		PF Admin Charges @ 1.10%	318.00		
		PF Payable	3,480.00		
		Professional Tax	670.00		
		Salary Payable	1,06,392.00		
		Direct Expenses	1,520.00		
		Assembling Charges	1,520.00		
		Indirect Expenses	19,227.75		
		Operating Expenses	19,227.75		
Total	42,26,444.81	Total	9,41,884.32		
	Net Inflow		32,84,639.09		

Fig. 5.2.1: Cash Flow Statement screen



To generate **Daily Cash Flow Statement**, press **F4**. To view information on the **average cash inflow/out flow** for any period, activate **Show Average Details** in **F12: Configure**.

5.3 FUND FLOW STATEMENT

Tally.ERP 9 facilitates generation of Fund Flow Statement, which displays the sources of the Funds and their applications. This report clearly indicates the movement in sources and application of funds impacting the business's working capital and cash position. It includes operational funds, increase and decrease in inventories, creditors/ debtors.

To view **Fund Flow Statement**:

- ❑ Go to *Gateway of Tally > Display > Cash/Funds Flow > Funds Flow*.
- ❑ Select any **month** and press **Enter**.

Funds Flow Summary		Universal Enterprises		Ctrl + M
Sources	Universal Enterprises 1-Mar-2009 to 31-Mar-2009	Applications	Universal Enterprises 1-Mar-2009 to 31-Mar-2009	
Fixed Assets	6,02,622.20	Loans (Liability)	39,121.27	
	6,02,622.20	Nett Loss	1,08,136.81	
		Unadjusted Forex Gain/Loss	292.50	
	1 more ...		1 more ...	
Total	6,02,622.20	Total	1,47,550.58	
Particulars		Opening Balance Closing Balance Wkg Cap Increase		
Current Assets		1,36,18,112.11 Dr	1,36,79,562.33 Dr	61,450.22
Current Liabilities		58,33,461.91 Cr	54,39,840.51 Cr	3,93,621.40
Working Capital		77,84,650.20 Dr	82,39,721.82 Dr	4,55,071.62

Fig. 5.3.1: Fund Flow Statement screen

5.4 RATIO ANALYSIS

Ratio Analysis is an indicator of the operating performance of a business. In Tally.ERP 9, we can generate Ratio Analysis report providing information on critical ratios (viz., operating cost percentage, return on working capital and so on) in a single report.

To view **Ratio Analysis Report**:

- ❑ Go to *Gateway of Tally > Ratio Analysis*.



Ratio Analysis		Universal Enterprises		Ctrl + M
Principal Groups	Universal Enterprises 1-Apr-2008 to 31-Mar-2009	Principal Ratios	Universal Enterprises 1-Apr-2008 to 31-Mar-2009	
Working Capital	82,39,721.82 Dr	Current Ratio	2.51 : 1	
(Current Assets-Current Liabilities)		(Current Assets : Current Liabilities)		
Cash-in-hand	10,19,901.25 Dr	Quick Ratio	2.26 : 1	
Bank Accounts	29,35,492.67 Dr	(Current Assets-Stock-in-hand : Current Liabilities)		
Bank OD A/c		Debt/Equity Ratio	0.04 : 1	
Sundry Debtors	65,16,336.68 Dr	(Loans (Liability) : Capital Account + Nett Profit)		
(due till today)	73,00,627.27 Dr	Gross Profit %	27.55 %	
Sundry Creditors	50,76,720.00 Cr	Nett Profit %	19.76 %	
(due till today)	48,62,156.00 Cr	Operating Cost %	80.24 %	
Sales Accounts	3,15,70,847.50 Cr	(as percentage of Sales Accounts)		
Purchase Accounts	2,41,98,697.50 Dr	Recv. Turnover in days	68.20 days	
Stock-in-hand	13,58,831.73 Dr	(payment performance of Debtors)		
Nett Profit	62,38,991.92 Cr	Return on Investment %	53.15 %	
Wkg. Capital Turnover	3.83	(Nett Profit / Capital Account + Nett Profit)		
(Sales Accounts / Working Capital)		Return on Wkg. Capital %	75.72 %	
Inventory Turnover	23.23	(Nett Profit / Working Capital) %		
(Sales Accounts / Closing Stock)				

Fig. 5.4.1: Ratio Analysis Report screen

5.5 BUDGETING & CONTROLS

Tally.ERP 9 helps us to create Budgets for different periods and compare the actual financial performance vs budgeted figures and generate variance reports. We can define budget values for each Group as well as for Ledgers.

To enable **Budgets**:

- ❑ Go to *Gateway of Tally > F11: Features > F1: Accounting Features*.
- ❑ Set **Maintain Budgets and Controls** to **Yes**.

To create **Budgets**:

- ❑ Go to *Gateway of Tally > Accounts Info. > Budgets > Create*.
- ❑ Specify **Name** for the **Budget**.
- ❑ Specify **Date** range for the budget.
- ❑ Set **Yes** to **Groups'/Ledgers** and assign budget to selected groups/ledgers.

To view **Budget Reports**:

- ❑ Select any report (i.e., Balance Sheet or Profit and Loss A/c or Trial Balance).
- ❑ Press **Alt + C (New Column)**.
- ❑ Specify details for **period**, **Currency** and **Method of Stock Valuation**.
- ❑ Select the created **budget name** for **Types of Value to show**.
- ❑ Set **Show Variance** to **No**.



Profit & Loss A/c Universal Enterprises Ctrl + M		
Particulars	Universal Enterprises Actuals 1-Apr-2008 to 31-Mar-2009	Universal Enterprises Expenditure Budget 1-Apr-2008 to 31-Mar-2009
Profit on Sale of Assets		
Profit on Sale of Fixed Assets		
Indirect Expenses	86,97,741.73	24,000.00
Depreciation on Fixed Assets	24,58,749.81	2,50,000.00
Interest & Finance Charges	6,02,622.20	
Operating Expenses	55,519.37	
Salaries & Remuneration Paid	3,33,568.75	1,24,000.00
Selling & Distribution Expenses	12,79,165.00	7,00,000.00
Employer ESI Contributions	19,400.00	5,000.00
Employer PF Contributions	8,668.00	
Bonus	44,596.49	
Business Promotion Expenses	50,000.00	
Depreciation	25,500.00	10,000.00
Discount		
Insurance Premium		
Interest Due		
Interest & Finance Charges		
Interest on Partner's Capital A/c		
Legal Fees	16,500.00	
Miscellaneous Expenses	13,210.00	8,000.00
PF Employers		
Repairs & Maintenance		3,000.00
Research & Development Expenses	10,000.00	
Rounding Off		
Nett Profit :	62,38,991.92	(-)2,74,000.00

Fig. 5.5.1: Budgeted Vs Actual Figures screen

Variance Analysis

In Tally.ERP 9, we can view **Variance Analysis** Report which provides information on the difference between the actual vs the budgeted figures.

To view **Variance Analysis** report, set **Show Variance** to **Yes** from the above **Insert Column (Alt+C)** screen or follow the steps given below:

- ❑ Go to **Gateway of Tally > Display > Trial Balance/Account Books (Group Summary)**.
- ❑ Select **Budget Variance (Alt + B)**.
- ❑ Select the **Type of budget** and press **Enter**.

Trial Balance Universal Enterprises Ctrl + M					
Particulars	Universal Enterprises 1-Apr-2008 to 31-Mar-2009		Universal Enterprises 1-Apr-2008 to 31-Mar-2009		Universal Enterprises 1-Apr-2008 to 31-Mar-2009
	Expenditure Budget		Actuals		Expenditure Budget Variance
	Closing Balance		Closing Balance		Closing Balance
	Debit	Credit	Debit	Credit	Debit Credit
Capital Account				55,00,000.00	
Loans (Liability)				4,63,216.03	
Current Liabilities			1,35,769.86	55,75,510.37	
Fixed Assets			40,65,111.88	6,02,622.20	
Investments			5,00,000.00		
Current Assets			1,24,09,735.66	89,005.06	
Sales Accounts		10,000.00		3,15,70,847.50	3,15,60,847.50 3568.67%
Purchase Accounts			2,41,94,697.50		
Direct Expenses	34,000.00		33,240.00	97.76%	760.00 2.235%
Indirect Expenses	2,50,000.00		24,62,249.81	984.90%	422,12,249.81 984.89%
Profit & Loss A/c		2,74,000.00		3,500.00	(-)2,74,000.00 (-)100%
Grand Total	2,84,000.00	2,84,000.00	4,38,04,804.71	15,64,23% 4,38,04,801.16 15,64,23%	(-)22,11,489.81 3,12,86,847.50

Fig. 5.5.2: Budget Variance Report screen



5.6 BANK RECONCILIATION STATEMENT

Tally.ERP 9 provides us the facility to reconcile the transactions of the company's Bank Book with the Bank Statement and instantly displays the Balance at Bank and as per the company's Bank Book.

To view **Bank Reconciliation Statement**:

- ❑ Go to *Gateway of Tally > Display > Account Books > Cash/Bank Book*.
- ❑ Select the required **Bank Account** and press **Enter** on the required month.
- ❑ Press **F5: Reconcile**.
- ❑ **Enter** the date of clearing (**Bank Date**), date on which the transaction is being debited/ credited, from the Bank Statement.

Bank Reconciliation		Universal Enterprises		Ctrl + M	
Ledger: HDFC Bank		(Reconciliation - All Vouchers)		1-Jun-2008 to 30-Jun-2008	
Date	Particulars	Vch Type	Bank Date	Debit	Credit
2-4-2008	Cash	Contra	2-4-2009		20,000.00
2-4-2008	Capital	Receipt	2-4-2009	55,00,000.00	
5-4-2008	Cash	Contra	2-4-2009		50,000.00
2-4-2008	Computer Junction	Receipt	5-4-2009	50,440.00	
9-4-2008	NextGen Systems	Payment	15-4-2009		28,000.00
13-4-2008	NextGen Systems	Payment	17-4-2009		4,680.00
18-4-2008	New Buzz Traders	Payment	22-4-2009		4,500.00
26-4-2008	Hyundai Motors (I) Pvt. Ltd.,	Payment	30-4-2009		2,00,000.00
30-4-2008	Travelling & Conveyance	Payment	3-5-2009		21,650.00
30-4-2008	Assembling Charges	Payment	3-5-2009		1,520.00
3-5-2008	Canara Bank	Contra	3-5-2009		2,00,000.00
8-5-2008	Jet Roadways (P) Ltd.,	Payment	12-5-2009		8,000.00
17-5-2008	Canara Bank	Contra	17-5-2009		3,00,000.00
15-5-2008	Office Automation Systems	Receipt	20-5-2009	1,00,000.00	
25-5-2008	Cholamandalam Auto Finance Coy.,	Payment	30-5-2009		19,603.66
30-5-2008	Cash	Contra	30-5-2009		1,00,000.00
29-5-2008	D R D O, Bangalore	Receipt	3-6-2009	1,00,000.00	
31-5-2008	Assembling Charges	Payment	4-6-2009		1,520.00
31-5-2008	D R D O, Bangalore	Receipt	4-6-2009	2,31,300.00	
6-6-2008	Jain Realtors	Payment	12-6-2009		4,00,000.00
8-6-2008	Jet Roadways (P) Ltd.,	Payment	15-6-2009		8,500.00
18-6-2008	Top Computers	Payment	22-6-2009		3,65,840.00
22-6-2008	TVS Electronics (I) Ltd.,	Payment	26-6-2009		2,00,000.00
29-6-2008	Cash	Contra	29-6-2009		1,00,000.00
25-6-2008	Cholamandalam Auto Finance Coy.,	Payment	30-6-2009		19,603.66
30-6-2008	Assembling Charges	Payment	3-7-2009		1,520.00
30-6-2008	D R D O, Bangalore	Receipt	4-7-2009	5,00,000.00	
30-6-2008	D R D O, Bangalore	Receipt	4-7-2009	2,00,000.00	
Balance as per Company Books :				26,11,264.33	
Amounts not reflected in Bank :				66,94,992.48	37,83,728.15
Balance as per Bank :					3,00,000.00

Fig. 5.6.1: Bank Reconciliation Report screen

We can predefine the date of reconciliation for transactions starting from where we want to reconcile, by specifying the **Effective Date of Reconciliation** in the **Bank Ledger Master**.

LEARNING OBJECTIVES

- What is e-filing?
- Understanding the procedure of e-filing
- Special points about e-filing process
- Overview on GST

6.1 INTRODUCTION

E-filing of tax returns and other documents is a major change in Indian tax administration scenario. In this era of information technology, everything is changing to “electronic” format. Change in tax administration was much awaited and expected. Today, all major tax administration matters are converted to electronic format. This has proved to be a big step towards increasing transparency and efficiency in tax administration.

6.2 WHAT IS E-FILING?

In simple words, it is giving information to tax authorities in electronic format. Giving information in electronic format is much easier for assessee as well as tax authorities.

Difference between e-filing and paper filing :

Sr.	Particulars	E-filing	Paper Filing
1	Convenience	Can be filed during any time of day. There is no concept called as office working hours.	To be filed during office working hours only.
2	Place of filing	Can be filed from anywhere in the world. No concept of office place for filing.	To be filed at a particular office only.
3	Possibility of errors	Very less as all possible electronic checks and controls are there.	Very high as there can not be any control or check before filing of return.
4	Processing of returns	Very fast	Very slow



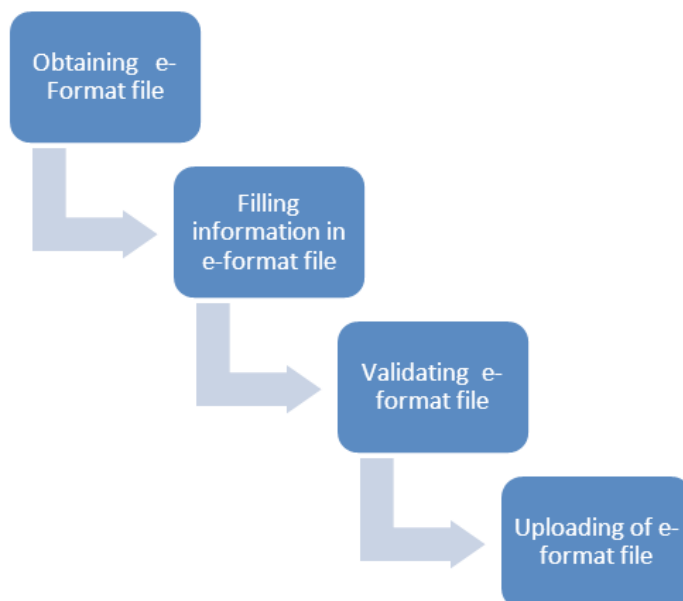
5	Obtaining information from tax authorities	Status of return processing, status of refund, etc. can be obtained within minutes as all the information is stored on the website only. Also, it is possible to obtain the information without any human intervention.	It is very difficult and time consuming to obtain any type of information.
6	Chances of Malpractices	Low	High
7.	Access to past records	The documents filed with tax authorities can be retrieved at later date for further use like obtaining loans, preparation for tax assessments, verification of historical records	Majority of documents were filed in physical form will require individual to retain these documents in secure form. Where original copies get mutilated, lost, destroyed will cause lots of problems to the assessee.

6.3 TYPES OF E-FLING

1. E-filing for Income Tax
2. E-filing for Service Tax
3. E-filing for Company Law
4. E-filing for GST

6.3.1 Common E-filing process:

By and large e-filing process is mostly common. In some cases it may differ to some extent. Following flow chart gives a broad idea of e-filing process.





(a) Obtaining e-format file :

This is the first step in e-filing process. In some cases, this step may not be needed. File formats are designed by tax authorities for filing of e-returns. The tax authorities each year at the beginning of the year notified tax returns format including the e-filing format in excel and other java based format for filing. These file formats have to be obtained first. E.g. for filing of income tax return of a practicing chartered accountant, the appropriate return form is ITR-3. This is an excel file and this file can be downloaded from www.incometaxindiaefiling.gov.in, the official website for e-filing of tax returns with income tax department. Similarly, various other formats are available on websites of different tax authorities for filing of returns. Assessee has to select and download the correct format for e-filing.

(b) Filling information in e-format file :

This is the next step after obtaining the e-format file. Information relating to tax compliance has to be filled in in this file. There are two ways of doing it.

- (a) Filling the information manually
- (b) Using some software for filling of information.

In some cases, due to typical file format, it is not possible for any human being to fill the information manually. In such cases, some software has to be used for filling of information in e-file format.

(c) Validating e-format file :

This is a process where e-file format is checked for mistakes/errors. Different types of errors can be committed while filling the information. E.g. Calculation of tax payable on taxable income, Interest payable on late payment of advance tax or setoff of carried forward losses by the assessee, date of filing return may not be a current date, PAN details of assessee may not be filled correctly, etc. These types of mistakes can be easily detected in the process of file validation. In some cases, file validation utility is built in in the e-file format itself. In some cases, it may be used externally. File validation utility is software, which checks for mistakes in the file. Once the file get validated the utility program showing errors and once these have been removed the e-filing file will be generated specified format as per tax authorities.

Uploading e-format file :

Once the file is validated and % error free, it can be uploaded on the website of respective tax authority. This is actual submission of information. It is just like attaching the file to an email. There are two types of uploading.

- (a) Uploading by assessee directly.
- (b) Uploading by agent of tax authority.

E.g. Income tax return has to be uploaded by the assessee directly, but TDS return can be uploaded by the assessee or through an tax intermediary. It has to be given to authorize TIN Facilitation Centre only.

After successful uploading of any tax return, acknowledgement is generated automatically. This can be printed immediately or later on also.



6.3.2 Income Tax E-Filing

Introduction:

Income tax return has to be filed by every assessee every year. For e-filing of income tax returns all the assesses are classified in two parts.

Individual / HUF

Firm, Association of Persons, Body of Individuals, Local Authority, Company, Trust,

ITR Forms for Individual, HUF :

Sr	Source of Income	Individual, HUF			
		ITR-1	ITR-2	ITR-3	ITR-4S
1	Income from Salary/Pension	•	•	•	•
2	Income from Other Sources (only Interest Income or Family Pension)	•	•	•	•
3	Income/Loss from Other Sources		•	•	•
4	Income/Loss from House Property		•	•	•
5	Capital Gains/Loss on sale of investments/property		•	•	
6	Partner in a Partnership Firm		•	•	
7	Income from Proprietary Business/Profession			•	
8	Income from presumptive Business			•	

Table 6.3.1 (A): ITR Forms for Individual, HUF

ITR Forms for Firms, Associations of Persons (AOP), Body of Individuals (BOI), Local Authority, Companies, Trusts, Fringe Benefit Tax (FBT) Return

Sr.	Source of Income			Trusts	Only FBT
		ITR4/ ITR-5	ITR-6	ITR-7	ITR-8 #See Note
1	Income / Loss from Other Sources	•	•	•	
2	Income / Loss from House Property	•	•	•	
3	Capital Gains / Loss on sale of Investments / Property	•	•	•	
4	Income / Loss from Business	•	•	•	
5	Fringe Benefit Tax	•	•	•	•

Table 6.3.1 (B): ITR Forms for Firms, AOP,BOI,Trust,FBT

#Note: ITR-8 is discontinued for e-Filing from AY 2010-11 onwards, still continued for AY 2007-08, 2008-09, 2009-10.

**List of Income Tax Returns:**

List of ITRs		
Return Type	Who can use this Return Form	Who cannot use this Return Form
ITR 1 (Sahaj)	1. This Return Form is to be used by an Individual whose Total Income for the assessment year 2017-18 includes - - Income from Salary/ Pension; or - Income from One House Property (excluding cases where loss is brought forward from previous years); or - Income from Other Sources (excluding winning from lottery and income from Race Horses, Income taxable under section 115BBDA or Income of the nature referred to in section 115BBE) Note: Further, in a case where the Income from another person like Spouse, Minor Child, etc. is to be clubbed with the income of the assessee, these Return Form can be used only if the Income being clubbed falls under the above categories	This Return Form should not be used by an Individual whose Total Income for the assessment year 2017-18 includes - Income from more than one house property; or - Income from winnings from lottery or income from Race horses; or - Income taxable under section 115BBDA; or - Income of the nature referred to in section 115BBE; or - Income under the head "Capital Gains" e.g., short-term capital gains or long-term capital gains from sale of house, plot, shares etc.; or - Agricultural income in excess of ₹5,000; or - Income from Business or Profession; or - Loss under the head 'Income from other sources'; or - Person claiming relief under section 90 and/ or 91; or - Any resident having any asset (including financial interest in any entity) located outside India or signing authority in any account located outside India; or - Any resident having income from any source outside India.
ITR 2	This Return Form is to be used by an individual or an Hindu Undivided Family who is not eligible to file Sahaj ITR-1 and whose income chargeable to income-tax under the head "Profits or gains of business or profession" is in the nature of interest, salary, bonus, commission or remuneration, by whatever name called, due to, or received by him from a partnership firm.	This Return Form should not be used by an individual whose total income for the assessment year 2017-18 includes Income from Business or Profession under any proprietorship.



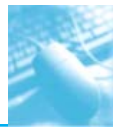
	Note: In a case where the Income from another person like spouse, minor child, etc. is to be clubbed with the income of the assessee, these Return Form can be used where such income falls in any of the above categories	
ITR 3	This Return Form is to be used by an individual or a Hindu Undivided Family who is carrying out a proprietary business or profession.	
ITR 4	This Return Form is to be used by an individual/ HUF/ Partnership Firm whose total income for the assessment year 2017-18 includes:- ● Business income where such income is computed in accordance with special provisions referred to in sections 44AD and 44AE of the Act for computation of business income; or ● Income from Profession where such income is computed in accordance with special provisions referred to in sections 44ADA; or ● Salary/ Pension; or ● Income from One House Property (excluding cases where loss is brought forward from previous years); or ● Income from Other Sources (excluding Winning from Lottery and Income from Race Horses). Note 1: The income computed shall be presumed to have been computed after giving full effect to every loss, allowance, depreciation or deduction under the Income-tax Act.	This form cannot be used in following cases ● Income from more than one house property; or ● Income from Winnings from lottery or income from Race horses; or ● Income under the head “Capital Gains”, e.g. Short-term capital gains or long-term capital gains from sale of house, plot, shares etc.; or ● Income taxable under section 115BBDA; or ● Income of the nature referred to in section 115BBE; or ● Agricultural income in excess of ₹5,000; or ● Income from Speculative Business and other special incomes; or ● Income from an agency business or income in the nature of commission or brokerage; ● Person claiming relief of foreign tax paid under section 90, 90A or 91; or ● Any resident having any asset (including financial interest in any entity) located outside India or signing authority in any account located outside India; or ● Any resident having income from any source outside India.



	Note 2: Further, in a case where the income of another person like spouse, minor child, etc. is to be clubbed with the income of the assessee, this Return Form can be used only if the income being clubbed falls into the above income categories.	
ITR 5	This Form can be used by a person being a firm, LLPs, AOP, BOI, artificial juridical person referred to in section 2(31)(vii), persons referred to in section 160(1)(iii) or (iv), cooperative society, registered societies and local authority.	A person who is required to file the return of income under section 139(4A) or 139(4B) or 139(4C) or 139(4D) or 139(4F) shall not use this form
ITR 6	This Return Form can be used by a Company	A Company claiming exemption under section 11 shall not use this Form
ITR 7	This Form can be used by persons including Companies who are required to furnish return under section 139(4A) or 139(4B) or 139(4C) or 139(4D).	
ITR 8	This Form is applicable in case of a person who is not required to furnish the return of income but is required to furnish the return of fringe benefits. Note: This Form is applicable from assessment year 2006-07 to 2009-10	

Table 6.3.1 (C): List of Income Tax Returns

Source : www.incometaxindiaefiling.gov.in



6.4 OVERVIEW OF E-FILING WEBSITE:

E-filing website of income tax department has been upgraded recently.



Fig. 6.4.1 E-filing website

E-filing website has become much more user friendly now. So many new features are added for increasing transparency. The first step for using income tax e-filing website is to register with it. Registration process is simple process just like creating an email account.

To register for the first time,

- Click on the “Register Yourself” button located on top right part of the website home screen.
- Select the user type, e.g. Individual, HUF, Company, etc.
- Fill in the required information like PAN, Name, Email ID, Mobile No, etc.
- Save the information.
- Linking of Aadhar of the assessee is not made mandatory w.e.f 1 July, 2017 onward

This is a one time activity only. Once registration is over, a user is allowed to enter into his/her own account and do lot of activities including uploading of his/her income tax return.

Some activities can be carried out on website without registration also.

Services offered by e-filing website:

Following are the services offered by e-filing website.

- Submit returns/ forms
- View Form 26AS (Tax Credit)
- Check the details of outstanding tax demand
- Check ITR-V receipt status



- Check CPC Refund Status
- Check rectification status
- Know your jurisdictional A.O.
- Know your PAN
- Know your TAN
- Apply online for PAN / TAN
- E-pay taxes
- Request for Reissue of Refund
- Changes in the address, bank details, Email-ID and Contact details

6.4.1 e-Filing Statistics:

Following two tables shows the figures relating status of e-filing till 31.05.2017.

Form Wise receipt of e>Returns:

	Form	FY 2015-16 (From 01/04/2015 to 31/03/2016)	FY 2016-17 (From 01/04/2016 to 31/03/2017)	FY 2017-18 (From 01/04/2017 to 31/05/2017)
1	ITR-1	1,79,46,687	2,14,55,515	8,98,887
2	ITR-2(OLD)	22,36,078	21,89,065	46,121
3	ITR-2(NEW)	-	-	78,538
4	ITR-2A	11,74,205	16,72,759	37,317
5	ITR-3(OLD)	8,88,598	9,66,823	27,406
6	ITR-3(NEW)	-	-	1,52,725
7	ITR-4S	81,35,210	1,18,57,709	5,57,798
8	ITR-4(OLD)	1,06,46,974	1,23,90,871	4,99,376
9	ITR-4(NEW)	-	-	3,85,679
10	ITR-5	12,52,465	12,61,922	38,007
11	ITR-6	7,78,069	8,01,115	18,407
12	ITR-7	2,85,451	2,72,258	10,764
Grand Total		4,33,43,737	5,28,68,037	27,51,025

Table 6.4.1 (A): Status of e-filing till 31.5.2017

Income Range & Status Wise e-Filing Returns (FY 2017-18 From 01/04/2017 to 31/05/2017)



Income Range	U p t o 5,00,000	5,00,001 - 10,00,000	10,00,001 -20,00,000	20,00,001 -50,00,000	50,00,001 -	A b o v e
Association Of Persons	6,961	139	70	37	13	32
Body Of Individuals	273	8	2	1	-	2
Company	13,990	677	568	651	404	1,237
Firm	30,110	910	526	372	130	202
Government	5	-	-	-	-	-
Hindu Un-divided Family	30,488	2,925	671	167	37	13
Artificial Juridical Person	546	8	-	3	2	2
Local Authority	134	1	-	1	-	3
Individual	23,03,862	1,73,910	37,964	10,769	2,175	1,155
Trust	9,410	193	53	26	8	13
Grand Total	23,95,779	1,78,771	39,854	12,027	2,769	2,659

Table 6.4.1 (B): Income range & Status wise of e-filing till 31.5.2017

Highlights of e-Filing

No of Registered Users as on 31/05/2017	6,32,49,130
Percentage of returns filed using Utility provided by Department	47.62%
Percentage of returns received outside office hours	47.29%

Table 6.4.1 (C): Highlights of e-filing

What is digital signature certificate?

- Technically, a digital signature is a mathematical scheme for demonstrating the authenticity of a digital message or document. A valid digital signature gives a recipient reason to believe that the message was created by a known sender, such that the sender cannot deny having sent the message (authentication and non-repudiation) and that the message was not altered in transit (integrity). Digital signatures are commonly used for software distribution, financial transactions, and in other cases where it is important to detect forgery or tampering.
- Digital Signature Certificates (DSC) are the digital equivalent (that is electronic format) of physical or paper certificates. Examples of physical certificates are drivers' licenses, passports or membership cards. Certificates serve as proof of identity of an individual for a certain purpose; for example, a driver's license identifies someone who can legally drive in a particular country. Likewise, a digital certificate can be presented electronically to prove your identity, to access information or services on the Internet or to sign certain documents digitally.
- Like physical documents are signed manually, electronic documents, for example e-forms are required to be signed digitally using a Digital Signature Certificate.



- A licensed Certifying Authority (CA) issues the digital signature. Certifying Authority (CA) means a person who has been granted a license to issue a digital signature certificate under Section 24 of the Indian IT-Act 2000.
- The different types of Digital Signature Certificates are: Class 2: Here, the identity of a person is verified against a trusted, pre-verified database.
- Class 3: This is the highest level where the person needs to present himself or herself in front of a Registration Authority (RA) and prove his/ her identity.
- The Certifying Authorities are authorized to issue a Digital Signature Certificate with a validity of one or two years.
- Digital Signatures are legally admissible in a Court of Law, as provided under the provisions of IT
- Price of a digital signature may vary from vendor to vendor. It includes the cost of medium (a UBS token which is a one time cost), the cost of issuance of DSC and the renewal cost after the period of validity. The company representatives and professionals required to obtain DSCs are free to procure the same from any one of the approved Certification Agencies as per the web site. The issuance costs in respect of each Agency vary and are market driven. However, for the guidance of stakeholders, a suggestive list showing costs of issuance of DSCs at the consumer end from the Certification Agencies is given as under.

Sr.	Name of Certification Agency (CA)	Cost of USB Cryptotoken	Cost of DSC with one year validity	Renewal Charges for DSC with one year validity	Cost of DSC with two year validity	Support charges
1.	MTNL CA	Reference of USB crypto token which the user can procure is provided on www.mtnltrustline.com .	Rs. 300/- (for MTNL phone subscriber) and Rs. 450/- for others (Taxes extra)	Rs. 300/- (for MTNL phone subscriber) and Rs. 450/- for others (Taxes extra)	Rs. 400/- (for MTNL phone subscriber) and Rs. 600/- for others (Taxes extra)	Inclusive
2.	TCS	Rs. 750 (Inclusive of 4% Sales Tax). Any other applicable Taxes Extra.	Rs. 1245 (Inclusive of 12.24% Sales Tax.) Any other applicable Taxes Extra.	Rs. 1000/- (Inclusive of 12.24% Sales Tax) Any other applicable Taxes Extra	Rs. 1900/- (Inclusive of 12.24% Sales Tax) Any other applicable taxes Extra	Not Provided by CA
3.	IDBRT	Not provided by the CA. The user can procure the token from market directly and get his DSC loaded into it	Rs. 750/- (Rs. 500/- towards	Rs. 750/-	Rs. 1500/-	Inclusive



4.		Rs. 1000/- Taxes extra	Rs. 995/- (No service tax applicable)	Rs. 995/- (No service tax applicable)	Rs. 1650/- (No service tax applicable)	Rs. 500/- per site visit payable directly to the Authorised Partner.
5.	nCODE Solutions	Rs. 900/- (Inclusive of VAT/ Sales Tax)	Rs. 1090/- (No service tax applicable)	Not Finalised	Rs. 1650/- (No service tax applicable)	Inclusive
6.	NIC	Certificate provided in Smart card. Cost of Card Rs. 400/-. For DSCs on USB token, the subscribers have to bring NICCA approved USB token	All certificates provided with 2 years validity	NIL	NIL for Government Rs. 150/- for PSU, Autonomous & Statutory Bodies	Training Charges: Rs. 500/- per participant (optional)
7.	Central Excise & Customs	Does not issue DSCs to person other than those from the Department				
8.	e-Mudhra (3i Infotech Consumer Services Limited)	Rs 700/- • Exclusive of VAT / Sales Tax / Courier charges	Rs. 899/- • Service tax not applicable	Rs. 899/- • Service tax not applicable	Rs. 1149/- • Service tax not applicable	Inclusive of Telephonic or Web support

Table 6.4.1: Name of Certification agencies

What is Electronic Verification Code (EVC) ?

Now w.e.f from Assessment Year 2015-16 the taxpayer can file verify their income return using Electronic verification code and thereafter they need not required to furnish physical copy of the ITRV to the CPC Bangalore within 120 days from the date of Income tax return filed online.

The verification of the ITR by the taxpayer would be possible by submitting an Electronic Verification Code (EVC) which can be generated presently by any of the following modes:

(a) Internet Banking –

In this process a person (with a PAN validated by the bank) can log in to his Net-banking account with a bank registered for this purpose with the Department and will be redirected to the E-filing website (by selecting appropriate option) where he can generate a EVC.

(b) Aadhaar One-Time Password (Aadhaar OTP) –

In this process, the Aadhaar number and the data of name, gender and Date of birth of the person as per the Permanent Account Number (PAN) database would be authenticated against the data of Aadhaar maintained by the Unique Identification Authority (UIDAI). On confirmation UIDAI would send an OTP to the Aadhaar registered mobile number of the person.



(c) Bank Account Validation –

In this process the taxpayer would submit his bank account particulars which would be instantly validated with the bank electronically to confirm the PAN of taxpayer submitted during KYC done by the bank after which taxpayer would be able to generate a EVC for submission of the return.

(d) Demat Account Validation –

In this process the taxpayer would submit his demat account particulars which would be instantly validated with NSDL/CDSL depositories electronically to confirm the PAN of taxpayer submitted during KYC done by the depository after which taxpayer would be able to generate a EVC for submission of the return.

(e) EVC through ATM –

In this process the taxpayer would log in to account in the ATM using his debit card and select the option to generate EVC.

(f) E-filing One Time Password (OTP)-

A person having total income as per the Income Tax Return of Rs. 5 lakhs or below without any refund claim, can generate an EVC on the Efiling website that will be sent to the Registered Email ID and Mobile Number of person with E-filing Website.

6.4.2 Steps for e-filing of income tax returns:

Before we discuss about the steps for e-filing of income tax returns, it is necessary to understand for whom it is mandatory and for whom it is optional.

E-filing of income tax returns / forms has been made mandatory for –

- Individual/HUF having total income of Rupees 5 Lakhs and above for AY 2015-16 and subsequent Assessment years.
- Individual/HUF, being resident, having assets located outside India for AY 2012-13 and subsequent Assessment years.
- He is not ordinary resident and has assets (including financial interest in any entity) located outside India or signing authority in any account located outside India or any income outside India.
- Individual/HUF/Firm auditable u/s 44AB of the IT Act, 1961 for AY 2011-12 and subsequent Assessment years.
- All companies/partnership form/Limited liability partnership firms
- Digital Signature is mandatory for Companies and Tax Payers audited u/s 44AB as per Income Tax Act 1961

There can be three types of e-filing options in case of income tax returns.

Option 1: Use Digital Signature Certificate (DSC)/EVC to e-File. There is no further action needed, if filed with a DSC/EVC.



Option 2: e-File without Digital Signature Certificate. In this case an ITR-V Form is generated. The Form should be printed, signed and submitted to CPC, Bangalore using Ordinary Post or Speed Post ONLY within 120 days from the date of e-Filing. There is no further action needed, if ITR-V Form is submitted.

Option 3: e-File the Income Tax Return through an e-Return Intermediary (ERI) with or without Digital Signature Certificate (DSC).

6.4.3 E-filing Steps:

To upload Income Tax Return:

- Step 1: On homepage, GO TO 'Downloads' section and select applicable Income Tax Return Form of the relevant Assessment Year OR Login to e-Filing application and GO TO 'Downloads' --> 'Income Tax Return Forms' and select applicable Income Tax Return Form of the relevant Assessment Year.
- Step 2: Download the excel utility of the Income Tax Return (ITR).
- Step 3: Fill the excel utility and Validate. (You can pre-fill the Personal and Tax Information in your Income Tax Return. To pre-fill, Login to e-Filing application and GO TO --> Downloads --> Download Pre-filled XML to the desired path/ destination in your desktop/system. Open the Excel utility (ITR) and click the "Pre-fill" button. This will require you to select the path/ destination where you have saved the XML and click OK. The details will be uploaded into your utility. You may edit the tax details, if needed).
- Step 4: Generate an XML file and save in desired path/ destination in your desktop/system.
- Step 5: LOGIN to e-Filing application and GO TO --> e-File --> Upload Return.
- Step 6: Select the Income Tax Return Form and the Assessment Year.
- Step 7: Browse and Select the XML file
- Step 8: Upload Digital Signature Certificate, if available and applicable.
- Step 9: Click 'SUBMIT'.
- Step 10: On successful upload, the return can be verified electronically
- Step 11: Four e-Verification options provided – Taxpayer can choose any one of the options provided to e-Verify the return:
 - ◆ I already have an EVC to e-Verify the return
 - ◆ I do not have an EVC and I would like to generate EVC to e-Verify my return
 - ◆ I would like to generate Aadhaar OTP to e-Verify my return
 - ◆ I would like to send ITR-V / I would e-Verify later

Note:

- You can upload the returns after you have registered in e-Filing.
- To e-File using Digital Signature Certificate (DSC), the DSC should be registered in the application. (To register DSC, you should LOGIN and GO TO --> Profile Settings --> Register Digital Signature Certificate)



- If the Income Tax Return is uploaded with DSC (digitally signed) or EVC (electronically verified), on generation of “Acknowledgement”, the Return Filing process is complete. The return will be further processed and the Assessee will be notified accordingly. Please check your emails on these notifications.
- If the return is not uploaded with a DSC (digitally signed) or EVC (electronically verified), on successful upload of e-Return, an ITR-V Form will be generated. This is an Acknowledgement cum Verification form. A duly verified ITR-V form should be signed and submitted to Centralized Processing Centre, Income Tax Department, Bengaluru 560500 by Ordinary Post or Speed Post (without Acknowledgment) ONLY, within 120 days from the date of e-Filing.
- On receipt of the ITR-V at CPC, the return will be further processed and the Assessee will be notified accordingly. Please check your emails on these notifications

6.4.4 E-filing without DSC/EVC :

The process of e-filing remains the same in both the case, with digital signature/Electronic Verification Code and without digital signature, except one additional step. E-filing without Digital Signature Certificate requires one more step of sending the acknowledgement to CPC at Bengaluru. After successful upload of income tax return, assessee has to take a printout of ITR-V, acknowledgement of income tax return, sign it and send it to Central Processing Centre at Bengaluru to complete the return filing process. This signed acknowledgement must reach Central Processing Centre within 120 days of uploading the return.

6.4.5 Important Points about ITR-V :

- Please use Ink Jet /Laser printer to print the ITR-V Form. Use of Dot Matrix printer should be avoided.
- The ITR-V Form should be printed only in black ink. Do not use any other ink option to print ITR-V.
- Ensure that print out is clear and not light print/faded copy.
- Please do not print any water marks on ITR-V. The only permissible watermark is that of “Income tax Department” which is printed automatically on each ITR V.
- The document that is mailed to CPC should be signed in Original. Photocopy of signatures will not be accepted.
- The signatures or any handwritten text should not be written on Bar code.
- Bar code and numbers below barcode should be clearly visible.
- Only A4 size white paper should be used.
- Avoid typing anything on the reverse side of the paper.
- Perforated paper or any other size paper should be avoided.
- Do not use stapler on ITR-V Acknowledgement.
- In case, you are submitting Original and Revised Income Tax Returns, do not print them back to back. Use two separate papers for printing ITR-Vs separately.



- Please do not submit any annexures, covering letter, pre stamped envelopes, along with ITR-V.
- The ITR-V form is required to be sent to Post Bag No.1, Electronic City Post Office, Bengaluru, Karnataka-560100, by Ordinary or Speed Post (without Acknowledgment) ONLY
- ITR-Vs that do not conform to the above specifications may get rejected or acknowledgement of receipt may get delayed.

6.4.6 E-Filing with DSC:

Here, there is no need of sending ITR-V acknowledgement to CPC, Bengaluru as the return is signed by the assessee digitally. While uploading income tax return, a question is asked as “Do you want to digitally sign ?”. Answer to this question must be set to “YES” to upload the return with digital signature certificate.

Fig.6.4.5: E-filing with Digital Signature

Registration of Digital Signature Certificate:

This is an activity to be performed before uploading the income tax return with digital signature certificate.

Path : Profile Settings > Register Digital Signature Certificate.

Select appropriate option and submit.

Fig. 6.4.6 (A): Registration of Digital Signature

Steps for register of Digital Signatures

Step1: - Download ITD e-filing DSC management Utility from the link provided in e-Filing website at the time of XML upload



- Step2: - Extract the zip folder and open the utility (DSC_MGMT_UTILITY.jar)
- Step3: - The utility will get opened as mentioned below. Select Register/Reset Password Using DSC tab.

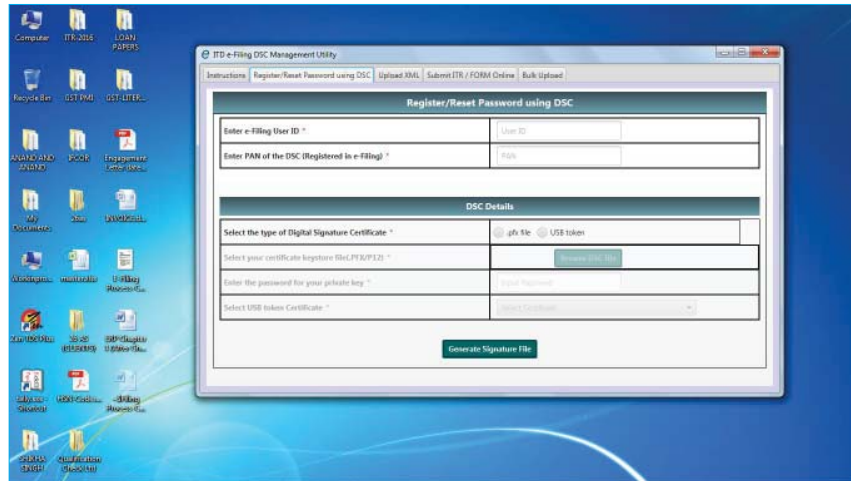


Fig.6.4.6 (B): Registration of Digital Signature

- Step 4: - Enter the e-Filing User ID.
- Step 5: Enter the PAN of the DSC registered in e-Filing. In case of NRI User this is not a Mandatory Field
- Step 6: Select the type of DSC
- Step 7: Select a valid USB token certificate
- Step 8: Enter the USB token PIN and then click OK.

A success message will be displayed and signature file will be generated and saved at the location where XML was stored.

Steps for uploading of Income Tax Return by Professionals:

- Step 1: GO TO 'Downloads' section and select applicable Income Tax Form of the relevant Assessment Year OR Login to e-Filing application and GO TO 'Downloads' --> 'Download Forms' and select applicable Income Tax Form of the relevant Assessment Year.
- Step 2: Download the excel utility of the Income Tax Form
- Step 3: Fill the excel utility and Validate
- Step 4: Generate an XML file and save in desired path/ destination in your desktop/system.
- Step 5: LOGIN to e-Filing application and GO TO --> e-File --> Upload Form.
- Step 6: Select the Income Tax Form and the Assessment Year.
- Step 7: Browse and Select the XML file
- Step 8: Upload Digital Signature Certificate.



- Step 9: Click 'SUBMIT'.
- Step 10: On successful upload, the Income Tax Form is sent to Assessee's workflow for acceptance.
- Step 11: The Assessee should LOGIN to e-Filing application, GO TO Worklist and accept/reject the Income Tax Form.
- Step 12: On Approval, the Form is successfully submitted with e-Filing application. No further action is required.
- Step 13: If rejected, the Tax Professional can prepare and e-File the Income Tax Form again by following the above mentioned steps.

Preparation and Submission of ITR-1 Online :

The taxpayer has the option of submitting ITR 1 by way of Uploading XML OR by Online submission

- Step 1: Login to e-Filing application
- Step 2: GO TO 'e-File' --> 'Prepare and Submit Online'
- Step 3: Select the Income Tax Return Form ITR 1 and the Assessment Year.
- Step 4: Fill in the details and click the SUBMIT button
- Step 5: On successful submission, Acknowledgement detail is displayed. Click on the link to view or generate a printout of Acknowledgement/ITR-V Form.

Common mistakes in filling of Income Tax Return

The accurate and complete filling up of the relevant column or detail in the Income Tax Return (ITR) form is most crucial for correct calculation of income. In case the computation of Income or refund is different than what had been entered or what is expected, please verify the accuracy of the data entered by you in the ITR. Except for limited number of complicated tax returns, for most taxpayers, the simple check points are the following:

- Salary from all employers, irrespective of whether Form 16 has been issued or not, should be entered in Item 1 of ITR 1 or details in Schedule Salary in ITR 2.
- Interest income from fixed deposits, savings bank account etc should be entered in Item 3 viz. Income from other Sources of ITR 1 or Schedule OS-Income from Other Sources in all other ITR's.
- House Property Income. Schedule HP should be filled carefully including the address details. Income from House Property should be entered in Item 1a viz. Annual lettable value/ rent received/ receivable. Municipal taxes paid should be entered in Item 1c viz. tax paid to local authority in Schedule HP-Income from House Property.
 - ☐ A flat deduction of 30% of the amount in Item 1e is the only deduction permissible for repairs and such expenses will be auto-populated in Item 1f of Schedule HP.
 - ☐ Deduction for Interest on housing loan should be entered in Item 1g viz. Interest payable on Borrowed Capital and is restricted to Rs 1,50,000 for 'Self Occupied' house. Therefore, correctly mention whether the house property is Self-Occupied or Let Out in Schedule HP.
 - ☐ Accordingly, the final value of Income from House Property will auto populate in Item 1i.



- ☐ In case of multiple house properties do not use ITR-1, details of each house property have to be entered completely as mentioned above.
- ☐ In case of ITR-1, the House Property loss should be entered as a negative (-) value in the 'Income from House Property' column.
- Income from Short Term Capital Gains should be entered in Item A of Schedule CG-Capital Gains.
 - ☐ Out of value auto-populated in column "Total Short Term Capital Gains", the amount of STCG attributable to STCG from sale of equity share in a company or a unit of an equity oriented mutual fund, typically, should be entered in column namely, 'Short term capital gain under section 111A included in 4'.
 - ☐ Moreover, the STCG under 111A as entered in column referred above is taxed at a lower flat rate of 10%
 - ☐ The residual value, where the STCG is due to sale of assets other than Equity Shares in a Company or Unit of an Equity Oriented Mutual Fund, if any, will auto populate in the column named, 'Short term capital gain other than referred to in section 111A'
 - ☐ The STCG due to sale of assets other than equity share in a company or a unit of an equity oriented fund is taxed at the normal slab based rates of tax.
 - ☐ Most mistakes in STCG are due to incomplete filling of the Schedule CG, incorrect apportionment of Total STCG into STCG on which Section 111A is applicable & STCG on which Section 111A is not applicable.
- Income from Long Term Capital Gains should be entered in Item B of Schedule CG-Capital Gains.
 - ☐ For Long Term Capital Gain (LTCG), the total value of consideration received for assets sold such as house property etc, typically, should be entered in Column 'Other Assets for which option under proviso to section 112(1) not exercised' in case the benefit of indexation is claimed.
 - ◆ Against this value of consideration received, the indexed cost of acquisition / improvement and allowable expenditure etc should be entered in appropriate columns provided thereafter.
 - ◆ The appropriate exemptions, if any, shall be entered in Column provided therein and the amounts will populate automatically wherever necessary.
 - ◆ LTCG in case of 'Asset in the case of others where proviso under section 112(1) not exercised' Column of ITR 2 is taxed at a flat rate of 20% and the benefit of indexation is allowed.
 - ☐ Where the benefit of indexation is NOT claimed then total value of consideration received for assets transferred, should be entered in 'Other Assets for which option under proviso to section 112(1) exercised' column.
 - ◆ Against this consideration, the cost of acquisition / improvement and allowable expenditure etc should be entered in relevant columns provided in Schedule CG.
 - ◆ The appropriate exemptions, if any, are filled in column provided for the same & amounts will auto populate automatically wherever necessary.



- ❑ LTCG in case of in 'Other Assets for which option under proviso to section 112(1) exercised', where the benefit of indexation is NOT allowed, as being displayed in the named column is taxed at a lower flat rate of 10%.
- ❑ The assessee is required to segregate the information date wise in Column D of Schedule CG, regarding Accrual or Receipt of Capital Gain failing which Interest under Section 234C will be wrongly calculated.
- Adjustment of current year and brought forward losses- Schedules CYLA, BFLA and CFL
Most taxpayers have left these Schedules completely blank. These schedules are used for permissible adjustment of loss of one head of income against another head of income. The main checkpoints are:
 - ❑ Only positive values need to be entered. No negative value is required to be entered in CYLA, BFLA & CFL.
 - ❑ Carry forward of Current year losses though claimed in return will not be allowed if the return is not filed within due date.
 - ❑ No value should be entered in the 'Greyed out' boxes.
 - ❑ The Amounts in Schedule CYLA/BFLA will populate automatically, however assessee will be allowed to claim loss in Schedule BFLA only if appropriate columns have been entered in Schedule CFL.
 - ❑ It is to be noted that the newly introduced Schedule namely Schedule UD currently is not linked with Schedule BFLA, therefore the assessee is required to mention the Brought Forward Depreciation amount separately in Schedule BFLA for claiming the loss arising from the same.
- Income chargeable to Income tax at special rates- Schedule SI
 - ❑ Most mistakes have occurred in this Schedule since taxpayers have not correctly filled the codes, rates or values. The following points may be considered:
 - ◆ Currently the Income Tax forms do not have Individual Columns for segregating DTAA income from Non DTAA income under each head of income therefore, the taxpayer is advised to give details of DTAA income & Tax thereon in Schedule SI.
 - ◆ Also, any special income other than Capital Gains income the figures for which auto populate from Schedule CG, the assessee is required to mention it in Schedule SI only & that income shall not be specified separately under any other head.
- Deductions from Income under Chapter VIA
 - ❑ Most mistakes have occurred due to incomplete details or leaving blank the value of deductions under respective schedules. In most cases only the total deduction value is mentioned.
 - ◆ The deduction amount claimed should be entered in Items 5a to 5m in ITR 1 and in Items a to o in Schedule VIA in ITR 2.
 - ◆ Eligible donation for the purpose of deduction under 80G for donations to charitable institutions (other than certain specified institutions or funds such as Prime Minister's Relief Fund or Rajiv Gandhi Foundation) is restricted to 10 % of total income after excluding income chargeable to special rates of tax.



- ◆ Likewise, all deductions have specific criteria and limits for claims. In the present utility a user enterable field for claiming deduction has been mentioned & correspondingly System Value for deduction claimed is also mentioned for the benefit of the assessee.
 - ◆ The sum of all deductions also cannot exceed the total income.
 - ◆ Deduction cannot be claimed against income chargeable to special rate tax.
- Reasons for difference in calculation of Tax or Interest under 234A, 234B or 234C and Interest on Refund.
- ◆ Mistakes in computation of Income as mentioned above leading to an increase in Income.
 - ◆ Mistake in entering data or Income chargeable to tax at special rates such as STCG on sale of shares, LTCG where indexation benefit is claimed, winnings from lottery.
 - ◆ Incorrectly computing special rates of tax.
 - ◆ Mistakes in entering data or leaving blank, important fields relevant for computation of tax such as date of birth (relevant for senior citizens) or gender (relevant for female taxpayers), resident or non-resident, status (relevant in case of HUF).
 - ◆ In case of any shortfall of tax payment either due to non-payment or due to non-matching of the tax payment or TDS, interest may be charged.
 - ◆ Typically, interest till the date of processing under 234A is charged if the return is filed beyond due date, interest under 234B is charged for shortfall in payment of advance tax and interest under 234C is charged for deferment of advance tax.
 - ◆ Interest under 234C is also charged in case advance tax on account of STCG under 111A, LTCG or Winnings from lotteries is not paid, beginning from the next quarter from the quarter in which the income is earned.
 - ◆ Details of quarter wise breakup of STCG, LTCG and Winnings from Lottery as mentioned in Schedule SI after adjustment of Losses and adjustment of basic exemption threshold, if applicable, are used for calculation of advance tax liability and interest under 234C.
- Reasons for mistakes in Credit for tax payments or TDS
- A major reason for difference in refund amount during processing is that the details of tax payment or TDS do not match with the data available with the Department. The critical checkpoints are as under:
- ◆ Corresponding deduction of tax (TDS) on salary by all Employers should be correctly entered in Schedule TDS1 in ITR1 or Schedule TDS 1 for ITR 2.
 - ◆ TDS on salary should be entered in Schedule TDS1 ONLY and TDS on other Income should be entered in Schedule TDS 2 ONLY.
 - ◆ Tax deduction Account Number (TAN) of the Employer/Deductor is the unique identifier for matching TDS claims made against TDS reported by Employer/Deductor. The TAN number is mentioned on the Form 16 given by the Employer or on the Form 16A given by the Deductor. In case the TAN of the Employer/Deductor is not correctly mentioned, no matching is possible and TDS credit will not be given.



- ◆ If the TAN has been correctly entered but the Employer/Deductor does not report the same TDS details to the Department, especially the taxpayer Permanent Account Number (PAN), then also the TDS cannot be matched. Therefore it is advised to check Form 26AS for the amount which has already been deposited by persons deducting tax on behalf of the taxpayer. Thereafter, the taxpayer should bring this fact in the notice of persons deducting tax so that they can act accordingly.
- ◆ In case of Tax payments of Advance tax or Self Assessment tax, the PAN used to submit the tax challan to the bank should be the same as the PAN used to submit the return. Without a valid PAN the tax payment received from the bank would be in suspense and cannot be matched with tax payment claim as entered in the return.
- ◆ While making the tax payment at the Bank, NO MISTAKE should be made in the challan while entering the PAN, Name, Major head (20 or 21), Assessment Year, Type of tax payment {advance tax (code 100), Self Assessment tax (code 300)}, tax applicable (Income tax other than companies).
- ◆ Any tax payment made under code 400 corresponding to 'Tax on regular Assessment' cannot be used for matching and accordingly credit cannot be given against advance tax or self assessment tax claims.
- ◆ The Challan Identification Number (CIN) is the combination of BSR code (any bank branch's unique 7 digit identification number issued by RBI), date of deposit of challan (DD-MM-YY), and the running serial number of the challan, and is mentioned by the Bank while accepting tax payment on its seal. In case this is not clearly legible, the Bank can be requested to provide correct details. This must be entered correctly in the return while claiming credit.

● Miscellaneous mistakes:

Mistakes in address etc do not affect processing but cause mis-delivery or non-delivery of communication or in case of Bank Account Number error cause rejection of refund credit to taxpayer account. The following points may be noted:

- ☐ The name in the return should be entered as it appears in the PAN card.
- ☐ Address should be correctly filled with correct city, state and PINCODE for faster and accurate delivery of communication from the Department.
- ☐ For faster credit of Income Tax refunds, correct bank account number and MICR code in the return should be mentioned. In case of any mistake in MICR or Bank Account number, the refund will not be credited. and a cancelled cheque showing correct particulars would be required to be submitted to CPC for correction in bank account number or MICR code.
- ☐ Do not Copy/Cut/Paste the data in the utility. It may lead to calculation errors.
- ☐ In case of Refunds below Rs 100, no refund is issued and if Demand is below Rs 100, it need not be paid.

● How to rectify the mistake and to get the correct refund Mistakes in the ITR due to any of the reasons may be corrected by submitting a rectification form. Some basic information is provided below:

- ☐ The procedure for rectification and correction of mistakes is available in HELP on the



website.

- ❑ In case of any difference in Date of Birth or Gender in the Department records or in case of any need to correct the data, it may be corrected by submitting a PAN Change Request Form (quoting the existing PAN) with correct details and providing relevant documents at any TIN facilitation center.
- ❑ In case of any mistake in MICR or Bank Account number, please raise a request after logging in to e-Filing application under 'My Account' --> 'Refund Re-issue request'.
- ❑ In case the charging of additional tax and interest is only because of non-matching of tax payment or TDS, upon correction of the details by taxpayer or employer / deductor, the additional tax and interest will be automatically reduced or eliminated.

Impact of Errors made while filing returns

- Returns can be classified as defective u/s 139 (9) and in some scenarios the return can be declared as invalid / Non Est. ITD is not introducing this concept to cover certain types of errors in order to prevent future grievances.
- Computation Errors - In electronic filing, it has been noticed that most of the errors are due to data errors as filed by the assessee. This includes non-filing of key schedules, wrong details etc resulting in rectification requests etc which delay closure of processing.
- Inability to pay refunds to the assessee.

Rules to be followed to ensure trouble free processing

- Once E filing is done (without digital signature), ITR V needs to be sent in time to CPC. In case ITR V acknowledgement is not received within reasonable time, the assessee may call up the CPC call centre to verify status.
- Nearly 10% of assessee fail to send the ITR V to CPC after E filing.
- Assessee needs to fill his email address, mobile number correctly to ensure appropriate communication from the Income Tax Department. The use of the Tax practitioner/CA's email address may not be appropriate.
- The assessee should make sure the correct (latest) address, bank account number, MICR number is filled.
- The assessee should verify tax credits available in Form 26AS/NSDL websites. Mismatches are the single largest cause of incorrect tax computation. Non-credits may be taken up with the TDS deductor and/or the banker as soon as they are noticed.

6.5 DOS & DON'T - ITR 1-7

Part A - Personal Information Schedule

- Name: Has to match the PAN database
- Date of Birth: Mistakes here will result in computation of higher taxes in case of senior citizens
- Address: House/Flat no, City, PIN Code, are mandatory fields. Non-filing will result in refund delays



- E mail Address: Needs to be filled correctly, is the basis of all communication from CPC. Mistake will result in non receipt of all intimations from CPC. Use of Auditor/Tax practitioner's ID may be avoided.
- Mobile No: Full Mobile No without use of +91 needs to be entered. This is essential for all SMS based communication.
- Sex: Should match the PAN database. If PAN database is wrong, it results in mistakes in computation.
- Status : Should be correctly filled
- Residential Status - the status of NOR and NRI should be mentioned only where applicable as they are not eligible for certain benefits available to resident assessee.
- Aadhar Number if available needs to be filled in the tax form.

Part B - TI

- Salary amount entered in BTI should be same as in TDS Salary and final value in Schedule salary.
- CYLA or BFLA loss has to be mentioned in the appropriate rows, else loss will not be allowed.
- In STCG many users confuse between STCG under section 111A and STCG others and enter against one another leading doubling to income from Capital Gains.
- In case of HP loss, BTI value for Income HP should be 0 or null and final value in schedule HP should be a loss
- It is not enough if just part B TI is filled. Respective schedules also need to be filled for Eg Schedule HP, Sch Depreciation etc. Else the return can be treated as a defective return u/s 139 (9).

Part B - TTI

- Relief under 89, 90, 91 is to be entered ONLY if applicable. The value entered in schedule TDS, IT and TCS has to be entered in Part B TTI also. Eg. Schedule IT is entered but in no amount is mentioned in this section as Advance Tax or SAT.
- The Bank account no. has to given correctly and entered even if no refund is due. This is to ensure that refund arising from re-computation of income by the ITD can be paid to the assessee. The A/c no and the name in the bank account has to tally.
- The MICR No. should be in 9 DIGITS and first 3 digits of MICR code denotes the place of residence as mentioned in address's PIN Code.

Eg. 560056025- '560' refers to Bangalore whose PIN starts with 560 000. The assessee may avoid giving bank accounts where MICR starts with '0'.

Income Schedules Salary, HP

- Net Salary should be entered and not Gross Salary. This will result in higher taxes
- The Salary value should tally with that entered in Schedule TDS



- In Schedule HP, the loss from house property has to be entered with all mandatory details of the property including details as to whether it is let out. Entering only the loss as summary makes it incomplete
- Co-owners of property should enter only the income pertaining to their share in the property. Entering the gross rental receipt and thereafter offering this share of income from such rental will increase total income

Capital Gains

- Deemed Capital Gains arising out of Schedule depreciation should be considered by the assessee in schedule CG.
- Non filing of full value of consideration or filling only expenditure under various sub categories of CG leads to incorrect computation of income.
- Filling of only cost of acquisition also leads to incorrect computation.
- The quarterly breakup of capital gains in the CG schedule should be post set off of all losses.
- Filling of accurate quarterly breakup is necessary for computation of interest under 234C.
- Correct section codes should be used depending upon the type of capital gains income in the SI schedule.
- Exempt LTCG should not be entered in CG schedule as well as in BTI, it has to be mentioned in Schedule EI

Schedule BP

- PBT should NOT BE included Deprecation value
- Income from speculative business included in PBT should be shown separately in Sl. 2 and Sl. 38 of schedule BP.
- Income offered under other heads other than BP included in P&L should be reduced in Sl. 3 of Schedule BP.
- All disallowances in Part A OI should be considered in Schedule BP.
- Income offered under section 44AF(Deemed Income) if included in PBT should be reduced in Sl. 4 of Schedule BP.
- Deprecation as entered In P&L should be shown in Sl.11 of Schedule BP alone and not in Sl 22 or 7 or another rows in BP. The schedule DPM, DOA should be mandatorily filled.
- Assessee claiming benefit of rule 7A 7B 7C should mention appropriate code in nature of business schedule.
- PBT in P&L and PBT shown in sl. No.1 of Schedule BP should be same.
- Specific schedule for ESR, 10A etc should also be filled when a claim is made in schedule B

SCHEDULES DPM, DOA, DCG AND DEP

- All the relevant values to arrive at the depreciation mentioned in Schedule BP is to be filled in Schedule DPM, DOA.



- DCG arising out of depreciation schedules should be accounted for in CG and taxes paid.
- The value of depreciation as per Schedule DEP and value mentioned in Schedule BP should be the same.

Chapter VI A, MATC

- In case of deductions where separate schedules are also required to be filled, the same should be FILLED WITHOUT FAIL- Eg. 80G, 80IA, 80IB, etc. Deductions will not be allowed if specific schedules are not filled.
- Entering of only total deductions alone in Schedule VIA total will not result in wrong computation of deductions. Section wise (amount claimed for 80C, 80IA, 80G etc) should be broken up and mentioned in as per the schedule
- To compute and avail MAT credit in MATC, sl. No. 1 to 6 should be filled with relevant details and the final value should be claimed in sl. No. 7 (Lower value of that in Sl.No. 3 or Sl. NO 6) should be specifically filled.

Schedule CYLA

- Loss sought to be adjusted should be claimed against a specific income and also under the loss to be adjusted heading. If lottery income is offered as part of OS income, the value to the extent of lottery income should be excluded while claiming income from OS in CYLA.
- The respective schedules should also contain loss details for CYLA.

Schedule CFL

- Date of filing of return for relevant year in CFL should be filled.
- Loss details should be entered under respective income sources.

Schedule BFLA

- Specific differentiation in allocating the losses under BFLA should be made and the claim of adjustment should be made based on the relevant heads

Schedule SI (Special Income) & Schedule EI (Exempt Income)

- The assessee has to verify the nature of special income and enter appropriate Section Code.
- Entering wrong section code can lead to consideration of the incorrectly offered income for taxation
- The assessee needs to bifurcate incomes taxable at special rate and normal rate and if there is no provision in respective schedules like CG or OS, he/she has to offer income chargeable at special rate- they need to be disclosed on in Schedule SI.
- The income exempt from tax shown in P&L or BP or BTI should also be filled in EI and they should tally

Schedule TDS and TCS

- TDS on salary should be claimed ONLY in schedule TDS Salary (ITR1) or TDS1 (ITR 2-4).
- TDS on Interest should be claimed ONLY in TDS on interest(ITR 1) or TDS2(2-4).
- Claiming of TCS claims in TDS schedules and vice versa will lead to mismatch translating into



excess demand or lower refund The claim of TDS amount should be made in TDS deducted as well as TDS Claimed for the year columns in schedule TDS2 and TCS.

- TDS claims should tally with Form 26AS or NSDL database which are accessible very easily.

Schedule IT

- Dates of deposits should be entered in DD/MM/YYYY format and not in any other format like MM/DD/YYYY format. This will lead to mismatches
- Exact amount paid in the challan should be claimed in return- rounding off to nearest 10 or 100 leads to mismatch.
- Individual payments should be separately claimed. Clubbing of multiple challans or entering consolidated payment will lead to mismatch.

6.6 SERVICE TAX E-FILING

6.6.1 Introduction

Service tax e-filing is taken care by www.aces.gov.in. After introduction of e-filing of Income Tax and VAT returns, service tax return filing was also changed to electronic format. Common website for Central Excise and Service Tax is used. User is required to select the option on the home screen itself as shown in Fig 6.6.1.

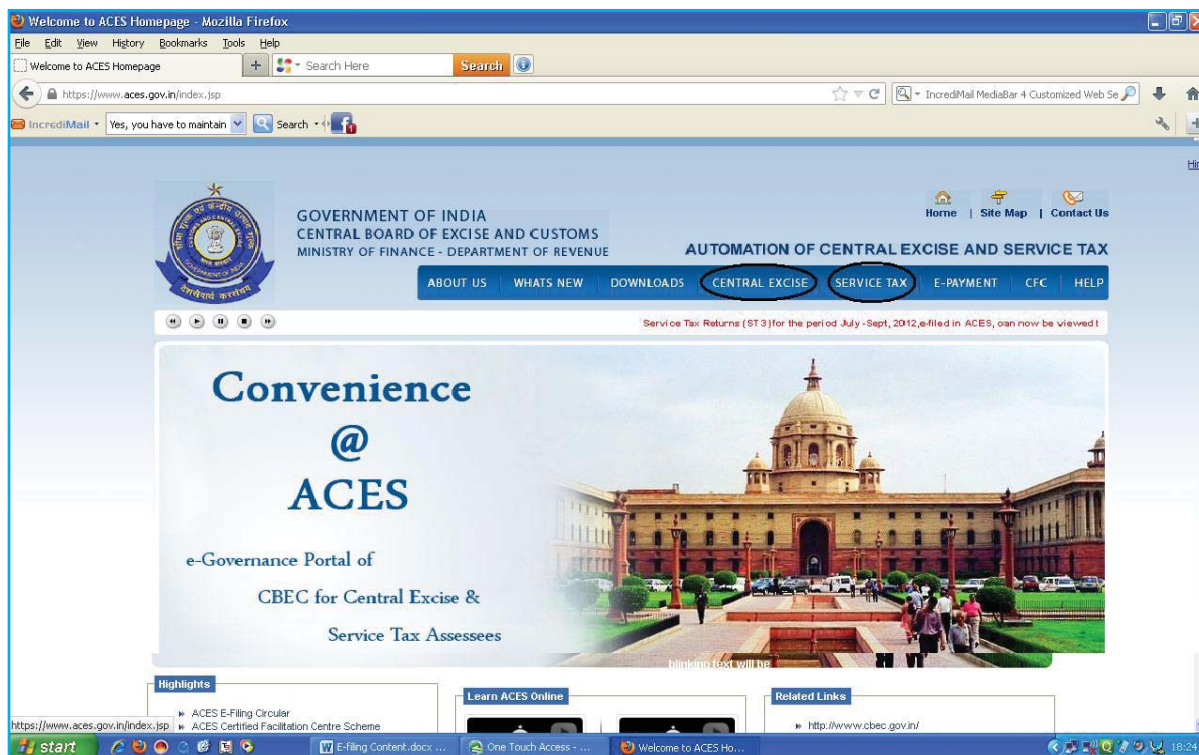


Fig.6.6.1: Common website of Central Excise & Service Tax

About ACES :

- ACES stands for Automation of Central Excise and Service Tax. It is a centralized, web based



software application which automates various processes of Central Excise and Service Tax for Assessee and Department, and gives complete end to end solution. Any Assessee can register with Department using ACES application, can file tax return, claims & intimations, track its status and get online messages.

- ACES application has two parts, one is for Central Excise and other for Service Tax. Assessee has to register separately to use each of them.
- In ACES, the various processes of Central Excise automated are Registration, Returns, Refunds & Rebate, Claims & Intimations, Provisional Assessments, Exports, Dispute Resolution and Audit.
- Any person who wishes to transact any business with Central Excise or Service Tax Department can use ACES.
- ACES can be used for:
 - Online registration and amendment of registration details
 - Electronic filing of documents such as Returns, Claims, Intimations and permissions
 - Online tracking of the status of applications, claims and permissions
 - Online facility to view documents like Registration Certificate, Returns, Show Cause Notice, Order-In-Original etc.
- A user not having PAN number can register with ACES application. PAN is required if Assessee wants to file a refund claim.
- ACES homepage is an interface for users/ Assessee to access the Central Excise and Service Tax applications. The website also enables users to make online payment through e-Payment option, download the Returns offline utilities through Download option. The website also keeps track on latest updates of the ACES application and gives links to various other sites under CBEC.
- Learning Management Software abbreviated as LMS is self learning software developed in flash. The software demonstrates to use various functionalities across ACES application. The software is accessible through Help section of ACES homepage. You need to have flash player installed at your computer along with speakers before using the same.
- User has to maintain user id and password for Central Excise and Service Tax application separately. But same email ID can be used for both the applications.

After clicking on “Service Tax” tab on home screen, user is taken to logon screen as under. Here existing users are required to enter their login details. A new user has to register first before using the website as shown in Fig 6.6.2.



The login screen features the Government of India emblem and the Central Board of Excise and Customs logo. It includes a header with the text "CENTRAL BOARD OF EXCISE AND CUSTOMS" and "Ministry of Finance - Department of Revenue". The main form has fields for "User Name" and "Password", followed by "Logon" and "Clear" buttons. Below the form, there are links for "New Users to Click here to Register with ACES", "Know your location", "Unlock your Account", and "Forgot your password". A copyright notice "© Copyright Information 2007" is at the bottom.

Fig.6.6.2: Login Screen

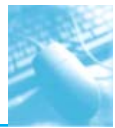
Registration on ACES website:

Click on "Click here" to go to registration page as shown in Fig 6.6.3.

The registration page is titled "REGISTRATION WITH ACES FOR SERVICE TAX". It contains several form fields: "User Name" (marked with an asterisk), "Email Address Of Assessee For Communication" (marked with an asterisk), "Name Of The Unit" (marked with an asterisk), "Designation" (marked with an asterisk), "First Name" (marked with an asterisk), "Middle Name", "Last Name", "Phone Number", and "Mobile Number". A red note states: "User Name can be 6-12 alphanumeric characters. First character should be an alphabet, it can contain the special character (_) only". At the bottom, there are "Submit", "Reset", and "Cancel" buttons. A copyright notice "© CopyRight Information 2005 - 2006" is at the very bottom.

Fig.6.6.3: Registration page

Registration on ACES site is a two step process, where first step is to register online and second step is to submit documents with Service Tax Department. After completion of both the steps successfully, user can login into his/her account on ACES.



E-filing Process:

It is similar to e-filing of income tax returns. The brief overview of steps is as under.

Login into your account with correct user ID and password.

Download utility for Form ST-3 in excel by following the path : RET > e Filing > Download e-filing Utility shown in Fig 6.6.4.

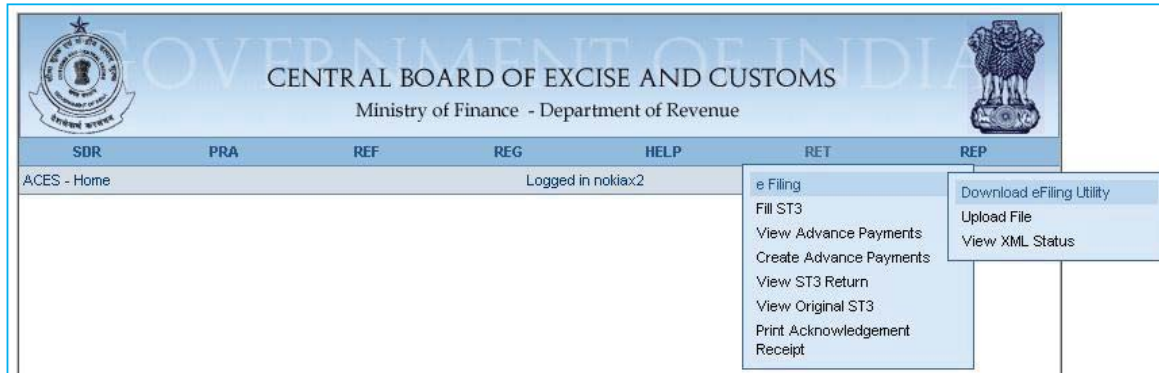


Fig.6.6.4: Download utility for Form ST-3

Unzip the downloaded excel utility and open excel file. Fill the excel file as shown below, in offline mode shown in Fig 6.6.5.

Fig.6.6.5: Unzip the downloaded excel utility & open excel file

Validate the excel file by validating each sheet individually. After successful validation, one XML file is generated.

To Upload the XML file, go to RET > e filing > Upload File. Select correct financial year, return period, return type. Browse for the correct XML file and attach it. Press save to upload the file as shown in Fig 6.6.6.



GOVERNMENT OF INDIA
CENTRAL BOARD OF EXCISE AND CUSTOMS
Ministry of Finance - Department of Revenue

SDR PRA REF REG **HELP** RET REP

File Attachment Logged in nokiax2 [Sign Out](#)

UPLOAD ST3 RETURN

Registration number :	AAEFG7381CSD002	Assessee's Name :	GHATE DESHPANDE & CO.		
Address of Registered Unit :	PLOT NO.75 SHANKUNTALA SADAN LENDRA PARK RAMDASPETH NAGPUR SHANKARNAGAR NAGPUR MAHARASHTRA 440010				
Commissionerate :	NAGPUR	Division :	SERVICE TAX CELL(NAGPUR CITY)	Range :	GROUP-II(Assessee Name Starting from C to H)
Financial Year :	2012-2013 *	Return for the period :	July-September *		
Attach Returns File :	Browse...				
Return Type :	Original ST3 *				

(Fields marked with * are mandatory.)

Please select the option 'Original' or 'Revised' carefully in both Excel Utility and Upload screen. In case of incorrect selection, the uploaded return is liable for rejection.

ACES Application Processing Time : < 1 Second © Copyright Information 2007

Fig.6.6.6: Upload XML file

After successful uploading of XML file, following screen shall appear as shown in Fig 6.6.7.

GOVERNMENT OF INDIA
CENTRAL BOARD OF EXCISE AND CUSTOMS
Ministry of Finance - Department of Revenue

SDR PRA REF REG **HELP** RET REP

File Attachment Logged in manava [Sign Out](#)

Your file has been uploaded successfully, Please view the status after one business day.

© Copyright Information 2007

Fig.6.6.7: Successful uploading of XML file

Special Points:

- Separate excel utility is to be used for each quarterly return.
- The version of Microsoft Excel should be Microsoft Excel 2003 or above.
- The downloaded excel utility needs to be unzipped using some unzipping software.
- Enable execution of Macros in excel utility.



- Data can be input by user in any of the green cell. Grey cells are locked for editing.
- All fields marked with asterisk (*) are mandatory. User is prevented from going ahead in case a mandatory field is left blank.
- After uploading the return, user can view the status of e-filed return accessing the menu RET > e-filing > View XML Status. There are three statuses as under along with its meaning.
 - ❑ Uploaded – Return was uploaded and is under process. Please view again after some time.
 - ❑ Filed – Return is accepted by ACES and it can be viewed by going to RET > View ST-3 Return.
 - ❑ Saved – Uploaded XML is saved in the system but, the return is still not submitted to the department. User can submit the return by going to menu RET > Fill ST-3 > Complete ST-3.
 - ❑ Rejected – Return could not be processed due to errors. The return needs to be corrected and to be uploaded again. If your return is rejected, then there will be hyperlink appearing on the return number on clicking which, user can see the errors.
- As per extant provision, ST-3 return filed can be modified only once, by filing a revised return within 90 days from the date of filing of original return. In case of filing of revised, confirmation view will be provided with “Submit” button only.

6.7 COMPANY LAW E-FILING

6.7.1 Introduction

Ministry of Corporate Affairs, Government of India brought up a revolutionary change in administration of company law matters by making it completely “electronic”. Right from name approval of a company till closing a company, everything is in electronic format. All the administrative activities are managed through www.mca.gov.in as shown in Fig. 6.7.1.

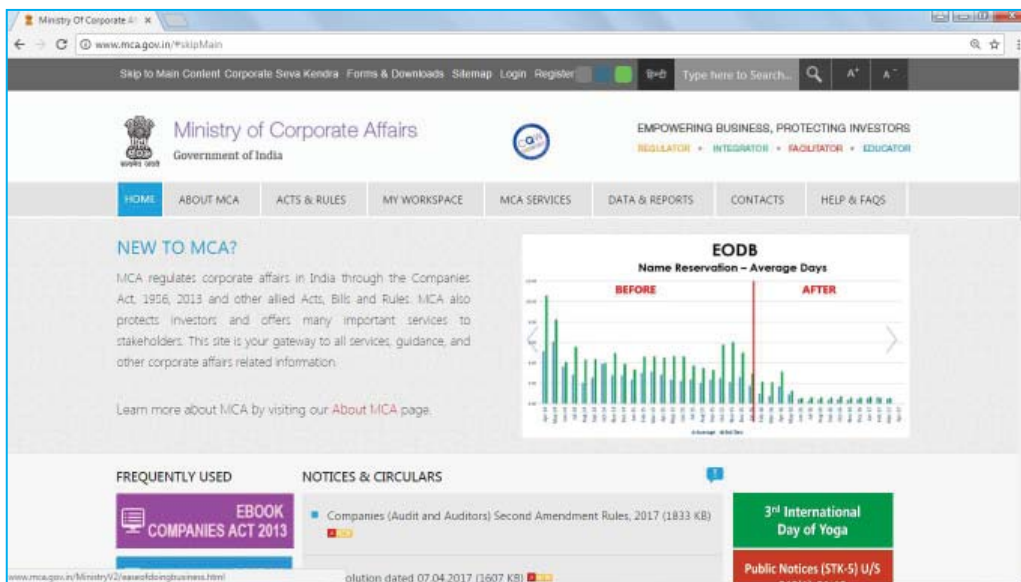


Fig.6.7.1: Website of Ministry of Corporate Affairs



6.7.2 Pre-requisite software for e-filing

For e-Filing on MCA21 your Computer must have the following components installed:

Windows 2000 / Windows XP / Windows Vista / Windows 7



All users using below mentioned services on MCA21 are required to have Windows XP (SP3)/ Windows Vista/ Windows 7 and JDK 1.6 updated version 30 installed on their machine -

- Any user logging on MCA21 using a DSC
- Any existing user registering/ updating a DSC
- Any new user registering using a DSC

Internet Explorer v6.0 and above, Google Chrome, Mozilla Firefox



Adobe Reader from version 9.4 or later



Java Runtime Environment (JRE) 1.6 or updated version 8 update 131 **NEW**



6.7.3 E-Filing Process :

In order to carry out e-filing on MCA21 you have facility to download the eform and fill it in an offline mode. Every form has the facility to pre-fill the data available in MCA21 system. Once the e-form is filled you would need to validate the e-form using Pre-scrutiny button. You would then have to affix the relevant digital signatures and save the form. You would need to be connected to the internet to carry out the pre-fill and pre-scrutiny functions. The step by step process is given below. The filled up e-form as per relevant instruction kit needs to be uploaded on the MCA21 portal. On successful upload, the Service request number would be generated and you would be directed to make payment of the statutory fees. The step by step process is given below. Once the payment has been made the status of your payment and filing status can be tracked on the MCA21 portal by using the 'Track Your Payment Status' and 'Track Your Transaction Status' link respectively.

Please follow the steps given below to proceed to do eFiling:

1. Select a category to download an eForm from the MCA 21portal (with or without the instruction kit)
2. At any time, you can read the related instruction kit to familiarize yourself with the procedures (you can download the instruction kit with eform or view it under Help menu).
3. You have to fill the downloaded eForm.
4. You have to attach the necessary documents as attachments (in PDF form only).



5. You can use the Prefill button in eForm to populate the grayed out portion by connecting to the Internet.
6. The applicant or a representative of the applicant needs to sign the document using a digital signature. Digital Signature should have been registered on MCA21 under one of the categories namely Director, Manager/Secretary or Practicing Professional.
7. You need to click the Check Form button available in the eForm. System will check the mandatory fields, mandatory attachment(s) and digital signature(s).
8. You need to upload the eForm for pre-scrutiny. The pre-scrutiny service is available under the Services tab or under the eForms tab by clicking the Upload eForm button. The system will verify (pre-scrutinize) the documents. In case of any inadequacies, the user will be asked to rectify the mistakes before getting the document ready for execution (signature). In certain forms such as Annual Filing forms namely Form 23AC, 23ACA, 20B and 66 pre-scrutiny is to be done in the form itself by clicking the tab given at the end of the respective form.
9. The system will calculate the fee, including late payment fees based on the due date of filing, if applicable.
10. Payments will have to be made through appropriate mechanisms - electronic (credit card, Internet banking, NEFT) or traditional means (at the bank counter through challan). Payments up to Rs. 50,000 are compulsorily required to be made through online mode. Recently PAY LATER facility has also been added whereby forms can be uploaded under this facility and payments can be made at a later date but before the expiry date mentioned on the Pay Later Challan generated by the system.
 - (a) Electronic payments can be made at the Virtual Front Office (VFO) or at PFO
 - (b) If the user selects the traditional payment option, the system will generate challan in the prescribed format. Traditional payments through cash, cheques can be done at the designated network of banks using the system generated challan. There will be five banks with estimated 200 branches authorized for accepting challan payments.
11. The payment will be exclusively confirmed for all online (Internet) payment transactions using payment gateways.
12. Acceptance or rejection of any transaction will be explicitly communicated to the applicant (including facility to print a receipt for successful transactions).
13. MCA21 will provide a unique transaction number, the Service Request Number (SRN) which can be used by the applicant for enquiring the status pertaining to that transaction.
14. Filing will be complete only when the necessary payments are made.
15. In case of a rejection, helpful remedial tips will be provided to the applicant.
16. The applicants will be provided an acknowledgement through e-mail or alternatively they can check the MCA portal.

Filing paper attachments with the E-form :

- You have to first get the paper attachments scanned and saved as a soft copy in PDF format. Then attach the same in the attachment section of the eForm by clicking the appropriate 'Attach' button.



- You can upload / submit the scanned documents by attaching the same with the e-form and submitting on the MCA Portal.
- It is important to ensure that the size of scanned PDF document is within the permissible size limits, it is recommended that scanning should be done in 'black & white' mode at 200 dpi resolution and should not exceed 2.5 MB (including size of the form).

Signing an e-form & Payment of fees :

- An e-form can be signed by the authorized signatory / representative using the Digital Signature Certificate (DSC). Click the red colour signature box in the e-form to affix the digital signature. To avoid increase in size of the e-form beyond permissible limit of 2.5 MB, always affix the DSC using the 'Sign and Save As' option.
- Payments can be made electronically through credit card/Debit Cards or Internet Banking. During the e-filing process, the system will prompt you to make payment. You can choose the mode of payment and make the payment accordingly.
- If you are not having a credit card or Internet banking facility, you can make payment at the counter of an authorized bank through the pre-filled challan generated by the system after e-filing
- Payments of value above Rs. 50,000, stakeholders would have the option either to make the payment in electronic mode, or paper challan. However such payments would also be made in electronic mode w.e.f .1st October'2011.)
- For the purpose of collection of payments numerous branches in all major cities and towns of the following five Banks have been authorized:
 - ☐ State Bank of India
 - ☐ Punjab National Bank
 - ☐ Indian Bank
 - ☐ ICICI Bank
 - ☐ HDFC Bank

Details of the branches of the above banks offering this facility are given on 'List of Authorized Banks' link on the MCA21 portal.

- On Successful e-filing and payment you can view the status of your transaction using the "Track your transaction status" link and you would be required to enter the SRN no. Once the form has been approved by the concerned official of the Ministry, you will receive an email regarding the same and the status of the form will get changed to Approved. In case the status is other than approved , you would need to take the necessary action as detailed below:

Status of SRN:

- Status - Required Resubmission

In this case you are required to re-submit your eForm to rectify the defect(s)/ incompleteness pointed out by the concerned MCA office, before the due date mentioned in the status of your SRN. If you fail to re-submit your eForm within prescribed period, you will be required to file the eForm afresh with payment of fee and additional fee, as applicable.



- **Status - Waiting For User Clarification**

In this case you are required to file eForm 67 (Addendum), to rectify the defects pointed out or furnish further information/ document(s) called for by the concerned MCA office. As per revised regulation 17, if you fail to furnish requisite information/ document within prescribed period, you will be required to file the eForm afresh with payment of fee and additional fee, as applicable.

- **Status - Defective**

In case of STP forms, for example annual forms MGT-7, & AOC-4 etc, if there is any defect or incompleteness, same is marked by the RoC as 'Defective'. You are required to file such form afresh after rectifying the defects/ incompleteness with payment of fee and additional fee, as applicable.

- **Status - Invalid and NBTR**

In such cases where an eForm has not been re-submitted or the requisite information/ document(s) has not been provided through eForm 67 (Addendum) within prescribed period, the status of SRN is marked as 'Invalid and Not been taken on record (Invalid and NBTR)' and in case of an application as 'Invalid and Transaction cancelled'. You are required to file such form afresh with payment of fee and additional fee, as applicable.

- **Status - Pending for approval under regulation 17(6)**

It means that the eForm is pending for the want of requisite approval from Central Government, Regional Director, Company Law Board or any other competent authority.

Viewing public documents on the MCA portal

- To avail the same you can register yourself on the MCA portal and click on the 'View Public Documents' link to view the documents of the specific companies available for viewing to public pertaining to specific company(s). Once you select the company(s), you will be prompted to make the payment of Rs. 100/- per company. On receipt of the payment, the system will allow you to view the documents pertaining to the selected company from the 'My Documents' link after logging on to the portal. You will be able to view the documents for a period of three hours from the time you start viewing. Documents such as balance sheets, annual returns for the preceding two years and permanent documents like MoA and AoA are available in the digital form for the companies falling under ROC going live on the MCA portal.
- User can get certified copies of the public documents by using the Get Certified Copies service. Once you make the necessary payment, your request will be routed to the concerned person.

Handling of ERRORS

Various types of errors may be committed while availing different services on MCA portal. Different types of errors, its impact and its remedy is as under.

- **Payment of challan not done before the expiry date:** If payment of challan is not made before the expiry date, the transaction gets cancelled and applicant needs to file the eForm again on MCA portal to generate a fresh challan for payment.
- **Payment of fees (via challan) through other option:** Once a challan is generated, its payment has to be made in an authorised bank branch. Payment against eFiling should not be made



using any mode of payment on MCA portal e.g. Miscellaneous Fee option, as in such a case the payment made does not get linked with the original Filing Transaction / SRN.

- Duplicate Payment : Always check the payment status of original / previous SRN before trying to make payment again for the same transaction. If the payment status is 'Paid' do not pay again.
- Verification of status of eFiling: The SRN No. is the key for verification of status of eFiling. Please note down the SRN generated by the system before making the payment / for the purpose of checking the payment / transaction status.
- Inspection of public documents: On confirmation of payment, a link is made available under 'My documents' tab to view the documents online. This link will be valid for seven days – you can view these documents anytime within 7 days of appearing those under 'My Documents'. However, online viewing is provided for continuous three hours maximum, once you begin this activity.
- eForm version used is not latest: Always download a fresh eForm for eFiling from the MCA portal.
- Modify or Sign the eForm numerous times which increases the size of the eform: While signing the eform click on 'Sign and save as' option to affix the DSC to keep the size of the eForm minimum.
- Uploading eForm in case of "Required Resubmission" : If the transaction status is "Required Resubmission", the eForm needs to be filled again correctly and filed against the original SRN. Do not use 'Addendum' option as transaction through 'addendum' will not be processed against 'Resubmission'. 'Addendum' facility is used for providing additional information, if any, to RoC.
- Mistaking the status "Required Resubmission" as rejection of the eform and take no action. If the status of SRN is "Required Resubmission" then file the eForm again by giving SRN of original filing and uploading eForm by clicking 'Resubmit' button, under 'eForm upload' link. After re-submission the status of SRN will change and eForm will be available for processing at RoC office.
- Wrong particulars in eForms – ensure accuracy while filling following values in the corresponding eForm:

Form INC1

Amount of authorized capital (eg.10 Lacs instead of 1 Lac)

Company type, should be either Private or Public

State under the jurisdiction of same RoC (eg. Jharkhand instead of Bihar)

Common reasons for rejection of a Company Name

Form INC1

Company type (e.g. "Part IX Company" or "Producer Company" in place of "New Company" or vice-versa)

Company category / sub-category (e.g. "SGC" or "GOI").

Form CHG-1

Date of charge creation / modification

Original / Final amount while creation / modification of charge



Form MGT-14

Type of resolution (Board / Shareholders / Ordinary / Special resolution type) selection differs from the attachment

Form SH-7

Wrong amount of revised capital

Simultaneous filing of multiple eForm 5 for a company before approval of erstwhile form 5 filed. Wait for first eForm's approval before proceeding with next eForm 5.

Please check the particulars filled in the eform before filing. Once an eform is approved, any wrong information given in the eform cannot be rectified.

Update JAVA / Adobe software.

Use only prescribed versions of JAVA / Adobe software, as listed on the portal.

Annual E-filing:

As a part of Annual eFiling, Companies incorporated under the Companies Act, 2013 are required to e-file the following documents with the Registrar of Companies (RoC):

Sr. No.	Document	e-Form
1	Financial Statements	Form AOC-4 to be filed by all Companies*
2	Annual Return	Form MGT-7 to be filed by all Companies l

Table 6.7.1 List of documents with RoC

* If the file size of Form AOC exceeds 5MB, please use Additional Attachment Sheet. Please follow the step-by-step process as given below, for uploading the Additional Attachment Sheet.

Step by Step Process for Additional Attachments to form AOC-4:

1. If the size of Form AOC-4 exceeds 5 MB, remove some attachments or split and attach only a small part of the attachment to limit the Form size to 5 MB. You can upload the remaining/ other parts of attachments separately using 'Additional Attachment Sheet' as below.
2. Download the 'Additional Attachment Sheet' from 'Annual Filing Corner' link on the homepage of MCA portal.
3. Enter the CIN and click 'Pre-fill' button to automatically fill the name and address of the Company in the eForm.
4. Fill the date of relevant Balance Sheet.
5. Select the type of document from the dropdown list and click 'Attach' button to 'browse and select' the file to be attached. You have the option to attach maximum 5 documents.
6. Fill the signatory details i.e. Designation and DIN/ Membership No.
7. Affix the Digital Signature Certificate of the signatory
8. Click 'Verify' button. In case of any error, rectify the same and repeat this step.
9. Close the Form and save it again on prompting by the system. Please ensure that size of 'Additional Attachment Sheet' does not exceed 2.5 MB.



10. If you wish to attach more attachments, please download a fresh Form and repeat the above steps. You have the option to upload maximum two 'Additional Attachment Sheet' against one Form AOC-4.
11. After uploading of Form AOC-4 on MCA portal, system will prompt for SRN Number with following options:
 1. Pay Later
 2. Pay Now
12. Proceed to 'payment option' screen.

Important Points to Remember

- The Balance Sheet, Profit & Loss Account and Annual Return are filed as attachments to the respective e-Forms. A scanned copy considerably increases the size of the document besides being more expensive. You are therefore, advised to convert the Text file/ Excel sheets by using the PDF converter software (PDF conversion facility is also available on the MCA portal for business users) and upload these attachments as PDF documents.
- The MCA database in respect of Authorised Capital and Paid-up Capital needs to be verified by the respective Companies, as it may not be correct. The Companies are requested to apply for correction of Master Data, should they find any discrepancies. In the meantime, the Companies can declare the correct amount of Authorised Capital and Paid-up Capital in the respective annual filing Forms.
- The Company representative can upload the e-Forms on the MCA portal through the 'Annual Filing Corner' link (after registering oneself as a user of the portal) at his convenience from his office/ home. This is the most convenient way of e-Filing.
- The Company representative can prepare the e-Forms as per guidelines, get them digitally signed by the authorized signatory, copy them in a CD or a pen drive and visit the nearest "Registrar's Front Office" (RFO). RFO staff will assist in uploading of eForms on MCA portal. For addresses/ phone numbers of RFOs, please refer to the "Facilitation Centre" link on the homepage of MCA portal.
- The Company representative can also contact any of the Certified Filing Centers (CFCs) for the Annual Filing of e-Forms by paying the service charges to the CFCs. The details about the CFCs are available under the 'Certified Filing Centre' tab on the homepage of MCA Portal.

Downloading of Forms

Two types of forms are available for download as under

- (a) Company Forms
 - (i) Approval Services – Headquarters
 - (ii) Approval Services – Regional Director
 - (iii) Approval Services – Registrar of Companies
 - (iv) Change Services
 - (v) Charge Management
 - (vi) DIN Forms
 - (vii) Company Registration



- (viii) Compliance Related Filing
- (ix) Informational Services
- (x) Investor Services
- (xi) Provisions related to managerial personnel
- (xii) Annual Filing e-forms

(b) LLP Forms

Approval Services (Headquarters) as shown in Table 6.7.2

Sr.	Description	e-Form
1	Form of intimation of appointment of cost auditor by the company to Central Government.	Form CRA-2
2	Form for filing application or documents with Central Government	Form CG-1

Table 6.7.2 List of e-Form of Company Forms

Approval Services (Regional Director)

Sr.	Description	e-Form
1	Application for confirmation by Regional Director for change of registered office of the company within the state from the jurisdiction of one Registrar to the jurisdiction of another Registrar	Form 1AD
2	Form for filing application to Regional Director	Form 24A

Table 6.7.3 Approval Services (Regional Director)

Approval Services (Regional Director)

	Description	e-Form
1	Application for removal of auditor(s) from his/their office before expiry of term	Form ADT-2
2	Application to Regional director for conversion of section 8 company into company of any other kind	Form INC-18
3	Application to Regional Director for approval to shift the Registered Office from one state to another state or from jurisdiction of one Registrar to another Registrar within the same State	Form INC-23
4	Memorandum of Appeal	Form ADJ
5	Applications made to Regional Director	Form RD-1
6	Application to Central Government for extension of time for filing particulars of registration of creation / modification / satisfaction of charge OR for rectification of omission or misstatement of any particular in respect of creation/ modification/ satisfaction of charge	Form CHG-8

Table 6.7.4

**Approval Services (Registrar of Companies)**

	Description	e-Form
1	Application by company to ROC for removing its name from register of Companies	Form STK-2
2	One Person Company- Application for Conversion	Form INC-6
3	Application for approval of Central Government for change of name	Form INC-24
4	Application to Registrar for obtaining the status of dormant company	Form MSC-1
5	Application for seeking status of active company	Form MSC-4
6	Applications made to Registrar of Companies	Form GNL-1
7	Application for grant of License under section 8	Form INC-12
8	Application for striking off the name of company under the Fast Track Exit(FTE) Mode	Form FTE

*Table 6.7.5 Approval Services (Registrar of Companies)***Change Services**

Sr.	Description	e-Form
1	Application for reservation of name	Form INC-1
2	One Person Company- Nominee consent form	Form INC-3
3	One Person Company- Change in Member/Nominee	Form INC-4
4	Notice of situation or change of situation of registered office	Form INC-22
5	Conversion of public company into private company or private company into public company	Form INC-27
6	Notice to Registrar of any alteration of share capital	Form SH-7
7	Particulars of appointment of Directors and the key managerial personnel and the changes among them	Form DIR-12
8	Return of alteration in the documents filed for registration by foreign company	Form FC-2
9	Annual accounts along with the list of all principal places of business in India established by foreign company	Form FC-3

*Table 6.7.6 Change Services***Charge Management**

Sr.	Description	e-Form
1	Application for registration of creation, modification of charge (other than those related to debentures)	Form CHG-1



2	Particulars for satisfaction of charge thereof	Form CHG-4
3	Notice of appointment or cessation of receiver or manager	Form CHG-6
4	Application for registration of creation or modification of charge for debentures or rectification of particulars filed in respect of creation or modification of charge for debentures	Form CHG-9
5	Details of persons/directors/charged/specified	Form GNL-3

Table 6.7.7 Charge Management

DIN Forms

Sr.	Description	e-Form
1	Application for allotment of Director Identification Number	Form DIR-3
2	Application for surrender of Director Identification Number	Form DIR-5
3	Intimation of change in particulars of Director to be given to the Central Government	Form DIR-6
4	A Report by a company to ROC for intimating the disqualification of the director	Form DIR-9

Table 6.7.8 DIN Forms

Incorporation services

	Description	e-Form
1	New Version - Simplified Proforma for Incorporating Company Electronically (SPICe) - with mandatory PAN & TAN application included.	SPICe
2	eMemorandum of Association (SPICe MoA)	SPICe MoA
3	eArticles of Association (SPICe AoA)	SPICe AoA
4	Application for reservation of name	Form INC-1
5	One Person Company- Nominee consent form	Form INC-3
6	Notice of situation or change of situation of registered office	Form INC-22
7	Particulars of appointment of Directors and the key managerial personnel and the changes among them	Form DIR-12
8	Application by a company for registration under section 366	Form URC-1
9	Information to be filed by foreign company	Form FC-1
10	Application for Incorporation of Company (Part I Company and Company with more than Seven Subscribers)	Form INC-7

Table 6.7.9 Incorporation services



Compliance Related Filing

Sr.	Description	e-Form
1	Form for filing Cost Audit Report with the Central Government.	Form CRA-4
2	Return of deposits	Form DPT-3
3	Information to the Registrar by Company for appointment of Auditor	Form ADT-1
4	Notice of Resignation by the Auditor	Form ADT-3
5	Statement regarding deposits existing on the commencement of the Act	Form DPT-4
6	One Person Company- Intimation of exceeding threshold	Form INC-5
7	Return of allotment	Form PAS-3
8	Letter of offer	Form SH-8
9	Declaration of Solvency	Form SH-9
10	Return in respect of buy-back of securities	Form SH-11
11	Filing of Resolutions and agreements to the Registrar	Form MGT-14
12	Notice of resignation of a director to the Registrar	Form DIR-11
13	Form for submission of documents with the Registrar.	Form GNL-2
14	Annual Return of a Foreign company	Form FC-4
15	Return of dormant companies	Form MSC-3
16	Persons not holding beneficial interest in shares	Form MGT-6

Table 6.7.10 Compliance Related Filing

Informational Services

	Description	e-Form
1	Notice of situation or change of situation or discontinuation of situation, of place where foreign register shall be kept	Form MGT-3
2	Form for filing Report on Annual General Meeting	Form MGT-15
3	Notice of address at which books of account are maintained	Form AOC-5
4	Changes in shareholding position of promoters and top ten shareholders	Form MGT-10
5	Intimation to Registrar of revocation/surrender of license issued under section 8	Form INC-20
6	Notice of Order of the Court or any other competent authority	Form INC-28

Table 6.7.11 Informational Services



Investor Services

Sr.	Description	e-Form
1	INVESTOR COMPLAINT FORM	Form ICP
2	SERIOUS COMPLAINT FORM	Form SCP

Table 6.7.12 Investor Services

Provisions related to Managerial personnel

Sr.	Description	e-Form
1	Form of application to the Central Government for approval of appointment or reappointment and remuneration or increase in remuneration or waiver for excess or over payment to managing director or whole time director or manager and commission or remuneration to directors	Form MR-2
2	Return of appointment of MD/WTD/Manager	Form MR-1

Table 6.7.12 Provisions related to Managerial personnel

Annual filing e-Forms

	Description	e-Form
1	Form for filing XBRL document in respect of financial statement and other documents with the Registrar	Form AOC-4 (XBRL)
2	Form for filing annual return by a company.	Form MGT-7
3	Form for filing financial statement and other documents with the Registrar	Form AOC-4
4	Form for filing consolidated financial statements and other documents with the Registrar	Form AOC-4 (CFS)

Table 6.7.13 Annual filing e-Forms

Addendum Form

Sr.	Description	e-Form
1	Addendum for rectification of defects or incompleteness.	Form GNL-4

Table 6.7.14 Addendum Form

Refund Form

Sr.	Description	e-Form
1	Application for requesting refund of fees paid.	Form Refund

Table 6.7.15 Refund Form

**1956 Act Cost Audit forms**

Sr.	Description	e-Form
1	Form of application to the Central Government for appointment of cost auditor.	Form 23C
2	Form for filing XBRL document in respect of cost audit report and other documents with the Central Government	Form I-XBRL
3	Form for filing XBRL document in respect of compliance report and other documents with the Central Government	Form A-XBRL
4	Information by cost auditor to Central Government	Form 23D

*Table 6.7.16 1956 Act Cost Audit forms***Companies Act, 1956 related**

Sr.	Description	e-Form
1	Form for filing XBRL document in respect of balance sheet and other documents with the Registrar.	Form-23AC
2	Form for filing XBRL document in respect of Profit and Loss account and other documents with the Registrar.	Form-23ACA
3	Filing annual return by a company having a share capital with the Registrar.	Form-20B
4	Particulars of annual return for the company not having share capital	Form-21A
5	Filing balance sheet and other documents with the Registrar 2.(a)	Form-23AC
6	Filing Profit and Loss account and other documents with the Registrar	Form-23ACA
7	Information by auditor to Registrar	Form-23B
8	Form for submission of compliance certificate with the Registrar	Form-66

*Table 6.7.17 Companies Act, 1956 related***Attachments**

Sr.	Description	Attachment
1	A Report by a company to ROC for intimating the disqualification of the director	Form DIR-9
2	Form of application for removal of disqualification of directors	Form DIR-10
3	Circular or circular in the form of advertisement inviting deposits	Form DPT-1
4	Return of Statutory Compliances	Form NDH-1
5	Application for extension of Time	Form NDH-2
6	Half Yearly Return	Form NDH-3
7	Information Memorandum	Form PAS-2
8	Private Placement Offer Letter	Form PAS-4

Table 6.7.18 Attachments



Limited Liability Partnership Forms

Sr. No.	Description	e-Form
1	Application for reservation or change of name	Form 1
2	Incorporation document and subscriber's statement	Form 2
3	Details in respect of designated partners and partners of Limited Liability Partnership	Form 2A
4	Information with regard to limited liability partnership agreement and changes, if any, made therein	Form 3
5	Notice of appointment, cessation, change in name/ address/ designation of a designated partner or partner. and consent to become a partner/ designated partner	Form 4
6	Notice of appointment, cessation, change in particulars of a partners	Form 4A
7	Notice for change of name	Form 5
8	Statement of Account & Solvency	Form 8
9	Annual Return of Limited Liability Partnership (LLP)	Form 11
10	Form for intimating other address for service of documents	Form 12
11	Notice for change of place of registered office	Form 15
12	Application and statement for conversion of a firm into Limited Liability Partnership (LLP)	Form 17
13	Application and Statement for conversion of a private company/ unlisted public company into limited liability partnership (LLP)	Form 18
14	Notice of intimation of Order of Court/ Tribunal/ CLB/ Central Government to the Registrar	Form 22
15	Application for direction to Limited Liability Partnership (LLP) to change its name to the Registrar	Form 23
16	Application to the Registrar for striking off name	Form 24
17	Application for reservation/ renewal of name by a Foreign Limited Liability Partnership (FLLP) or Foreign Company	Form 25
18	Form for registration of particulars by Foreign Limited Liability Partnership (FLLP)	Form 27
19	Return of alteration in the incorporation document or other instrument constituting or defining the constitution; or the registered or principal office; or the partner or designated partner of limited liability partnership incorporated or registered outside India.	Form 28



20	Notice of (A) alteration in the certificate of incorporation or registration; (B) alteration in names and addresses of any of the persons authorised to accept service on behalf of a foreign limited liability partnership (FLLP) (C) alteration in the principal place of business in India of FLLP (D) cessation to have a place of business in India	Form 29
21	Application for compounding of an offence under the Act	Form 31
22	Form for filing addendum for rectification of defects or incompleteness	Form 32

*Table 6.7.19 Limited Liability Partnership Forms***Firm Conversion Form**

Sr.	Description	Form
1	Form for intimating to Registrar of Firms about conversion of the firm into limited liability partnership (LLP). (To be filled in physical form and submitted to Registrar of Firms)	Form 14

*Table 6.7.20 Firm Conversion Form***DIN Forms**

Sr.	Description	e-Form
1	Application for allotment of Director Identification Number	Form DIN 1
2	Intimation of change in particulars of Director to be given to the Central Government	Form DIN 4

*Table 6.7.21 DIN Forms***6.8 XBRL E-FILING****6.8.1 about XBRL**

XBRL is a data-rich dialect of XML (Extensible Markup Language), the universally preferred language for transmitting information via the Internet. It was developed specifically to communicate information between businesses and other users of financial information, such as analysts, investors and regulators. XBRL provides a common, electronic format for business reporting. It does not change what is being reported. It only changes how it is reported

XBRL is a world-wide standard, developed by an international, non-profit-making consortium, XBRL International Inc. (XII). XII is made up of many hundred members, including government agencies, accounting firms, software companies, large and small corporations, academics and business reporting experts. XII has agreed the basic specifications which define how XBRL works.

6.8.2 XBRL tags

In XBRL, information is not treated as a static block of text or set of numbers.

Instead, information is broken down into unique items of data (eg total liabilities = 100). These data items are then assigned mark-up tags that make them computer-readable. For example, the tag <Liabilities>100</Liabilities> enables a computer to understand that the item is liabilities, and it has a value of 100.



Computers can treat information that has been tagged using XBRL 'intelligently'; they can recognize, process, store, exchange and analyse it automatically using software.

Because XBRL tags are formed in a universally-accepted way, they can be read and processed by any computer that has XBRL software. XBRL tags are defined and organized using categorization schemes called taxonomies.

6.8.3 XBRL taxonomies

Different countries use different accounting standards. Reporting under each standard reflects differing definitions. The XBRL language uses different dictionaries, known as 'taxonomies', to define the specific tags used for each standard. Different dictionaries may be defined for different purposes and types of reporting. Taxonomies are the computer-readable 'dictionaries' of XBRL. Taxonomies provide definitions for XBRL tags, they provide information about the tags, and they organize the tags so that they have a meaningful structure.

As a result, taxonomies enable computers with XBRL software to:

- understand what the tag is (eg whether it is a monetary item, a percentage or text);
- what characteristics the tag has (eg if it has a negative value);
- its relationship to other items (eg if it is part of a calculation).

This additional information is called meta-data. When information that has been tagged with XBRL is transmitted, the meta-data contained within the tags is also transmitted.

Taxonomies differ according to reporting purposes, the type of information being reported and reporting presentation requirements. Consequently, a company may use one taxonomy when reporting to a stock exchange, but use a different taxonomy when reporting to a securities regulator. Taxonomies are available for most of the major national accounting standards around the world.

6.8.4 Working of XBRL

XBRL is a member of the family of languages based on XML, or Extensible Markup Language, which is a standard for the electronic exchange of data between businesses and on the internet. Under XML, identifying tags are applied to items of data so that they can be processed efficiently by computer software.

XBRL is a powerful and flexible version of XML which has been defined specifically to meet the requirements of business and financial information. It enables unique identifying tags to be applied to items of financial data, such as 'net profit'. However, these are more than simple identifiers. They provide a range of information about the item, such as whether it is a monetary item, percentage or fraction. XBRL allows labels in any language to be applied to items, as well as accounting references or other subsidiary information.

XBRL can show how items are related to one another. It can thus represent how they are calculated. It can also identify whether they fall into particular groupings for organisational or presentational purposes. Most importantly, XBRL is easily extensible, so companies and other organisations can adapt it to meet a variety of special requirements.

The rich and powerful structure of XBRL allows very efficient handling of business data by computer software. It supports all the standard tasks involved in compiling, storing and using business data. Such information can be converted into XBRL by suitable mapping processes or generated in XBRL



by software. It can then be searched, selected, exchanged or analysed by computer, or published for ordinary viewing.

XBRL offers major benefits at all stages of business reporting and analysis. The benefits are seen in automation, cost saving, faster, more reliable and more accurate handling of data, improved analysis and in better quality of information and decision-making. All types of organisations can use XBRL to save costs and improve efficiency in handling business and financial information. Because XBRL is extensible and flexible, it can be adapted to a wide variety of different requirements. All participants in the financial information supply chain can benefit, whether they are preparers, transmitters or users of business data.

XBRL enables producers and consumers of financial data to switch resources away from costly manual processes, typically involving time-consuming comparison, assembly and re-entry of data. They are able to concentrate effort on analysis, aided by software which can validate and manipulate XBRL information.

6.8.5 Data Collection and Reporting

By using XBRL, companies and other producers of financial data and business reports can automate the processes of data collection. For example, data from different company divisions with different accounting systems can be assembled quickly, cheaply and efficiently if the sources of information have been upgraded to using XBRL. Once data is gathered in XBRL, different types of reports using varying subsets of the data can be produced with minimum effort. A company finance division, for example, could quickly and reliably generate internal management reports, financial statements for publication, tax and other regulatory filings, as well as credit reports for lenders. Not only can data handling be automated, removing time-consuming, error-prone processes, but the data can be checked by software for accuracy.

6.8.6 Data Consumption and Analysis

Users of data which is received electronically in XBRL can automate its handling, cutting out time-consuming and costly collation and re-entry of information. Software can also immediately validate the data, highlighting errors and gaps which can immediately be addressed. It can also help in analysing, selecting, and processing the data for re-use. Human effort can switch to higher, more value-added aspects of analysis, review, reporting and decision-making. In this way, investment analysts can save effort, greatly simplify the selection and comparison of data, and deepen their company analysis. Lenders can save costs and speed up their dealings with borrowers. Regulators and government departments can assemble, validate and review data much more efficiently and usefully than they have hitherto been able to do.

6.8.7 Steps for e-filing of financial statements in XBRL format on MCA portal :

1. Creation of XBRL instance document :

This is the first step in e-filing financial statements in XBRL format on MCA portal. To begin with, user has to map company's each financial statement element to a corresponding element in published taxonomy.

Companies have the option to create their own XBRL documents in house or to engage a third party to convert their financial statements into XBRL form. The first step in creation of an instance document is to do tagging of the XBRL taxonomy elements with the various accounting heads in



the books of accounts of the company. This would create the mapping of the taxonomy elements with the accounting heads so that the accounting information can be converted into XBRL form.

Mapping is the process of comparing the concepts in the financial statements to the elements in the published taxonomy, assigning a taxonomy element to each accounting concept published by the company. Selecting the appropriate elements for some financial statement elements may require a significant amount of judgment. For that reason those in the company who are most familiar with the financial statements should be associated with mapping of accounting concepts to taxonomy elements.

The mapping should be reviewed before proceeding further as the complete reporting would be dependent on the mapping.

In case any information is present in the financial statements for which corresponding tag/element is not available in the taxonomy, then the same needs to be captured in the next-best-fit element in the taxonomy or should be included under the corresponding 'Others' element. This should be followed only in case the relevant tag is not available in the taxonomy. It should not be used generally. Further, it is imperative to include footnote w.r.t. the same while preparing the instance document.

For tagging or capturing the information which is often included in brackets in the labels in the company's financial statements, can either be captured as footnote or if detailed tags are available, the same should be tagged with the detailed tags in the taxonomy. The complete information as contained in the annual accounts and related documents; and the information required to be filed with the Registrar of Companies should be reported in the XBRL instance documents to be submitted with MCA. For preparing instance document, the taxonomy as applicable for the relevant financial year is to be used.

Once the tagging of financial statement accounting elements with the published taxonomy elements is done, the next step is to create the instance document. An instance document is a XML file that contains business reporting information and represents a collection of financial facts and report-specific information using tags from the XBRL taxonomy. It is to be noted that no extensions to the core Taxonomy will be allowed. Separate instance documents need to be created for the following:

- (a) Stand Alone Balance sheet of the company
- (b) Stand Alone Profit and Loss Account of the company
- (c) Consolidated Balance sheet of the company
- (d) Consolidated Profit and Loss Account of the company

The instance document should contain the financial information for both the current as well as the previous financial year. Consolidated balance sheet and Profit and Loss instance documents to be created only in case the same is applicable to the company. Once the instance document has been prepared, it needs to be ensured that the instance document is a valid instance document and all the information has been correctly captured in the instance document. MCA Validation Tool provides for 'human readable' pdf printable form as well as a view of the instance document.

2. Download XBRL validation tool :

A Validation Tool has been provided on the MCA XBRL portal for validating the generated XBRL instance document. Validating the instance document is a pre requisite before filing the balance sheet and profit & loss account on MCA portal. You are required to download the tool from the



portal and validate the instance document before uploading the same. The MCA XBRL validation tool can be downloaded from the XBRL website of the Ministry (www.mca.gov.in/XBRL). This Validation Tool shall be used for all MCA XBRL filings i.e. Financial Statement FY 2010-11 (based on previous Schedule VI) and FY 2011-12 (based on new Schedule VI) as well as Cost Audit and Compliance Report (which shall be enabled later in the tool). Before Validating an Instance document, the applicable taxonomy is to be selected by the user from the drop down option “taxonomy”.

In case the user is under LAN network, then he/she is required to click the link ‘Proxy Settings’ under ‘Taxonomy’ menu in the tool to enter the Proxy Host and Port along with user name and password. This is to setup the Internet connection, required to download the taxonomy through the XBRL Validation Tool.

3. Load the instance document :

To load the instance document, you need to click the open button, select the instance document and open it. You need not exit the tool to load another instance document just click on ‘open’ again in the menu bar to open the next document.

The detail of the company is available under the General Information tag in the XBRL viewer.

4. Validate the instance document :

The next step is to validate the instance document. The following validations shall be performed by the tool-

- Validating that the instance document is as per the latest and correct version of taxonomy prescribed by MCA
- All mandatory elements have been entered
- Business Rules as specified by MCA
- Validations relating to XBRL technical Specifications as per taxonomy

5. Pre-scrutiny of the instance document :

Once the instance document is successfully validated from the tool, the next step is to pre-scrutinise the validated instance document with the help of the same tool. For pre-scrutinizing the instance document, a working internet connection shall be required. In the Pre-scrutiny, the server side validations (i.e. validations which are to be validated from the MCA21 system) shall be performed.

6. Convert to pdf and verify the contents of the instance document :

This step is essential to ensure that the disclosures contained in XBRL document are as per Audited Financial Statement adopted in the AGM and the textual information entered in the instance document are clearly viewable

Once the instance document has been successfully pre-scrutinized, the next step is to generate pdf by using ‘Export to pdf’ functionality in the tool to verify the final instance document. It is imperative that the company and the professional certifying the instance documents should use this feature to verify the accuracy of the instance document.

In case there is pdf conversion error or the size of the converted pdf is zero kilobytes, then check the textual information entered in the instance document and follow the html guidelines provided under the technical specifications to correct the instance document and validate and pre-scrutinize again.



Please Note:

Verification of PDF document is essential to ensure that the textual information entered in the instance document is clearly viewable. It shall be ensured that disclosures in this pdf file are as per the adopted and published financial statement of the company in all material aspects. It may however be noted that due to XBRL taxonomy, HTML guidelines, etc., the display/presentation of these disclosures may not exactly match with those in published financial statements of the company. Such variations in human-readable pdf version of the XBRL document and published financial statements of the company are unavoidable, and thus permitted.

In case of validation errors (other than warnings) with respect to non-adherence to the HTML guidelines, PDF document will not be created. For such cases, the HTML guidelines needs to be followed and the in stance document needs to be corrected, validated and pre-scrutinized again

7. Attach instance document to the Form 23AC-XBRL and Form 23ACA-XBRL :

There is a separate set of Form 23AC-XBRL and Form 23ACA-XBRL available on the MCA portal for filing in XBRL instance documents by the Company under section 220 of the Companies Act. First fill up the Form 23AC-XBRL and Form 23ACA-XBRL. Thereafter, attach the validated and pre-scrutinised instance document for Balance sheet to Form 23AC-XBRL. Similarly, the instance document for Profit and Loss account is to be attached to Form 23ACA-XBRL. Separate instance documents need to be prepared for Standalone financial statements and consolidated financial statements

8. Submitting the Form 23AC-XBRL and Form 23ACAXBRL on the MCA portal :

After the forms are filled, you are required to perform pre-scrutiny of the form, sign the form and then upload the same as per the normal e-Form filing process. It shall be ensured that the attached instance documents are validated and pre-scrutinised from the XBRL validation tool.

Viewing of balance sheet and profit and loss submitted in XBRL form on MCA portal :

The XBRL instance documents submitted along with Form 23AC-XBRL and 23ACA-XBRL are in machine readable format. Therefore, for viewing the same in a human readable format, these shall be converted into human readable format by the MCA21 system. For viewing the same on MCA portal and for taking certified copies of the same, these converted documents shall be made available

Annual filing-XBRL-eForms

Sr.	Description	e-Form
1	Form for filing XBRL document in respect of financial statement and other documents with the Registrar	Form AOC4-XBRL

Table 6.8.1 Annual filing-XBRL-e-Forms

6.9 OVERVIEW ON GST

The present system of indirect taxation has multiplicity of taxes levied by the Centre and State. This has led to a complex and conflicting principles in indirect tax structure, adding to the multiple compliance and administrative costs. There is no uniformity in tax rates and structure across States. There is cascading of taxes due to 'tax on tax'. There are too many restrictions on seamless credit available, i.e., credit of excise duty and service tax paid at the stage of manufacture is not available



to the traders while paying the State level sales tax or VAT, and vice-versa. Further, no credit of State taxes paid in one State can be availed in other States. (CST)

Goods and Service Tax, which subsumes a large number of Central and State taxes into a single tax, is meant to mitigate the cascading effect of taxes, provide near seamless credit and make way for a common market. However, realization of all the foregoing objectives appears to be a Herculean task and requires the co-operation of all States.

6.9.1 Why GST is necessary for India?

- GDP Growth will go Up by about 1 -2 % after the new law stabilizes (2018-19)
- International Competitiveness will increase by about 5%
- Increased Foreign Direct Investments due to improve ease of doing business and serious reform measures.
- Common Market- Tax distortions due to differential tax structures and entry tax impositions. Further check post delays would not be there.
- Lower transaction cost (multiples returns on different events at different rates in different States.
- Reduced corruption due to use of information technology, less interaction and less discretion.
- Increased IDT revenue as grey market operators would slowly start joining the mainstream.
- This would also lead to increased Direct Tax Revenue due to higher sales/ services disclosure.

6.9.2 GST Concepts

Power to tax GST

Under new Article 246A (inserted by the Constitution Amendment Act, 2016), the Parliament has exclusive power to make laws with respect to GST where the supply of goods or services or both take place in the course of inter-State trade or commerce. Subject to the above, every State would have powers to make laws with regard to GST imposed by the Union or that State.

What is GST (Goods and Service Tax)?

GST is a destination based tax and levied at a single point at the time of consumption of goods or services by the ultimate consumer. GST is based on the principle of value added tax. GST law emphasizes on voluntary compliance and on accounts based reporting and monitoring system. It is a comprehensive levy and envisages tax collection on both goods and services at the same rate.

Internationally, GST was first introduced in France and now more than 160 countries have introduced GST. Most of the countries, depending on their own socio-economic formation, have introduced National level GST or Dual GST.

Definition of Good and Service Tax (GST) - The term GST is defined in Article 366 (12A) to mean “*any tax on supply of goods or services or both except taxes on supply of the alcoholic liquor for human consumption*”.

In terms of Section 2 (52) of the CGST Act “*Goods*” means *every kind of movable property other than money and securities but includes actionable claims, growing crops, grass and other things attached to or forming part of land which are agreed to be severed before supply or under a contract of supply*.



In terms of Section 2(102) of the CGST Act “Services” means anything other than goods, money and securities but includes *activity relating to the use of money or its conversion by cash or by any other mode, from one form, currency or denomination, to another form, currency or denomination for which a separate consideration is charged.*

Thus, all supply of goods or services or both would attract CGST (to be levied by Centre) and SGST (to be levied by State) unless kept out of the purview of GST.

There is no requirement of actual sale of goods under GST. The alternative methods of supply of goods could be in the form of:

- inter State or distinct person stock transfer;
- captive consumption in another State location;
- supply on consignment basis or any other basis by the principal to his agent;
- supply on job work basis (if working under returnable basis- no tax need be paid);
- any other supply such as donation, sample etc.

Structure and type of taxes:

India is proposing to implement dual GST. In dual GST regime, all the transactions of goods and services made for a consideration would attract two levies i.e. CGST (Central GST) and SGST (State GST).

- **Central Goods and Service Tax (CGST)**

The Central GST (CGST) is expected to replace the existing central excise duty and service tax. CGST would also cover sale transactions.

The Constitutional Amendment Act, 2016 contains suitable provisions to enable Centre to tax sales. CGST would be administered by the Central Government. The CENVAT credit balance available under CENVAT Credit Rules with the manufacture or service provider, as on the date of transition into GST, could be carried forward. In respect of tax paid goods in stock as on the date of transition credit not availed in the past or not eligible at that point of time, available under GST could also be availed and used towards disbursing CGST (Central GST) liability. There could be a time bound transition for carry forward of credit availed prior to introduction of GST. The declaration of closing stock as on the date of transition to claim credits, which were not earlier captured, would also be time bound.

- **State Goods and Service Tax (SGST)**

State GST would replace State VAT, Entry tax, Octroi, Luxury tax, etc. SGST would be levied on services as well. To enable taxing of services by the State, the Constitutional Amendment Act, 2016 contains suitable provisions. SGST is to be administered by the State Governments. The SGST payable could be set off from the SGST credit or the IGST credit available. The closing input VAT balance available under VAT Act would also be made available to the dealer, as on the date of transition into GST, and could be set off towards SGST (State GST) liability. Further it is expected that the duty and tax paid on closing stock would also be available as credit, which may not have been claimed as set off in the VAT regime.



● Inter-State Goods and Service Tax (IGST)

IGST would be levied on all supplies of goods and /or services in the course of inter-state trade or commerce. IGST would be applicable to import of goods or services from outside country as well, which is indicated in the Constitutional Amendment Act, 2016.

The balance of credit under VAT as well as Cenvat Credit can be carried forward from the earlier regime. Further the duty and tax paid on closing stock would be available as credit where duty paying documents available, for hitherto exempted products / services which may not have been claimed as set-off. Lower deemed credit is available for those who do not have duty paying documents.

What are the taxes subsumed and NOT subsumed into GST?

State taxes

subsumed	NOT subsumed
Value Added Tax	State Excise Duty
Purchase Tax	Stamp Duty
Entry Tax, Octroi, Local Body Tax	Profession Tax
Sales Tax partially	Motor Vehicle Tax
Entertainment Tax (other than the tax levied by Local tax authorities)	Electricity Duty –Doubtful because of inclusion of electricity in the definition of term “goods”
Luxury Tax	Sale tax on five petroleum products namely Petroleum Crude, Motor Spirit (petrol), High Speed Diesel, Natural Gas and Aviation Turbine Fuel for a period of time. GST Council would decide the date of including them in GST.
Betting, Gambling and Lottery Tax	
Surcharges and State Cesses	

Central taxes

subsumed	NOT subsumed
Central Excise Duty	Customs Duty.
Additional Duties of Excise	
Excise on Medicinal and Toiletries Preparation Act	
Additional Customs Duty (CVD) – equal to central excise on like goods manufactured in India	
Special Additional Duty – Supposed to be equal to CST which was earlier 4%. Not changed inspite of drop in CST rate to 2%.	
Surcharge and Cesses	
Central Sales Tax	



6.10 BROAD PRINCIPLES OF GST

A. Levy and Collection of CGST Bill (Section 9)

In terms of Section 9(1) of CGST Act, 2017 Central Goods and Services Tax (CGST) shall be levied on all intra-State supplies of goods and/or services on the value determined under section 15 and at the rate notified by the Central/State Government in this behalf, on the recommendation of the Council. However, the aforesaid rate of CGST shall not exceed 20%. Further, the CGST shall be collected in the prescribed manner.

In terms of Section 9(3) the Central Government may, on the recommendation of the Council, by notification, specify categories of supply of goods and/or services the tax on which is payable on reverse charge basis and the tax thereon shall be paid by the recipient of such goods and/or services. This has been restricted to the very unorganized sectors like transport. (See Notification for list) Consequently, all the provisions of the CGST Act shall apply to such person as if he is the person liable for paying the tax in relation to the supply of such goods and /or services. However, this cannot be adjusted with the credit but only in cash.

In terms of Section 9(4), CGST in respect of supply of goods or services or both by an unregistered supplier to a registered recipient will be paid by such registered recipient under reverse charge. This is a significant change which would force even small tax payers to go for the regular scheme of full tax with credit if they want to deal with any registered businesses. No business in competitive environment can afford to break the credit chain and may avoid buying from unregistered or composition dealers. Central Government vide *Notification No. 08/2017-Central Tax (Rate)*, dt. 28-06-2017 has w.e.f 1st July 2017 exempted supplies of goods or service or both received by a registered person from any or all such unregistered supplier(s) if the aggregate value of such supplies **does not exceed Rs. 5000 in a day**.

In terms of Section 9(5), the Central Government may specify categories of services the tax on which shall be paid by the Electronic Commerce Operator if such services are supplied through it. Consequently, all the provisions of the CGST Act shall apply to such Electronic Commerce Operator as if he is the person liable for paying the tax in relation to supply of such services. In other cases where the e-com operator only provides a platform the need to pay TCS (Tax Collection at Source) of 1% and reporting the same has been fastened. The supplier would be liable for discharge of the GST applicable as such persons not eligible for threshold exemption of Rs. 20 / 10 Lakhs.

B. Composition Levy (Section 10)

In terms of Section 10(1) a registered person whose aggregate turnover in the preceding financial year did not exceed Rs.75 lakhs, may opt to pay amount (not tax), in lieu of tax payable in normal levy but not exceeding following % of turnover in State or in Union Territory:

- (i) 1% of turnover, in case of a manufacturer
- (ii) 2.5% of the turnover in case of restaurant services (excluding alcohol)
- (iii) 0.5% in case of others

Note: a) Barring Uttarakhand, which has opted for a Rs. 75 lakh threshold for the composition scheme, the Rs. 50 lakh threshold will continue for all other special category states except for Jammu & Kashmir.



b) The State GST may be an equal amount of Rs. 75 Lakh.

The above-mentioned composition levy shall not be granted to a taxable person-

- who is engaged in the supply of services other than supply of food and beverages (outdoor caterer/ hotel etc.); or
- who makes any supply of goods which are not leviable to tax under the CGST Act; or
- who makes any inter-state outward supplies of goods; or
- who has any instate or imported stocks in hand
- who makes any supply of goods through an Electronic Commerce Operator who is required to collect tax at source; or
- who a manufacturer of such goods is as may be notified on the recommendation of the Council.

the registered person shall not be eligible to opt for the composition scheme unless all registered person opts the scheme. Resultantly, registered taxable person, having the same PAN has obtained more than one Registration, whether in the same State or in two different States as Head Office and Branch, then the Head Office and Branch cannot opt for Composition Levy Scheme in isolation. Both will have to opt for Composition Levy.

In terms of Section 10(3), the Composition Levy Scheme shall stand withdrawn from the day when the aggregate turnover of the registered taxable person during a financial year exceeds Rs. 75,00,000/- or specified limit.

In terms of Section 10(4) a taxable person who pays tax under composition levy shall not collect any tax from the recipient on supplies made by him nor shall he be entitled to any credit of input tax.

It is also worth noting here that in terms of Section 10(5) if the proper officer has reasons to believe that a taxable person was not eligible to pay tax under Composition Levy Scheme, the concerned taxable person shall be liable to pay the following:

- (a) Any tax which may be payable by him under other provisions of the Act; and
- (b) Penalty; provision of section 73 and 74 for shall apply for determination of tax and penalty

It is also to be noted that since Composition Levy Scheme cannot be availed by a taxable person who is engaged in the supply of Ice-cream, Pan Masala & Tobacco, supply of services, works contractors providing Works Contract Services shall not be eligible for Composition Levy Scheme. Consequently, aforesaid Works Contractors would be forced to maintain proper Books of Accounts and Records. Traders doing B2B activity may not find the composition levy economically viable.

In terms of Section 2(107) Taxable Person means a person who is registered or required to be registered under Section 22 or 24 of this Act. One who is required to obtain multiple registrations in different States or within one State would be considered as *distinct person* in each State.

Following persons are not liable to registration as per sections 22-24:

- (a) Any person engaged exclusively in the business of supplying goods and/or services that are not liable to tax or are wholly exempt from tax under CGST Act.
- (b) An agriculturist to the extent of supply of produce out of cultivation of land the persons who are only engaged in making supplies of taxable goods or services or both, the total tax on which



is liable to be paid on reverse charge basis by the recipient of such goods or services or both under section 9(3) of the CGST Act, 2017

- (c) Any supplier if his aggregate turnover in a financial year does not exceed Rs. 20 lakh.
- (d) Any supplier if his aggregate turnover in a financial year does not exceed Rs. 10 lakh from Special Category States. Following is the list of aforesaid "Special Category States"

S. No.	Special Category States	S. No.	Special Category States
1.	Arunachal Pradesh	7.	Nagaland
2.	Assam	8.	Sikkim
3.	Jammu & Kashmir	9.	Tripura
4.	Manipur	10.	Himachal Pradesh
5.	Meghalaya	11.	Uttarakhand
6.	Mizoram		

In terms of Section 24 read with Section 22, following persons are required to be registered under CGST Act:

- (a) Every supplier shall be liable to be registered under the CGST Act in the State from where he makes a taxable supply of goods and/or services if his aggregate turnover in a financial year exceeds Rs. 20 lakh. However, in respect of Special Category States, the aforesaid threshold registration limit has been reduced to Rs. 10 lakh.
- (b) Person making any inter-state taxable supply (no threshold limit).
- (c) Causal Taxable Persons (No threshold limit).
- (d) Persons liable to pay GST under reverse charge (no threshold limit).
- (e) Electronic Commerce Operator in respect of specified categories of services if such services are supplied through it.
- (f) Non-Resident Taxable Persons.
- (g) Persons who are required to deduct tax at source
- (h) Persons who are required to collect tax at source
- (i) Persons who supply goods and/or services on behalf of other taxable persons whether as an agent or otherwise (no threshold limit).
- (j) Input Service Distributor.
- (k) Persons who supply goods and/or services through Electronic Commerce Operator who is required to collect tax at source (No threshold limit).
- (l) Every Electronic Commerce Operator (No threshold limit).
- (m) Every person supplying Online Information and Database Access or Retrieval Services (OIDAR Services) from a place outside India to a person in India, other than a registered taxable person.
- (n) Such other person or class of persons as may be notified by the Government on the recommendation of the Council.



C. Meaning and scope of supply (Section 7)

Supply includes:

- (a) all forms of supply of goods and/or services such as sale, transfer, barter, exchange, license, rental, lease or disposal made or agreed to be made for a consideration by a person in the course or furtherance of business,
- (b) importation of service, for a consideration whether or not in the course or furtherance of business, and

In terms of Section 7(3) the Government may, upon recommendation of the Council, specify, by notification, the transactions that are to be treated as –

- (i) a supply of goods and not as a supply of services; or
- (ii) a supply of services and not as a supply of goods; or
- (c) In terms of Schedule I to the CGST Act, following are to be treated as supply even if made without consideration:

1. Permanent transfer or disposal of business assets where input tax credit has been availed on such business assets.
2. Supply of goods or services between *related persons* or between *distinct persons* as specified in Section 25, when made in the course or furtherance of business. In terms of Section 10, following are deemed distinct persons

(i) Deemed Distinct Persons in Case of Multiple Registrations- Section 25(4)

A person who has either already obtained or is required to obtain more than one registration under this Act shall be treated as distinct persons in respect of each such registration. It is immaterial whether the aforesaid multiple registrations have been obtained or are required to be obtained in one State or more than one State.

Example

Mr. Ravi is engaged in supply of professional services as Chartered Accountant. He has obtained a Registration in the State of West Bengal in respect of his Head Office. In addition, he has obtained registration in the State of Delhi in respect of his branch.

In the above case, in respect of each registration at West Bengal and Delhi, Mr. Ravi shall be treated as distinct person.

(ii) Deemed Establishments of Distinct Persons in case of Multiple Registration in Different States -Section 25(5)

An establishment of a person who has either obtained or is required to obtain registration in a State and any of his other establishments in another State shall be treated as establishment of distinct persons for the purposes of this Act.

Example

Raj Ltd. is engaged in supply of specified goods. It has obtained a Registration in the State of Haryana in respect of its Head Office. In addition, it has obtained registration in the State of Punjab in respect of its branch located at Jalandhar.

In the above case, the establishment in Haryana and establishment in Punjab shall be treated as establishments of distinct persons.



3. Supply of goods-
 - (a) by a principal to his agent where the agent undertakes to supply such goods on behalf of the principal, or
 - (b) by an agent to his principal where the agent undertakes to receive such goods on behalf of the principal.
4. Importation of services by a taxable person from a *related person* or from any of his other establishments outside India, in the course or furtherance of business.
1. Schedule II-following matters to be treated as a supply of goods or a supply of services:
 1. *Transfer*
 - (a) Any transfer of title to goods is a supply of goods. Normal sale.
 - (b) Any transfer of goods or right in goods or undivided share without transfer of title is supply of services. Example- Renting of laptops.
 - (c) Any transfer of title in goods under an agreement which stipulates that property in goods will pass at a future date upon payment of full consideration as agreed is a supply of goods. Example – Supply of Refrigerators under Hire- purchase Agreement
 2. *Land and Building*
 - (a) Any lease, tenancy, easement, license to occupy land is a supply of services.
 - (b) Any lease or letting out of the building including a commercial, industrial or residential complex for business or comer, either wholly or partly, is a supply of services
 3. *Treatment or process*

Any treatment or process which is being applied to another person's goods is a supply of services.
 4. *Transfer of business assets*
 - (a) Where goods forming part of the assets of a business are transferred or disposed of by or under the directions of the person carrying on the business so as no longer to form part of those assets, whether for a consideration, such transfer or disposal is a supply of goods by the person
 - (b) Where, by or under the direction of a person carrying on a business, goods held or used for the purposes of the business are put to any private use or are used, or made available to any person for use, for any purpose other than a purpose of the business, whether for a consideration, the usage or making available of such goods is a supply of services
 - (c) Where any person ceases to be a taxable person, any goods forming part of the assets of any business carried on by him shall be deemed to be supplied by him in the course or furtherance of his business immediately before he ceases to be taxable person. However, aforesaid provision of deemed supply of goods shall not apply in the following cases:
 - (i) Where the business is transferred as a going concerned to another person; or
 - (ii) Where the business is carried on by a personal representative who is deemed to be a taxable person

The declared services under the present ST Law shall be treated as supply a service.



The following shall be treated as supply of goods

Supply of goods by any unincorporated association or body of persons to a member thereof for cash, deferred payment or other valuable consideration

In terms of Section 8 of the Act, the tax liability on a composite or a mixed supply shall be determined in the following manner-

- (a) a *composite supply* comprising two or more supplies, one of which is a principal supply, shall be treated as a supply of such principal supply. Example- Supply of food during the course of transportation of passengers by air services shall be treated as supply of transportation of passengers by air.
- (b) a *mixed supply* two or more supplies shall be treated as supply of that particular supply which attracts the highest rate of tax.

D. Meaning of inter-state and intra-state supply [Section 7 and 8 of the IGST Act]

In terms of Section 7(1) & (3) of the IGST Act supply of goods or services in the course of inter-state trade or commerce means any supply where the location of the supplier and the place of supply are in

- (a) Two different state
- (b) Two different union territories
- (c) A State and a Union territory

On the other hand, in terms of Section 8(1) and (2), intra-State supply of goods or services means any supply of goods where the location of the supplier and place of supply are in the same State or same Union territory. However, the intra-State supply of goods shall not include:

- (i) Supply of goods to or by a SEZ developer or to or by an SEZ unit;
- (ii) Supply of goods brought into India in the course of import till they cross the customs frontiers of India.
- (iii) Supplies made to a tourist leaving India on any supply of goods taken out of India by him

E. Classification under GST

The classification of goods is to be done with reference to the broad category as per the GST Tariff Act. In case of any doubt the specific coverage within the alternative entries is to be chosen. The Harmonized System of Nomenclature (HSN), issued by the World Customs Organization, Brussels, could be adopted for classification of goods and with respect to services it would be in line with WTO classification. This would integrate Indian trade and industry with global trade even at each State level. Further it would ensure that there is uniformity amongst Union and the States in the matter of classification of goods. Where the entry is not clear or more than one classification appears to be relevant, then reference could be made to the rules of interpretation contained in the HSN to resolve such a conflict. The notification issued on the interpretation rules and the rates may be referred for clarity.

Where there are, still some doubts the decisions of the Courts laying down certain principles (like trade parlance theory, function based classification, ISI glossary etc.) could be referred. Classification of service would probably be based on the service tax definitions as they exist presently as also the provisions as they existed prior to 2012.



F. Exemptions under GST (Section 11)

1. Exemption in Public Interest by Notification – Section 11(1)

The Central Government may exempt goods and/or services of any specified description from the tax leviable thereon. However, following cumulative conditions need to be satisfied:

- (a) Exemption is to be granted in public interest only;
- (b) Exemption is to be granted on the recommendation of the GST Council;
- (c) Exemption is to be granted by a Notification in the Official Gazette;
- (d) Exemption to be granted either absolutely [i.e. without any condition] or subject to specified conditions;
- (e) Exemption can be from the whole or any part of the tax leviable thereon; and
- (f) The effective date of exemption may either be from the date of issue of notification or any date subsequent thereto as may be specified in the relevant Notification

Further, in terms of Explanation to Section 11, where an exemption in respect of any goods and /or services from the whole of the tax leviable thereon has been granted absolutely, the taxable person providing such goods and/or services is not allowed to pay the tax on such goods and/or services. However, if the goods or services are exported then there is facility for claiming the rebate or refund of tax paid on inputs etc.

2. Exemption in Public Interest by Special Order under Circumstances of an Exceptional Nature –Section 11(2)

The Central Government may exempt from payment of tax any goods and/or services on which tax is leviable. However, following cumulative conditions need to be satisfied:

- (a) Exemption is to be granted in public interest only;
- (b) Exemption is to be granted on the recommendation of the GST Council;
- (c) Exemption is to be granted by a special order in each case; and
- (d) Exemption is to be granted under circumstances of an exceptional nature to be specified in the aforesaid special order.

3. Insertion of an Explanation in the Notification or Order – Section 11(3)

The Central Government may insert an explanation in the Notification or Order issued under Section 11(1) or Section 11(2) respectively. However, following conditions need to be satisfied cumulatively:

- (a) Explanation is to be inserted only if the Central Government considers it necessary or expedient to do so;
- (b) Explanation is to be inserted with a view to clarify the scope or applicability of any Notification or Order; and
- (c) Explanation is to be issued within one year of issue of the Notification or Order.

Further, such Explanation shall have the effect as if it had always been the part of the original / first relevant Notification or Order.

The classification at higher rates than the correct rate may lead to assessee being uncompetitive.



The classification at lower rate can severely damage the business when the demand for several years with interest and penalty is raised.

Therefore, it is important that classification is not done in a hurry and done accurately and in case of doubt reference to the entry, HSN, case laws be examined in an independent manner. It may be noted that the Apex court has held that exemptions are to be construed strictly.

G. Decision on Registration (Section 22)

The decision regarding registration as a supplier of goods or service would be made when GST is payable. The intermediate goods supplier should not claim exemption and take the registration from the start of the enterprise to ensure competitiveness due to availability of input credit set off.

The supplier [whether an importer, distributor or retailer] who wishes to pass on the input tax credit in respect of the GST paid on goods traded/imported by him to customers, would be required to register under the GST law. Prescribed accounts and records will have to be maintained by them and they must issue proper invoice for the supply of goods and services.

H. Place of Supply (Sections 10- 14 read with Sections 7 & 8 of the IGST Act)

The place of supply would determine first as to whether the transaction is in India or outside India. If it is outside India it would not be liable to GST.

It would also determine the place of levy. Most transactions are expected to be taxed at the rate prevailing at the destination. There would be some exceptions in regard to services and a few in regard to goods.

Section 7 of the IGST Act provides that place of supply of goods shall, depend on the location of the supplier and place of supply. In terms of Section 7(1) of the IGST Act Inter-State supply of goods means any supply of goods where the location of the supplier and the place of supply are in different States, On the other hand, in the Section 8(1) intra-State supply of goods means any supply of goods where the location of the supplier and the place of supply are in the same State.

In terms of Section 12 & 13 of the IGST Act the place of supply for services is quite elaborate and based partially on the present Place of Provision of Services Rules under the service tax. Place shall be decided by way of location of immovable property, place of performance of services, place of event, location of supplier of service, location of recipient of service etc.

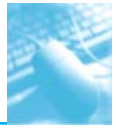
I. Time of Supply (Sections 12 & 13 of the CGST Act)

The liability to pay CGST/SGST on the goods shall arise at the time of supply. The time of supply of goods would be earlier of the following dates, namely:

- (a) the date of issue of invoice by the supplier or the last date on which he is required to issue the invoice with respect to the supply; or
- (b) the date of receipt of payment by the supplier

However, in case of supplies in respect of which tax is paid or liable to be paid on reverse charge basis, the time of supply shall be the earliest of the following date, namely: -

- (a) the date of receipt of goods, or
- (b) the date of payment as entered in the books of account of the recipient or the date on which the payment is debited in his bank account, whichever is earlier; or



- (c) the date immediately following 30 days from the date of issue of invoice or any other document, by whatever name called, in lieu thereof by the supplier:

In case of service, the time of supply shall be earlier of the following dates, namely: -

- (a) the date of issue of invoice by the supplier if the invoice is issued within the prescribe period (i.e. 30 days)
- (b) The date of provision of service, if invoice is not issued within the prescribed period
- (c) The date on which the recipient shows the receipt of services in his books of account, in the case (a) and (b) do not apply.

J. Rate of GST

The rates could be as under:

- (a) Revenue Neutral Rate (RNR) – 18%
- (b) Products/ service which are basic necessities – 12%
- (c) Essential Goods – 5%
- (d) Demerit/ luxury goods – 28% + some Cesses
(Upto 160 %)

The Codes and Rates of various goods and services under GST have already been notified by CBEC and are available on www.cbec.gov.in

K. Valuation (Section 15)

GST would normally be payable on the 'transaction value'. Transaction value is the *price actually paid or payable* for the said supply of goods and/or services between un-related parties and price is the sole consideration. The transaction value is also said to include:

- Taxes other than GST
- Expenses incurred by recipient in relation to supply
- Incidental expenses charged at the time or before the supply
- Interest etc. for late payment
- Subsidies directly linked to the price excluding subsidies provided by the Central and Governments

As regards *discounts/incentives*, it will form part of 'transaction value', if it is allowed *after* the supply is effected. However, discounts/ incentives given *before or at the time* of supply would be permissible as deduction from the transaction value. This would be indicated in the invoice itself.

Volume / quantity discounts would be passed on by way of credit notes.

Valuation Rules provides that, where the supply of goods or services is for a consideration not wholly in money, the value of supply shall be:

- (a) open market value
- (b) if (a) is not, then sum total of consideration in money and equivalent thereof
- (c) value of like kind and quantity



- (d) cost+10%
- (e) by reasonable means.

However, where there is no consideration and the receiver is eligible for credit then the value declared would be accepted as the proper value. Though not specified, it may be ideal to ensure that reasonable value is ascribed to such transaction to avoid any questions at the time of audit or otherwise.

The valuation provisions envisaged may result in disputes is the understanding as on date. The settled case laws in Customs for market value and in Central Excise for other than sole consideration may assist in guidance in case of tainted transactions.

L. Input Tax Credit (Section 16 – 22)

Current CENVAT Credit regime disallows CENVAT Credit on various services such as motor vehicle related services, *catering services, employee insurance, construction of civil structure* etc. Similarly, State VAT laws restrict input tax credit in respect of construction, motor vehicle etc. Currently, this denial of credits leads to un-necessary cost burden on assessee though they are used in furtherance of business.

It was expected that in GST regime, seamless credit would be allowed to business houses without any denial or any restriction except say goods / services which are availed for personal use and not for official use (something similar to United Kingdom VAT law).

However, surprisingly, inter-alia, many of the aforesaid credit restrictions continue to remain (in respect of both goods and services). Further, credit is denied on goods and/or services used for private or personal consumption, to the extent they are so consumed. This continuation of denial will lead to substantial tax cascading (as rate of GST would be higher than the current rate of service tax). Also, another round of litigation will result as interpretation issues would crop up while determining eligibility or otherwise of GST paid on personal consumptions such as business lunch with clients.

The credit on the inputs and the input services, pertaining to Central GST, Integrated GST and State GST should be accounted separately. There is likely to be a restriction on cross utilization i.e. credit pertaining to CGST would not be allowed for set-off against SGST and vice versa. However, this restriction would not be applicable to inter-State transactions. Further, the rules for taking and utilization of CGST, IGST and SGST credit would be aligned. The credit on the capital goods could be aligned with inputs and services and would be available for set off 100% in the first year itself.

The provision of supply of goods or services inter-State between the same entities would be subject to GST. When there is no supply but input services are commonly used then the concept of *Input Service Distributor* would apply.

Doubts/ issues in transition as well as post transition continue to be confusing arbitrary and illogical leading to disputes as in the past. It is expected that in the next 6 months these would be made reasonable and cascading impact be reduced further.

M. Set off of input Credit (Sections 16 – 22)

The input tax credit would be eligible for set off as under:

1. The CGST SGST and UTGST paid on supply of service to be set off against the output CGST, SGST and UTGST respectively.
2. When an item is procured for resale, then credit of CGST and SGST/ UTGST is available for all items.



3. When inputs and consumables are procured for the manufacture of goods on which CGST/SGST/ UTGST is paid, then credit of CGST and SGST/ UTGST is available for all items.
4. SGST/ UTGST would be allowed first to be utilised against SGST/ UTGST and then IGST.
5. Similarly, would be allowed first to be utilised against CGST for CGST and then IGST.
6. IGST would be allowed for IGST, CGST and then SGST/ UTGST in that order.

The SGST/ UTGST would not be allowed to be adjusted to the CGST and vice versa. This may lead to accumulation of credit in some places.

Credit of:	Allowed for Payment of		
	IGST	CGST	SGST
IGST	✓ (1)	✓ (2)	✓ (3)
CGST	✓ (2)	✓ (1)	
SGST	✓ (2)		✓ (1)

N. Number of Legislations:

There would be 38 GST laws in India in GST regime; there would be 1 CGST law and 31 SGST laws for each of the States including two Union Territories and 5 UTGST Law and 1 IGST law governing inter-State supplies of goods and/ or services.

O. Whether branch transfer taxable?

At present, the transfer of goods without payment of CST is permissible when one transfers it to self or agent under Form "F". Many States have input tax reversal to be made in such cases on value of goods purchased locally For Example 2% in Karnataka, 5 % In Tamil Nadu and full credit reversal in some States etc.

Under GST, the movement of goods or services from one State to another on transfer basis would be subject to IGST [total of CGST+SGST/ UTGST]. Therefore, tax would not cascade to the extent of restriction. However, it will have issues of increased working capital, storage and logistics.

The transfer of goods or services within a State with a separate business vertical would be liable to SGST/ UTGST and CGST. In case there is only one registration in the State then there would be no GST [CGST+SGST/ UTGST] on the stock transfer.

P. Supply in the course of Import (Section 11 of IGST)

At present import of goods is liable to Customs Duties comprising of Basic Customs duty [BCD], Additional duty of customs equal to Excise duty on like goods manufactured in India [CVD], Special Additional duty (SAD). Service tax is leviable on services which are provided from outside India and received in India and payable by the service receiver under reverse charge mechanism.

The import of goods or services would be deemed as inter-State supply of goods or service and be subjected to the levy of Inter-State GST (IGST). The import of goods would continue to attract Basic Customs Duty (BCD) and also IGST.



Q. Supply in course of export (Section 11 of IGST)

GST would not be charged on goods or services exported from India. In case, the supply of goods or supply of services qualifies as export out of India as per the place of supply provisions, the transaction would be zero rated. The supplier would be allowed to export the goods or services without charging any tax, but can avail the CGST/SGST and IGST credits. If they are unable to utilise the credit, then they can go for refund of. CGST/ SGST/ IGST paid on procurement of such goods and/or services.

R. Transitional Provisions

The key to the success of GST would be when all present tax payers comfortably migrate to GST so that they can continue their businesses without any difficulty. The transition should also enable all to start on a **level playing field**. In the present act and rules there are a couple of aberrations which treat hitherto exempted manufacturers or taxable and exempted product manufacturers unfairly and unequally. Some important transition provisions are briefly explained hereunder:

- (a) Every person registered under VAT, Central Excise or Service tax etc. having a *valid PAN* would be provisionally registered. Further particulars to be provided (online) to enable final registration. (Section 139)
- (b) The CENVAT Credit (manufacturer/ service provider) or the VAT credit (manufacturer/ Trader) or Entry Tax credit (where allowed to be adjusted – few States enable this) can be carried forward if eligible as input credit under GST. It must be ensured that the last return before switching over to GST is made very carefully after proper reconciliation with books of account. Only eligible credits credit to be carried forward. Capturing the complete credits of VAT, Central Excise and Inputs credit could be a value-added activity. The time limit specified is 90 days from 1st July or another 90 days if Commissioner extends. (Section 140(1))
- (c) Capital goods credit is available to a manufacturer/ service provider normally upto 50% in the year of acquisition and balance 50% in the subsequent year/s. Where one has either not availed though eligible or availed 50% pre-GST, the balance can be availed in the subsequent year. However, this credit has not been extended to traders who have capital goods in use as well as area based exempted units. (Section 140(2))
- (d) All manufacturers/ traders and to a lesser extent service providers would have stock of goods which may be in the form of raw material/ components, semi-finished goods and finished goods. Taxes (central excise duty, Input tax credit, service tax) paid under the earlier regime which are available in GST should be allowed as credit as now the payment would be under GST. Those not liable to be registered under the earlier law, claiming exemption, providing works contract service or claiming abatement or 1st and 2nd stage dealer would be eligible to avail the credit on closing stock. This again may not be fair. The proof of existence of stock may also be retained such as stock taking, entries in the running stock registers.

The claim for credit of taxes paid on stock can be made for all the above situations along with duty paying documents to maximize the credit. Where no documents are there, Transitional Rules prescribe deemed credit of 60% can be availed in case of supply of goods taxed at 18% or higher and 40% credit can be availed in case of supply of goods taxed at less than 18% within 6 months, subject to certain conditions. If supply is IGST then it would be 30 % and 20% respectively. (Sections 140(3))



- (e) The credit for duty/ tax paid for goods in transit can be claimed within a period of 30 days with the condition that the same has been recorded in the books. A statement as prescribed should be submitted. (Section 140(5))
- (f) Many dealers and works contractors who are under the composition scheme in the local VAT laws as well as the service tax law are ineligible or may not find it economically viable especially if, they are into Business to Business (B2B). However, if such dealers opt for regular scheme under GST, the credit on inputs held in stock and inputs contained in semi-finished or finished goods held in stock on the appointed day is allowed subject to certain conditions. (Section 140(6))
- (g) The common input services for services received before GST by an Input Service Distributor would be available for distribution as credit under GST Act even if invoice(s) relating to such services is received on or after implementation of GST. [Section 140(7)].
- (h) Where a taxable person having Centralized Registration under the earlier law has obtained a registration under CGST Act, such person shall be allowed to take in his Electronic Credit Ledger, credit of the amount of CENVAT Credit carried forward in a return, furnished under the earlier law by him in respect of the period ending with the day immediately preceding the appointed day. However, the taxable person shall not be allowed to take credit unless the said amount is admissible as input tax credit under the GST Act. Further, such credit may be transferred to any of the registered taxable persons having the same PAN for which the Centralized Registration was obtained under the earlier law. (Section 140(8))
- (i) Under the service tax law when one had not paid for services within 3 months, the credit was to be reversed. If payment is made within 3 months of GST such credit can be re-claimed (Section 140(9))
- (j) Where any duty paid Goods under the earlier law are sent 6 months prior to the appointed day i.e. introduction of GST date and are returned to any place of business on or after the aforesaid appointed day, the Registered Taxable Person(RTP) shall be eligible for refund of the duty paid under the earlier law where such goods are *returned by a person, other than a RTP*, to the said place of business within a period of six months from the appointed day when such goods are identifiable to the satisfaction of the proper officer. However, if the said goods are returned by a RTP, the return of goods shall be deemed to be a supply. (Section 142(1))
- (k) When inputs/ Semi Finished/ finished Goods sent for job work on payment of duty are returned after GST date within 6 + 2 months of GST date no GST will be payable. If not returned, then the input tax credit would have to be reversed. This provision would apply where the credit on the stock in hand of job worker is claimed by the principal (sender). Enabling provisions have been made for receipt of goods directly by job worker or supply from job workers premises. (Sections 141)
- (l) The issue of supplementary invoices, debit/ credit note can be done within 30 days of the date of price revision. In case of credit note, the reversal of the credit by the receiver needs to be confirmed. (Section 142)
- (m) The claims for refund of any amount of CENVAT credit, duty, tax or interest paid made and pending as well as claims made after GST date but pertaining to a period prior would be under the earlier law required to be disposed of as per the earlier law and any amount eventually



accruing to him shall be paid in cash. In case of a claim being rejected (subject to appeal in the old law) the amount so rejected would lapse (Section 142)

- (n) The claim for CENVAT credit or ITC or output duty or tax liability or dispute on Reverse charge mechanism made under the earlier law which is in adjudication etc. would be disposed of under the old law and any amount found to be admissible to the claimant shall be refunded to him in cash. In case of recovery of credit under old law it would be as per the provisions of GST. (Sections 142)
- (o) The returns under central excise can be revised before the end of the month, and service tax returns within 90 days; under VAT in most States a 6 months' time is provided for such revision. If aforesaid revision of returns results in any amount recoverable from the assessee, the same shall be recovered as an arrear of tax under GST Act and the amount so recovered shall not be admissible as input tax credit under GST Act. On the other hand, if pursuant to aforesaid revision of return, any amount is found to be refundable or CENVAT Credit is found to be admissible to any taxable person, the same shall be refunded to him in cash. (Section 142(9))
- (p) Contracts entered prior to GST spilling over to GST would be liable to tax under GST. No tax shall be payable on the supply of goods and/or services made on or after the appointed day where the duty or tax payable thereon has already been paid under the earlier law. (Section 187)
- (q) The tax in respect of the taxable services / taxable goods paid under earlier law, tax shall be levied under this act, and the taxable person shall be entitled to take credit of taxes paid under the existing law to the extent of supplies made after the appointed day and such credit shall be calculated in such manner as may be prescribed. (Section 142(11))
- (r) In many States the stock transfers are after reversal of input tax credit. No such credit reversal is permissible under GST though it was desirable.
- (s) Where goods are sent on approval and are returned within 6 + 2 months, then no liability to pay exist under GST. Beyond that tax is payable by the person returning the goods. If not returned, then the sender has to pay the GST of such earlier supplies. (Section 142(12))
- (t) Where a supplier has made any sale of goods in respect of which tax was required to be deducted at source under the earlier law and the supplier has also issued an invoice for the same before the appointed day, no tax is to be deducted at source shall be made by the deductor under Section 46 of the CGST where payment to the said supplier is made on or after the appointed day. (Section 142(13))

Impact of GST on Trade, manufacture, service

Impact on Traders

- (a) *Tax on value addition:* The impact of tax on the wholesaler or retailer would be limited to the value addition. The tax paid at earlier stages (except CGST & SGST of other States) would be available as set off for payment of GST on supplies. Therefore, traders would prefer to buy/ receive supplies with invoice pre-and post GST.
- (b) *Reduce cascading:* Cost of products and services would reduce normally due to the cascading effect of tax being reduced. Service tax credits would be available and going forward even the capital goods used for storing, handling etc.



- (c) *SGST/ UTGST levy*: CGST and SGST/ UTGST would be levied on the local supply of goods within State. IGST (comprising of CGST and SGST) would be levied on inter-State supply of goods.
- (d) *No subsequent sale or sale in transit under the CST Act against Forms E-1/2*: This exemption as per section 6(2) of the CST Act is not continued under GST levy. GST would be charged on both transactions.
- (e) *Export supplies Under Form H/ Supplies to SEZ under form I*: Not available.
- (f) *Stock transfers*: Presently, stock transfer is done without charging CST against Form F. Under GST law, stock transfers from one State to other would be liable to GST.
- (g) *Stock transfers to branches/consignment agents within the State*: Under GST, these transfers would not be taxed as the registration number of transferor and transferee is same. Where the division/ branch or agent has a different registration CGST & SGST would be charged.
- (h) *Small Traders*: They would be eligible for the composition scheme upto Rs 75 lakhs provided their aggregate turnover in the preceding financial year did not exceed Rs. 75 lakh. After that, normal rate will apply. The essential conditions to be complied for availing the benefit of the aforesaid Composition Scheme are as under
 - (i) No credit to dealer/ customer;
 - (ii) No inter-state supply of goods.

Only suitable for Business to Consumer transactions.

2. Impact on Manufacturers

- (a) *Competitive in market*: There would be a saving in taxes due to less restrictions in taking setoff of taxes paid at various stages of manufacture reducing the cost of goods/ services supplied. This would make them more competitive both in domestic and the international markets.
- (b) *Valuation of the supply of goods*: At present, excise duty is paid on the event of manufacture of excisable goods and VAT on the sale of goods. VAT/ CST is computed on sale price+ excise duty paid. With the shift of taxable event from manufacture to supply of goods, the valuation of goods could be simplified. Under GST, actual value received as a consideration for the supply of goods would be subject to GST with some exceptions.
- (c) *Cheaper exports*: Exports would be cheaper as taxes paid at earlier stages could be refunded to a larger extent. [credit restrictions can lead to tax sticking]
- (d) *Ease of doing Business*: Adoption of Information technology in GST regime will enable the organization to do business with ease.
- (e) *Transaction costs*: The transaction costs of compliance would reduce due to widespread computerization and online filling of forms and returns and payment of taxes. However, the need to upload all transactions may lead to increased compliance cost for medium sector while for the small sector it may not be bearable.
- (f) *Manufacturers under administration of State VAT officials*: Manufacturers having a value of clearances of less than Rs. 150 Lakhs are exempt under present Excise law. The matter of administration has not been resolved as on date.



3. Impact on Service Providers

- (a) *Present destination based to proposed consumption based levy:* Presently, service tax is levied mainly at the origin and is a destination based levy, the burden of which is borne by the end customer. Under GST generally they would be taxed in the same way except that the place of supply would have to be confirmed. Tax would flow to the place of consumption.
- (b) *Service tax-SGST levied by States:* Under GST law, the service tax would be levied not just by Centre but also by the States which would be empowered to levy SGST by amendment to the Constitution of India.
- (c) *Taxes received by consuming State:* If services are rendered from one State to another, then tax would ultimately go to the consuming State.
- (d) *Increased set off with VAT:* The VAT credit for goods which was not available to the service provider would be available under GST.

4. Impact on the Consumers

- (a) *Reduction in price:* Generally, the purchase price would reduce as tax content of most products would come down. But if a product has hitherto not been subjected to tax completely then the price would increase. Further those items which are now taxable where tax rate earlier was zero may be more expensive as exemption and zero rated lists of items may come down in the GST regime.
- (b) *Transparency:* The tax paid would be clearly mentioned in the invoice given to the customer.
- (c) *Options to customer:* There would be free trade and commerce between States and throughout the country which would provide more options to the consumer.

5. Central Government

- (a) *Increased collection of CGST and IGST:* The collection of taxes-CGST and IGST would increase when more and more assesses register and pay taxes due to simplified tax laws under GST regime.
- (b) *Loss of CST revenues:* The CST which was 2 % accruing to the State of collection has been subsumed into GST. This revenue would not be available to the States.
- (c) *Refunds under GST:* The refunds under Central excise and service tax laws take long time. However, in GST Regime, refunds are expected to be processed faster with 90% of the total refund amount being available on submission of proper documents.
- (d) *Reduced corruption:* When the laws are simplified, then the chances of multiple interpretations would get reduced, leading to reduction in disputes and consequent litigation. Also, the automation of the payments/returns filing and other compliances could mean that the interaction between the assessee and the department officers would come down to minimum. This would reduce corruption and increase ethics gradually.
- (e) *Compensation for loss of revenues to States:* The compensation of loss of tax revenues to the States on account of implementation of GST would be an outgo. In reality there may be minimal outgo except for the weaker States. All expected to gain due to increased compliance.



6. State Government

- (a) *Proliferation of computerization leading to fall in transaction costs:* Due to increase in computerization due to GSTN, the tax administration would be easier and cost of collection would be less.
- (b) *The Destination Principle:* States which are net consumers would benefit due to the accrual on destination. The producing States may have a comparative disadvantage.

7. Impact on the country

- (a) *Increased FDI:* The flow of Foreign Direct Investments may increase once GST is implemented as the present complicated/ multiple tax laws are one of the reasons foreign Companies are wary of coming to India in addition to widespread corruption.
- (b) *Growth in overall revenue:* It is estimated that India could get revenue of \$15 billion per annum by implementing the Goods and Services Tax as it would promote exports, raise employment and boost growth. Over a period, the dilution of the principles may see that only part of this is accruing.
- (c) *Single point taxation:* Uniformity in tax laws will lead to single point taxation for supply of goods or services all over India. This increases the tax compliance and more assesses will come into tax net.
- (d) *Simplified tax laws:* This reduces litigation and waste of time of the judiciary and the assessee due to frivolous proceedings at various levels of adjudication and appellate authorities. Present law appears to be much worse and an amalgam of the bad parts of VAT/ ST/ CE.
- (e) *Increase in exports and employment-* GST could also result in increased employment, promotion of exports and consequently a significant boost to overall economic growth and factors of production -land labour and capital.

Overall Impact

- (a) *Change in law and procedure:* Since it is a major indirect tax reform in India, there would be new legislations and procedures. The entire indirect tax code would be a new one.
- (b) *Change in tax-rates:* The standard rate of 12.5 % for central excise, Service tax, along with residuary rate of VAT at 12.5-14.5% brings the overall rate to 25%-30%. But, post GST, the general rate will be 18%; a net gain of almost 7%-12%. Most of the dealers and consumers would experience the change in tax rates, either significantly or marginally. When the tax rates are increased for some products it could lead to continued tax evasion as well.
- (c) *GST based on HSN:* The central excise tariff based classification which had stabilized over a period of time may no longer be applicable. The present rate structure would substantially increase the interpretational issues in respect of class of commodities. Disputes expected to mushroom in the coming years.
- (d) *Availment of tax credit:* GST would facilitate near seamless credit across the entire supply chain and across all States under a common tax base. At present no cross credits are available across central excise/service tax to local VAT/sales tax. Under the GST law, the input tax credit (ITC) (set off) would be given for Central GST against CGST and the States would give input tax credit (ITC) SGST to SGST. Cross-utilization of credit between Central GST and State GST would not be allowed.



- (e) *Credit availment based on vendor's invoices:* The credit of excise duty paid is available based on the excise invoice raised by manufacturer or service provider. The credit is available under the Service Tax law when the invoice amount is paid within 6 months of the invoice date. In respect of joint charge and reverse charge, based on receipt of payment on the basis of payment challans of the assessee. Under State VAT law, credit is allowable on the basis of tax invoice. Under GST the credits could be availed based on the invoices of vendors under CGST and SGST. But the onus may shift onto the assessee to ensure that the amount of the CGST/SGST has been deposited in the respective Government treasury by the vendor. This provision has been added to bring in tax discipline but smaller businesses may find transaction cost increasing due to this.
- (f) *Avoidance of Double Taxation:* Presently, several transactions suffer VAT as well as Service Tax such as works contract or licensing of software. This could be resolved under the GST regime by redefining what is goods and service.
- (g) *Changes in the Accounting Software:* Dealers and service providers need to modify/replace the accounting and taxation software. Initially there could be investment costs, costs of training in GST of people at each level starting from junior/mid to higher level managerial staff, management group/stakeholders.
- (h) *Training:* Comprehensive training would be required to the staff members of the business community, both at senior level and also at junior level across the purchase, sales and finance functions. VAT + CE/ ST officers would also need to understand the law well.
- (i) *Competent Professionals:* There are specialized consultants for Excise Duty, Service Tax and VAT. With the GST, only a single consultant maybe required who can handle all GST matters. Compliance for the SME may necessitate competent tax preparers.
- (j) *Amending existing contracts:* Assesseees have to incorporate an extra clause in the existing contracts to collect CGST and SGST as applicable.

Impact on Specific Sector

Impact on Agriculture

1. In India, food items are generally exempt from central excise duty. But many food items, including food grains and cereals, attract State VAT at 4-5%.
2. The exemption under the State VAT laws is restricted to unprocessed food, e.g., fresh fruits and vegetables, meat and eggs, and coarse grains.
3. These items would be subject to tax in GST at nil rate when unbranded and at a lower rate, 5% (combined GST rate), which, if so, would certainly make some of these items dearer.

Impact on Works Contract

Works contracts are composite contracts involving material and labour. The material portion involving the supply of goods is taxable to Value Added Tax (VAT), while the service portion is liable to service tax. If a new commodity comes into existence, in the process of executing a works contract, then, Central Excise duty may be levied.

Under GST law, works contract could be taxed on gross value with ITC on goods and services being available. It would be considered as a service. It would be at 18%. in general and if value of land were included 12%. Credit in respect of Steel, cement, electrical items would more than offset the present



net tax in most States for projects started after GST implementation. However, projects in progress may be severely impacted. Clarity is expected.

Impact on Leasing Companies

1. At present, if there is transfer of right to use goods involving transfer of effective control and possession, then it is subject to VAT; otherwise, it is subject to service tax.
2. Under GST it would be a service.

Impact on International Trade

Importers of goods and services may be affected under the GST regime due to -

1. Change in tax rates leading to higher tax incidence when the goods or services are imported into India from outside India.
2. Exports of goods and services shall continue to be zero rated and eligible to claim refund of input tax credit which could be fast tracked.

Impact on Pure sale of Land or completed building

As they already attract stamp duty may be kept out of GST purview.

Other Impact

1. The 5 specified petroleum products namely Petroleum Crude, Motor Spirit (petrol), High Speed Diesel, Natural Gas and Aviation Turbine Fuel as well as electricity are outside the ambit of GST. In addition, tobacco would attract other taxes applicable in addition to GST.
2. At present products known as sin goods and luxury items are taxable not only at higher rate of tax but also subject to multiple taxes. Under GST they may be taxed at 28% + cesses upto 160%.

Challenges before the Government

Most concerns expressed about the implementation of GST can broadly be divided into three categories -

- A. Design issues
- B. Operational issues
- C. Infrastructure issues.

A. Design issues

The broad framework of GST is now clear. This is on the lines of the model approved by the Empowered Committee of the State Finance Ministers in much diluted form. The Revised Model GST law in terms of quality is analysed hereunder.

Is it simple? - No, amalgam of CST, VAT, CE, Customs; stringent rules expected to be moderated over period of time.

Is it certain? - No. Increased uncertainty as drafted by tax officers. Next 2 years we can expect a slew of changes.

Is it fair? - No. Revenue augmentation/ safety have been focused and business needs have not been addressed fully. Seamless credit is not a reality- restrictions exist in law and also poor drafting will



lead to denial. Many products the total tax has increased. The concept of equalizing the earlier tax rate is not in line with inviting those outside to join in. There should have reduction in tax rates of evasion prone products.

It is transparent? -Yes – due to adoption of information technology- process may be able to keep distance between the tax payer and officers.

The GST would be a dual tax with both Central and State GST component levied on the same base. Thus, all goods and services barring a few exceptions would be brought into the GST base. Importantly, there is no distinction between goods and services for the purpose of the tax with a common legislation applicable to both.

However, a number of issues remain to be resolved, which are under the consideration of the Empowered Committee. These issues include:

- (a) *Enactment of Legislations* - It has been stated by the Finance Minister that there would be no power to tax, if GST is not implemented before September 2017. The date of 1st July seems to be possible as of now.
- (b) *GST Rates*: Finalizing the rate structure with clarity and with list of exemptions considering the unintended impact.

B. Operational issues

- (a) Common approach of the States, i.e., a common law, a common assessment procedure and even a common return.
- (b) Monitoring of inter-State trade by flying squad and a computer-generated number for every supply of goods.
- (c) Sharing of information using comprehensive IT network.
- (d) Improving relations between the Centre and the States.

C. Infrastructural Issues

- (a) *IT infrastructure* - A simple system for inter-State transactions and verification of dealers is essential to ensure tax compliance and check avoidance. Given the volume of such transactions, this system necessarily has to be IT based. GSTN appears to be on the job proactively testing the beta version. It can plug in for States which are not ready. However, SMEs would need to educate themselves and comply which is not practicable for the uneducated and the unorganized.
- (b) *Decision on elimination of Check Posts* to avoid enormous delays in road traffic, and reducing delivery times for goods.
- (c) *Impact on Small Enterprises* - The impact of GST on small enterprises is often cited as a concern. On the State GST component, the position would exactly be the same as under the present VAT regime. There may be three categories of small enterprises in the GST regime:
 - Those below the threshold of Rs. 20 lakhs (10 lakhs in case of specified) need not register for the GST. Practically they can only be in business to consumer traders/ manufacturers/ food service providers.
 - Those between the threshold and composition turnover of Rs. 50 Lakhs have the option to pay 2.5 per cent in the case of manufacturers and 1 per cent in the case of traders.



Given the possibilities of input tax credit, not all small enterprise that do B2B business may seek the turnover tax option. Practically they can only be in business to consumer traders/ manufacturers/ food service providers.

- The third category of small enterprises above the turnover threshold would need to be within the GST framework.

- (d) *Harmonization* - For GST to be effective there should be identical GST laws across States as well as at the Centre. Moreover, not only the law but also the procedures relating to levy, assessment, collection and appropriation of the GST should be similar across States and the Centre. It would be so, we await the analysis of the SGST law in all States.
- (e) There should be a *thorough re-engineering of the departments of SGST and the CGST*. This is to clearly define the responsibility, accountability and authority of both departments. The day-to-day operations should be assigned to the States. The dealers would register and submit their return to the State department where they are located. The dealers should interact with a single tax authority only.
- (f) *Cross-verification of documents must be strengthened* - In the absence of proper cross-verification; the dealers avoid tax payment and claim undue credit for taxable sales. Tax evasion can be prevented by setting up departments similar to centralized and regional anti-evasion organisation as in France.
- (g) *Common procedure for Levy, assessment, collection and appropriation* - For industry to reduce the transaction and compliance costs, it is necessary that apart from a common law, implementation of the law also be similar across States. All stages of the taxation chain from the levy of the tax to its assessment, collection and appropriation should be similar. This would involve similar rules across the States dealing not only with assessments, audit, refunds, but also more basic issues, like registration, filing of returns, treatment of transportation of goods etc.
- (h) *A common dispute resolution mechanism* as well as a mechanism for giving advance rulings would further facilitate trade and industry.
- (i) *Persuasions of the State Government* - Few State Governments have recently indicated their opposition to the implementation of GST at the present juncture. While their objections need to be carefully examined, it must also be recognized that while implementation of the GST is aimed at being revenue neutral to the States, it would be budget positive for the Government. This is because Governments are large purchasers in the market for their own consumption and their cost of procurement would come down significantly with the implementation of GST.
- (j) *Role of the Finance Commission* - It is possible that some States may want assurances that existing revenues would be protected when they implement GST. The Commission is willing to consider providing for compensation in order to advance the implementation of a "flawless" GST.
- (k) *Training* - Since the dual GST is considerably different from the present indirect tax regime, a massive training initiative would be required at both Federal and State levels to familiarize the respective administrations with the concepts and procedures of the dual GST. However, the task is not limited to technical training but also extends to a similar effort to re-orient the attitude and approach of the tax administration in order to achieve a fundamental change in mindset.



- (l) *Compensation Package to the States for Losses* - Another major challenge before the Government is to finalize the compensation package for the States in case of loss due to implementation of the GST.

Centre has provided five-year compensation period.

Under the GST structure, the tax would be collected by the States where the goods or services are consumed, and hence losses could be unfavorable for the producer States and the Centre would be required to compensate them for loss of revenue.

It is now universally acknowledged and recognized that the GST, in whatever form, should be introduced at the earliest as a fundamental fiscal reform measure. If we are really serious about the early introduction policy makers, as also the tax administrations at the Federal and State levels, need to be immediately galvanized into action under a clearly laid-out timetable for introduction and implementation.

GST preparedness –The Way Forward

The GST Act 2017 indicates that the Government may be ahead of the industry and professionals in GST.

The essence of a GST regime is that it removes the cascading effect of CENVAT and Service tax with set-offs. Although a transparent and corruption-free tax administration is yet another purpose of this new Act, its implementation may not be without administrative challenges and legal hurdles. It is just important that in order to accomplish the objectives of such a regime, business entities be prepared. Along with having to comprehend, analyze and comply with the perplexing laws of CGST and IGST, greater challenge could come when each State has its own SGST enactment, which would lead to a multiplicity of the SGST laws and procedures unless all States agree on basic commonalities in the SGST law.

Business entities need to take many actions as part of their preparation. Some of the main actions are listed below:

- (a) **Sensitize the business eco-system:** It is an accepted fact that GST is not merely a tax change but a business change as it would impact all functions of an organisation such as finance, product pricing, supply chain, information technology, contracts, commercials etc. Thus, it's imperative that all these functional teams should be aware about the GST. But the underlying question is what should these team members read/ refer for GST?

In this regard, it's pertinent to note that most of the key aspects of the proposed GST regime are contained in the Model law though procedures are yet to be finalized.

Thus, based on the aforesaid knowledge available in public domain business entities may consider sensitizing its employees.

They can consider sensitizing its entire business eco-system i.e. not only the employees but also vendors (such as Tier-1, Tier-2 vendors etc.) and key customers of the organisation. An early initiation of training would give the concerned employees, vendors and customers a sense of involvement in discussion much before GST legislation is put in public domain.

- (b) **Understand GST Impact on operations** GST may provide opportunities but at the same time it could bring threats. Given this, an organisation may consider carrying out an exercise to identify how its operations would get impacted because of GST. For GST Impact Analysis exercise, the



respective department heads such as finance, supply chain, product pricing, human resource etc. should be involved to ensure that they provide their inputs and suggestions.

Going one step forward, entities can also identify possible cost savings which key suppliers / vendors could be entitled to in the proposed GST regime. Based on the possible cost savings to suppliers / vendors, they can have discussion with its vendors for passing of benefits by way of cost reduction in the coming years (i.e. after GST is introduced). Early discussion and engaging with vendors for GST would ensure maximum possible benefit to be passed on to the organisation.

Business entities in service sector would also have to take into consideration the increase (most likely!) or decrease (least likely!) in tax compliances. For most of the entities, in GST regime, compliances are expected to increase dramatically. Take example of a service tax assessee, who currently files 2 returns on an annual basis. Now, in GST regime, Service tax assessee could be required to file as many as 61 returns (5 returns per month plus 1 annual return)!!! Thus, the human resource department would have to be informed about the GST regime so that they can anticipate the increase (and decrease in certain cases) in the manpower.

- (c) **Gear up for transition of Information Technology (IT) systems** - Information Technology is a key area for business organisations as irrespective of the fact whether the organisation is ready or not, on the very first day GST is introduced, the information technology system of an organisation has to be ready and running else it would bring the entire business to standstill.
- (d) **Design Alternate Business Strategies** - To gear up for GST regime, the organisation may identify alternate efficient business strategies to ensure smooth transition to GST. Even, supply chain strategies is expected to undergo a major change as entire India would become one market and there may not be any tax cost involved for intra-State vis-à-vis inter-State procurement of goods. An organisation would have to re-visit their pricing strategies as business competitors may well reduce prices of their product to pass on the GST benefits.

However, while forming alternate business strategies, it goes without saying that the organisation should take into consideration the commercial feasibility of alternate business strategies before these strategies are recommended.

- (e) **Make representation before the Government** - Introduction of GST regime could affect negatively (than positively!) few industries/ sectors. Thus, efforts should be made to identify the possible issues for which appropriate representation could be made before the Government through various trade chambers and forums.

Given this, while current economic situation is characterised by volatile economic conditions, introduction of GST remains a ray of hope; thus, early initiation of aforesaid steps can certainly help the organisations gain insight of all aspects of the proposed GST regime.

- (f) Thorough reading of the GST law draft to pre-empt the possible consequences on one's business
- (g) Assessing the manner and quantum of input credit as available under law.
- (h) Evaluation of the competitiveness and the demand for the products in the backdrop of the new GST rate structure to ensure that products are neither overpriced nor under priced
- (i) Preparation of procedures/SOPs to be followed in the organization



- (j) Special attention to:
- Registrations – existing migrants as well as new applicants
 - Records to be updated up to the authorized date and necessary amendments/ additions/ deletions to be made in records for meeting the requirements of the new law
 - Transition requirements
 - Returns to correctly reflect the details of business e.g. CENVAT credit as reflected in the return for the period ending 30th June, 2017, would only be allowed to be carried forward post the authorized date
 - Inventory check and proper recording
 - Development of IT infrastructure to support the GST requirements
 - Analysing the MIS reports that would be required post GST implementation
 - Analyzing impact of other laws and integration with customs and FTP
- (k) **Spreading of GST awareness/Trainings:** To ensure that the transition is smooth and effected in a timely and effective manner, spreading of adequate awareness of GST is a must. Regular workshops and training programs need to be conducted in order to understand the applicability of GST provisions vis-a-vis the existing business of a person/organization. The following steps could be taken in this case:
- Start focused reading/ practice in CST/ VAT, Central Excise or Service Tax now!!
 - Use online resources – idtc.icai.org, Google GST, caclubindia, yahoo CA groups, taxindiaonline, linked in.
 - Form a small group for GST in your area, meet regularly to understand the latest developments.
 - Make yourself ready before GST is implemented to add value to your organization / clients.
 - Read books/ attend workshops/ seminars on topic.