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BASIC INFORMATION SYSTEMS

Development of information systems and management of information systems serve substantially to improve the quality of life in different walks of life, especially in developing countries like India. Owing to the emergence of the service sector as the fastest growing sector, which contributes nearly 90 per cent of the job market, the market is influenced by information service to the maximum extent. Developing countries have recently begun to recognize the significance of information and its strategic importance, and to make it the priority area. These information services can be used in the management of land records resulting in less litigation, in natural resource planning leading to the optimum use of water, oil, electricity, coal, etc. in banking and financial services for better money management, in improving the legal delivery system and in networked educational institutions to facilitate better resource sharing.

The information requirements of managers and organisations will vary according to the nature of the function that they are expected to perform. Information is a catalyst and an ingredient of management that coalesces the functions of management, such as planning, operating and controlling. An organisation can achieve its overall objectives, only if it possesses the means for the acquisition, use, retention and transmission of information. Thus, besides management information system, various other functional information

systems are also to be developed, to ensure the easy performance of managerial functions and organisational tasks, and to support the MIS.

The basic information systems in a manufacturing company are those which contribute to the planning, operating and controlling functions in the organization and include Engineering Information Systems (design information systems), Manufacturing Information Systems (operations systems), Marketing Information Systems, Financial Information Systems (administrative information systems), Project Planning or Controlling Information Systems, and Support Systems. All these information systems are interrelated. They interact with each other by providing a mechanism to tie up the various subsystems in the organizational system, and help to integrate the functions of planning, operating and controlling. These information systems serve any one or more of these basic managerial functions.

1. Financial Information System

The most popular information system in the modern business world is financial information system. It assumes greater significance in business organizations, since finance is the life-blood of every business, and contributes to the overall growth of the organization. The system is designed to ensure the proper flow of finance throughout the organization. Financial information systems facilitate the profitability and responsibility accounting systems and ensure that they follow the organization structure. The system utilizes various internal and historical data regarding the financial planning, and is forward-looking in nature. Even though computerized financial information systems are developed, manual systems are still widely used in organizations owing to the nature of their operations. Financial information systems are generally concerned with budget preparation and control. In financial information system, master budgets are prepared by combining various functional budgets and assigning responsibilities for maintaining investments, income, costs, etc. within specified limits. The performance is compared with the planned result, and corrective measures are initiated in the case of deviations. Financial information system involves determination of equitable standards for control, determination of actions required to attain the standards,

and to obtain frequent and speedy information about deviations. Computerization can be used only at the third stage, whereas the first two stages require manual work. It is the most important management information system. The effectiveness of financial information system lies in the ability of the system designer to use it as an inevitable tool for operations and planning. Since the functioning of all other information systems requires finance and financial information this information system influences all other information systems in the organizations. A typical computerized billing system is an example of a financial information system. Invoices can be prepared with the help of a computer, which provides benefits like clerical savings, timely processing, and so on. It increases the speed and accuracy of operation and influences the cash flow.

2. Personnel Information System

It is an important information system that provides information about the human resources and their flow, and the future human resource requirements in an organization. It normally deals with personnel functions such as recruitment, selection, placement, training, compensation and maintenance. Human resource functions have been traditionally known as personnel functions, whose scope is very narrow. However, human resource management considers the total system and its interaction with other major systems, such as marketing, production, finance, and even the external environment. The human resource management program helps these various information systems by predicting and forecasting the personnel requirements of the organization, keeping an adequate working staff, and controlling and regulating the personnel policies and programs.

In order to facilitate human resource planning and forecasting, an information system is needed, called the human resource management system, which in turn consists of a number of subsystems that are integrated through information flow. The human resource management system considers and integrates the functions of the personnel manager with the duties of the operating personnel. The important personnel information subsystems are recruitment, placement, training and development, compensation and maintenance. The demands placed by the external

environment on the human resource management system are: equal employment opportunity, affirmative action, Occupational Safety and Health Act, and Employee Retirement Income Security Act. The human resource management systems focus on designing skills inventory programs called 'skills banks' or 'manpower assessment programs', to identify and locate the talented resources of the organization for maximum utilization. The working of a skills inventory program can be represented in the following diagram:

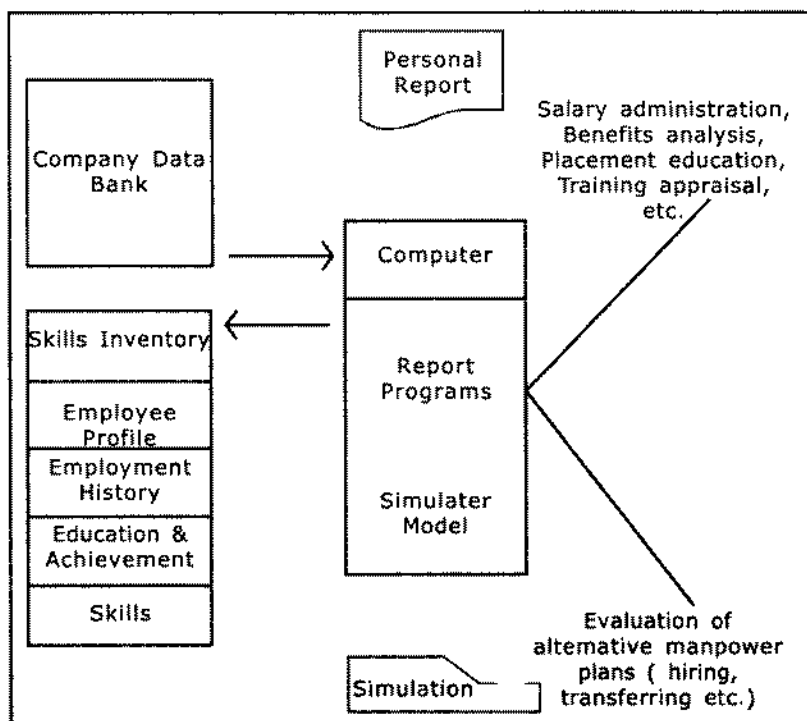


Fig. 14.1: Manpower Assessment Program

3. Operational Information System (Production Information System)

It provides information about the flow of goods and services in physical terms, and is concerned with production planning and control, inventory planning and control, management of purchases, distribution, and transportation. Automation can be easily adopted in information systems of

this kind, because of huge volume of data, and timing of information so essential, these systems can provide huge benefits such as critical and costly problem solving. The important features of production information system that make it suitable for automation are: speed, length, quantity, repetitiveness of tasks involved, complexity of problems, exact inputs, and accurate outputs.

Timeliness in handling large volume of data provides economy in production or operations. Proper information is needed for the effective management of production in organizations. In any manufacturing company, production information system plays a crucial role since it has an influence on various subsystems throughout the organization. It offers opportunity for development, cost savings, and management improvement. The input for operational information system is the customer order. The areas of production information systems are: purchasing, materials planning, operations, scheduling, etc. The objectives of purchasing activity in production information systems are: determination of EOQ (Economic Order Quantity— the optimum quantity for which order should be placed for purchase every time when materials are to be purchased.), reduction of clerical cost, monitoring the buyer performance, identification of high volume vendors to get high discount, and determination of supplier performance. Materials planning aims at planning and controlling parts from a predetermined production schedule, reducing the time and cost of ordering, allowing non descriptive change in production schedule, forecasting future needs and changes in materials requirements, as a result of changes in the production schedule.

Operations scheduling activity helps to identify the future loads of work center, to check whether they are overloaded or under loaded to evaluate alternatives to meet delivery dates, to identify orders to be rescheduled, to forecast the time and location of equipment and tooling needs, to forecast skills and trades required to compute starting data, and to forecast order release dates. A typical production information system integrates various subsystems, such as: sales analysis, engineering, inventory control and production scheduling, production facilities, purchasing, financial and sales and distribution, and reflects the information flow in the entire organizational production system.

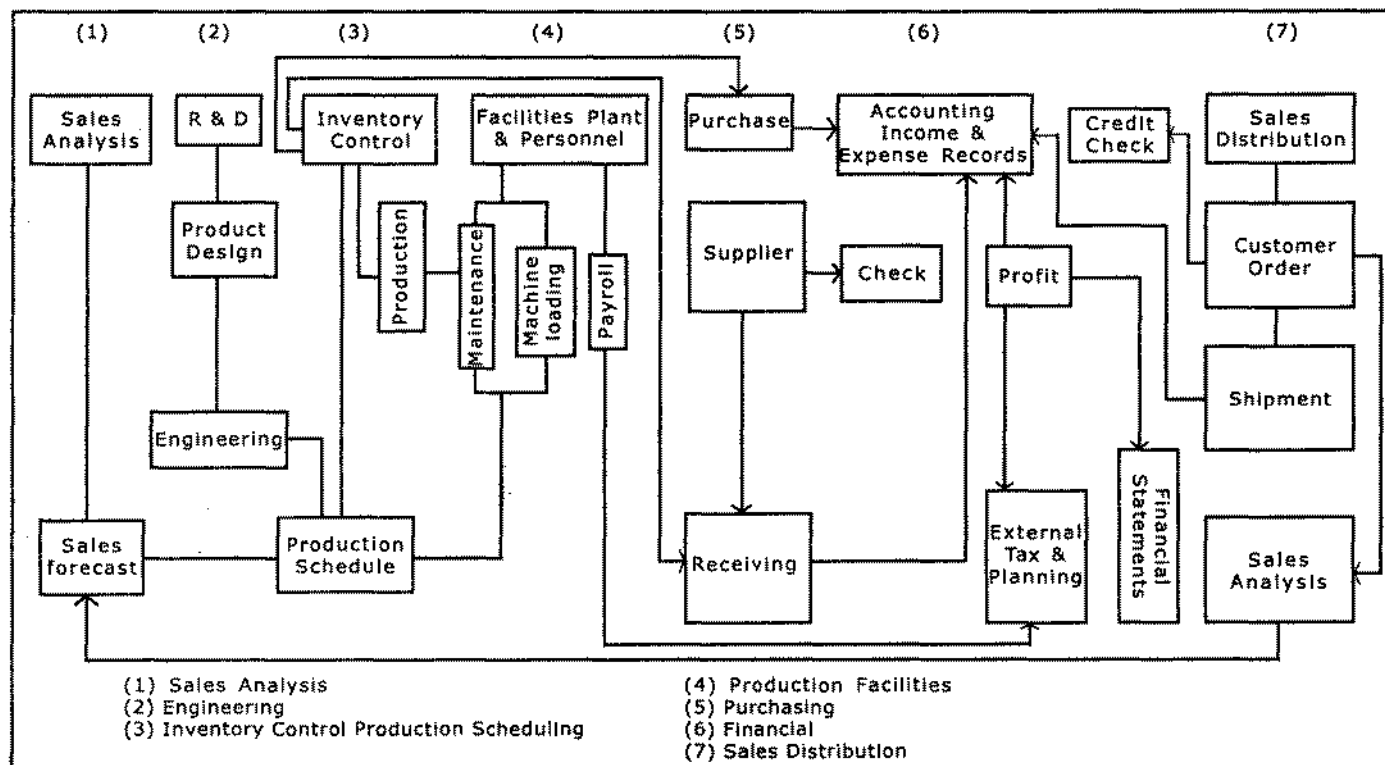


Fig. 14.2: Information Flow in Production Information System

4. Marketing Information System

It involves activities such as forecasting (sales planning) market –research, advertising, and operating and control information required to manage the marketing function. Generally, marketing is performed on the basis of certain assumptions and intuitions, and only few executives use marketing information systems to get such activities performed. A majority of the organizations keep information only about sales and orders of shipment. Marketing information system helps organizations to make decisions regarding pricing, advertising, product promotion policy, sales force effort, etc. and considers all internal and external information relating to the marketing efforts of the company. Such information systems are developed on the basis of feedbacks available from markets, which are used to judge and analyse the performance of the system in the past as well as to apprise the new activity. The important applications in marketing information system are: marketing planning (forecasting), purchasing, credit management, market research, pricing policy, advertising strategy, advertising expenditure, marketing control, marketing costs, sales performance, control of sales, distribution and costs. These marketing information systems can be divided into three categories, such as control systems, planning systems, and market research systems. Marketing information system can be designed in four formats, such as: sales recap, record summaries, transaction analysis and exception inquiries.

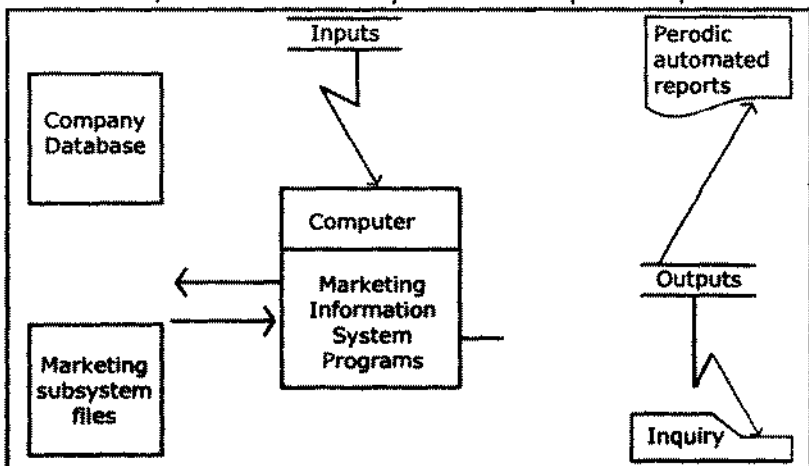


Fig. 14.3: Manpower Information System

An example of a marketing information system is the system of inventory management prevailing in organizations. The reports prepared by inventory management systems, after an evaluation of the entire system and various other subsystems, are: distribution by value report, and distribution-by-value with item movement.

5. Other Information Systems

The other important information systems are:

- (a) Purchasing information system: where the computer automatically prepares requests, updating the orders, handling routine follow-ups, processing requisitions. Order writing, Vendor rating, Computation of EOQ, accounts payable cheques, etc., are other applications of this system.
- (b) PERT (Program Evaluation and Review Technique): used for effecting control over the time, cost and work involved in a project or program.
- (c) Research and development : an information system exchanging information on the results of research findings, provisions for examination, storage and retrieval of research information.
- (d) Simulation that permits simulating decisions to act as a vital tool for planning.
- (e) Strategic Planning, which involves projections of the future and provides data for other uses in the system, such data being generated internally or externally.

The typical management information systems in an organization can be classified on the basis of the functional areas they deal with, and include production information system, finance information system, personal information system, and Marketing information system. The tasks assigned to these information systems will vary according to the level of management. The production information system at the strategic level performs tasks relating to new plant location, at the strategic level, it deals with the bottlenecks in production process, at the operational level, it calls for daily work scheduling. The financial information system at the strategic level aims at findings out strategic and alternative financing sources, at the tactical level it provides for variance analysis,

and the operational level managers in the finance information system deal primarily with the payroll preparation.

The personal information system concentrates on welfare policy at the strategic level, performance appraisal at the tactical level, and leave records of employees at the operational level. In the marketing information system, the strategic management level gives emphasis to competitor survey, at the tactical level the focus is on advertising, the operational level managers give importance to sales analysis. Even though the implementation of MIS and various other information systems provides for organizational advancement and growth, where and how these systems do fit into the organization is not at all clear to the executives. As a result, the implementation of these systems are very difficult in such a way as to contribute to the overall organizational objectives.

The spectacular development in the field of information technology, and communication facilities leading to the changing role of information systems from passive data support to providing new business opportunities, are viewed as powerful weapons in the world of competition. A mastery of these information systems helps to exploit the potential of various technologies used in these functional areas in an optimal manner. The system designer must ensure that in every functional area in an organization, mapping of informational pyramid is carefully worked out, since these information systems significantly influence the functional areas.

Accounting Information System

The New Economic Policy launched by the Government of India and subsequent changes in the economy owing to globalisation, liberalization and privatization, have pushed the industrial sector to new areas of competition. The industrial and business houses have started to adopt measures for improving their overall performance. The most inevitable requirement for strengthening financial soundness of the enterprises is the arrangement for appropriate decision making. Availability of accurate and reliable information at the right time to the right person is the vital ingredient in decision making process.

The major reason for most of the weaknesses of the existing information set up of many industrial organizations

in India is lack of a system approach. To provide information in the right form and at the right time, a systems approach is essential. Such a system will help to collect, discriminate, select, relate, classify and interpret the information according to the needs of the user. If the set up is based on the information needs of the user and is scientifically developed so that all inter-related aspects of information such as analysis, storage, retrieval and flow are adequately covered, then it fulfills the requirements of an Information System. The system would connect the mass of data available in the organization into meaningful and required information. Let us see how the accounting can be an aid to the information system in business and industrial enterprises in our economy.

Changes in Accounting

The systematic march of industrial and business activities towards progress is seen throughout the world. In the course of this process, accounting has also been undergoing significant changes. The modern accountant is not like the old bookkeeper. The nature and scope of the accounting functions have become multidimensional. The area of operation of accounting now covers such fields as costing, productivity, taxation and integrated information system. Informative accounts facilitate an atmosphere of confidence for the growth of capital investment. The increased area of accounting for management purposes and the related development of accounting techniques and methods have offered the accountant a crucial role in the working of the organization. The accounting system is now regarded the central holder of information needs throughout. The accountant gives equal importance for internal reporting and external reporting and thereby meets the information needs of insiders and outsiders. He develops a system for the flow of informations both horizontally and vertically in internal reporting. The system requires perfection since the information supplied by the accountant is taken for granted by the management in formulating policies and programme. Insiders in the organization ask for accounting information in terms of money, time and other valid units of measurement. Fair, adequate and understandable disclosure of facts in the form of financial statements remains with due prominence as the main responsibility of the accountant towards external reporting.

Specialisation

The functions of accounting have not only deepened, but widened. More specialization and differentiation has also taken place. In addition to general financial accountants highly specialized ones like cost accountants and management accountants have emerged. The primary responsibility of each category of accountant is to serve the information needs of various groups and the difference exists only in their respective roles. The financial accountant is entrusted with the task of recording financial transactions and preparing accounts and statements containing the working results (i.e., trading and profit and loss account or income and expenditure account as the case may be) and the financial position (i.e., Balance Sheet). The cost accountant provides information related to costs at different intervals enabling the management to effectively control the operations. He able to point out the areas of losses and wastes and this helps the management to initiate steps for corrective action. The management accountant is largely responsible for advising the top management to come to a proper decision. His job is to collect, analyze, interpret and present all accounting information useful to the management, applying his skill in accounting, statistics and other techniques in financial management.

User Groups

Accounting information is inevitable for every activity. Since accounting information covers the entire activities of the organization the necessity of it is felt by various user groups such as:

- Equity investors and holders of convertible debentures;
- Employees and trade unions;
- Loan creditors;
- Government authorities like income tax, excise and sales tax departments and Reserve Bank of India;
- Business contact groups like customers, trade creditors, investors and business rivals;
- Public including consumers, tax payers, political parties and environmental protection societies; and
- Special groups like financial analysts, journalists, economists, statisticians, researchers and brokers.

Common Needs of Users

Common needs of the various user groups are:

- to decide when to buy, hold or sell an equity investment;
- to assess the stewardship or accountability of management;
- to determine the ability of enterprise to pay and provide the benefits to its employees;
- to ascertain the security for amounts lent to the enterprise;
- to analyze taxation policies and benefits;
- to estimate distributable profits;
- to prepare and use income statistics; and
- to regulate activities of the enterprise.

Qualities of Accounting Information

Information is power, competitive edge and opportunity. An accounting language is a set of specific definitions, policies and procedures and the information generated through the application of accounting language should be really useful to the user groups. This necessitates some qualitative characteristics for accounting information as stated below:

- An essential quality of accounting information is that it must be readily understandable to the concerned user groups.
- To be useful information must be relevant to the decision-making needs of the user.
- Materiality of the information is very crucial.
- Information must have the quality of reliability, that is it should be free from material errors.
- Information must represent faithfully the transaction and other events. For example, the Balance Sheet should represent faithfully the transactions and other events that result in asset, liability or equity of the enterprise at the reporting date.
- It is necessary that information is represented in accordance with the substance and economic reality and not merely the legal form.

- The information contained in financial reports should be neutral i.e., free from bias.
- The Accountants should exercise prudence in the preparation of financial reports. For example, a degree of caution in the exercise of the judgment is needed to ensure that assets or incomes are not overstated and liabilities and expenses are not understated.
- Information in financial statements must be complete within the bounds of materiality and costs. For example, an omission can cause information to be false or misleading and thus unreliable and deficient in terms of its relevance.
- Users must be able to compare financial statements of an enterprise through time in order to identify trends in its financial position and performance. Like this information must be useful for inter-firm comparison.

Limitations

Being essentially monetary, accounting information excludes non-monetary or qualitative elements like employee morale, social and environmental issues. Flexibility of using alternatives is also wide and this often misleads comparisons. In the global scene accounting information further suffers from varied monetary units, commercial traditions, government regulations, tax systems, professional standards and reporting practices. It requires special mention in this context that new measures have been attempted to overcome these limitations.

Recent Trends

Dependence on accounting information of varied nature by different user groups has put new responsibilities on accountants. He has been improving tools and assuming new burdens so as to ensure greater alternative and respect for his products, as detailed below:

With the urge to perform with great speed and accuracy integrated information system has started gaining ground. This system handles accounting data, engineering data, research data etc. by using mechanical and electronic devices. The accountant has acquired skills in systems analysis, data processing and computer programming.

Besides accounting, services of the accountants are now used in other areas also. Recently professional accountants are actively involved in policy decision and strategic planning. Even in the administrative set up of the Government the accounting profession has been given due recognition with the creation of Indian Audit and Accounts Service, Indian Railway Accounts Service, Indian Revenue Accounts Service etc.

The need for following uniform accounting policies and practices was felt all over the world immediately after Second World War. However, serious efforts in this direction were attempted by the formation of Accountants International Study Group in 1967. International Accounting Standards Committee (IASC) was constituted in 1973 with the objective of formulating and publishing international standards to be observed in the presentation of financial statements. It was also intended to promote world wide acceptance and observance of such standards. So far, IASC has published several statements of standards, known as International Accounting Standards (IAS). Another international body titled International Federation of Accountants was established in 1977 to issue guidelines on auditing.

The Institute of Chartered Accountants of India and the Institute of Cost and Works Accountants of India are member of the IASC. Accounting Standards Board (ASB) was formed in India in 1977, to formulate accounting policies and practices keeping in view of the international development. ASB issues accounting standards, more or less, on the lines of IAS with suitable modifications required in our economy.

From the above discussion, it is clear that the accountants are tend to be regarded as information technologists. The opportunities and challenges for accountants in the present society have enormously increased. In view of the changes, accountants have to acquire knowledge of other disciplines like mathematics, statistics, economics, and actuarial sciences, coupled with IT skills if they are really serious of playing a vital role at the enterprise level working. The ever-changing technical and professional environment also demands constant updating of knowledge and competence.

Conclusion

Every functional area in an organization must have its own set of information processing systems, such as: finance information system; purchase information system, production information system, marketing and personnel information system. They facilitate the easy operation of the functions and ensure local control. These systems integrated into a common data source called DataBase Management System (DBMS). Support system is also developed to help the functional managers in decision-making. They include Decision-Support-System (DSS) Executive Support Systems (ESS) etc. By generating summary information like trend, pattern, exceptions, etc., these support systems help the functional managers and facilitate non-programmed decision-making.

Exercise

Short Answer Questions

1. Write a short note on financial information system.
2. What do you mean by personnel Information system?
3. Explain the significance of human resource information system in an organization.
4. Discuss operational information system in an organization.
5. Explain the functioning of marketing information system.
6. Describe accounting information system and its significance.

Essay Questions

1. Discuss in detail the basic information system in an organization.
2. Explain the components of organizational information system.