

Chapter - 14

Computer in Accounting

Learning Objectives

Afer studying this chapter, you will be able to find out :

- What is the order of computer invention?
- How does a computer works ?
- How many types of computers are there?
- How many types of information systems can be developed in a business organization?
- What are the applications of Computer in Business?
- How to develop a Computer Accounting System?
- How is the structure of accounting software?
- How flow chart and decision table can be used in the business?

7.1 Computer : An Introduction

If we search for the hidden history behind the invention of computer, then we will know that calculation was a complex problem for humans, which prompted them to make certain devices which can be used for calculation. These series of inventions ended with the invention of the computer.

Order of invention:

- The counting work was done by marking on the walls when the humans used to live in the caves.
- As human civilization began to develop, changes in methods of calculation began. The first device to be used was Abacus.
- In the 17th century, the Nepeyers, the Pascal Calculator, was used.
- Defense engine was built by Charles babez in the 19th century. Due to their contribution in the field of computing, they are called the father of modern computers. Charles Babez also created analytical engine. That became the base of today's modern computer.
- In the same century Harman Hairlith gave a new method of punching data on the card which was used for census in the United States.

Generation of Modern Computer

First Generation (1946-59):

In the first generation Electronic, Numerical, Integrator and Calculator (ENIAC) were invented. It used vacuum tube or diode valve. All the commands were given in 0 and 1. The data were stored in the punchcard.

Second Generation (1959-1965)

Transistor was invented in the second generation computer in which; magnetic tape was used to store the data in it and

the assembly language was used, which was much easier than machine language. UNIVAC, IBM700 & ATLAS were the computers of this generation.

Third Generation (1965-1971)

In the third generation many transistors were combined to construct a powerful electronic integrated circuit. A high level language was used in it, named as Fortran. In this generation PDP was the main series of computers.

Fourth Generation (1971-1985)

Microprocessors were created in the fourth generation, which were used as the main ingredient in the following generations. The high level languages developed in this generation were Basic, Cobol, Pascal etc. In this generation IBM PC were main computers.

Fifth generation (1985-present):

Very large scale integrated circuit (VLSIC) technology was used in the fifth generation. Artificial intelligence in these computers was also present. These computers do billions of calculations in seconds; their speed is measured in fraction of a second. Super computer and robot etc. are categories of computers of this generation. In the popular inventions of the present generation, the products available are www, HTML, HTTP, web, TV, Java, DVD, iPod, youtube etc., with the addition of Apple's Power Book (1991), Pentium Micro Processor (1993), Sun Ultra Workstation (1996), P4 (1998), Apple iMac, Personal Computer (2002), Power Mac (2003), Smart Phones etc. In the emerging field of computer environment, cloud computing can be shared.



Figure 7.1: Computer Structure

Meaning and Elements of Computer System

Computer is capable of providing fast speed and accurate output through electronic data processing. The composition of the computer consists of switch wire, motors, transistors, integrated circuit (electronic photon). In an integrated form it is termed as computer system that contains Key board, printer, visual display unit, disk drive central processing unit etc.

7.1.1 Operating system of a Computer

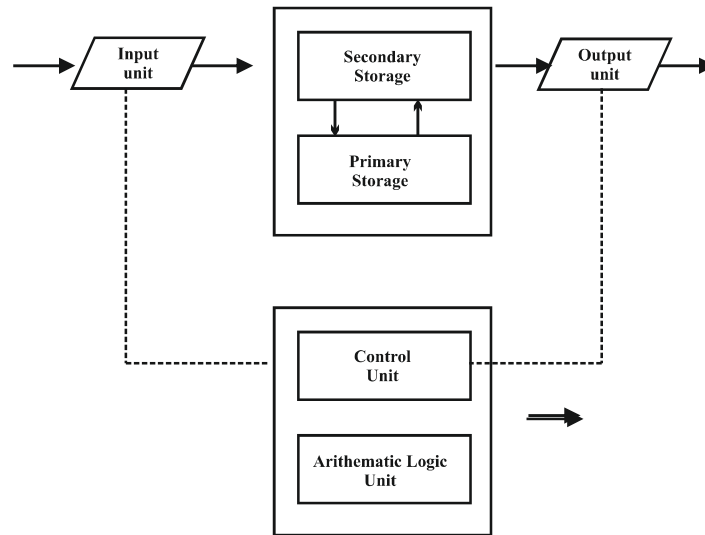


Figure 7.2: Computer's operating system

In addition to its components to make the computer operative, it requires a special type of message i.e. software through the software, the computer makes the tasks determined by them for each device connected to it. The information about how to put any device into operation is already established within the software. Computer process has immense power and capacity, but the software cannot do anything on its own it, requires, within instructions. Its special units to run, such as processor, motherboard, RAM, hard disk, floppy drive, CD Rom that enables the computer by making synergy between all the other devices, i.e. provides the life to the computer. Software is usually divided into three parts System software, application software and general purpose software:

System software:- This software already exists in the computer which acts as an interface between hardware and software. For example, MS DOS, Windows operating system, Unix, Linux programming language etc.

Application Software:- The program used for certain data processing tasks is known as application software. For example - Railway reservation software, banking software, Tally etc.

General purpose software:- The program used by the large number of users of the entire institute for business and scientific work is known as general purpose software. For example - MS. Word, MS Excel, payroll etc. Computer provides the information to the user by analyzing the information given on the basis of available facts.

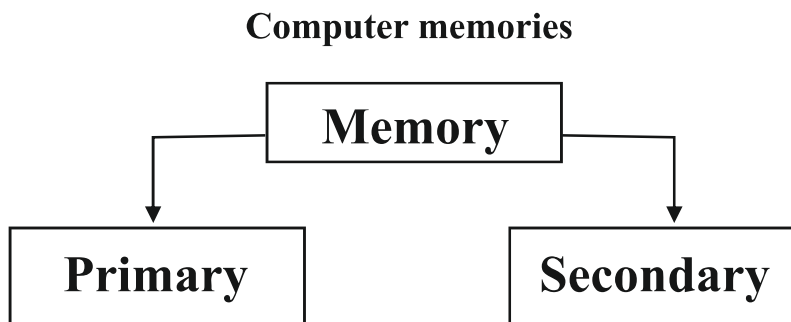
7.1.2 Data Processing with Computers.

This whole process is done in a phased manner.

1. **Input** - Filling the data is done through input device in the computer. Input device that includes, Keyboard, OCR, OMR, MICR, Touch paid, Touch Screen, Scanner, Mouse, Card Reader, Digital Camera, Speech and Audio interface.
2. **Processing** - This work is done by the Central Processing Unit (CPU) also called a microprocessor, it is the main part of the computer. This electronic circuit is made on a small chips of silicon, several pins are attached on the chip. These chips are called microprocessors, which are used to make

connections. Computer designing is done according to the microprocessor chip. The microprocessor works only on all the specifications given by the user, the processor has three main sections: control unit, logical unit and memory unit. The control unit controls the entire process and distributes the work to ALU & MU on the basis of given instructions, then forwards it to the result given by them. It is also called the brain of the computer. Their capability is measured in Kilohertz, Megahertz, Giga hertz etc. The processor's work is measured on a bit basis, such as 8-bit, 16-bit, 32-bit and 64-bit. Every single bit has two values (00 or 01) in which the meaning of 0 is closed and the meaning of 1 is turned on. Thus, in 32-bit, the total is capable of working on data up to 2^{32} . The more bits in a processor, the effectiveness and accuracy of their work will be more effective. A microprocessor, RAM, Chipset, graphic Controllers are established on Mother Board.

3. **Storage :** - Information available on the protection device is stored in Hard disk. Permanent memory of computer. The information established on it persists forever. These are computer's secondary storage devices. Their capacity is much higher than RAM, and information stored on them even after the power shutdown. It only erases when users themselves want to erase them. Their capacity is measured in megabytes, gigabytes, terabytes etc. (8 bits = 1 byte, 1025 Bytes = 1 KD, 1024 KD= 1 MB, 1024 MB= 1 GM, 1024 GB = 1TB).



Computers have two types of memories, main memory or internal memory or primary memory and external memory or secondary memory.

Primary memory is within the CPU. Its storage capacity is limited. This is used during data processing. It is temporary. Two main types of memory are found in the computer.

2. **RAM and ROM:** RAM (Random Access Memory) computer has a temporary memory, it is the primary storage device of the computer. It is directly connected with computer .The information and instructions given by the user are first processed in the operating system are then received in RAM, CPU collects any information as needed accordingly and sends back to it. The memory of RAM can be damaged if the electrical circuit is interrupted in the computer. If memory is destroyed, as a result, all information contained in may be lost. Their capacity is measured in kilobytes, megabytes and gigabytes. Read only Memory (ROM) : This memory allows the user to only read the items in it. It does not allow any further access to it. Second memory or supplementary memory comes with hard disk, CD, DVD, flash drive.

3 Output: Displays the information provided by the users on screen or print by printer. For example - Monitor, Printer, Plotter etc. is the computer's output device.

7.1.3 Types of Computer Based on Functioning

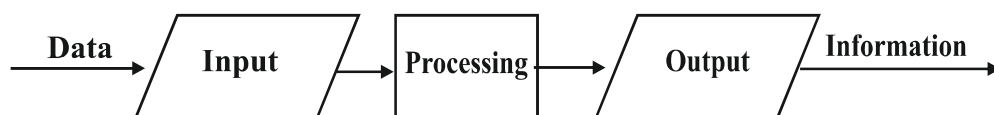
Computers are divided into 3 sections, which are as follows:

1. Digital Computer - The computer that is used to process information with quantities using digits, usually using the binary number system. It functions on numbers only to show all types of information internally in numerical form, and uses only two numbers 0 and 1. Digital computer performs calculations, but solutions are only solved for all mathematical problems. These computers take all data and instructions simultaneously and work together as per the instructions. In such computers knowledge of the program is essential for using these computers. All computers used in banks, schools and offices are usually digital computers.

2. Analog Computer - These computers do not work on numbers but works on some other signals, such as temperature, speed, electric current etc. Analog computers take only one instruction at a time. These computers do not make calculations to give results. Thermometer, the speed meter apparatus of vehicles, etc. are examples of such an analog computer.

3. Hybrid Computer - The hybrid computer contains the properties of both digital and analog computers. These computers work as per the instructions given by the programs provided, but their programs are stored in memory, so there is no need for the Programming knowledge. The machine used to print the bill on the STD, PCO shops is an example of a hybrid computer.

Modern computer has made its presence in business and industry. Through this the data is processed in the information. Computer based information is obtained in the correct and speedy process. The way the finished goods obtained by processing raw materials, in the same way, the information is obtained when the data (numerical and factual) are processed. The word data is the plural of the Greek word datum. Data are facts in an unorganized form, whereas information is obtained by processing the data. Data is used for decision making. Data is the basis of working and information is the final product. The system is used to change data into information. System is a group of many components that relate to each other or are interconnected or dependent on each other and are working together to achieve one common objective. Just like the human body is a system in which the brain, arms, legs, heart, cells etc. as its components. All of these organs are associated with veins, etc. and work together in the balanced form so that they can achieve their shared purpose which we call life.



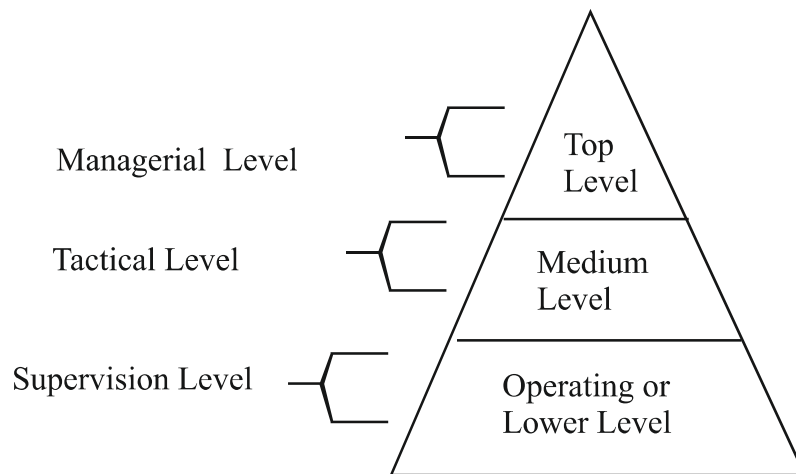


Figure: 7.3 Types of Information in a Business organisation

Information System of an Organization

Our society is an information based society. The information is so powerful that it can affect any system. In order to run any organization, mainly five resources have been considered essential, which are respectively called human, money, machine, raw material and method. But the administrators have now felt the need for a more significant resource and it is information.

The organization will have to develop an information system that provides the right information in right quantum on the right time. In order to fulfill this responsibility, an organization can develop different information systems.

1. Transaction Processing System

It is related to the automation of the daily activities of any organization. It is used to process the various activities of the organizations, performed among various institutions, by making an input in the computer and preparing various reports.

- It is a computerized basic information system.
- It is used for the automation of the daily work.
- Its data sources are internal.
- This is for supervisor level managers.

2. Management Information System

Transaction procedure system is prepared for the automation and maintenance of the daily activities of the organization. On the other hand Management Information System (MIS) is developed to help the management to make decisions and solve problems at various management levels.

- It helps in decision making.
- Data sources are both internal and external.
- It is used by high and middle level managers.

3. Decision Support System

Decision-making system helps the system administrators to make decisions or solve the problem. It provides information for decision making and also suggests decision making models. Decision models are specially designed

programs where administrators can check the results of their decisions. It is not necessary that all the decisions in the management are repetitive by nature; there are many decisions that are taken once during the life time of the manager. Decision-making systems are made to take unique type of decisions. For example - 'What if ' command in spreadsheet software is used for decisions. The main examples of accounting in accounting are: cost accounting system, capital budgeting system, budget differential analysis system. Model base decision is the brain of the support system because it helps in computing and analyzing the data given by the user.

- It is helpful in taking unique types of decisions.
- It provides assistance to the management by providing information and decision models.
- It also enables to fulfill the changing information requirement.
- It is used by high and middle level managers.

4. Management Information System

This information system is created for the use of the organization's higher level managers. An information mechanism is developed, which carries out data base and model bases are prepared for various tasks in the organization for the management. This provides information to the system administrators as a summary.

Computer network is used to execute this information system. In this network, based on the Client Server technology, all types of data base and model base are stored and then stored on Central Computer or server and all the managers are given a terminal through which they get support for using the system themselves.

- It is helpful in the decision making system of high level managers.
- This helps by providing data base and model base.
- It provides information in graphical mode.
- It is based on the Client server.
- It provides online tools for knowledge and analysis of market conditions.

5. Expert System

Expert system is developed in the form of replacement of human expertise. Instead of giving inputs to their problems by system managers and providing them information and model bases, it provides readily available compiled decisions. Different expert systems are created for different areas. For example, there are different expert systems for medical science, management, engineering etc. It is known as knowledge based system. It contains the data of rules and relationships, which can be used to solve a problem, besides that it contains specific sector statistics in it. Expert System is a result of the decisions taken by experts for various problems and the computer's artificial intelligence.

- It is a system based on artificial intelligence technique.
- It is developed as a substitute for experts.
- It resolves problems by giving executive self-decisions

6. Accounting Information System

Under financial accounting we record business transactions in account books. Its purpose is to get information about the profit-loss and financial position of the business. Identifying business transactions under accounting involves recording, classifying, summarizing and interpreting. It is easy to make business decisions. The accounting information system is the most important dimension to the use of technology in the business sector.

The accounting information system is informational system based on transactions. It provides information about the financial practices related to the business. Out of this, most of the financial businesses are regular in business i.e. they occur on day to day basis. Such as purchase, lending transactions, payment of receipts, payments etc.

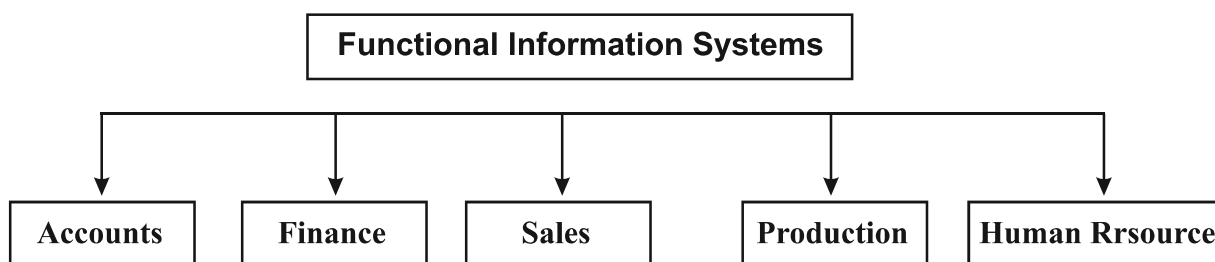


Figure: 7.4 Functional Information Systems

Evolution: Accounting system is the oldest in information systems used in business. The initial accounting information system was used to obtain legal information. At present, the use of accounting information system is becoming more and more to provide information related to transaction of business. Due to the development of information technology, the use of accounting information system is becoming very strong. At present, there will hardly be any office or area where the computer is not being used for writing and expressing transactions. The accounting department is responsible for inculcating accounting practices, but it also provides information to other departments of the business, such as production, sales and other functional groups. Use of the information available in accounting can be direct and indirect parties, and those who want to associate themselves with the business can also use such information.

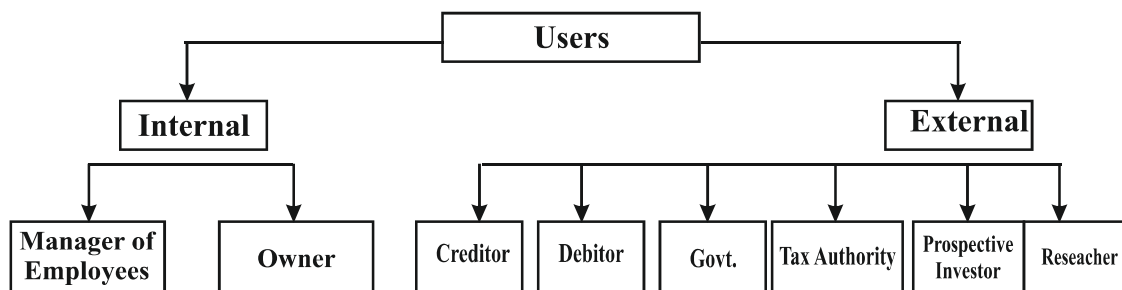


Figure: 7.5 Accounting information users

Four main functions of accounting information system -

- Data Collection
- Data Manipulation
- Data Storage
- Document Preparation

When the information structure is created only by humans (Manual), then it is called the manual accounting information system. When the information structure is created by using only computers, then it is called computerized accounting information system. When both human and computer resources are included, it is called a computer based accounting information system.

Data Processing under Accounting Information System

Data is processed in accounting information system in various forms as under :

Original bill - In the first phase of data processing, original documents are prepared which are called authenticators.

Input - In this phase, accounting data is entered in the computer. It works on double entry method

Storage - Data is stored in this step in an empty data record. A data structure is created to prepare the data base format for accounting.

Conversion – Data transformation is necessary to prepare annual report. Such converged data are operated separately and after this it is used to prepare final / annual reports.

Issue - With the help of conversion data, financial statements like cash book, account book, sediment, final accounts etc. are obtained according to pre-determined format.

Objectives:

1. Providing reliable accounting information to different users related to business.
2. Protection of business ventures from potential fraud and misrepresentation.

Features of Accounting Information System

- Accounting information system is related to the historical practices of finance.
- This system summarizes data for the fulfillment of managerial objectives.
- Accounting information system classifies financial transactions and provides a code to the transaction of every, person, property and liability ,asset, revenues and expenses.
- Accounting information system works for other business functions such as finance, production, sales, human resources, etc.
- Determines the future estimates of financial requirements, production demand and budget provisions.

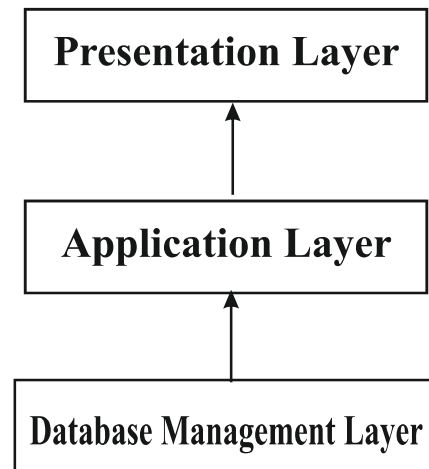


Figure: 7.6 Architecture of Accounting Information System

The structure of the accounting information system is prepared in such a way that correct information is reached to the right person. The presentation level determines how to present the information given to the user. Currently users use different types of digital devices like Laptops, Android, Mobile, Ipad, etc. to view information and data.

All the transactions related to the business are stored in the Central Data Base. It involves business activities such as purchases, sales, stocks, payments of expenses, purchasing of properties, etc. All types of data are maintained in a certain format. Whenever any data are required for decision making of business managers, data is received from the database, through necessary procedures. The process of recruiting sync and processing of information by them is done on the application layer and the Application Layer sends logically processed syncing to the presentation layer. As an example, the order for online sale was obtained in the business, for its processing, by the seller's code; the nature of the transaction (cash or credit) is entered into the computer system in the form of number and quantity. The customer credibility limit is checked by the computer program and if necessary, the customer's account is updated by increasing the credit limit, if the credit limit does not increase, details of the cancelled transaction is prepared. In the next step the invoice or bill is printed on the seller terminal or on the central computer. The bill printing on the warehouse permits the warehouse incharge to send the goods. The availability of goods is also checked and if the stock is in shortfall the information is processed to the customer, so that he can wait for further delivery or cancel his order. A document with the goods, called a bill of lading, is attached. The balance of the stock is reduced as soon as the data is updated in the inventory master file. The new balance is obtained by adding the amount of the goods sent to the customer's account. The sales file is updated. So that area-wise sales can be analyzed.

- **Application of accounting information system:** To establish an information system at the beginning of any business or to make changes to the existing systems in the accounting system is not

an easy task; Information about system, rules and formats etc. are necessary for successful implementation of the system. Just like an engineer is not aware of the creation of accounting system and implementing it, in the same way an accountant is not aware of the production process or construction work.

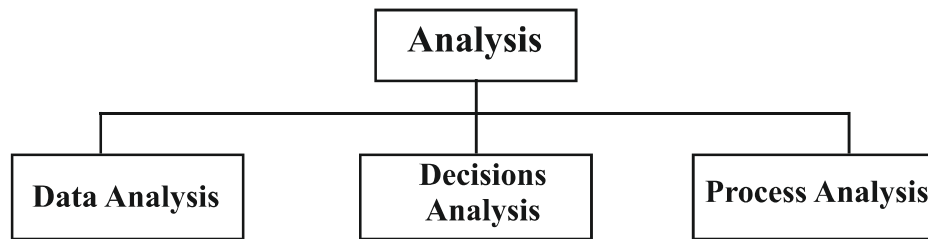
A team of individuals with different knowledge in the formation and development of software is constituted. In this, from the analysis of the user's requirement of software, preparation of the software correct implementation, a series of proceedings are required to be completed.

Chartered accountant can be engaged to implement accounting system in a business. If a computerized accounting system is to be implemented then it is necessary to have a team of people in different areas working for codification purposes.

Implementation phase of Accounting Information System

1. Planning - In order to implement an accounting information system, the first step is to determine the objectives and areas of the project, control of the project responsibilities, project phases, the estimated time of each stage and final output etc.

2. Needs Analysis - In order to understand the shortcomings of the current system, the system transactions, behaviors, reports and queries are given to be compiled. Analysis helps to make changes acceptable. Data analysis is mainly used when designing transaction processing.



In the decision analysis, different model designs are developed for the functioning of the accounting information system, which help the management to collect financial and other information. This method is useful in those institutions, where the main purpose of the system is to support decisions. Process analysis involves improving the cost of services or service quality in institutions through neutral re-engineering. It is useful in institutions whose main purpose is to enable the institution's system to be automated and technically capable.

3. System design: System indicator is prepared by determining the input design and output format of information. For example, if the manager wants to know the current ratio, then the programmer will define which assets to be included in current assets and in what are to be included in current liability, their ratio is the current ratio.

It is considered in the design phase that the design is done according to the requirement of the designers at the time of analysis and all aspects of the developed model are reviewed i.e. input, processing, storage and output etc. and it is also seen that ,whether or not the developed system is capable of completing different tasks related to business.

4. Document and Checking - After preparing the system, the instruction booklet is prepared for the system process and its use, which is given to the buyer with the system.

Prior to implementing any system, it should be checked by the inputs and outputs of the data that the system is tailored to the user's requirement, for example, whether all the data are correct and fully entered or not, whether the inputs are stored in the files or not. Processing of data is error free or not, whether all the required report comes in output or not. For all the above and many other investigations, the analyzer uses some artificial data which is similar to the actual data of the users. The results of these artificial data are first taken out manually by calculating and after that the results are obtained by processing these data from the newly created system. In the end, both results are compared and if the results of both comparisons are found satisfactory then the system check is complete.

5. Implementation and Maintenance - When the information system is found correct during the investigation, it is executed on the user's workplace and given for experiment and checking. Computer hardware is first installed for implementation. After that all programs in the system are put together one by one. As the information system is technically complex, users are required to have training. In this phase of implementation, training programs for the users are also prepared and trained. So that the user can get information about the menu, reports, tools of the software developed. Data backup must be kept at the time of transfer from one system to another, so that there is no fear of loss. In the beginning of the situation, the existing system in parallel should also be maintained, when the new system is fully implemented and the user believes that the new system is doing the right thing and then the old system can be removed. Because the information technology follows the phenomenon of garbage in and garbage out, it is important that all information based system is pure and authentic. Elimination of errors after implementation; enabling the future, users to make desired changes in the system and by adding new tools from time to time, to make the system more useful, etc. This process in Work system is called maintenance.

Scope of Accounting Information system - Performing an integrated form by reporting the functions of various activities of the business is accounting information system. The accounting information system is developed by mixing a lot of sub-systems. Its scope is as follows.

Market and sales analysis system - In this system, the finished goods are used for inventory control, order processing and market analysis.

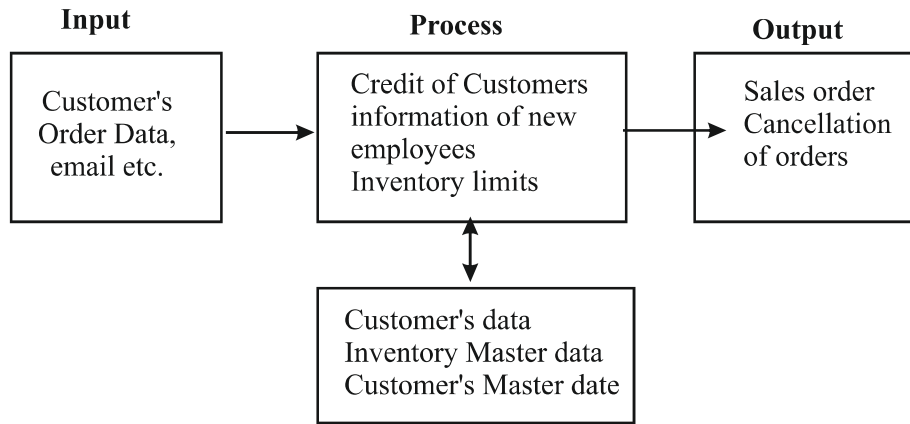


Figure: 7.7 Sales order processing system

2. Production Management System - In this system of material inventory control, semi-finished process control, cost estimation and production list are analyzed.

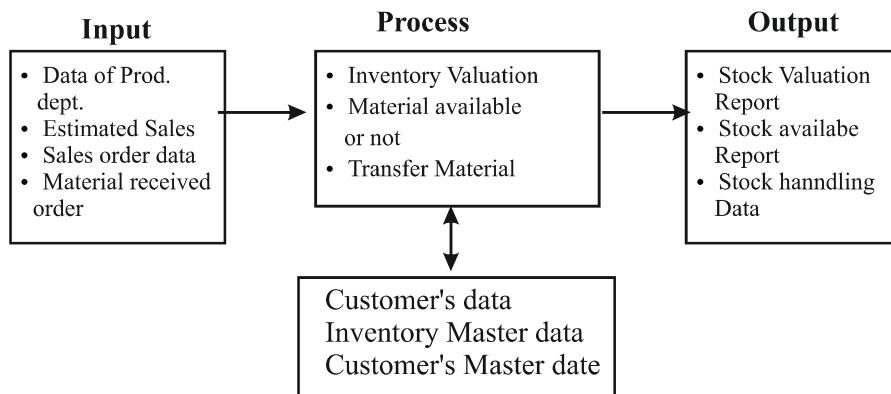


Figure: 7.8 Functions of Inventory Control

3. Journal Accounting System - General accounts, budgeting and accountability and profitability reports are made in this.

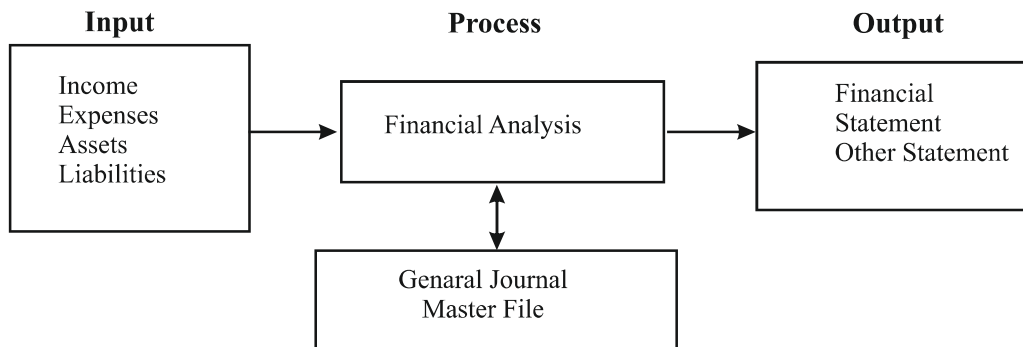


Figure: 7.9 General Account system

4. **Receivable liability and payment system** - accounts of the accounts, payable articles and salary sheets are analyzed.

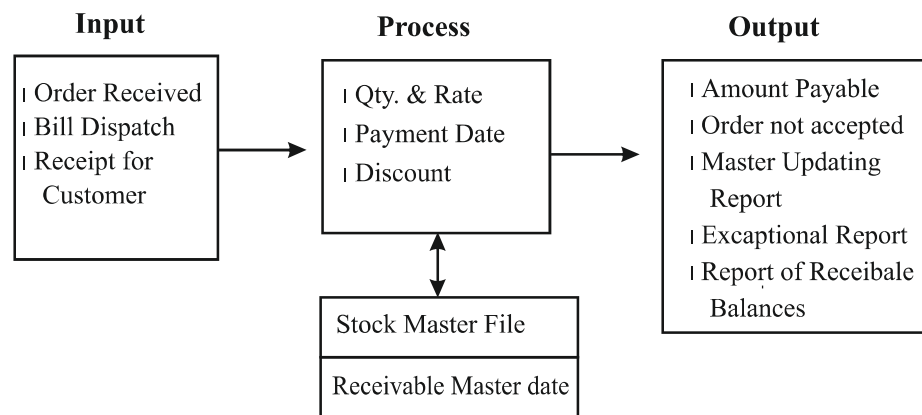


Figure: 7.10 Receivable Accounting System

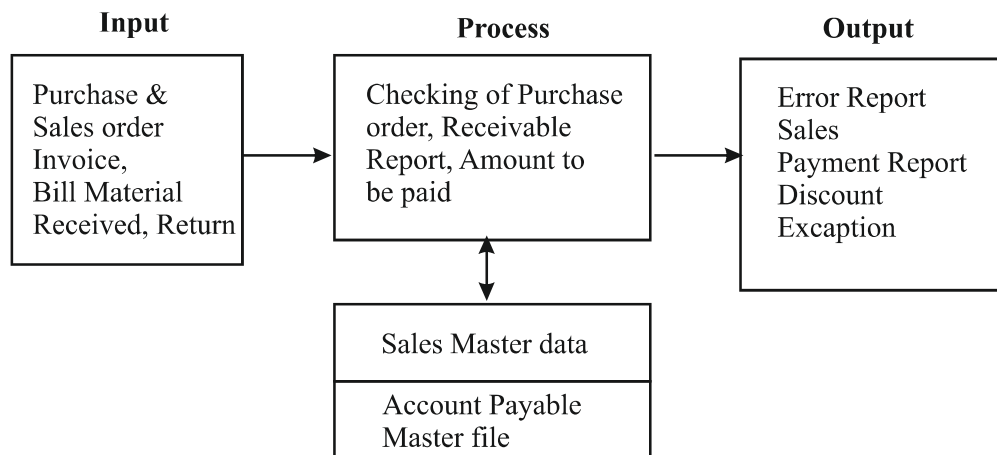


Figure : 7.11 Payable Account System

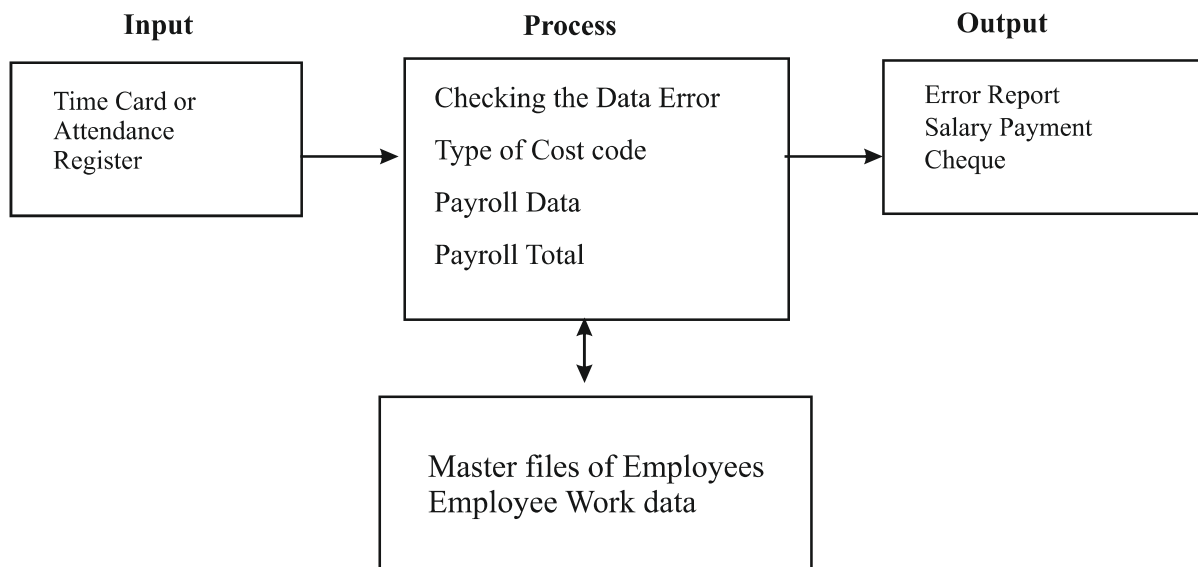


Figure : 7.12 Payroll Accounts System

Other sub-systems in the accounting information system are also recording of permanent assets, billing system, budget system, income tax calculation system, weight calculation and input credit system.

7.3 Business Application of Computer : Computer is used effectively in communication, transportation, backing, insurance space science, defense business etc. E-commerce, e-business, e-retailing, e-payment, e-governance, e-filing etc. are based on computer information system. The internal and external parties of the business are connected via Internet intranet or extranet.

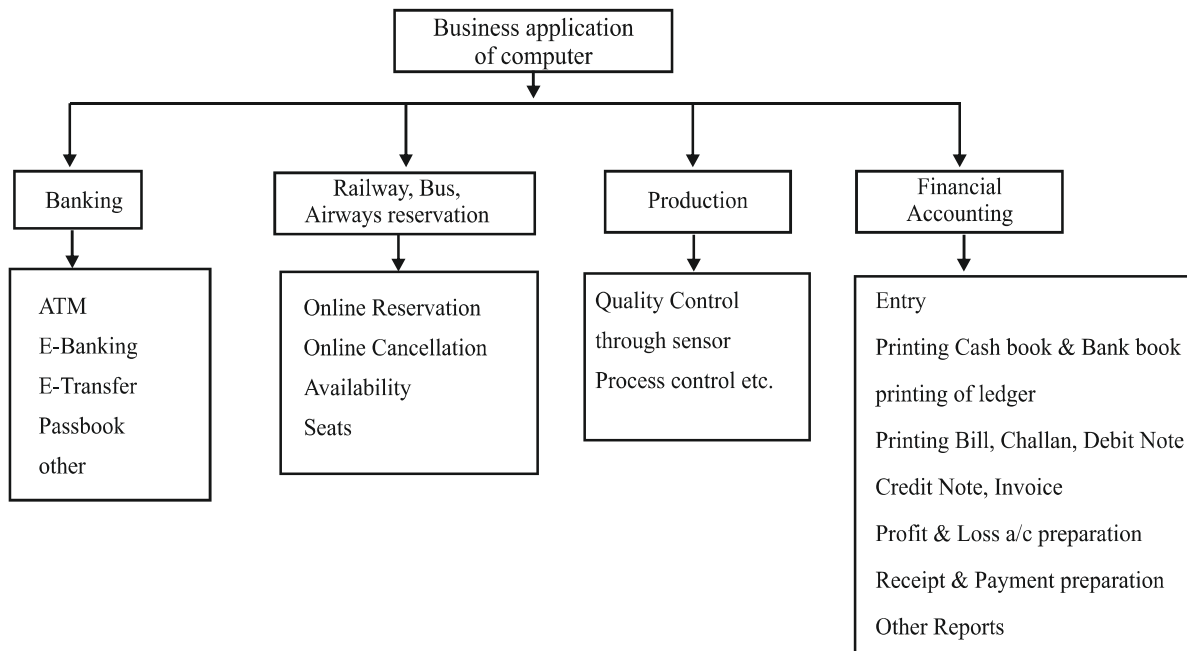


Figure : 7.13 Computer Application of Business

7.3.1 The emergence of computerized accounting - The accounting officer at the inception of accounting used to perform book keeping. Further with the help of technical inventions, the billing machines were circulated. Accountants kept books with cash books or account books. Balance of accounts were withdrawn each year and final accounts were created. In the modern era it is necessary to collect accounting equations in such a way that the data can be used at the right time. The use of computerized accounting has begun to get instant information with the complexities of the transaction. The format of storage and processing of data in the computerized accounting system is called operating environment, in which hardware and software are included. In this system, accounting framework format, such as accounting principles, codes and accounting group structure are required.

In the computerized accounting system, the data base is created when there is a data accumulation, in which the data can be properly stored and can be retrieved if required.

7.3.2 Meaning of Data Base - Data expressed by the systematic method are called information. A compilation of information in which the data is arranged in the form of a table is called a data base. Based on the systematic information, the data base can be used fairly.

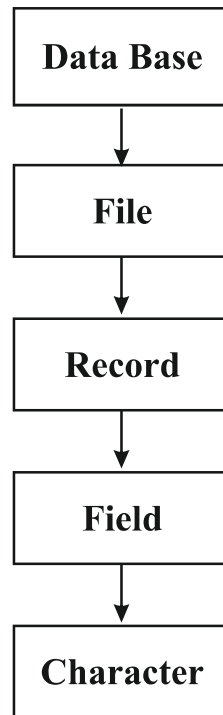
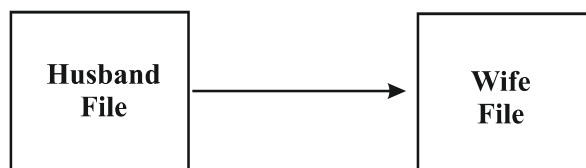


Figure: 7.14 File Structure

- **Character** - The group of eight binary digits is called a byte, which denotes a letter. This is the smallest part of the data stored in the computer.
- **Field or data** - Combination two or more letters or bytes together creates a field. In other words, any information related to an individual's object is called a data item or field. For example, the name of any employee in the file of the employee, the roll number of any student in the file of the students, amount of any stock item in the stock file, etc. all can be called field or data items.
- **Record** - The group of different information related to a person, place or object is called a record. In other words, together two or more fields or data items, create a record. For example, in the file of the students of an institution, the roll no., name, address class etc. of any one student produces his record. While structuring the record design, we generally conceptualize both types of records, logical record and physical record respectively. The logical record is composed of a lot of data items related to each other. Whereas the data items that are stored together on the disk are called physical records. Thus, there can be more than one logical record in a physical record.

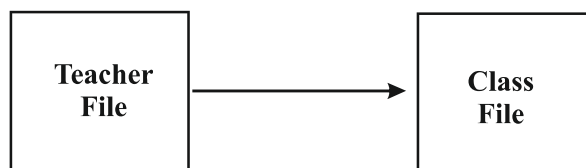
- **File** - The collection of records relating to each other creates a file. There is no limit on the number of records in the case of a file. That is, on the basis of the available space of the files records can be stored in the supporting memory, we can store any number of records in a single file.
- **Data Base** - The data base is the highest form of file structure. The group of different files related to each other is called a data base.
- **Data relationship** - The biggest advantage of a data base technology is the establishment of relationship between the data base records. Three types of relationships can be established between the records of different files -
- **One to one** - one record of the first file, if related to only one record of another file such relation is one to one record.



One to Many - one record of the first file, if related to more than one record of another file such relation is one to many record



Many to Many - More than one record of the first file is related to more than one record of another file, then many to many relationship is established.



7.3.3 Data Base Management System - Managing a data base through a systematic method can be achieved through the data base management system. Adding, removing, or changing data in this system is easier than any other system. It is also easy to calculate the data collected by it. This system can get some selected data or records or a certain order of records. For this, a record is required for a field.

7.3.4 Relational organization of data base – Relevant records of data base in an organization are arranged in the form of Two-dimensional tables, which itself is like an independent file. These tables are called the relation in the relation to the record stored in the Tuple and the fields of record are called attributes.

Student Data Base										
Student's Master					Marks					
R.No.	Name	Address	Phone	Fathers Name	Roll No.	M1	M2	M3	M4	M5

Fig: 7.15 Relational Data Base of Organization

The following are important items in the Data Base -

- In this, relationships between the records are not physically identified but are represented logically.
- Being logically represented, there is flexibility in their relationships and they can be changed as per requirement.
- Users can update tables as per their requirement.
- The entire table can be processed together
- A table can be divided into more than one tables, and a table can be formed by combining two tables.
- This database base supports all types of queries and the results of the query can also be placed as a temporary / permanent table.
- **Normalization** - After creating the data base, all the fields of the same table are not required in the same report simultaneously and sometimes the field of two tables has to be included in order to prepare a report. In other words, there is no need for complete structure after making the tables. In such a situation, we have to do normalization process. Normalization is a process in which a table is divided into small tables as needed, so that data is present in each of the tables. For example -

Student's Master				Marks		
R.No.	Name	Father's Name	Address	Subject Name	Marks	Grade
1	Ram	M. D. Verma	Anand Nagar	Accounts	71	A+
				Business	63	
				BBE	69	
2	Shyam	N. K. Baid	Bapu Nagar	Accounts	63	A
				Business	59	
				BBE	61	
3	Mohan	S. P. Sharma	Vaishali Nagar	Accounts	74	A+
				Business	72	
				BBE	69	

Fig: 7.16 Relational Data Base of Organization

The above table can be divided into following two tables after generalization -

Student's Master			
R.No.	Name	Father's Name	Address
1	Ram	M. D. Verma	Anand Nagar
2	Shyam	N. K. Baid	Bapu Nagar
3	Mohan	S. P. Sharma	Vaishali Nagar

R.No.	Accounts	Business	BBE	Grade
1	71	63	69	A+
2	63	59	61	A
3	74	72	69	A+

Fig: 7.17 & 7.18

7.4 Computerized Accounting – Ledger creation is done only once in computerized accounting system. The account is to be created in the respective group. After that the accounting work is completed, along with the voucher entry, there is no need to calculate the balance of the accounts. Software automatically prepares financial statements. If we wish to know the financial status of any particular day on a selected date, we can find immediately as per requirement. The software understands the nature of pre-defined groups. The main group has Asset, liability, income and expenditure groups. Accounts are automatically organized into the final accounts according to the groups.

Pre determined Group (Primary and Sub Group) -

1. Capital Accounts
 - Reserves and Surplus
2. Current Assets
 - Bank
 - Cash in Hand
 - Deposits
 - Stock
 - Debtors
3. Current Liabilities
 - Creditors
 - Bank overdraft
4. Fixed Assets
5. Investments
6. Loan
 - Secured
 - Unsecured
7. Suspense Account
8. Miscellaneous Expenses
9. Branch/Divisions
 - Revenue primary group
10. Sales Account
11. Purchase Account
12. Indirect Income
13. Indirect expense

7.4.1 Key Requirements for Using Computer in Accounting

1. Front end Data Base - This is a link to communicate between the user and the software. As an example, the purchase of goods is done by its accounting method, its entry is done through purchase vouchers. Once the entry is done, it is stored in the data base. The system automatically adds it to the previously stored data base, after the second purchase through the purchase voucher. Queries can be made for report analysis and other information if required, through the software program. For example to get this information regarding, how much was the first tri-monthly purchase done?

2. Data base of the back end - Such data bases which are not visible to the user, but always exist in the computer system. Whenever the information is sought through the questions of the advance software, the information base of the back end provides this information. Individuals employed for different tasks in the business have the right to see and receive the required data .

3. Synchronization Process - This is a sequential process in which the received data are converted into useful information or decisions.

4. Report System - Report can be made as needed by mixing differently stored information. Such as profit-loss accounts and balance sheet is made from journal entries and ledgers.

7.4.2 Comparison between manual and computerized accounting:

1. Identifying Financial Transaction - The first thing that is to be done for the accounting process is to identify those transactions for which accounting is to be done. This work is mainly done by clerk or accountant. This work is similar in both manual and computerized accounting.

2. Hierarchy - Business transactions in manual accounting are recorded in the primary books / books known as journal after that they are posted in ledger. While the computer categorizes business transactions with the help of computer software in computer accounting. Data stored in the data base is taken for preparation of various financial statements.

3. Recording - In the case of manual accounting, recording of transaction, posting of ledger, preparation of trial balance, subsidiary books, final accounts etc are done by clerks or Accountants. While all these functions in computer accounting are completed once the data is entered in the computer from the already existing data base.

4. Summarizing - Every primary book of accounts completed by making the total and the balance of each account is calculated in the process of manual accounting. Trial balance and final accounts are prepared based on these balances of each account of the account book. While in computer accounting, all the work is done automatically once the data is put into the data base . Each task is done automatically till the preparation of trial balance and final accounts. It is not necessary to prepare the account book in a complete way to prepare the trial balance in computer accounting.

5. Adjustment entries - Adjustment entries are required to rectify accounting errors and modify the final accounts. This work is similar in both manual and computerized accounting.

6. Preparation of Financial Statements – In manual accounting, it is necessary to prepare a trial balance before preparing the final account and to create a financial statement, while there is no need to prepare trial balance in order to prepare financial statements in computerized accounting.

7. Closure of books of accounts - Many types of final entries have to be made while closing account books at the end of the financial year. To transfer the balances of old account books in new account books, entries have to be made. While in computerized accounting, the work of closure of books and the introduction of new account books is automated, which is accomplished with the help of software.

Based on the above explanation, we can find the following main differences in accounting and computerised accounting through human efforts.

Work	Computer	Manual
Speed	Fast	Very Slow
Memory	Very Good	Normal
Accuracy	Very High	Normal
Decision making	Less	Higher
Compliance	Very good	Normal

Computer calculations are faster than any other mode. Computer has left man behind in all the fields, except thinking and self-decision. But there is no intelligence in the computer. Computers get their efficiency from the software. This software is prepared by humans. So it is actually the brain of a that who works with the computer. The power and efficiency of the computer depends on the computer software , if the program maker has made a mistake while creating its software then the computer will keep repeating the mistake in its computations.

7.5 Structure of Accounting Software

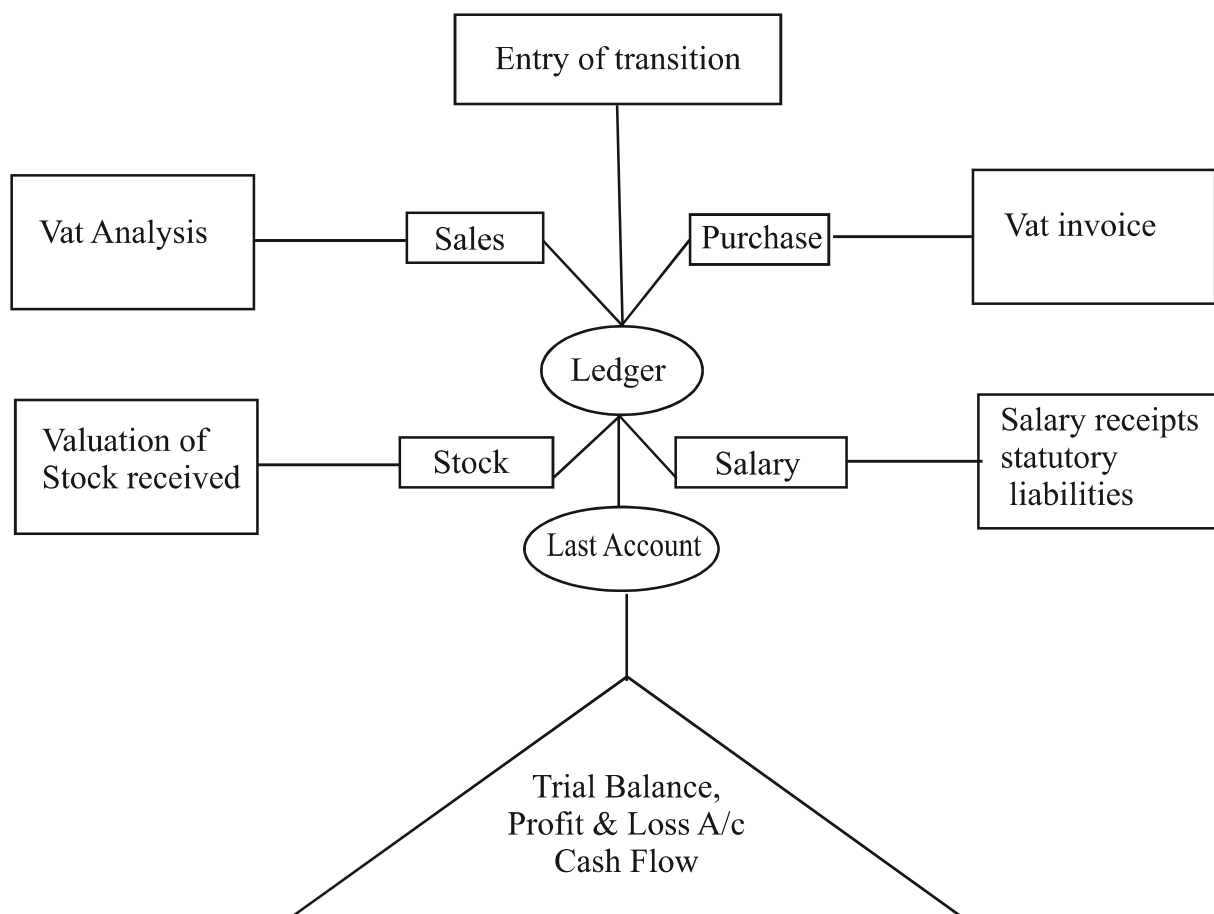


Figure 7.19 Components of Computerized Accounting Software

To understand the software structure, student is required to create a company and vouchers in the tally and then obtain the results as per the required transactions. Here is the flow chart of the process in the format of accounting data base for designing software in picture 7.15. This is for student's information only.

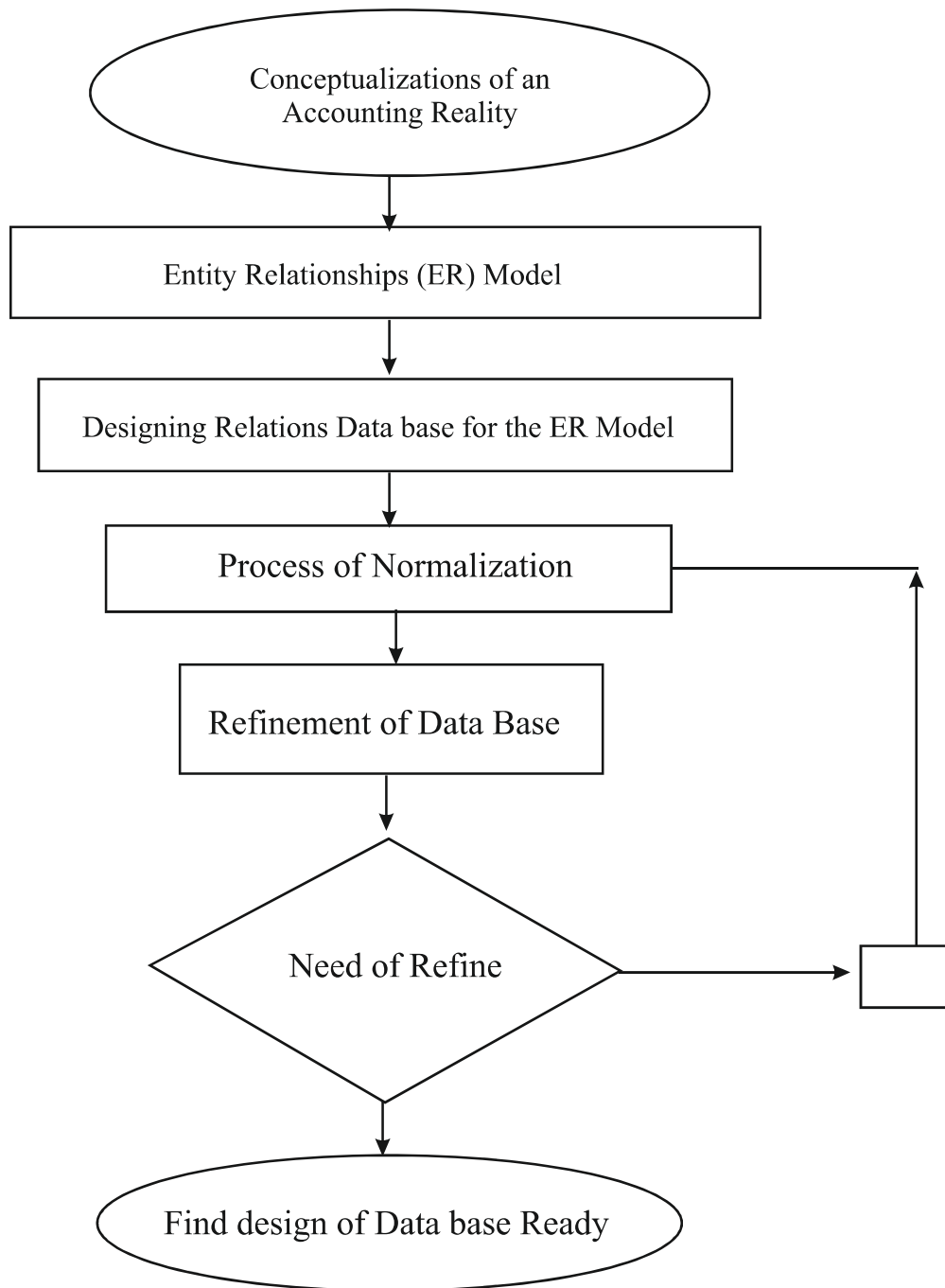


Figure 7.20 : Flow Chart showing structure of Database

7.5.1 Types of Accounting Software - There are many readymade softwares in the market which is used by small and medium businessmen. These are called pre-built accounting software. But if the business is large and its requirement and nature of the transaction are different then accounting software can be developed as per the requirement, which is called Taylor made software. If the pre-built accounting software is changed to suit the needs of the business, then it becomes a customized software. The spreadsheet created in a computerized environment can also be used in business accounting. Generally, the major business entities give priority to the standardized packages, where different modules are made for the work in different parts of the institute. As a company works in production, service, research, financial services etc., all of these are shown in collective form by accounting in different modules.

1. Pre-built software – At present various types of pre build software are available in the market such as Tally,E.X.Busy etc. The functionality of a pre-built software can be understood in this way. In this there is master file,that registers the name of the institution, address, phone number and other details, pen number, tin number, weight number, etc. for the purpose of creating accounts for the customer's business institution. Further, the accounting period determines the accounting year by entering the first and the last date of the financial year. Some accounting software facilitates passwords for convenience.

After the primary information of the institute, necessary steps are taken to create the accounts. According to the nature of each account, their indicators are added to the master file by classifying the accounts into Asset, liability, income and expenditure. If the accounts are already running, the balance of the previous year is given directly to accounts related to master files from the beginning of the current year. Each company should set its criteria so that the information regarding cash, debtor, creditor, donations etc could be given to the software. Details of the product, unit of measurement, initial stock and value information should be entered in the product master file and the base of the valuation of the stock should be given in the product master file of the first in first out, the last in first out weighted average etc .

Generally speaking, the following master files are used in certified pre-built accounting software i.e. company master file, account master file, sub account master file, customer master file, vendor master file, product master file, and department master file etc.

Normally the entry of transaction is done by vouchers. Different vouchers are available for entry. Generally, there are screens of the following basic tasks available in pre-built accounting software - (1) For cash receipt and payment entry (2) For receipt and payment entry from the bank (3) General entry (4) For petty cash payments (5) Debit and Credit Note (9) Cash Sale and Purchase Memo (10) Production, Consumption and Payment for purchase order, purchase order, invoice and sale return . The option of making changes in each screen is available so that the date, voucher number etc. can be changed.

Generally, cash book, bank book, purchasing book, sales book, stock book etc. are kept in software, from which the report can be obtained. Special reports such as administrative reports like analysis of debtors, classification, cash flow details, stock speeds etc. can also be extracted.

Merit - This software is prepared by trained and experienced persons, difficulty in using them is very low, and accounting work is based on a double accounting system. Therefore, pre-built software has an uniform structure of accounting. The accounting work on such software is based on the double accounting system.

Therefore, pre-built software uniformity persists. The accounting work based on these is easy to understand. It is not very expensive and it saves a lot of time.

Demerit - If the accounting data is wrongly grouped then misleading results can be obtained, therefore one should be more cautioned while working on such software.

2. Taylor made Software – Taylor made software is designed according to the user's requirement. In this, computer programmers prepare to write a program to solve specific problems of the customer.

Merit - These softwares are used by trained people, so maximum work is done. These are prepared for some special purposes, so they have great importance in management information system. It is more useful in comparison to other software.

Demerit - Since they are specially prepared, they cost more. If a person using the taylor made software leaves the job of the organization, then the fresh employee takes a lot of time to understand it.

3. Spreadsheet package - A common spreadsheet is created like a graph paper with the help of Rows and columns. Each part of the row and column is called the cell, data is entered in the cell. It is done on MS Exel software.

Merit - Counting and other works related to calculation of data can be easily done on spreadsheets with the help of formulae and functions. Import and export of data and information given in other software, etc. can be easily done. Information from graphs and charts etc. can be displayed. Executable capacity can be analyzed with the help of different statistics and financial sources.

Demerit - Report is not automatically generated. Duplicate accounting entry is not automatically generated in the spreadsheet package, for which the user has to use different types of formulas.

7.6 System Documentation

Meaning - The documents are specified on each step in the system development life cycle, which is called system documentation. Large organizations have formal system development evidence. Typically, the formulation of system development documentation represents the form of an organisation. The backup copy of all the documents should be kept for the purpose of retrieving the

data of an organization so that in some cases they can be used if the primary documents are destroyed. System documents should be temporarily checked so that it can be certified that they are fully operational and sufficient.

System development life cycle documentation : It can be explained with the help of the following table

Stage	Documentation
System planning and analysis	Economic and technical probability study, logical flow line diagram, data dictionary, user specifications
System design	Conceptual format, system format report, flow chart, scheduler, program description, operating methods, file description.
System implementation and evaluation	Conversion plan, checking plan, operation and maintenance schedule
System audit and review	User comments

Generally, programmers create programs to meet the needs of their clients, since the client has to use themselves as a the end-user. So it is difficult for the client to understand therefore, it would be reasonable to write all the necessary instructions for taking it in the program in a booklet and giving it to the user. This booklet is called a program document. The following information should be present in an ideal program document:

- The objective of the program for which it is designed for any data processing.
- Samples of data that are required and necessary instructions for inserting it.
- Instructions to implement and automate the program.
- Sample report received in output
- The structure of the data file created by the program.
- Flowchart of the program
- Test data used during the investigation of the program.

7.6.1 Flow Chart - A flow chart is a drawing that is made by the programmer. It presents, various steps of the procedure to be followed for solving a problem. It reflects such correlations that are not immediately clear at first instant. Flowchart clearly displays each stage and its functions, so there is no possibility of skipping any process. Flowchart can be divided into four parts, such as the system framework chart, system flowchart, run flowchart, program flowchart. The program flowchart is displayed here.

Before studying the actual program flowcharts, we will discuss the flowchart of an employee's morning routine to understand the concept of flowchart and the symbols used in it.

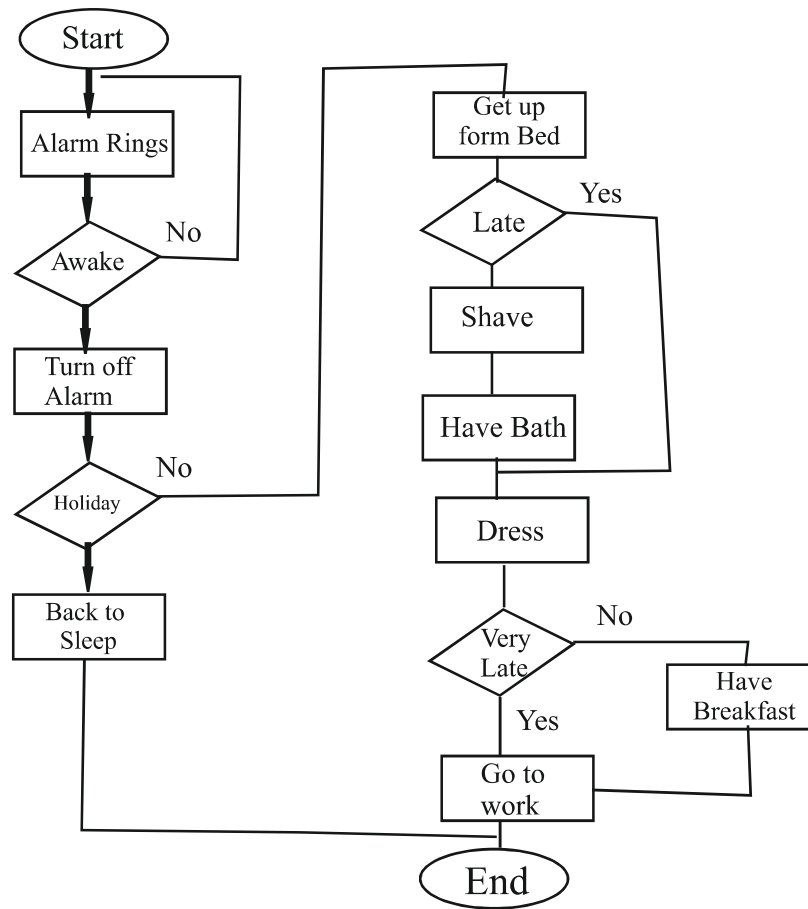


Figure 7.21: Flow Chart of Daily Routing

The box displayed in the picture is a symbol of work, like ready, etc. are written in the box. Working in terms of program flowcharts involves various mathematical procedures.

The diamond depicted in the picture is the question symbol. It has two outcomes as alternatives to Yes or No. This is a symbol of comparison or restriction in the program flowchart. The oval displayed in the picture is a symbol of the beginning and end of a work. Diamond is used for wake up in the picture. It is in the loop which closes the alarm. It draws attention to the importance of the program. It expresses the person's wakefulness and the ringing of the bell.

Example of Program Flow Charting - The goods imported from abroad for the customs duty are classified into four categories. Various classes of goods and customs payable on them are shown in the following table -

Percentage of Custom duty to be paid on different items

1. Drink, Foods 10
2. Footwear, Clothes 15
3. Heavy Machinery 17.5
4. Luxury Items 40

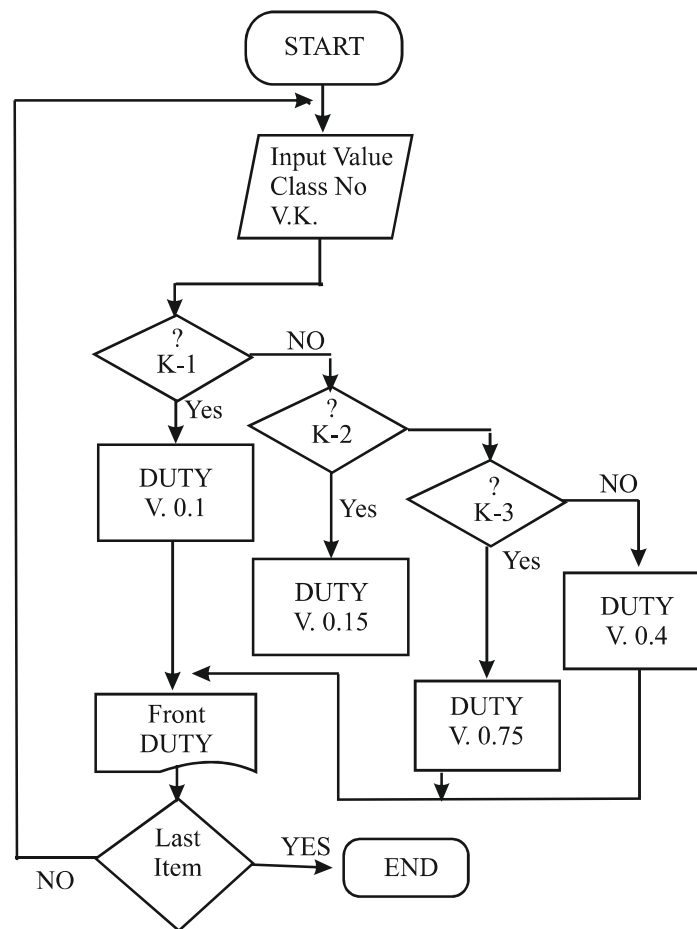


Figure 7.22 : Flow chart for custom duty

Advantages of Flow Chart

1. With the help of the flow chart, the lengthy methods can be understood more easily and quickly, and the program can be easily written.
2. For any problem the flow chart has its broad framework. It can be divided into different parts for study and by observing it other aspects of problem can be considered.
3. **Communication** - The problem of a business data can be given to skilled persons so that other ways can be searched for solving that problem.

4. **Documentation** - Flow Chart works as an excellent document for rewriting or modifying the program. In the case of transfer of employees, for the new employee it is an important document to understand the program.
5. **Micro coding** - The flow chart guides for program writing and system analysis, no step is missing in it that is checked by the flow chart . With the help of the chart, the flow of the program can be taken care of.

Limitations

1. **Complicated logic** - If the logic of the problem is complex then the flow chart can also be complicated.
2. **Changes** - If there is any modification in the flow chart, then the entire flow chart has to be recreated.
3. **Authentication** - Although program flow charts are easy to understand, it cannot be written in standard language, nor can the flow chart be easily translated into the language of the program. Each programmer resolves the problem in its own way and creates a flow chart accordingly.

7.6.2 Decision Table

The decision table is like a table in which rows and columns are used to check all the conditions given for the program and to show them decisions in the right or wrong circumstances. It is attached to any flowchart and defines any possible event and also describes the work done in the circumstances arising from any such event. The branches of the flow charts are doubled on each Diamond symbol and their number can easily reach hundreds. This is how the need for a decision table is arises. Therefore, if a programmer creates a flowchart without the decision table, then it is possible that some required branches are missed. An example of a decision table is given below.

		Heading	Rule			
			R1	R2	R3	R4
Condition Identifier	C1	Credit limit is appropriate Payment History is favorable	Y	Y	N	N
	C2		Y	N	Y	N
Action Identifier	A1	Provide Credit Limit	x	x	x	
	A2	Cancel				x

Figure 7.23 : Part of decision table

Condition Identifier - This is the serial number of the conditions, as given in the given example there are 4 conditions, so this is C1, C2 if it is more then C3, C4 etc. could be given.

Action Identifier - The predetermined sign that displays the action A1, A2, A3.

Heading - This is the subject of decision table .Since our example is about the facility of lending, so we have the facility to lend our decision here.

Condition Stub - This is the area of the decision table where all the conditions to be checked are written. If there are only two possibilities of a condition, then only one decision should be included in the table. For example, the credit limit is fine or not, whether the payment possibility is favorable or not. Only one prospect is taken for checking here.

Action Stub - All decisions taken are written in this area of the decision table .

Condition Entry - It is mentioned in this area which conditions are right and which are wrong, two signs are used here. If there is no difference in the decision, whether there is a right or wrong of any condition, then the sign is placed in area of Condition entry

Action Entry - The decision chosen on the basis of the conditions is marked in this area. The symbol is placed in this column before the decision is chosen.

Rule- Rule is a column that is formed together with condition entry and action entry. In decision table the number of rules depends on the number of conditions.

Advantages of the decision table

1. It presents the framework for the realization and total description of the decision, logic or processing. It implements a discipline to the programmers to think on the basis of all possible scenarios.
2. Decision table is easy to make in comparison to flowcharts.

Disadvantages of the decision table - All the steps of problem solving process is not clearly displayed, that is, as in the flowchart, the overall view of the solution of the problem is displayed. It is not possible in the decision table.

Example of the decision table -

In order to make the invoice for the customers, there is a need to calculate the discount due in each order. A lump sum discount of 8 percent is offered if amount is more than ₹ 20000 /-.

The customer engaged in this business is given 10 percent discount. 5 percent special discount is given to any such customer who has been ordering for the last 5 years.

For the above procedure, make a decision table and flowchart for the calculation done by the clerk.

	Discount Policy	R1	R2	R3	R4	R5	R6	R7	R8
C1	Order Value>Rs. 20,000	Y	Y	Y	Y	N	N	N	N
C2	Trade Customer	Y	Y	N	N	Y	Y	N	N
C3	Year-Ordering Regularly>5Years	Y	N	Y	N	Y	N	Y	N
A1	Nil Discount								x
A2	5% Discount							x	
A3	8% Discount				x				
A4	10% Discount						x		
A5	13% Discount			x					
A6	15% Discount					x			
A7	18% Discount		x						
A8	23% Discount	x							

Figure 7.24 : Part of decision table

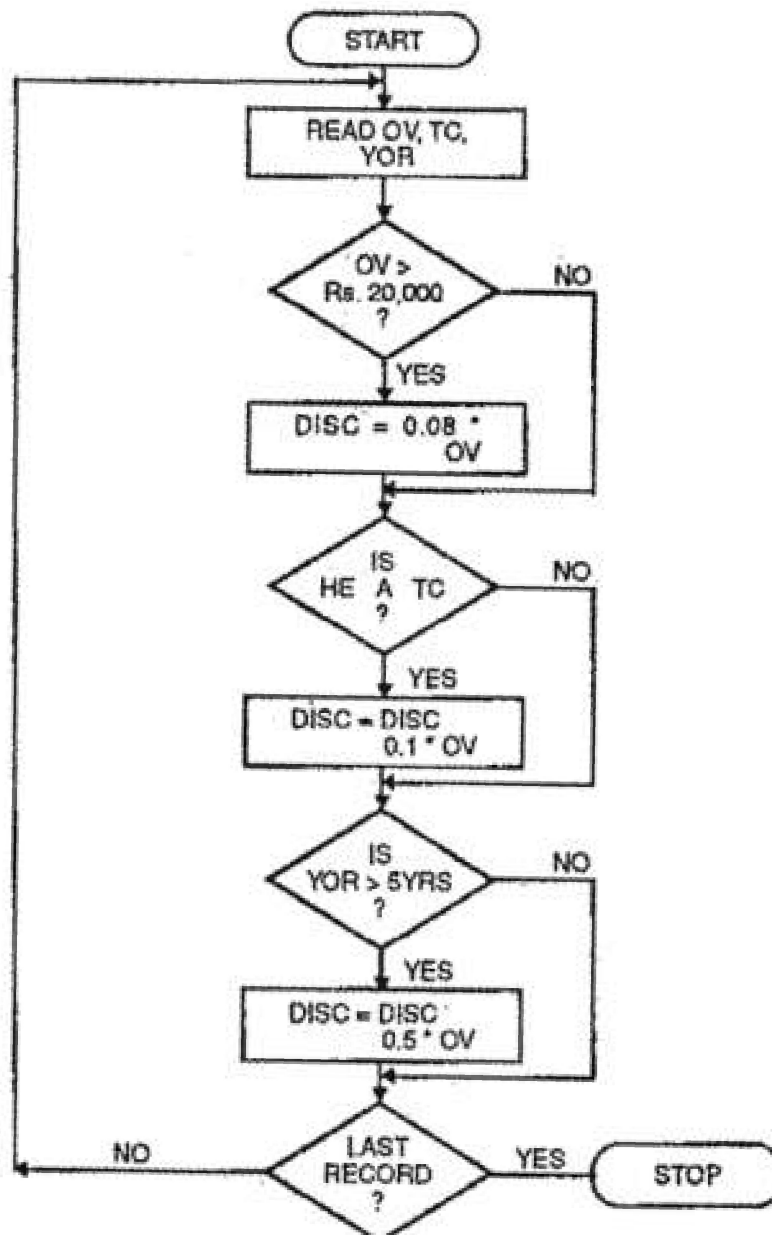


Figure 7.25 : Part of decision table

7.6.3 Data flow diagram - Data flow diagram, known as the Bubble Chart was first created by Larry Constantine. While designing one of the modules of the information system, he used to demonstrate the requirements of the information system in a pictorial way. The main purpose of the chart is to explain the system requirements, which will identify the mechanisms of the system, and will be converted into programs when designing the system. That means it can be considered as the starting point of the system's design process. Data flow diagram is a bunch of bubbles that are connected with the help of lines. Here each bubble shows the data transit and the lines display the flow of data.

To create a data flow image, four standard images or symbols are used. Which are shown in the picture below.

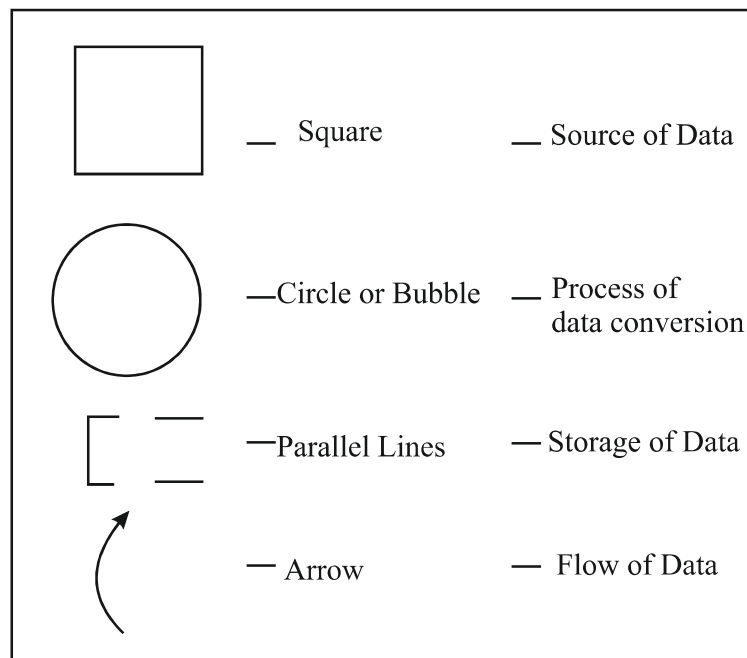


Figure 7.26 : Signs of Data Flow

1. Square: This icon of the square is used to show the source of data and the destination of data, this source and destination can be either a person or an organization or department.

2. Circle or Bubble - This sign of the picture is used to show the processes by which the data is converted from one form to the other.

3. Parallel Lines or Open Rectangle - This icon is used to display data collection. Data collection can be of any type, permanent or temporary.

4. Arrow - This sign is used to represent the flow of data. This arrow mark is used to indicate which data is flowing and in which direction is the flow.

The most important thing about data flow diagram is that with its help, the flow of data is shown in the system, not the procedure of processing it. Therefore, any information system does not depend on the hardware,

software data structure etc. used in that system. With the help of DFD we try to find the answer to the question such as from which sources the data is received, which data is received, what are the main processes by which the data is converted to obtain the output and in which files the data is stored.

Context data flow diagram - Data flow diagram is divided into continuous parts to illustrate the detailed information about the information system that can be obtained. The first and highest level data flow diagram is called the reference data flow image clip. It displays a tiny form of mechanism. With its help, relations between the information system and external units are shown. The picture below shows a reference image of the mechanism prepared for calculating the salary of the employees.

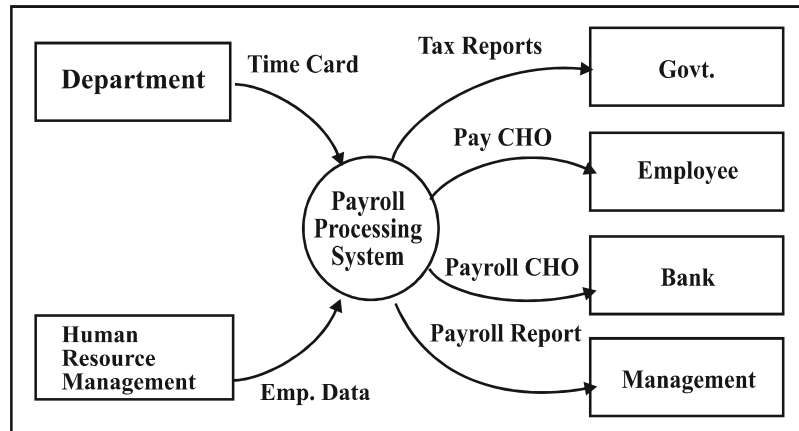


Figure 7.27 : Mechanism of Salary Calculation

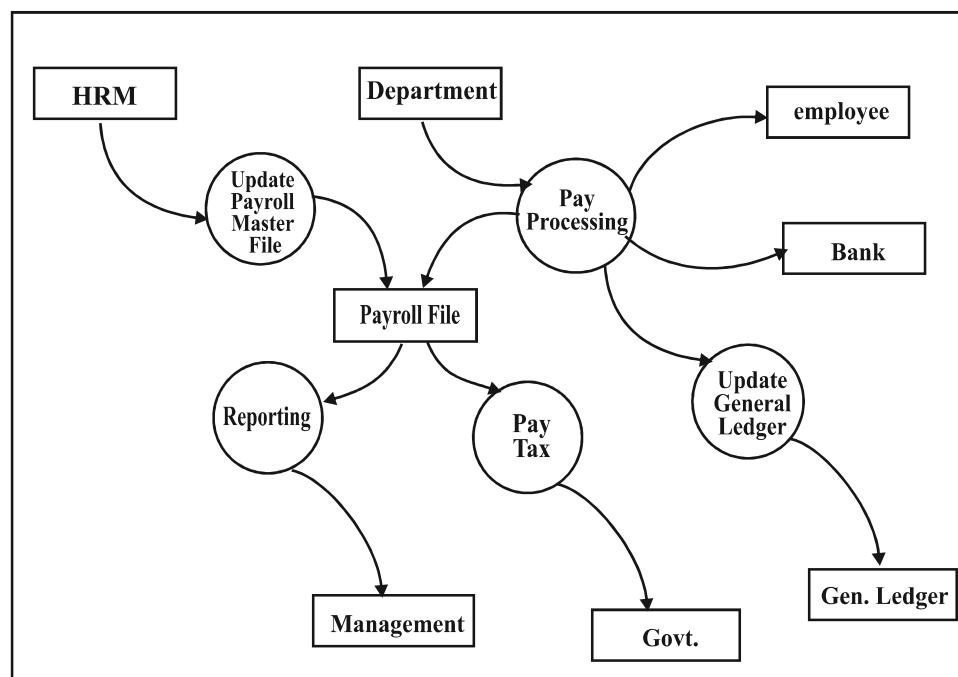


Figure 7.28 : Payroll Processing

Summary

1. Computer system has its physical components namely monitor, keyboard, mouse etc. and its intangible contents are software, programs, data, information etc. All components work simultaneously and achieve their shared purpose data processing.
2. Computer memory is of two types - primary and secondary
3. On the basis of the operating system, there are three types of computers - digital computer, analog computer, hybrid computer.
4. The information can be changed by processing data through the information system.
5. The accounting information system in a business is the oldest.
6. The accounting information system classifies financial transactions and provides an indicator for the transactions of each individual, person, property and liability side.
7. The information system's craft consists of data-base, management level, application level and presentation levels come.
8. The highest form of file structure is the data base. The group of different files related to each other is called a data base.
9. Just as a high-level programming language is used to work on data files, particular software is used to create, record input, record retrieval and processing of data base files in the same way. that is called Data Base Management System.
10. Normalization is a process in which a table can be divided into small tables as needed, so that data is present in every location of the table.
11. Computerized accounting is better than manual accounting in speed memory, accuracy and instructions.
12. Tally is pre-built software, which is currently more prevalent.
13. Program Flowchart and Decision Table are created to solve the problem. While the data flow is the starting point of the drawing mechanism of the design process, which demonstrates the need for information system in a pictorial form.
14. The formula for extracting the rule number in the decision table is 2^n .
15. Cloud computing is the emerging dimension in the emerging environment of the computer.

Important words

Abacus

Computer

Accounting information system

Client server

Computerized accounting

Generalization

Accounting software

Flowchart

Decision table

Data stream image

System reproduction

cloud computing

Multiple choice questions

1. MIS is
(A) Manage Information System (B) Management Information System
(C) Management Information System (D) Management interface system
2. Data flow Diagram is known by which of the following other names.
(A) Data Image (B) Bubble Picture
(C) Flow diagram (D) All of the above
3. A group of eight bits is called.
(A) file (B) record
(C) Byte (D) None
4. Who difference engine?
(A) Charles Babes (B) Pascal
(C) Lady Eda Lovelace (D) None of these
5. Which of the following is the output unit.
(A) Monitor (B) Mouse
(C) CPU (D) None of these
6. Artificial intelligence is used in.
(A) Transaction Procedure System (B) Management Information System
(C) Expert System (D) Executive Information System
7. Tally software is.

- (A) Prefabricated (B) Tailor-made
(C) Customized (D) None of the above
8. Flowchart symbolizes condition as.
(A) Box (B) Diamond
(C) Oval (D) None of the above
9. The formula for the number of rules in the decision table.
(A) $2n$ (B) $3n$ (C) $4n$ (D) $5n$
10. Data flow in the picture is the symbol of open rectangle or parallel lines
(A) Data Source (B) Conversion Process
(C) Data flow (D) data collection

Very Short Answer type Questions:

1. Construct the block diagram of the computer function.
2. Explain the meaning of the accounting information system.
3. Name the sub systems of accounting information system.
4. What is data base?
5. What is the purpose of computer software?
6. Name various elements of computerized accounting system.
7. Name the types of accounting software.
8. Explain two differences between manual and computerized accounting.
9. Show different symbols of flow charts.
10. What are the main components in the decision table?
11. Name the computer's input-output device.
12. Explain the meaning of system reproduction.
13. What is known as the data flow diagram?
14. Give examples of primary and secondary memory of the computer.
15. Explain the main parts of the microprocessor.

Short answer questions

1. What do you mean management information system ? Explain.

2. Explain processing cycle under the accounting information system.
3. Explain the system design phase in implementing the accounting information system.
4. What do you think of data relation in the data base? Explain the various relationships.
5. Explain the system reproduction.
6. Explain the meaning of flowchart and its benefits and limitations.
7. Describe the meaning of the decision table and explain its advantages and disadvantages.
8. Explain the data flow diagram by example.
9. Explain the functioning of the computer through the block diagram.

Essay type questions

1. Suppose you have a savings bank account on 1.1.2015, the annual interest rate is 5 percent. Interest is compounded at the end of each month. Assuming that your initial deposit is ₹.X. Prepare a flowchart of the print out of your account balance at the end of each month for two years?
2. ₹. 10, 11, 12, 13 are invested for 14 years at an investment of 10000 per annum of 3% per yearly interest.
3. Following are the rules for distribution charges for items purchased from ABC ltd :

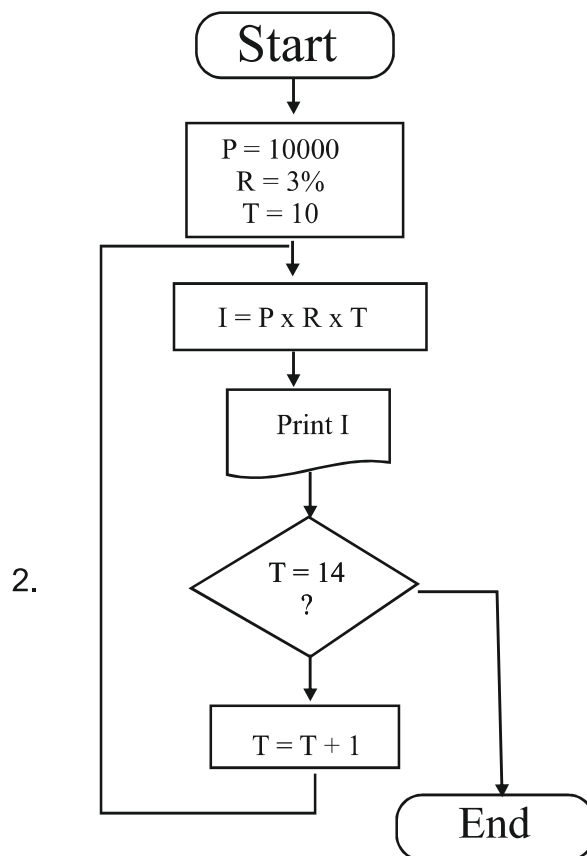
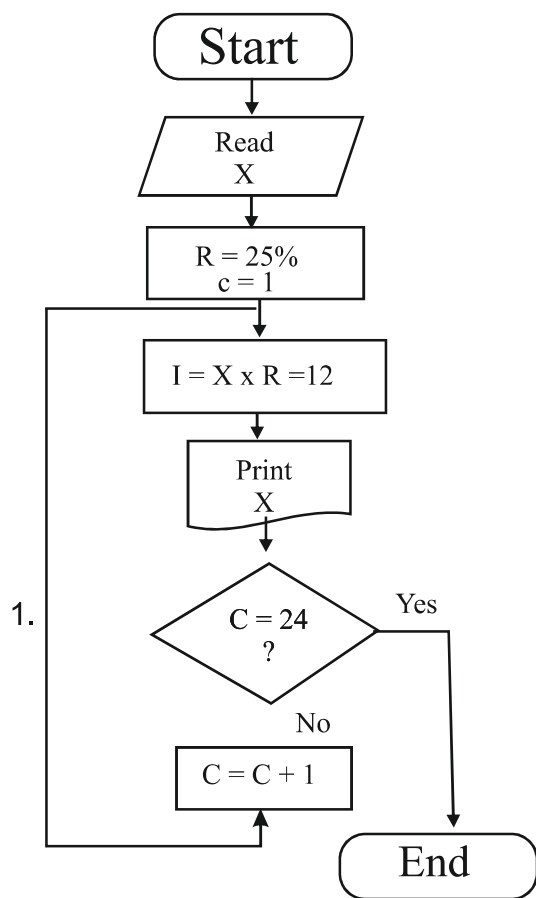
In order to calculate the distribution charges customers are divided into two parts. The first part has code 10 or more and the second part code is less than 10. If code is less than 10 and invoice price is less than ₹10000 then distribution charges are ₹ 200 will be added in invoice price but if invoice price is more than ₹ 10000 then distribution charges will be ₹ 100. If code is 10 or more then distribution charges will be ₹ 250 and ₹ 150
4. Explain various type of computer software
5. Explain the steps to implementing Accounting Information system
6. Explain the basis of differences between manual and computerized accounting system. Discuss its application in business.

Practical Problems

1. Students are required to review the accounting information system of any business organisation.
2. Students are required to work on tally

Answer Key

Ques.	1	2	3	4	5	6	7	8	9	10
Ans.	A	B	C	A	A	C	A	B	A	D



Decision Table

3.

Conditions	Rule			
	1.	2.	3.	4.
Condition entries				
Sales region code 10 >	Y	Y	N	N
Invoice amount is Rs. 10000	Y	Y	N	N
Action Stub				
Action entry				
Delivery charges				
Add ₹. 100 to Invoice total			X	
Add ₹. 150 to Invoice total	X			
Add ₹. 200 to Invoice total				X
Add ₹. 250 to Invoice total		X		