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LIBRARY AND INFORMATION SYSTEM MANAGEMENT

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SYLLABI-BOOK MAPPING TABLE

Library and Information System Management

Syllabi	Mapping in Book
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Unit XIII: Management of Electronic libraries - Job descriptions of IT manager - Evaluation of IT - Technology Assessment -Equipment, Infrastructure, Service, Staff, Self - Technology development -updation

Unit XIV: Total Quality Management : Concept, Definition, Elements - Operations Management Systems - Tools and techniques for improving quality-Inventory planning and control, - Inventory control model - Quality Audit, LIS related Standards - Resource mobilization, Outsourcing, Library Consortia, Open Access - Technology Management

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BLOCK VI: ELECTRONIC LIBRARY AND TOTAL QUALITY MANAGEMENT

INTRODUCTION

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Library science is an interdisciplinary field that applies the practices, perspectives, and tools of management, information technology, education, and other areas to libraries. The issues taken up in the field encompass the collection, organization, preservation, and dissemination of information resources; and the political economy of information.

The importance of information system management cannot be understated. Its introduction in libraries, as well as the development of development of online catalogues and bibliographic databases, availability of documents in vast array of new media and formats, and huge amount of information sources made available by the Internet, has brought about tremendous changes in the management of libraries. This book, *Library and Information System Management*, will take up these issues.

This book is divided into fourteen units that follow the self-instruction mode with each unit beginning with an Introduction to the unit, followed by an outline of the Objectives. The detailed content is then presented in a simple but structured manner interspersed with Check Your Progress Questions to test the student's understanding of the topic. A Summary along with a list of Key Words and a set of Self-Assessment Questions and Exercises is also provided at the end of each unit for recapitulation.

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BLOCK I
BLOCK I: LIBRARY MANAGEMENT & THOUGHTS

UNIT 1 CONCEPT OF MANAGEMENT AND ORGANIZATION

Structure

1.0 INTRODUCTION

Management is the administration of an organization, whether it is a business, a not-for-profit organization, or government body. Where there is a human activity, whether individual or joint, there is management. The process of management can be noticed in all spheres of life. Management is a set of principles relating to the functions of planning, organizing, directing and controlling, and the application of these principles in harnessing physical, financial, human and informational resources efficiently and effectively to achieve organizational goals. In this unit, you will define the nature, functions, and importance of management. This unit will also discuss library and information system as non-profit organizations and organizational structure of different types of library.

1.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain the nature, functions and importance of management
- Discuss library and information system as non-profit organizations
- Explain organizational structure of different types of libraries

1.2 DEFINITION OF MANAGEMENT AND ORGANIZATION

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No doubt management, as an academic body of knowledge has come a long way in the last few years. It has grown and gained acceptance all over the world. Yet, the term 'management' continues to be the most misunderstood and misused. A study of the process of management reveals the following points about the nature of management:

Management is a universal process

The basic nature of management activity remains same in all arenas, whether the organization to be managed is a family, a club, a trade union, a trust, a municipality, a business concern or the government. Slight variations in approach and style may be there from organization to organization, but the management activity is basically the same everywhere.

Management is a factor of production

Management is regarded as a factor of production. Just as land, labour and capital have to be brought together and put to effective use for the production and distribution of goods and services, similarly managerial skills have also to be acquired and effectively used for the purpose.

In the modern industrial set-up, qualified and efficient managers are essential to reap the fruits of huge investment in business where the pattern of production has become capital-intensive. In fact, in this scenario, more important would be the role of management.

Management is goal oriented

The most important goal of all management activity is to accomplish the objectives of an enterprise. These objectives may be economic, socio-economic, social and human and thereby management at different levels seeks to achieve these in different ways. But at all times, management has definite objectives to pursue and it employs all the resources as it commands – men, money, materials, machines and methods in the pursuit of the objectives.

Management is supreme in thought and action

Determination of the objectives of an enterprise tests the collective wisdom and sense of imagination of its management. The objectives should be neither too high sounding or difficult to achieve, nor too low pitched to rob the workers of their sense of achievement. But, mere setting of objectives will be of no avail, if there is no vigorous action to achieve them.

Managers set realizable objectives and then mastermind action on all fronts to accomplish them. Managers belong to that rare breed of men who are not only

aware of what is to be achieved and how, but also possess the capability and courage to accept the challenges of doing it.

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Management is a group activity

An enterprise will not be able to achieve its objectives if only one or a few individuals or departments are efficient and the rest are inefficient. The calibre of each individual and each department needs to be efficient in order to make a project successful.

Example: A marketing manager is responsible for increasing the sales of the products of any organization; human resources manager is responsible for recruiting new people, developing organizational policies for the employees, etc.

Management is a dynamic function

Management is a dynamic function of a collective enterprise, which is constantly engaged in casting and recasting the enterprise in the world of an ever-changing business environment. Not only this, it sometimes also initiates moves that reform and alter the business environment. If an enterprise is well equipped to face the changes in business environment brought about by economic, social, political, technological or human factors, it can soon adapt itself to a changed environment or make innovation to attune itself to it.

Management is a social science

Management means getting the tasks done by different people with different qualities. This involves dealing with individuals each one of whom has a different level of sensitivity, understanding and dynamism. In fact, no definite principles or rules can be laid down with respect to human behaviour. These principles change from individual to individual and from situation to situation. No doubt, a manager may seek guidelines from established principles and rules but he cannot base his decisions on them.

Management is an important organ of society

Management shares a direct relationship with society. While the society influences the managerial actions, managerial actions also influence society. By their decisions, management of large undertakings influence the economic, social, political, religious, moral and institutional behaviour of the members of society. This creates an impact on the social and moral obligations of business management which cannot be easily ignored.

Management is a system of authority

It is the job of management to bring about a harmonious arrangement and pattern among the different resources employed in an undertaking. In fact, management's role as a factor of production forces itself to be methodical in plans and procedures and on the other hand systematic and regular in their implementation. For this, it is necessary that the authority vested in the management is to be exercised properly

and correctly. Therefore, this calls for well-defined lines of command and delegation of suitable authority and responsibility at all levels of decision making.

Management as a profession

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Management makes judicious use of all available means to accomplish certain predetermined ends. To achieve this successfully, managers need to possess managerial knowledge and training. Moreover, they have to conform to a recognized code of conduct and remain conscious of their social and human obligations. Managers are well paid and well provided by the organization for their work. Moreover, they enjoy considerable social prestige too.

Management as a process

Management is an activity consisting of a distinct process, which is known as the management process. This process is primarily concerned with the important task of goal achievement. No business enterprise can achieve its objectives until and unless all the members of the unit make an integrated and planned effort under the directions of a central coordination agency. In management terminology, this central coordinating agency is technically known as 'management'. The methodology of getting things done is known as 'management process'. The process, in general, is defined as a series of actions or operations conducted to achieve a goal. The functions that are performed by a manager and the sequence in which they are performed are together called the 'management process'.

Ordinarily there are two main functions of each manager—decision–making and implementation of the decisions. Collectively, these two fall under the management process. The processes such as planning, organizing and actuating involved in the achievement of business goals together form the management process.

Scope of Management

Management is an essential component of all social organizations and is to be found everywhere as a distinct, separate and dominant activity. The importance of management cannot be over, emphasized. The significance of 'management' may be outlined in the following paragraphs:

1. **Meeting the challenges of change**: In recent years, the challenge of change has become intense and critical. Only scientific management can overcome the complexities of modern business.
2. **Effective utilization of the Seven Ms**: There are seven Ms in business: men, materials, money, machines, methods, markets and management. Management stands at the top of all these Ms. It determines and controls all other factors of business.
3. **Development of resources**: Good management procures good business by creating vital dynamic and life-giving force in the organization.

4. **Providing management directs the organization**: Just as the mind directs and controls the body to fulfil its desires, management directs and controls the organizations to achieve the desired goal.
5. **Integrate various interests**: There are various interest groups that put pressure over other groups for maximum share in the total output. Management balances these pressures and integrates the various interests.
6. **Management provides stability**: In the modern society, management provides stability by changing and modifying the resources in accordance with the changing environment of the society.
7. **Management provides innovation**: Management provides new ideas, imaginations and visions to the organization and necessary life for better and greater performance.
8. **Management provides coordination and establishes team spirit**: Management co-ordinates the activities of the different departments in an enterprise and establishes team spirit amongst the personnel.
9. **To tackle business problems**: Good management serves as a friend, philosopher and guide in tackling business problems. It provides a tool for doing a task in the best possible manner.
10. **A tool of personality development**: Management is necessary not only for productivity, but also for improvement in the efficiency of mankind. Management helps improve the personality of people and therefore attempts to raise their efficiency and productivity.

1.2.1 Nature, Purpose and Structure Of Organization

A formal organization is a cooperative system in which people gather together and formally agree to combine their efforts for a common purpose. It is important to note that the key element in this rather simplistic definition is conscious coordination and it implies a degree of formal planning, division of labour, leadership and so on. For example, if two individuals agree to push a car out of a ditch, as a one-time effort, then these individuals would not be considered as an organization. However, if these two individuals start a business of pushing cars out of ditches, then an organization would be created. More recently, Bedeian and Zamnuto have defined organizations as 'social entities that are goal directed, deliberately structured activity systems with a permeable boundary'. There are four key elements in this definition:

1. **Social entities:** The word social as a derivative of society, basically means gathering of people as against plants, machines, buildings, even though plants, machines and buildings are necessary contributors to the existence of the organization. Organizations will cease to exist if there are no people to run them, even if other things remain. For example, if everybody resigns from a company and no one is replaced, then it is no longer an organization even though all the material assets of the company remain until disposed off. On

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the other hand, there are organizations such as neighbourhood associations, which have only people in them and no physical assets. Accordingly, it is the people and their roles that are the building blocks of an organization.

2. **Goal directed:** All efforts of an organization are directed towards a common goal. A common goal or purpose gives organization members a rallying point.
3. **Deliberately structured activity systems:** By systematically dividing complex tasks into specialized jobs and categories of activities into separate departments, an organization can use its resources more efficiently. Subdivision of activities achieves efficiencies in the workplace. The organizations are deliberately structured in such a manner so as to coordinate the activities of separate groups and departments for the achievement of a common purpose.

4. Permeable boundary: All organizations have boundaries that separate them from other organizations. These boundaries determine as to who and what is inside or outside the organization. Sometimes, these boundaries are vigorously protected. However, the dynamics of the changing world has made these boundaries less rigid and more permeable in terms of sharing information and technology for mutual benefit.

Importance of Organizing

Organizing is the second major function of management. If planning involves the determination and achievement of objectives, then organizing is the process of selecting and structuring the means by which those objectives are to be achieved. The organizing process deals with how the work is to be divided and how coordination of different aspects is to be achieved and so on. We are truly a society of organizations. All work has to be organized efficiently in order to use the resources available to us in the most efficient manner. One reason for organizing is to establish lines of authority. This creates order within the organization. Absence of authority almost always creates chaotic situations and chaotic situations are seldom productive—hence, the importance of organizing efforts well. Effective organizations include coordination of efforts and such coordination results in synergy.

Organizations shape our lives, and better managers can shape effective organizations. However, it is not just the presence of organizations that is important but also the knowledge of organizing. Consider how the Olympic games are organized or how large airports are built. Without proper organization of people and resources the project could not be successful.

Check Your Progress

1. What is the most important goal of all management activity?
2. List the seven Ms in business.

1.3 LIBRARY AND INFORMATION SYSTEM AS NON PROFIT ORGANIZATIONS

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The word library these days has many different characteristics. Libraries today range from physical public libraries to the digitally available online libraries. A library is a place where people find all kinds of information may it be through a book (in case of a brick and mortar library), an online site, or database entry (in case of a digital library). Let us now have a look at some definition of the word.

Following definition is included in, *The Librarian's Book of Lists* (Chicago: ALA, 2010) by George Eberhart:

> 'A library is a collection of resources in a variety of formats that is (1) organized by information professionals or other experts who (2) provide convenient physical, digital, bibliographic, or intellectual access and (3) offer targeted services and programs (4) with the mission of educating, informing, or entertaining a variety of audiences (5) and the goal of stimulating individual learning and advancing society as a whole.' (p.1)

Libraries are of many kinds, e.g., government library, monastic library, academic library, new library, public library, proto-library, subscription library, and special library. Public libraries are the ones which are generally funded by governments (either fully or partially), it is recognized under state empowering laws or guidelines to provide service to a community, locality, or district. A public library must offer the following at least:

- A structured assemblage of library material whether in print or other form,
- A public library must be supported by paid staff for its regular functioning,
- The library must have a customary program according to which public is able to make full use of the services of the library staff,
- All facilities available at the library must be fully supported by an efficient staff, as proper schedule, etc.,
- It must be either partially or fully funded by public funds.

Libraries as a non-profit organization

By virtue of being public libraries, these organizations are fully engaged with their regional social sector organizations providing them community service. Social sector organizations in any community are an integral part of the community as they offer such services which make a difference to the community. Such organizations play the role of substantial programming associates and library promoters, and over and above this, they might become a part of the library's referral network supporters. The social sector also forms a very big part of the economy of the country. This sector accounts for almost 10.3 per cent of employment provided by the private sector.

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There are some customary non-profit organizations and charities which are included in the social sector. Many times, customary non-profit organizations serve needs of the community like providing shelters for animals, arranging programs in addition to school programmes, and providing services for the needy and homeless. Organizations providing social good likewise may consist of occupations and industrialists with an ulterior motive of serving the community by giving it back to the community and to make this world a happier place to live in. Such industries and occupations that form a part of the community must be included by libraries in their services to the social sector. Public libraries can include the following non-profit functions in their charter:

1. Information and training resources for non-profits

A library can render help to organizations by giving the right to use and providing help with information resources. The information requirements of non-profits consist of prospect research, startup support, and recommendations to local non-profit networks and maintenance services.

Prospect research entails the procedure for searching contributors and givers of grants which could possibly provide funding to an organization or mission. Many times foundations desirous of making grants are not supported by requisite book banks or websites. It is in such situations that public libraries can provide help by setting up a website for the cause or providing databases.

2. Helping setting up new charities

Another non-profit feature of public libraries is to provide assistance to charitable organizations in starting their business and setting up their organization. Libraries can help by finding out about the other organizations providing similar services or selling similar products and list them together for the benefit of new organizations. In addition, such an information can come in handy for those newly set up charities to recognize prospects for partnership, and this can even help in determining whether a new non-profit start up in that specific field is actually required or not.

3. Provision of legal referrals to new set ups or established organizations

Libraries can arrange for training programs and which are set up in order to help support the work of non-profits. The most needed areas which need to be looked into with respect to planning and support are; planning for raising funds, formulating schemes, book-keeping, and development of board. Information related to the funding network gives a chance to libraries for expansion or strengthening their association with the non-profit organizations working locally.

4. Involvement of local social organizations in work

As non-profit organizations, libraries must involve other local organizations dedicated to the cause of doing good. This job can be done by researching, examining on going trends, and forming associations with other local non-profit organizations

providing service. Social media tools, e.g., LinkedIn and Facebook prove to beneficial for conducting such researches on local organizations and people. Libraries can arrange programs in which local speaker can be invited to give their views on topics beneficial for the general public of that local area. Such programs can be organized with the help of perhaps small business houses or organizations which can assist in finding and inviting people for talks. Libraries can also take upon themselves to be a host venue for non-profit conferences or seminars.

5. Liaison with local organizations

With a view to evaluate the data related to a library's services, a library will have to accumulate statistics and info about all those rendering help to the library. In order to do that the library must keep a track of the in-coming and organizations and their requirements. That must be done in order to establish and maintain a long term mutually relationship. A good long term relationship must consist of healthy give and take so that both parties involved have a desire to carry on in the relationship.

1.3.1 Library as a System (Libraries and Digitalization)

The institution of information technology in libraries, advancement of availability of online catalogues and databases and accessibility to large collection of documents related to media and formats has been offered by the World Wide Web (WWW) which is used at large by people for gaining information on a plethora of subjects. Libraries, like all other things in the environment, are undergoing a constant change, thus, considering the perspective of this ever changing environment, the ups and downs seen in the day to day running of libraries must not be missed out. In order to keep abreast with changing times, libraries must always endeavor to come up with latest and improved techniques in order to prepare effective strategies or wide-ranging codes of conduct to ensure the following:

(i) Creation of online library collections of wide ranging collection of all kinds of bibliographic resources both, old as well as new.

(ii) Good quality library networking, and

(iii) Efficient means of searching and information download facility from databases available on library's website, catalogues made available by publishers as well as the Internet.

The need of the hour is an automation of the library system. A computerized or automated library system generally comprises of many practical and workable modules, for example, acquisitions, flow of books or digital information, classification, serializations, and an OPAC (Online Public Access Catalogue). The best and most practical library system is that kind of a system which is 'integrated' and 'automated'. A system which contains all such functional modules which have a common bibliographic database.

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In a non-integrated library system, one particular book might be having two bibliographic records at two different places. In an integrated library system, each book would be registered under only a single bibliographic record. The same might have been created at the time of the order of the book. However, there are some libraries systems which, despite having double bibliographic records, are considered to be integrated as modifications in the bibliographic record are transmitted on their own. For instance, a modification made to a bibliographic record in the acquisition file would on its own made to the second bibliographic record being maintained in the catalogue. In these partly-integrated systems, movement between the units and their second files is smoothed by a kind of connecting mechanism.

Integration of a library system can be achieved in many ways:

- An integrated system can be bought by a library and its different purposeful modules can be bought from only one particular seller;
- A library can buy different modules from different sellers and connect them to each other.
- A library can implement some of the bought modules (from either one or many sellers, and thereafter join them to bases of information that are not contained in the library.

Benefits of an integrated library system

Following are the benefits of an integrated library system:

- A library may or may not have an integrated system. However, as it is easy to handle a library having an integrated system, it will always remain better than the one which has not been integrated.
- An integrated system does not require double effort of creation and maintenance of multiplicity of bibliographic records.
- Single entries reduce chances of errors during entry of records. This also induces automatic changes in the entire system.
- Entire information related to the library can be found at a single location. The staff is able to find out (at only one glance) about when the book was issued and when it is due to be returned. Pending orders and newly purchased books can also be tracked in a similar fashion.

Method of selection of an integrated system by a library

Integrated systems are sold by many sellers. Other than the availability of numerous vendors in the market, different systems are suitable for different kinds of libraries, e.g., the requirements of a huge academic library may be very different from a small school library. A system installed in the library must have the potential to address various library related issues. It should be able to handle the different transactions carried out in the library. Such as, the number of books checked out every day, in the library.

Besides the above, while selecting a system for the library, the future growth prospects of the system must be seen. Like, what will be its capacity to handle clienteles and resources down the line? What is its scope to transfer from its present form to an advanced form?

Comparison between old and new library systems

- **Generic system vs personalized system:** In the beginning days of computerized library systems, certain big libraries designed and employed their personal library systems. Some of these tailor made systems later were developed and transformed into commercial systems. The NOTIS library system is one such example, which was developed from mechanization systems established at Northwestern University. In contrast to this design some off-the-shelf systems are available. Such systems are basically all-purpose the - one-size-fits-all - kinds. Though there is no doubt that generally all libraries have similar functions, like acquisition and categorization. Nevertheless, one type cannot benefit all. Library can face problems in accommodating some specific processes, which are unique to it.
- **Application and organization matters:** After selecting the right system for the library, the next most important step is the correct application process of the selected system in the library and handling with the associated organization matters. As has been mentioned above, one of the foremost characteristics and benefits of an integrated system is bibliographic record sharing of among different modules of the system. This lone characteristic can prove to be highly beneficial in library management. Application of integrated library systems has been impacted by many organizational changes like:
  - o Different forms of communication between people working at the library, particularly amid technical amenities staff and public amenities staff.
  - o More and more delegation of accountability and taking decisions to staff at the lower level.
  - o Need for all members of the library staff to gain technical awareness and acquire procedural skills.

Future shifts in integrated library systems

The way of defining integrated systems is witnessing a change in comparison to older systems which shared bibliographic records among local functions. Developments in the technological field, for example, client/server constructions and uniform protocols for moving information from system to system, are aiding this incorporation of information from external sources with the local systems. For instance, a book ordering system available online, may provide an opportunity to the librarian to search the bibliographic database publisher's, select records of books to be purchased, and download those records from the of the publisher. In addition to this, many libraries having an extended integrated system provide their clients to access their database, by means of their local OPACs.

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Online and card catalogues

In the present times, online library catalogues contain huge records which used to be contained in catalogues that used to look like cards, these were called 'card catalogues'. The underlying structure of both forms of catalogues, however, still remains more or less same. In changing modern scenario, proposed modifications catalogue rules must sustain change and systemization of erstwhile bibliographic data listed on the card catalogues. The transformation of physical data into electronic must be done in a suitable manner. Re-creation of bibliographic records available in the documented form presently into technological formats like: text files, sounds images, video clips, etc., is a herculean task. Over and above the conversion of the data from physical to electronic form, its storage, organization, and retrieval for usage is also a daunting challenge. To bring the required changes in cataloguing rules, it is necessary for us to understand the differences between the environments of card catalogue and online catalogue, and the need of developing computer-based library information systems and services.

1.3.2 Organizational Structure of Different Types of Libraries

Library is a store-house of information for anyone seeking knowledge or information. With passage of time many new ways have been devised to record and store knowledge. Few years ago, the only way to store data was in written or printed in form. But due to expansion of science and technology, contemporary era is making wide use of electronic media. These mediums are not limited to just a few types of libraries rather all types of libraries viz., public, academic, national or special libraries are dependent on this kind of media storage. Well, the practice of storage of knowledge has been prevalent since the beginning of human civilization. Nevertheless, it must be acknowledged here, that libraries in olden eras used to be very different from the present times libraries. The growth of libraries has been very dynamic and they have been improving with the growth of human civilization. It must be noted that there are so many different people having different intellectual needs, thus, one general type of a library cannot suffice for the needs of all hence, different types of libraries exist in the world which cater to the different communal, financial, intellectual and ethnic needs of people.

All round development of a human being is possible only based on the up gradation of his knowledge and information base. It is not possible for one person to store enough data for this purpose, so libraries which take care of the intellectual need and gratification, provide the requisite resources. The contemporary information civilization is regarded to be having the need to compete. The libraries thus look after the supply and demand of information and knowledge which meet the diverse and multifaceted requirements of people. Propagation of correct data to the rightful user at the adequate time is the motto of all the good libraries. Thus, it won't be wrong to say that a library is an organization for distribution of knowledge and information. A library operates on the fundamental function of educating people. The modern society libraries aim to inform the society in a comprehensive sense.

Libraries have an immensely imperative role to play in the learning progression of formal and non-formal education, they are extremely important in the field of research and development, in cultural activities, in spiritual and conceptual territories, in in the field of leisure and entertainment. With the remarkable developments in information technology and growing classifications of different kinds of users and their data requirements in varied situations; modern society is moving towards such a well-informed society in which the dominant mechanism of modification, dynamism and course of change are based on information and knowledge. Let us now have a look at the various kinds of libraries which cater to various intellectual needs of people belonging to different status of society. On basis of the type of amenities provided to the readers; libraries can be generally classified into four types:

1. Public Library
2. Academic Library
3. Special Library
4. National Library

(I) Public Library

The term 'Public Library' has been elucidated in many different ways by different specialists based on the prominence given by it to its purposes. Nevertheless, the most extensively recognized description of a public library was framed by UNESCO in 1949 which later underwent a revision in 1972 (UNESCO 2004). The following description of a public library is included in the manifesto of UNESCO:

(a) Public Library is financed for the most part out of public funds.

(b) It charges no fees from users and yet is open for full use by the public.

(c) It is intended as an auxiliary educational institution providing a means of self-education which is endless.

(d) It houses educative and informative materials giving reliable information freely and without partiality.

A public library is a kind of library which can be accessed by the common people, belonging to all spheres of society, having varied intellectual needs. Public libraries are generally funded by public funds collected by governments, for example, taxes. These libraries are managed by librarians and special library professionals, who are government employees.

Characteristics of a Public Library

The five essential features shared by public libraries are as follows:

- Public libraries usually function on the financial support gathered from collection of taxes.
- A board of professionals governs the functioning of these libraries in order to serve the public interest.

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- Public libraries are freely accessible to all. Every member of the community can make use of the material available in a public library.
- Membership to public libraries is on a voluntary basis.
- Public libraries do not charge for the basic services provided.
- Many countries across the world provide their citizens the facility of public libraries. They are considered a vital part of providing the general population education and literacy.
- Public libraries are different in comparison to school libraries, research libraries, and other special libraries. They are formed with the aim to serve the information needs of the public in general. Whereas, other libraries cater to the specific needs of school going children, members of an organization, or research association.
- Many free reading materials provided by public libraries, for example, preschool story or rhyme books, picture dictionaries, etc., give encouragement to early literacy.
- Public libraries provide books and info material some of which can be borrowed and taken away and other which cannot be taken off the library premises.
- Some public libraries provide computer and the Internet facility to its patrons.

An Overview of Public Libraries

The present day public libraries are a result of ages of developments in the fields of printing, typing, publishing, ink and paper, along with an ever-increasing information- focused society, augmented marketable activity and consumption, improved fundamental philosophies, enormous growth in population and greater rates of literacy. The availability of books to general public is not a new phenomenon. The practice of providing scrolls in dry rooms to patrons of the baths in the Roman Empire can said to be a kind of initiation of libraries in the Roman Empire.

The beginning of actual public libraries can be dated back to the middle of 19th century. This was the time when public libraries started to be run by the state owned forces and funded by taxes. In this connection, Matthew Battles says that, 'It was in these years of class conflict and economic terror that the public library movement swept through Britain, as the nation's progressive elite recognized that the light of cultural and intellectual energy was lacking in the lives of commoners.'

Public libraries were generally begun with a donation, or were in the charge of local districts, churches, schools or towns. These collective and organized libraries shaped the basis of numerous academic and public library of the contemporary days.

Functions of a public library

Following are the functions a good public library

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1. *Availability of information and education tools:* The principal role of a public library is to choose and to consolidate requirement-based writings and other resources of information and education appropriate for the needs of the local community of the location of the library.
2. *Contributory towards informal self-education:* Adult members of the society rely heavily on public libraries for collection of information. They provide people with appropriate learning material in order to hone their expertise and proficiency in fields of interests. Public libraries are a good place to gain self-education in the fields of agriculture, poultry farming, bee keeping, etc.
3. *Promotion of cultural and social activities:* Many socio-cultural associations, for example, children's clubs, dramatic clubs, youth forums, teachers', doctors' or lawyers' associations, film societies etc. are provided support for the conduct their activities in the premises of public libraries or by the way of its rich educational, informative and cultural materials.
4. *Safeguarding the local material:* Yet another significant function of a contemporary public library is to classify and gather relevant cultural material existing in its area. Collection and conservation of works of art or sculpture, paintings, documents, musical instruments etc. by public libraries helps in conserving the local culture of the place. Preservation of such materials connects people with their heritage and cultural past.
5. *Strengthening the spirit of democracy:* Congregation of people from different parts of the socio-culture under one roof gradually inculcates a sense of harmony, a feeling of respect for other groups, a tolerance towards different languages, faiths, traditions and etiquette. Thus, a public library can be justified as a democratic institution in the true sense.

Organizational structure of a public library

A public library may be divided into various departments inside based on its scope, monetary condition, place, and the number of patrons associated with it.

Library control and management is a multidimensional effort involving organization, preservation, collection, circulation, and maintenance of all kinds of resources available in the library. It also entails management, training, development and employment of staff, budgeting and managing funds, and complete running of the library.

The following is the most fundamental organizational structure of a public library:

- Public Library Director
- Library Authority
- Library Committee

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Types of Library Committees

Few general kinds of library committees are as follows:

- **Ad hoc Committee:** It is a special committee of members having far-sightedness and intelligence to accomplish special tasks related to the growth of library, its administration, and control. Members of this committee arrive at quick and smart decisions collectively.
- **Elected Committee:** It is a group of people who are voted for by a superior committee which deputes the task of taking decisions and completing tasks. The committee elected in such a way is however not completely free as it needs to report to the higher parent committee.
- **Self-sustaining Committee:** It is a group of people who are instrumental in the creation of the library. The entire right to manage the funds and library rests with this committee.
- **Executive Committee:** It is the committee which takes decisions related to very critical matters. All powers with respect to those issues rest only with this committee and it does not even report to its library authority.
- **Reporting Committee:** It takes decision on some crucial strategies bound by specific limitations. This committee must report to the authority for any kind of an approval.
- **Recommending Committee:** It does not have any actual power for taking decisions or conducting library operations. The recommendations of proposals made by this committee on library government are subject to approval of the library authority.

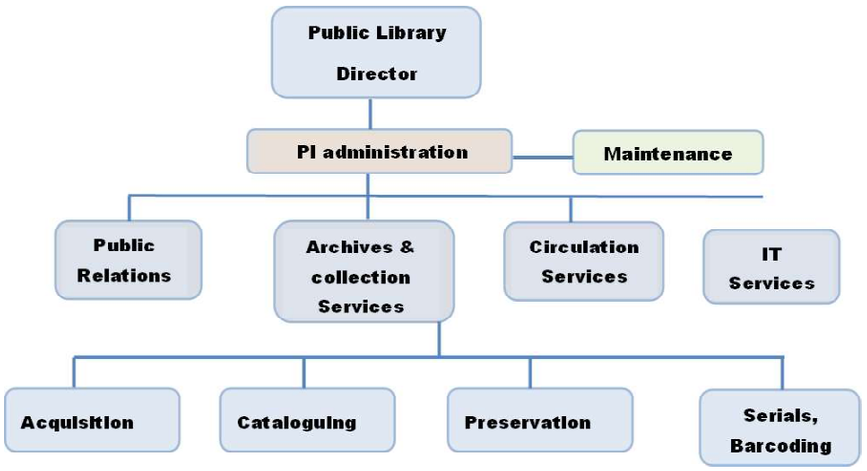

Fig. 1.1: *Public Library organization hierarchy chart*

Public library and society

All societies are made up of multi-lingual and multi-cultural features. In such heterogeneous societies, respect and regard for other people's language and culture

is necessary to fortify the social unanimity in multiplicity. That is the reason why, a public library must take an initiative in coordinating gatherings and meetings of diverse ethnic groups. Such congregations bring out the aspirations and contributions of people of diverse cultures before others. Public libraries must make full use of occasions such as, national festivals and religious festivals, or birthday anniversaries of national or religious leaders to fulfil such aims. One more prominent part that a public library plays in bringing the society together is the conservation and sharing of indigenous cultural materials. Public libraries accomplish this task with the help of local historians, literary persons and archaeologists. Such an activity brings together experts from different fields, which in turn proves to be beneficial for the society at large. Public libraries do the very important job of providing a connection between the past and future.

According to the UNESCO Manifesto, a public library provides nourishment to the spirit of man by providing him books and other reading material which relaxes him and provides him pleasure. The term 'book' referred to in the manifesto is understood in the broadest sense which means that it refers to all chronicled materials related to mankind portraying his expertise in novel writing, writing of verse, plays, creating music, painting, dance and sculpture. Just like a public library is needed to fulfil the different needs society, in a similar fashion, content related to native or local cultural is also revered very highly. Therefore, a public library is fundamentally a library available free of cost, which has the financial support of public funds. A public library provides unprejudiced service to all members of the community alike, regardless of their cast, colour, creed or financial status. It is a democratic organization which provides knowledge, education and ethos to all its patrons based on their varied requirements.

The status of public libraries in India

With the ever increasing population of India, literacy and schooling remain its biggest challenges. These are the regions where public libraries play a very important role. In fact the role of public libraries in this field as defined by UNESCO Public Library Manifesto (UNESCO, 2004) declares public libraries as the local gateway to knowledge. They have been called those institutions which provide a fundamental situation for lifetime learning, autonomous decision-making capability and individual as well as groups cultural development. According to this view, public libraries are understood as institutions made to serve people, facilitating them in their overall development. Well, despite the glorified description of public libraries by UNESCO, the state of public libraries in India however remains dismal.

Public libraries in our country possess neither frequently reintroduced books or printed matter nor vivacious non-print multimedia resources which have the capability of luring illiterate or quasi-literate people into acquiring this skill. These libraries are devoid of any kind of variety in their infrastructure. They constantly struggle with paucity of skilled manpower and financial constrictions often break their back. Due to lack of proper governing bodies, public libraries in India do not

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have devoted policy makers and implementers of rules. At a time when the citizens of the country seek advanced support and facilities from its libraries, India has arisen as one of the universal frontrunners in information technology and has exported knowledge workers all across. In this era of high-tech technology, Indian population must therefore take into consideration public libraries not only as a premier of books and knowledge but also as a prominent point of entry for digital age beneûts. The challenges faced by India due to being a developing country, the financial environments for libraries is not very bright, especially in contrast with the developed countries. Other than this, a wide gap is visible between the digital libraries of cities which are equipped with automation and networking facilities (especially in the in special and academic libraries) and small public libraries established in rural areas, which is home to a majority of Indians, which are completely or partially dependent for ûnancial support on central or state government. For these libraries, collection of resources and infrastructural development is a very big challenge. Due to lack of interest in the authorities and unawareness among the common masses, development of modern tools and IT services in public libraries seems a farfetched idea.

Though the public library system in India faces numerous limitations and restraints, yet for operative distribution of information, the provision of traditional library services with is helping those who actually need and seek knowledge for specific purposes. Many public libraries, particularly in the cities, have implemented Information Communication Technology (ICT), due to the help rendered by RRRLF. In spite of these slow advances towards progression in the field of public libraries there are still miles to go before we sleep. The Indian public library system is fated to continue as peripheral to the real knowledge requirements of the general public. Most of the stored data in public libraries on our country is in a miserable state, which is nothing more than a storeroom of leisure reading material, and most of this material is available only in regional languages. Out-of-date library services do not have the capability to be extended to fulfil the patrons' needs. People visiting these libraries are faced with distinctive and diverse challenges related to accessing the library delivery of information.

Superior financial provisions, practical development, and advancement are needed to give good library services and to accomplish better results in community teaching and learning. An ardent and persistent effort is required in order to preserve value service in public libraries. Library organizers and leaders ought to have the expertise to make and cultivate a whole new generation of library culture, which encourages modification and envisions implementation of high class library services. According to Susan Kent, library leadership matters primarily spin around three issues: architecture, technology and planning. Taking into consideration the public library setup in the Indian context, none of these features seem to be anywhere in the offing yet. Christopher Edwards in his article has rightly pointed out ¯Providing access to information has traditionally been about buildings, based around institutions offering services to onsite users. Building tomorrow's libraries will not simply be a

matter of installing rows of computers with Internet access: our users will increasingly expect to be able to access material from where they live and work. Providing access will increasingly be about developing electronic information services such as Internet portals and acting as a broker between content providers and remote users.

(II) Academic Library

An academic library is the library that is generally a part of an educational institution, for example a school, a college, a coaching or a research centre or a university. An academic library functions keeping in mind the educational requirements of the students, research intellectuals, educators and other staff of that particular educational institution. Foremost aim of an academic library is to provide maximum learning material to its patrons in order to equip them fully at their individual levels. Academic libraries are characterized into school libraries, college libraries and university libraries.

1. School Library

A school library is a knowledge workshop, having a selection of educational media, important for optimal maintenance of the training programme. A school library functions with the aim to achieve the purposes of the educational programme. It is related to the growth of effective intellectual techniques, indoctrination of social outlooks, attainment of imperative knowledge and promotion of evolution and progression among children. A school library functions in order to help students in the course of their self-discovery, to assume high morals in life, develop educational competence by means self-study and to advance their critical thinking capacity.

2. College Library

A college is a very important key in the process educational development of a student. A college which is not equipped with a well-stocked library can be compared to a tree without roots. The standing of a college can be gaged by having a look at the infrastructural and stock facilities of its library. Therefore a college library should not be anything less than a teaching instrument in itself. A college library must support the goals of the college. Consequently, it can be said that the fundamental role of a college library is to support its college in carrying out its programmes to the utmost.

3. University Library

A university is a seat of academic learning, thus it is very important for a university to have a well-stocked library catering to the needs of all departments of the university. It won't be wrong to say that a library can do exist in the absence of a university but on the contrary, it is not possible for a university to function in the absence of a library. A university library is a vital part of the organization. It is chiefly preserved for the advantage of students, professors, faculty members,

university officers, and research scholars. It plays a very imperative role in the academic life of the university community by gathering material for scholastic use for the assistance of learners and instructors of different departments.

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(III) Special Library

The concept of special libraries gained popularity somewhere around the beginning of 20th century. The material congregated in a special library is collected keeping in mind the needs of a specific group of people, for example, the employees of a particular company or members of some department of the government, or the staff and members of a professional or research organization. Thus the information material specific to that particular organization is made available in such libraries.

This kind of a library provides specified information resources on the subject that the organization deals with. It patronizes a particular and restricted clientele, and provides dedicated service, in terms of provision of knowledge and information to them. Libraries made for the benefit of the staff in a corporate house, a particular government department, a court of law, a hospital, a museum, an NGO, or a non-profit organization are example of special libraries. Some academic institutions such as, law colleges or medical schools also have special libraries within them. Such libraries are termed as special libraries mainly because of two reasons, firstly because of the kind of material provided by them and secondly because they are funded separately from the rest of the institution to meet the intellectual requirements of a particular user group.

Fundamental features of a special library

1. As discussed above, special libraries generally have a more specific patronage in comparison to the customary libraries found in academic institutions or public organizations.
2. They deal with more particular type of information specific to only that organization. The information material available in them and the services provided is more oriented and particular to the requirements of their patrons.
3. The reason behind the conceptualization of these special libraries is the overall development and provision of support to the undertaking of the parent organization.
4. Some special libraries are open to the general public and some may not be. The difference in both these kind of libraries lies in the kind of material that they have to offer. Open libraries may consist of wider research material or information base in comparison to, subject specific, closed special libraries.
5. Sometimes information centres are compared with special libraries, but actually both are different in terms of the information base provided by each. The basic difference between a special library and an information centre is that the latter has 'a very narrow scope.'

Special libraries are termed 'special' because of the availability of special information and educational material, their specific users, and their specialized services. For instance, a library of a research institute may have specific information for the benefit of scientists who do not have enough time to go places in order to collect the required material. Though the expanse of each varies but special libraries may be known by different names, for example, information centres, information resource collections, etc., the name is usually given by the institution that houses the library. A special library may or may not have a proficient and eligible librarian on staff. Special libraries choose and obtain printed material and other relevant material documents in the specific field in which their parent institution excels and broadcast the information to those desirous of gathering information. They offer anticipated knowledge and info to their patrons based on their demand.

Types of Special Libraries

- Corporate
- Medical
- Correctional Institutional
- Music
- News
- Museum
- Military
- Performing Arts
- Federal
- Transportation
- Theological

(IV) National Library

A national library is a library explicitly instituted by the government of a country to serve as the foremost source of information for the nation. In contrast to public libraries, national libraries hardly have any provision to lend books or other material to their patrons. Generally, these libraries house abundant unusual, valued, or important works. A national library is concerned with the responsibility of accumulating and conserving the literature of the country.

Check Your Progress

3. Define the term 'library'.
4. List the four types of libraries.

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1.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The most important goal of all management activity is to accomplish the objectives of an enterprise. These objectives may be economic, socio-economic, social and human and thereby management at different levels seeks to achieve these in different ways.
2. The seven Ms in business are men, materials, money, machines, methods, markets and management.
3. Library is a store-house of information for anyone seeking knowledge or information.
4. Libraries can be generally classified into four types, such as follows:
   - Public library
   - Academic library
   - Special library
   - National library

1.5 SUMMARY

- The basic nature of management activity remains same in all arenas, whether the organization to be managed is a family, a club, a trade union, a trust, a municipality, a business concern or the government.
- The most important goal of all management activity is to accomplish the objectives of an enterprise. These objectives may be economic, socio-economic, social and human and thereby management at different levels seeks to achieve these in different ways.
- Management is a dynamic function of a collective enterprise, which is constantly engaged in casting and recasting the enterprise in the world of an ever-changing business environment.
- Management is an activity consisting of a distinct process, which is known as the management process.
- Management is an essential component of all social organizations and is to be found everywhere as a distinct, separate and dominant activity.
- A formal organization is a cooperative system in which people gather together and formally agree to combine their efforts for a common purpose.
- The word library, these days has many different characteristics, libraries today range from physical public libraries to the digitally available online libraries.

- A library is a place where people find all kinds of information may it be through a book (in case of a brick and mortar library), an online site, or database entry (in case of a digital library).
- A library can render help to organizations by giving the right to use and providing help with information resources.
- As non-profit organizations, libraries must involve other local organizations dedicated to the cause of doing good.
- In the present times, online library catalogues contain huge records which used to be contained in catalogues that used to look like cards, these were called 'card catalogues'.
- The term 'Public Library' has been elucidated in many different ways by different specialists based on the prominence given by it to its purposes.
- A public library may be divided into various departments inside based on its scope, monetary condition, place, and the number of patrons associated with it.
- According to the UNESCO Manifesto, a public library provides nourishment to the spirit of man by providing him books and other reading material which relaxes him and provides him pleasure.
- An academic library is the library that is generally a part of an educational institution for example a school, a college, a coaching or a research centre or a university.
- A school library is a knowledge workshop, having a selection of educational media, important for optimal maintenance of the training programme.
- A college is a very important key in the process educational development of a student. A college which is not equipped with a well-stocked library can be compared to a tree without roots.
- A university is a seat of academic learning, thus it is very important for a university to have a well-stocked library catering to the needs of all departments of the university.
- A national library is a library explicitly instituted by the government of a country to serve as the foremost source of information for the nation.

1.6 KEY WORDS

- **Management:** According to Peter Drucker, management is a multi-purpose organ that manages business and manages managers and manages workers and work.
- **Formal Organization:** A formal organization is a cooperative system in which people gather together and formally agree to combine their efforts for a common purpose.

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- **World Wide Web:** The World Wide Web, also called the Web, is an information space where documents and other web resources are identified by Uniform Resource Locators, interlinked by hypertext links, and accessible via the Internet.
- **Ad Hoc Committee:** It is a special committee of members having far-sightedness and intelligence to accomplish special tasks related to the growth of library, its administration, and control. Members of this committee arrive at quick and smart decisions collectively.

1.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is the scope of management?
2. State some ways in which an integration of a library system can be achieved.
3. What are the benefits of an integrated library system?
4. Draw a comparison between old and new library systems.
5. Write a short note on the term 'public library'.
6. Mention some functions of a public library.

Long Answer Questions

1. Explain the nature of management.
2. Discuss the importance of organizing.
3. Describe the method of selection of an integrated system by a library.
4. Identify the characteristics of a public library.
5. Discuss the various kinds of library committees.
6. Enumerate some fundamental features of a special library.

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UNIT 2 VARIOUS SCHOOLS OF MANAGEMENT THOUGHT

Structure

2.0 INTRODUCTION

The schools of management thought are theoretical frameworks for the study of management. Each of the schools of management thought are based on somewhat different assumptions about human beings and the organizations for which they work. Since the formal study of management began late in the 19th century, it has progressed through several stages as scholars and practitioners working in different eras focused on what they believed to be important aspects of good management practice. Over time, management thinkers have sought ways to organize and classify the voluminous information about management that has been collected and disseminated. These attempts at classification have resulted in the identification of management schools. In this unit, you will deal with the classical approach and human relations approach to management.

2.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the classical theory of management
- Explain the administrative management theory
- Describe the quantitative approach to management

2.2 CLASSICAL APPROACHES TO MANAGEMENT

The industrial revolution brought about an unprecedented growth in productivity and this gave rise to three types of contemporary management theories, which collectively are known as the 'classical approach' to management. These are:

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scientific management, administrative management theory and bureaucratic theory. The major contributors to these theories are shown as follows:

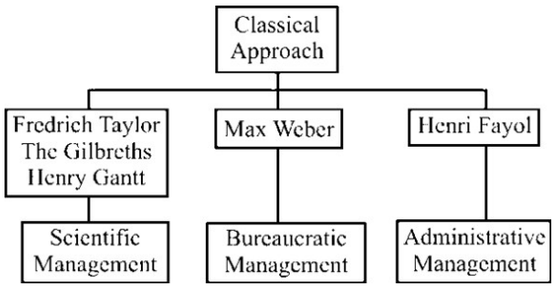

Fig. 2.1: *The major contributors to classical approaches*

The classical approach to management is based upon the ideas similarly generated in the late 1800s and early 1900s and is primarily based upon the economic rationality of all employees. This evolved around the classical assumption of Adam Smith that people are motivated by economic incentives and that they will rationally consider opportunities that provide for them the greatest economic gain. The three branches of classical approach to management which feed on similar underlying principles are explained as follows:

Scientific Management

Scientific management which focuses on production efficiency is primarily attributed to the ideas and works of Fredrick W. Taylor (1856 -1915) who is known as the 'father of scientific management.'

It is to be noted that scientific management has been studied in detail in Unit 4.

Bureaucratic Management

Based on the writings of Max Weber (1864-1920), who was a German sociologist, a bureaucratic form of an organization refers to a management approach which is based on a rigid formal organizational structure with set rules and regulations. Weber looked for rules to eliminate managerial inconsistencies that contribute to ineffectiveness. He further believed that every deviation from the formal structure interferes with efficient management. He believed in strict adherence to rules which would make bureaucracy a very efficient form of organization founded on principles of logic, order and legitimate authority. Weber describes it as follows:

> 'The purely bureaucratic type of administrative organization….. is from a purely technical point of view capable of attaining the highest degree of efficiency…..It is superior to any other form in precision, in stability, in the stringency of its discipline and in its reliability. It thus makes possible a particularly high degree of calculability of results for the heads of the organization and for those acting in relation to it. It is finally superior both in intensive efficiency and in the scope of its operations and is formally capable of application to all kinds of administrative tasks.'

The various requirements for an effective and efficient bureaucracy, according to Weber are: division of labour by functional specialization, a well defined hierarchy of authority, a system of rules covering the duties and rights of employees, certain obedience to a superior's command, appointments and promotions purely on the basis of merit, separation of personal lives from organizational positions, a system of procedures dealing with work situations and implementation of an adequate control system.

Bureaucracy, even through necessary for large organizations, has come to be associated with red tape and excessive rules and regulations and hence delay in getting changes done or proposals approved. In the competitive global market of 1990s, organizations are moving towards participative management, team work and employee innovation and creativity.

Administrative Management

This approach to management, also known as functional or process approach is primarily based on the ideas of Henri Fayol (1841-1925). He observed the organizational functions from managerial' point of view. He believed in universality of management and reasoned that those who acquire general knowledge of managerial functions and principles can manage all types of organizations. He proposed the breaking of the complex management process into separate interdependent areas of responsibility. He divided the administrative activities into six groups, all of which are closely dependent on one another. These six areas of operations are as follows:

1. **Technical:** This area is concerned with manufacturing products.
2. **Commercial:** It involves purchasing of raw materials for the products and selling the finished products.
3. **Financial:** This area involves searching for and acquiring capital and allocating it to various functions in an optimal manner and keeping an overview control of the flow of capital.
4. **Security:** Security operations are designed to take the necessary and adequate steps for the production and safety of goods and people.
5. **Accounting:** This area covers all accounting aspects of the organization including recording and taking stock of costs, profits, liabilities, assets, preparing balance sheets and compiling accounting statistics.
6. **Managerial:** Fayol's primary concern was with the managerial functions of planning, organizing, command, coordination and control.

In addition to these areas of operations, Fayol proposed 14 principles of administration which he believed would be most often applied for more efficient managerial behaviour and more logical organizations. These 14 principles are summarized as follows:

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1. **Division of labour:** This means that a worker is given only a small element of work, in which he becomes a specialist and the more people specialize, the more efficiently they can perform their work. Division of labour improves productivity by simplifying the tasks required of each worker. This can be applied to all kinds of work, technical as well as managerial.
2. **Authority and responsibility:** Authority is the right to command and the power to exact obedience in order to get the work done. Responsibility is the accountability of authority so that the official authority is not misused.
3. **Discipline:** Fayol considered discipline as 'outward marks of respect' observed in accordance with the employment agreements and organizational rules. These rules and agreements should be clearly specified and understood by all. Also, these rules and regulations should be enforced fairly and judiciously.
4. **Unity of command:** Each organizational member should receive orders from only one superior, otherwise conflict and confusion in authority and instructions would result.
5. **Unity of direction:** This principle states that 'there should be one head and one plan' for a group of activities having the same objective. For example, the personnel department should have only one personnel manager with a specified plan for personnel policies, feeding personnel *to* all departments.
6. **Subordination of individual interest to organizational interest:** While the individual interests should be integrated with the organizational interests as much as possible, the interests of the organization must take priority over the interest of an individual or a particular group, whenever there is a conflict between the two.
7. **Remuneration of staff:** All employees should be fairly paid with appropriate additional incentives for additional efforts.
8. **Centralization:** Fayol believed that while some authority should be given to the subordinates to make operational decisions, al1 major policy decisions should be made at the top management level.
9. **Scalar chain:** There should be a clear chain of command from the top to the bottom of the organization and the line of authority should run in the order of rank from the top management downwards. This helps to ensure the orderly flow of information and communication.
10. **Order:** A place for everything and everything in its place. Materials and people should be in the right place at the right time for maximum efficiency. People in particular, should be in the jobs they are most suited for.
11. **Equity:** Managers should be both fair and friendly *to* the subordinates. Equity results when friendliness is coupled with justice. This will help in soliciting loyalty and devotion from subordinates.

12. **Stability of staff:** Employee turnover should be minimized. Tenure and long term commitment should be encouraged. It results in a sense of belonging to the organization.
13. **Initiative:** Employees should be given the freedom to be innovative. They should be encouraged to initiate new ideas and carry out their plans, even when some acceptable - mistakes result.
14. **Esprit de corps:** Employees should work as a team because there is strength in unity and the management should promote this team spirit.

Check Your Progress

1. What are the three branches of classical approach to management?
2. Who is known as the 'father of scientific management?'

2.3 HUMAN RELATIONS APPROACH OR BEHAVIOURAL APPROACH TO MANAGEMENT

The classical approach to management primarily viewed individuals as mechanisms of production. The emphasis was on productivity by moving the workers to produce by giving them incentives. Behavioural approach to management is based on the premise that 'those involved in the organization are the prime determinants of organizational and managerial effectiveness. It is to be noted that the behavioural approach to management has been discussed in detail in Unit 3.

Quantitative approach to management

This approach emphasizes the use of mathematical techniques and models in solving many complex management problems. These quantitative tools and methodologies, known as operations research techniques are designed to aid in decision making relating to operations and production. The basic contention of this approach is the premise that if managerial and organizational operations and decisions are based on a logical process, then these may be expressed in terms of mathematical symbols and relationships. According to Lindsay, these techniques assist the management for improving the quality of their decisions by:

- Increasing the number of alternatives that can be considered.
- Assisting in faster decision making based upon objective analysis of available information.
- Helping management in evaluating the risks and results of different courses of action.
- Helping to bring into optimum balance the many diverse elements of a modern enterprise.

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The quantitative techniques generally involve the following five steps.

1. The system whose behaviour must be explained to solve the problem is observed systematically.
2. A mathematical model is constructed with variables of such observed system reflecting the important factors in the situation to be analyzed.
3. The decision rules are established and some standards are set for the purpose of comparing the relative merits of possible courses of actions.
4. The values of the relevant variables in the system are determined and substituted in the mathematical model.
5. The mathematical calculations are executed so as to find a course of action that will maximize the objective function or the goal utility.

These quantitative techniques are increasingly being used by management. The advent and increased use of sophisticated electronic computers has significantly facilitated the use of this approach. Some of the areas where these techniques are extensively used are as follows:

- **Linear Programming:** The linear programming techniques have been used in calculating as to how best to allocate scarce resources among competing uses. An example would be how to use a fixed advertising budget to different types of media in order to get the best results.
- **Queuing Theory:** This technique has been successfully used in planning for the optimum number of service stations in order to minimize the service cost as well as the customer's waiting time. Examples are the number of tellers in the bank, the number of toll booths at a toll station on a highway or the number of gasoline pumps at a gas station.
- **Inventory Modelling:** Mathematical models have been built for establishing the optimal inventory levels of raw materials and finished goods and how much to order at a time and when to place such an order.
- **Simulation:** This involves building a model which simulates the actual problem under study and many solutions to the problem under different values of decision variables are obtained by using a computer and the best solution is selected.
- **Preventive Control and Replacement Problems:** These problems involve maintenance of equipment and replacement of parts. For example, should we replace all the light bulbs in the factory at the same time in a cyclic manner or should we replace them as their fuses blowout? Similarly, as a preventive control, should we see a doctor every six months for a check-up or, only when we get sick? There are certain costs involved in each of these choices and the quantitative techniques are used to formulate optimal policies.
- **Competitive Problems and Game Theory:** The game theory techniques have been extensively and successfully used in military planning and decision

making by evaluating the possible actions of the 'enemy' and then formulating best responses to these possible actions. In the business world, the problems of competition must be anticipated and responsive moves planned.

The quantitative approach to management has provided the manager with some important tools in solving problems, especially where the managerial process can be rationalized and quantified. However, the involvement of the human factor which is not quantitative must be fully appreciated and emphasized in all managerial processes and decisions.

Check Your Progress

3. What is the behavioural approach to management?
4. What is the basic contention of the quantitative approach?

2.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The three branches of classical approach to management are scientific management, bureaucratic management and administrative management.
2. Fredrick W. Taylor is known as the 'father of scientific management.'
3. Behavioural approach to management is based on the premise that 'those involved in the organization are the prime determinants of organizational and managerial effectiveness.
4. The basic contention of quantitative approach is the premise that if managerial and organizational operations and decisions are based on a logical process, then these may be expressed in terms of mathematical symbols and relationships.

2.5 SUMMARY

- The industrial revolution brought about an unprecedented growth in productivity and this gave rise to three types of contemporary management theories, which collectively are known as 'classical approach' to management.
- The classical approach to management is based upon the ideas similarly generated in the late 1800's and early 1900's and is primarily based upon the economic rationality of all employees.
- Based on the writings of Max Weber (1864-1920), who was a German sociologist, a bureaucratic form of an organization refers to a management approach which is based on a rigid formal organizational structure with set rules and regulations.

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- The classical approach to management primarily viewed individuals as mechanisms of production. The emphasis was on productivity by moving the workers to produce by giving them incentives.
- Behavioural approach to management is based on the premise that 'those involved in the organization are the prime determinants of organizational and managerial effectiveness.
- The linear programming techniques have been used in calculating as to how best to allocate scarce resources among competing uses.
- The game theory techniques have been extensively and successfully used in military planning and decision making by evaluating the possible actions of the 'enemy' and then formulating best responses to these possible actions.
- The quantitative approach to management has provided the manager with some important tools in solving problems, especially where the managerial process can be rationalized and quantified.

2.6 KEY WORDS

- **Bureaucratic Management Theory:** Bureaucratic management theory developed by Max Weber, contained two essential elements, including structuring an organization into a hierarchy and having clearly defined rules to help govern an organization and its members.
- **Administrative Management Theory:** Administrative management theory attempts to find a rational way to design an organization as a whole. The theory generally calls for a formalized administrative structure, a clear division of labour, and delegation of power and authority to administrators relevant to their areas of responsibilities.
- **Linear Programming:** The linear programming techniques have been used in calculating as to how best to allocate scarce resources among competing uses.

2.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. According to Weber, what are the various requirements for an effective and efficient bureaucracy?
2. Write a short note on scientific management.
3. Mention the five steps in the quantitative techniques.
4. Critically analyse the queuing theory.

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Long Answer Questions

1. Discuss the classical theory of management.
2. Explain the administrative management theory.
3. Describe the 14 principles of administration proposed by Fayol.
4. Explain the quantitative approach to management.

2.8 FURTHER READINGS

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UNIT 3 BEHAVIOURAL SCHOOLS OF THOUGHT

Structure

3.0 INTRODUCTION

The behavioural management theory is often called the human relations movement because it addresses the human dimension of work. Behavioural theorists believed that a better understanding of human behaviour at work, such as motivation, conflict, expectations, and group dynamics, improved productivity. In this unit, you will you will deal with the major contribution of scholars like Taylor, Fayol, Gantts, McGregor and Maslow in management.

3.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the major contribution of scholars like Taylor, Fayol, Gantts, McGregor and Maslow to management
- Explain the various behavioural management theories
- Critically analyse the Hawthorne experiments
- Describe the fundamental principles that Taylor saw underlying the scientific approach to management

3.2 MANAGEMENT THEORIES: CONTRIBUTION OF TAYLOR, FAYOL AND GANTTS

In this section, you will deal with the major contribution of scholars like Taylor, Fayol and Gantts.

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Contribution of F.W. Taylor—Scientific Management

Frederic Winslow Taylor started his career as a machinist in 1875. He studied engineering in an evening college and rose to the position of chief engineer in his organization. He invented high-speed steel cutting tools and spent most of his life as a consulting engineer.

Taylor is called the father of scientific management. His experience from the bottom-most level in the organization gave him an opportunity to know at first the problems of the workers. Taylor's principal concern was that of increasing efficiency in production, not only to lower costs and raise profits, but also to make possible increased pay for workers through their higher productivity.

Taylor saw productivity as the answer to both higher wages and higher profits. He believed that the application of the scientific method, instead of customs and rule of thumb could yield this productivity without the expenditure of more human energy or effort.

F.W. Taylor's Principles

Taylor published a book entitled, *The Principles of Scientific Management*, in 1911. But, his ideas about scientific management are best expressed in his testimony that was placed before a committee of the House of Representatives in 1912. He said:

> 'Scientific management is not any efficiency device, not a device of any kind for securing efficiency; nor is it a bunch or group of efficiency devices. It is not a new system of figuring costs; it is not a new scheme of paying men; it is not a piece work system; it is not a bonus system; it is not a premium system; it is no scheme for paying men; it is not holding a stop watch on a man and writing things down about him; it is not time study; it is not motion study, not an analysis of the movements of men; it is not the printing and loading and unloading of a ton or two of blanks on a set of men and saying "Here's your system; go and use it". It is not divided foremanship or functional foremanship; it is not any of the devices which the average man calls to mind when scientific management is spoken of ...'

Now, in its essence, scientific management involves a complete mental revolution of the part of the working man engaged in any particular establishment or industry. This complete mental revolution focuses on the duties of the organization toward its work, toward its fellowmen and towards its employees, and it involves an equally complete mental revolution on the part of those on the management's side, which involve the foreman, superintendent, owner of the business, board of directors, and so on. The great mental revolution that takes place in the mental attitude of the two parties under scientific management is that both sides take their eyes off the division of the surplus as an important matter and together turn their attention toward increasing the size of the surplus, which becomes so large that it is unnecessary to quarrel over how it should be divided. They come to see that when they stop pulling against one another and instead both turn and push shoulder to shoulder in the same direction, the size of the surplus created by their joint

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efforts is truly appreciable. When friendly co-operation and mutual helpfulness replace antagonism and strife, it becomes possible for both the parties to make the surplus so enormous that there is ample room for a large increase in wages for the workmen and an equally great increase in profits for the manufacturer.

The fundamental principles that Taylor saw underlying the scientific approach to management may be summarized as follows:

- Replacing rule of thumb with science
- Obtaining harmony in group action, rather than discord
- Achieving co-operation of human beings, rather than chaotic individualism
- Working for maximum output, rather than restricted output
- Developing all workers to the fullest extent possible for their own as well as company's highest prosperity

Taylor concentrated more on productivity and productivity based wages. He stressed on time and motion study and other techniques for measuring work. Apart from this, in Taylor's work, there also runs a strongly humanistic theme. He had an idealist's notion that the interests of workers, managers and owners should be harmonized.

Contribution of Henri Fayol—Principles of Management

Henri Fayol is claimed to be the real father of modern management. He was a Frenchman born in 1841 and was working as an engineer with a mining company. He improved the condition of the company from virtual bankruptcy to high success. From his practical experience, he developed some techniques. He brought out some basic principles, which he felt, could be used in all management situations, irrespective of the organizational framework.

He wrote a book entitled, *General and Industrial Management*, in French that was later on translated into English. It is now considered as one of the classics of management literature. The book mainly covers the aspects of the immutable and repetitive character of the management process and the concept that management can be taught in the classroom or the workplace. He also laid down the principles of management, which he deemed important for any organization. The principles are as follows:

- **Division of work:** This is the principle of specialization, which is very well expressed by economists as being a necessary factor for efficiency in the utilization of labour.
- **Authority and responsibility:** In this principle, Fayol conceives authority as a combination of official authority deriving from a manager's official position and personal authority, which is compounded of intelligence, experience, moral worth, past services, etc.
- **Discipline:** Holding the notion that discipline is 'respect for agreements which are directed as achieving obedience, application, energy and the

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outward marks of respect', Fayol declares that discipline requires good superiors at all levels, clear and fair agreements and judicious application of penalties.

- **Unit of command:** This is the principle, which states that an employee should receive orders from one superior only.
- **Unity of direction:** According to Fayol, the unity of direction principle implies that each group of activities having the same objectives must have one head and one plan. As distinguished from the principle of unity of command, Fayol perceives unity of direction as related to the functioning of personnel.
- **Subordination of individual interest to general interest:** In any group, the interest of the group should supersede that of the individual. When the interests differ, it is the function of the management to reconcile them.
- **Remuneration of personnel:** Fayol perceives that remuneration and methods of payment should be fair and also should be able to afford the maximum satisfaction to employee and employer.
- **Centralization:** Although Fayol does not use the term, Centralization of Authority, his principle definitely refers to the extent to which authority is concentrated or dispersed in an enterprise. Individual circumstances determine the degree of centralization that gives the best overall yields.
- **Scalar Chain:** Fayol thinks of the scalar chain as a line of authority, a chain of superiors from the highest to the lowest ranks. And, because it is an error of a subordinate to depart needlessly from the lines of authority, the chain should be short-circuited.
- **Order:** Breaking this principle into material order and social order, Fayol thinks of it as a simple edge for everything. This organization is the principle, which refers to arrangement of things and persons in an organization.
- **Equity:** Fayol perceives this principle as one of eliciting loyalty and devotion from personnel with a combination of kindliness and justice in managers while dealing with subordinates.
- **Stability of tenure of personnel:** Finding that instability is both the cause and effect of bad management, Fayol points out the dangers and costs of unnecessary turnover.
- **Initiative:** Initiative is conceived as the process of thinking out and executing a plan. Since it is one of the keenest satisfactions for an intelligent man to experience, Fayol exhorts managers to sacrifice personal vanity in order to permit subordinates to exercise it.
- **Esprit de corps:** This principle implies that union is strength and an extension of the principle of unity of command. Fayol here emphasizes on the need for teamwork and the importance of communication in obtaining it.

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Henry L. Gantt (1861-1919)

Henry Gantt worked with Taylor and was responsible for introducing 'Task and Bonus Plan' and the Gantt chart. The 'Task and Bonus Plan' was aimed at providing extra wages for extra work in addition to a guaranteed minimum wage. Bonuses were also awarded to supervisors who were successful in getting their workers to meet the output goal. The Gantt chart, which was a forerunner of today's PERT (Program Evaluation and Review Technique) was a chart on which the process of work could be recorded.

Managerial operations were Fayol's primary concern and he defined these operations in terms of five functions. These functions are as follows:

1. Planning
2. Organizing
3. Comm and
4. Coordination
5. Control

Check Your Progress

1. What was Taylor's principal concern?
2. Who is known as the real father of modern management?

3.3 BEHAVIOURAL SCHOOLS OF THOUGHT: MCGREGOR AND MASLOW

It moves away from supervisory procedures and industrial engineering techniques such as time and motion study and focusses on increase in production and managerial efficiency through an understanding of the people. Central to this approach is an increased understanding of the individual worker with emphasis on motivation, needs, interpersonal relationships and group dynamics.

Some of the major contributors to the behavioural aspects of management are as follows:

- Mary Parker Follett-Group influences
- Elton Mayo-Hawthorne experiments and the impact of human motivation on productivity
- Abraham Maslow-Hierarchy of human needs
- Douglas McGregor-Theory X and theory Y
- Chris Argyris-Human and organizational development

Mary Parker Follett (1868-1933): One of the early proponents of behavioural approach to management, Mary Parker Follett was a social worker who became

interested in employment and worker issues. She laid the groundwork for studies in group interaction and group dynamics and believed that instead of preparing and training managers to give orders, they should be trained to work with employees so that together they can attain the organizational goals. She suggested that 'power', which is the ability to influence change, should be jointly developed in a cooperative manner, involving employees and managers working together. Her concept of 'integration', which is the 'harmonious blending of the differences of group members to produce a solution acceptable to all', heralded modern methods of conflict resolution.

Elton Mayo (1880 - 1949): Elton Mayo, along with F.J. Roethlisberger (1896-1974), conducted the famous Hawthorne experiments (1924-1932) at the Hawthorne plant of Western Electric Company. These experiments proved to be a milestone in the development of the Behavioural School of Management. These studies were primarily conducted to determine the effect of better physical facilities and material incentives on worker output. These studies showed that better physical environment or increased economic benefits alone were not sufficient motivators in increasing productivity. In effect, the emphasis shifted to psychological arid social forces, in addition to economic forces. Mayo discovered that when workers are given special attention by management, the productivity is likely to increase irrespective of actual changes in the working conditions:

The Hawthorne experiments suggested that an office or a factory is not only a work place but also a social environment in which the employees interact with each other. This gave rise to the concept of the 'social man', whose interactions with others would determine the quality and quantity of the work produced. As one writer has pointed out, 'No other theory or set of experiments has stimulated more research and controversy nor contributed more to a change in management thinking than the Hawthorne studies and the human relations movement they spawned.'

Even though Hawthorne studies have been criticized because of some major flaws in conducting the study (such as changing several factors at the same time) and some important factors, such as the impact of financial incentives were sometimes ignored in drawing conclusions, they were primarily responsible for consideration of non-financial incentives in improving productivity. Accordingly, it must be understood that in spite of the fact that the social environment is an important factor in improving the quality and the output, it does not replace economic benefits, especially for low level salaried workers.

Abraham Maslow (1908-1970): In support of Mayo's contention and findings, Abraham Maslow presented a theory of individual needs. The basic aim of this theory is to increase the organizational effectiveness of its human resources which could be achieved by properly taking care of human needs of people in the organization. These human needs could be physiological or psychological. According to Maslow, these needs fall into a hierarchy. At the bottom of the hierarchy are the lower level needs which are biological in nature and are necessary

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for survival. At the upper level are the psychological needs, which are the needs for growth and self-fulfilment. In general, the lower level needs must be satisfied before the higher level needs arise. The human needs, according to hierarchy are: physiological (lowest), safety, social, esteem and self actualization (highest).

Maslow's work dramatized to managers that workers have needs beyond the basic requirement of earning a living. Being aware of these needs enables a manager to use different methods to motivate workers. This is important and significant because of the complexity of human nature. Different people will react differently to the same situation or their reaction may be similar to different situations. Hence, management must be aware of these differences and act accordingly.

Douglas McGregor (1906-1964): A professor of industrial management, for most part of his career, at Massachusetts Institute of Technology (MIT), Douglas McGregor contributed to management thought by suggesting two alternative views of management towards employees. He developed the concept of theory X and theory Y, a dichotomy dealing with the possible assumptions that managers make about workers. These assumptions are summarized as follow:

Theory X Assumptions

1. Most people dislike work and avoid it whenever possible.
2. They need to be directed, controlled and threatened with punishment in order to move them to work and achieve organizational goals.
3. An average person is lazy, shuns responsibility, prefers to be directed, has little ambition and is only concerned with his security.
4. Most people avoid leading and want to be led.

Theory Y Assumptions

1. Work is natural to most people and they enjoy the physical and mental effort involved in working, similar to rest or play.
2. Commitment to objectives is also a natural state for most individuals. They will exercise self direction and self control in pursuit and achievement of organizational objectives.
3. The average person learns, under proper conditions, not only to accept but to seek responsibility.
4. Commitment to goals and objectives is a function of the rewards available, especially the rewards of recognition and appreciation.
5. Most people have the capacity for innovation and creativity for solving organizational problems.
6. Many individuals seek leadership rather than the security of being led.

McGregor believed that managers who hold theory X assumptions are likely to treat workers accordingly. As a result, managers often find that employees

respond in ways that reinforce these assumptions. On the other hand, managers who hold theory Y assumptions treat their workers as committed and responsible persons and give them more latitude in performing their tasks. These managers encourage innovation and creativity, minimize the use of supervision and controls and redesign the work to make it more interesting and satisfying with regard to higher level needs of workers. They integrate individual goals with organizational goals so that with commitment and dedication, both goals are achieved at the same time.

It must be understood, however, that in some situations where workers do require greater controls, Theory X assumptions are more effective in achieving organizational goals.

Chris Argyris: A Yale University professor, Chris Argyris believed that people normally progress from a state of immaturity and dependence to a state of maturity and independence along a continuum. According to him, mature people are active, not passive; independent, not dependent and self-aware and self-controlled. He also believed that most organizational structures inhibit maturity and healthy personality.

- Division of labour limits initiative and self-expression.
- Chain of command inhibits self control and self-direction and makes individuals passive and dependent on the leader
- Unity of direction puts the leader in a position of control which creates problems when employees are unable to express their abilities and innovative skills.

Argyris believes that organizations can evolve out of the formal structure with managers changing to Theory Y assumptions. In this changed model, organizations are governed by a very different set of values. They:

- Give workers access to information so that they can make informed judgments.
- Allow workers to be innovative in setting up their own work environments within the general organizational guidelines.
- Give employees the freedom but do set up a system for monitoring the results of workers decisions.

Argyris concluded that it is in the interest of the organization to give workers more responsibility and control over their work environment.

Check Your Progress

3. Who conducted the famous Hawthorne experiments (1924-1932) and where?
4. What is the Hawthorne effect?

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3.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Taylor's principal concern was that of increasing efficiency in production, not only to lower costs and raise profits, but also to make possible increased pay for workers through their higher productivity.
2. Henri Fayol is claimed to be the real father of modern management.
3. Elton Mayo, along with F.J. Roethlisberger (1896-1974), conducted the famous Hawthorne experiments (1924-1932) at the Hawthorne plant of Western Electric Company.
4. The Hawthorne effect is a type of reactivity in which individuals modify an aspect of their behaviour in response to their awareness of being observed.

3.5 SUMMARY

- Frederic Winslow Taylor started his career as a machinist in 1875. He studied engineering in an evening college and rose to the position of chief engineer in his organization.
- Taylor's principal concern was that of increasing efficiency in production, not only to lower costs and raise profits, but also to make possible increased pay for workers through their higher productivity.
- Scientific management is not any efficiency device, not a device of any kind for securing efficiency; nor is it a bunch or group of efficiency devices.
- Taylor concentrated more on productivity and productivity based wages. He stressed on time and motion study and other techniques for measuring work.
- Henri Fayol is claimed to be the real father of modern management. He was a Frenchman born in 1841 and was working as an engineer with a mining company.
- Henry Gantt worked with Taylor and was responsible for introducing 'Task and Bonus Plan' and the Gantt chart.
- The 'Task and Bonus Plan' was aimed at providing extra wages for extra work in addition to a guaranteed minimum wage.
- One of the early proponents of behavioural approach to management, Mary Parker Follett was a social worker who became interested in employment and worker issues.
- Elton Mayo, along with F.J. Roethlisberger (1896-1974), conducted the famous Hawthorne experiments (1924-1932) at the Hawthorne plant of Western Electric Company.

- In support of Mayo's contention and findings, Abraham Maslow presented a theory of individual needs. The basic aim of this theory is to increase the organizational effectiveness of its human resources which could be achieved by properly taking care of human needs of people in the organization.
- A professor of industrial management, for most part of his career, at Massachusetts Institute of Technology (MIT), Douglas McGregor contributed to management thought by suggesting two alternative views of management towards employees. He developed the concept of theory X and theory Y, a dichotomy dealing with the possible assumptions that managers make about workers.

3.6 KEY WORDS

- **Scientific Management:** Scientific management is a theory of management that analyzes and synthesizes workflows. Its main objective is improving economic efficiency, especially labour productivity.
- **Discipline:** Discipline is action or inaction that is regulated to be in accordance with a particular system of governance.
- **Centralization:** Centralization is the process by which the activities of an organization, particularly those regarding planning and decision-making become concentrated within a particular geographical location group.
- **Bonus:** A bonus is any financial compensation, reward, or return over and above the normal expectations of the recipient.

3.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the fundamental principles that Taylor saw underlying the scientific approach to management?
2. Write a short note on the 'Task and Bonus Plan' introduced by Henry Gantt.
3. What is the basic aim of Abraham Maslow's theory of individual needs?
4. What do you understand by the concept of theory X and theory Y developed by Douglas McGregor?

Long Answer Questions

1. Write a detailed note on the contribution of Henri Fayol in management.
2. Discuss the principles of management laid down by Henri Fayol.
3. Managerial operations were Fayol's primary concern and he defined these operations in terms of five functions. Describe these five functions.

4. Critically analyse the Hawthorne experiments.
5. Explain the various behavioural management theories.

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3.8 FURTHER READINGS

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BLOCK - II
MANAGEMENT PRINCIPLES

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UNIT 4 SCIENTIFIC MANAGEMENT

Structure

4.0 INTRODUCTION

The scientific management school is primarily attributed to the ideas and works of Fredrick W. Taylor, who is known as 'the father of scientific management.' Some of the other notable contributors to this school are Frank and Lilian Gilbreth, Henry L. Gantt, and Harrington Emerson. Scientific management has been briefly touched upon in Unit 2. However, this concept will be discussed in detail in this unit.

4.1 OBJECTIVES

After going through this unit, you will be able to:

- Define the concept of scientific management
- Discuss the principles of scientific management
- Explain the scope of scientific management

4.2 CONCEPT AND PRINCIPLES OF SCIENTIFIC MANAGEMENT: DEFINITION AND SCOPE

Fredrick Taylor is well known for his famous work, *The Principles of Scientific Management*, published in 1911, which became the foundation of scientific management movement.

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Taylor criticized the methods of traditional management which were composed of the following elements:

(a) Subjective or intuitive evaluation. Decisions were based on feelings, opinions and traditional past experience, rather than scientific investigation.

(b) Jobs were performed by rule of thumb, rather than standard times, methods or motions.

(c) The prevalent practices were assumed to be correct and no efforts were made to introduce new and novel techniques of management.

(d) Training at least, was under an apprentice system and no formal techniques of skill and professional development existed.

(e) Management was considered as a group of overall supervisors rather than a group performing unique duties.

Taylor was interested in replacing the traditional management by scientific management by developing the most scientific and rational principles for handling people, machines, materials, and money and to secure maximum benefits for the employers as well as employees. He offered four principles as basis for scientific management. These are as follows:

1. Every job should be broken into its elements and a scientific method to perform each element should be established.
2. Workers should be scientifically selected with right attitudes for the job and ability and then properly trained to perform the work.
3. Management should cooperate with workers to ensure that all work is done in accordance with the scientific principles.
4. Scientific distribution of work and responsibility between workers and the managers. The management should design the work, set up and supervise the work and the workers are free to perform the work.

The contributions of the Gilbreths, Frank Gilbreth (1868-1924) and Lilian Gilbreth (I878-1972) as husband and wife team contributed extensively towards the concept of scientific management and were primarily responsible for analysis of time and motion study of workers, thus improving upon time and motion elements by eliminating unnecessary motions. They were also responsible for such management tools as the process chart, flow diagrams and merit rating system for employees.

In the area of motion studies, the Gilbreths identified 18 basic hand motions by breaking down the task into, its fundamental elements. They called these elemental motions as 'Therbligs' (which is their name spelt backwards). The elements are as follows:

1. Search,
2. Find
3. Select,

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4. Grasp,
5. Transport loaded
6. Position,
7. Assemble,
8. Use,
9. Disassemble,
10. Inspect,
11. Preposition,
12. Release load,
13. Transport empty,
14. Rest,
15. Unavoidable delay,
16. Avoidable delay,
17. Plan,
18. Hold.

These elements are not necessarily sequential, but they are all essential elements of an activity. This study laid foundations for areas of job simplification, work standards and incentive wage plans. In one applicational study of the work of some brick-layers, this technique, by eliminating the unnecessary motions, tripled their productivity.

Henry L. Gantt (1861-1919): Henry Gantt worked with Taylor and was responsible for introducing 'Task and Bonus Plan' and the Gantt chart. The 'Task and Bonus Plan' was aimed at providing extra wages for extra work in addition to a guaranteed minimum wage. Bonuses were also awarded to supervisors who were successful in getting their workers to meet the output goal. The Gantt chart, which was a forerunner of today's PERT (Program Evaluation and Review Technique) was a chart on which the process of work could be recorded.

Harrington Emerson: Harrington Emerson is known as the high priest of efficiency. He came to fame when he was called as an expert by the Interstate Commerce Commission in 1911 in a hearing for increase in the railroad freight rate. His startling statement that 'railroads could save a million dollars a day' simply by, streamlining their operations and the introduction of more scientific methods, popularized the field of efficiency improvement. His book, *Twelve Principles of Efficiency* published in 1912, contained principles and techniques for optimum productivity achieved in the; most efficient manner.

Emerson also advocated the line and staff type of organization which characterizes most of our business and industrial organizations today.

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Specific Application of Scientific Management Approach

This approach generally leads to the following specific applications:

1. Maximum utility of efforts, thus eliminating waste.
2. More emphasis on fitting workers to particular tasks and training them further to best utilize their abilities.
3. Greater specialization of activities, with proper design of jobs, specification of methods and set time and motion standards,
4. Establishment of standards of performances as average output and maximum output per capita.
5. The role of compensation and other incentives for increase in productivity.

Opposition to Scientific Management

Some of the critics of this approach propose that it ignores the social needs of the worker. The assumption that most people are motivated primarily by economic rewards seems to be too mechanical and physiological and it neglects the organizational and motivational considerations such as job satisfaction and self actualization.

There has been opposition to scientific management approach since its inception both from employees as well as management. Dr Mathur has listed some of the areas of this opposition. These are as follows:

1. It promotes individualism, rather than team spirit because of the competitive nature of 'more work, more pay.'
2. Specialization makes the worker unfit for other types of jobs, and thus he is at the mercy of his employer.
3. It ignores or excludes the average worker, because of tough competition to be more efficient and productive.
4. Specialization makes the work repetitive and monotonous. Workers are merely converted into machines to carry out the set instructions, thus leaving no grounds for initiative and innovation.
5. It puts in the hands of employers an immense mass of information and methods which may be used to the detriment of workers, since all workers are not going to measure up to the set standard.
6. It is anti-democratic in the sense that it separates the manager from the worker, since it gives the management only the right and the prerogative to manage, and the workers have the duty to work. In a truly democratic situation, the workers and the management should work together to achieve the Integrated individual and organizational goals.

Some Other Schools of Management

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Whether we consider management an art or a science, there is no single approach that is applicable to all situations, even if the situations are similar in nature. Accordingly, there are a number of different approaches, some of them uniquely defined, creating a jungle of confusion in which not only the management practitioners get involved but also professionals of many other disciplines. The growing importance of management in all areas of life has a far-reaching effect on our society. Hence, it has attracted serious attention of sociologists, psychologists, economists, econometricians, mathematicians, biologists, anthropologists, physicists, political scientists and a host of scholars from various other fields. All these scholars have defined and interpreted management from their own angle and in their own conceptual thinking. Prof. Harold Koontz has described the present state of management as a 'jungle'. These different schools presented here, are based upon the writings of Prof. Koontz.

1. *The Empirical School.* The empirical school as the name suggests, is based upon learning from past experience, either your own or that of other people in the form of case studies. A study is conducted as to how a problem was solved in the past so that some methods can be used in the present to solve a similar problem. The proponents of this school hold that management is an art and can only be learned by experience. Accordingly, case examples of successes and failures of practicing managers are collected, analyzed and some generalizations are drawn from it, which give insights into management challenges, opportunities, problems and errors. Earnest Dale calls it 'the operational approach.' According to him, 'Past operations are studied to determine facts, then theories are developed to explain the facts and lastly, the facts and theories are used to make predictions about future operations.'

   This approach suffers from two pitfalls. First, the dynamics and volatility of environment make the situations in the future exactly comparable to the past extremely unlikely, hence the applications of techniques used in the past will not be adequate in the future. Secondly, when the manager chooses a particular technique for an action, he cannot compare the results of his action with the results of any other alternative he might have chosen. This closes the door on innovation and experimentation.

2. *The Social System School.* Based on the human relations concept and proposed by Chester Barnard, this school looks upon manage-ment as a social system or a system of cultural inter-relationships which is conceived as the cooperative interaction of ideas, forces, desires and thinking of a group of people. This concept has been attributable to the theory of cooperation whereby an individual tries to satisfy his biological, physical, and social needs through coopera-tion with others. Barnard calls this set of inter-relationships as a 'formal organization' which, unlike the authority

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activated concept of management, is any cooperative system which is a system of con-sciously coordinated activities towards a common goal. This group interaction really means that we work together and we share the rewards together or in other words, it is like 'scratching each other's back.'

This approach is similar to behavioural approach, except that it is more formal in nature. As in behavioural school, it criticizes the con-cept of 'economic man', but instead dwells on the organization as a social organism, subject to all the pressures and conflicts of the cultural environment. It is a study and analysis of the concept of the individual social behaviour and the group behaviour as it affects the field of management.

3. *The Sociotechnical Systems Approach.* This approach, one of the more recent ones, is based on the studies conducted by E.L. Trist and his associates in 1951 at the Tavistock Institute in England. It was found that there was a definite inter-relationship between men and machines. The technology of operations (machines and methods) has a strong influence on the individual attitudes as well as group behaviour. It does not require exhaustive study and analysis to con-clude that the newer working equipment and modern methods of operation induce a highly positive response from the workers. Accordingly, the management must consider the social and technical systems together and make sure that they both operate in harmony.
4. *Managerial Roles Approach.* This approach was popularized by Henry Mintzberg, who proposed that managerial activity (or roles), could be established simply by observing what the managers do. His study concluded that managers are not always involved in the traditional managerial functions of planning, organizing, coordinating, and controlling. Additionally, the study found only inadequate evidence of such executive activities as organizational structures, goal setting, strategy formulation and implementation, executive development, etc. Instead, he found that managers have three dominant roles:
   (i) *Interpersonal:* As a figure head performing ceremonial duties on behalf of the organization, as a leader and as a liaison link with outsiders.
   (ii) Informational: He receives information about the operations of the organization, passes on the information to subordinates and transmits information to outside concerned parties.
   (iii) Decision making: He acts as an entrepreneur for new ideas, as a resource allocator, like allocating funds for different activities, as an arbitrator in case of a conflict among the workers or between workers and management and he negotiates contracts.

   Even though these studies cannot be considered comprehensive, they do provide a checklist of what managerial roles are so that the activities of other managers can be compared with this checklist.

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5. *The Operational Approach.* This approach, based upon the works of P.W. Bridgman, indicates that the foundations for manage-ment science and theory are drawn from a number of other schools and areas. While the central core of knowledge about managing, such as line and staff organization, departmentation, span of control, managerial appraisal, etc., is unique to management, it also draws pertinent knowledge from other fields such as sociology, psychology, political science applied mathematics, economics, decision theory, industrial engineering cultural anthropology, and individual and group behaviour theories. The operational approach only draws that portion of knowledge from these areas that are pertinent and useful to management.
6. *The Comparative Management Approach.* This approach seeks to develop generalization from a study of management systems in diverse cultures, taking into consideration the external and environmental differences. It is a study to classify the different management characteristics in different countries and cultures and to explain why they exist. This would enable us to identify why particular situations and actions occur and to anticipate the outcome of different decisions.

   The proponents of this school believe that management is culture bound and is regionalized and hence it may not be possible to find a common set of 'management principles' that are universally applicable. Benjamin Prasad defines this approach as 'a study and analysis of management as a process and as a philosophy in all managerial situations and in all countries where further industrialization is pursued as an integral part of economic development.' This will provide an insight into operations of large scale multi-national corporations and form a foundation for some management techniques in different countries but with similar cultural background, as in many countries of the Middle East.

Towards a Unified General Theory of Management

So many different theories and schools and approaches to manage-ment make one wonder whether they have solved the problem of defining management in one universal language. Koontz calls it a jungle warfare-a kind of confused and 'destructive jungle warfare', in which every academician and practitioner is trying to bring out a 'better theory' of management, while attacking the one that existed.

If the management must have a universal application, then this confusion must be removed and this jungle must be disentangled. Perhaps, it is time to realize that all these different theories may not be different at-all and may have ideas and processes that are more common than different. Herbert Simon, while chiding his fellow scholars for creating confusion, suggested, 'It is important that we think of ourselves and all the management theorists as participants in the same enterprise and not as representatives of competing or contradictory approaches.'

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Recently, attempts have been made to bring some unification in these various theories. The first approximation of a general theory was presented by Litchfield as early as 1956, the idea got a national attention during a symposium held on this subject by Harold Koontz, even though no consensus came out of these discussions. However, an evolvement of the symposium was that a general theory of administration may be achieved through interdisciplinary approach. This approach was supported by John F. Mee.

According to Ericson, the interdisciplinary general theory will be inter-contextual in nature, in which all the different disciplines are analytically compared and eventually 'integrated and synthesized.

According to Greenwoods, it may be the development of a completely new and all-embracing 'general management systems' theory, evolving from 'general systems' theory or the traditional management process theory any continue to be refined by voluntary integration of theories of other disciplines.

Check Your Progress

1. Who is known as the high priest of efficiency?
2. What is the empirical school?
3. Define the comparative management approach.

4.3 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Harrington Emerson is known as the high priest of efficiency.
2. The empirical school as the name suggests, is based upon learning from past experience, either your own or that of other people in the form of case studies.
3. Benjamin Prasad defines the comparative management approach as 'a study and analysis of management as a process and as a philosophy in all managerial situations and in all countries where further industrialization is pursued as an integral part of economic development.'

4.4 SUMMARY

- Fredrick Taylor is well known for his famous work, *The Principles of Scientific Management*, published in 1911, which became the foundation of scientific management movement.
- Taylor was interested in replacing the traditional management by scientific management by developing the most scientific and rational principles for

handling people, machines, materials, and money and to secure maximum benefits for the employers as well as employees.

- The contributions of the Gilbreths, Frank Gilbreth (1868-1924) and Lilian Gilbreth (I878-1972) as husband and wife team contributed extensively towards the concept of scientific management and were primarily responsible for analysis of time and motion study of workers, thus improving upon time and motion elements by eliminating unnecessary motions.
- In the area of motion studies, the Gilbreths identified 18 basic hand motions by breaking down the task into, its fundamental elements. They called these elemental motions as 'Therbligs' (which is their name spelt backwards).
- Henry Gantt worked with Taylor and was responsible for introducing 'Task and Bonus Plan' and the Gantt chart. The 'Task and Bonus Plan' was aimed at providing extra wages for extra work in addition to a guaranteed minimum wage.
- Harrington Emerson is known as the high priest of efficiency. He came to fame when he was called as an expert by the Interstate Commerce Commission in 1911 in a hearing for increase in the railroad freight rate.
- Some of the critics of this approach propose that it ignores the social needs of the worker. The assumption that most people are motivated primarily by economic rewards seems to be too mechanical and physiological and it neglects the organizational and motivational considerations such as job satisfaction and self actualization.
- The empirical school as the name suggests, is based upon learning from past experience, either your own or that of other people in the form of case studies.
- According to Ericson, the interdisciplinary general theory will be inter-contextual in nature, in which all the different disciplines are analytically compared and eventually 'integrated and synthesized.

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4.5 KEY WORDS

- **Therbligs:** Therbligs are 18 kinds of elemental motions used in the study of motion economy in the workplace.
- **Program Evaluation and Review Technique (PERT):** The program evaluation and review technique is a statistical tool used in project management, which was designed to analyze and represent the tasks involved in completing a given project.
- **Line Organization:** Line organization is the basic framework for the whole organisation. It represents a direct vertical relationship through which authority flows.

4.6 SELF ASSESSMENT QUESTIONS AND EXERCISES

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Short Answer Questions

1. Write a short note on the contributions of the Gilbreths towards the concept of scientific management.
2. What are the disadvantages of the operational approach?
3. Write a short note on the social system school.
4. Differentiate between the sociotechnical systems approach and managerial roles approach.
5. What is the comparative management approach?

Long Answer Questions

1. Discuss Taylor's four principles as basis for scientific management.
2. Explain the specific application of scientific management approach.
3. Critically analyse the scientific management approach.
4. Describe some other schools of management presented by Prof. Koontz.

4.7 FURTHER READINGS

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UNIT 5 APPLICATION OF SCIENTIFIC MANAGEMENT PRINCIPLES TO LIBRARY AND INFORMATION CENTRES

Structure

5.0 INTRODUCTION

The smooth and effective functioning of an organization requires skilled and efficient management. Libraries and information centres are also organizations that need to be managed and run in a manner similar to running any other organization performing in a regular manner. From the end of the 18th century to the beginning of the 19th century, the significance of management as a reason defining the success of an organization has all been reinforced. Numerous theorists conducted innumerable tests to find out the most effective method of managing an organization. Max Weber, Abraham Maslow, Elton Mayo, Douglas McGregor and Frederick Taylor are a few names which rose to prominence. One name however has left an indelible mark on the formulation of these principles, i.e., Henri Fayol, who till the present times is regarded as the biggest envoy of management learning. The findings of the experiments conducted by these scholars led to the hypotheses of numerous management principles, which are also known as theories or philosophies. However, many management principles have been suggested and formulated by management scholars, but the fourteen management principles promulgated by Henri Fayol, remain most widely acclaimed and accepted.

This acceptance and extensive implementation of the management principles founded by Henri Fayol led to him being known as the father of modern management. Management scholars over the years believe that the 'fourteen

principles of management' advocated by Henri Fayol transformed into current management and organization science, particularly after 1949, after the translation of his book from French to English. It is thought that all organizations of the world in the present-times are influenced by Fayol's principles of management. An organization is after all a collection of individuals chasing a combined objective. Based, exactly on this principle, let us analytically examine the consequences of Fayol's fourteen principles of management with a view to underlining their effects to the administration of library and information centres.

5.1 OBJECTIVES

After going through this unit, you will be able to:

- Examine Fayol's fourteen principles of management
- Discuss Henri Fayol contribution to management
- Explain some advantages and disadvantages of scientific management principles of library management

5.2 HENRY FAYOL'S FOURTEEN PRINCIPLES OF MANAGEMENT

In this section, we will discuss Henry Fayol's fourteen principles of management.

Principle 1: Division of Work

Henri Fayol based his first management principle on the basis of division of work. He is of the opinion that employees of an organization give better performance at work when they are allocated employment based on their fortes. Therefore, the splitting up the entire organizational work into smaller segments is of utmost importance. Consequently, expertise becomes very important as the employees accomplish particular jobs not only at a single time, but even in the course of their routine job also.

For smooth management of library functions also, such a division of work is required. For smooth functioning, a library is also divided into many departments viz., Technical Services User Services, Public Services, Customer Services, etc. Employees working in these separate departments must know the job that they ought to perform to the best of their capability. Fayol was undoubtedly correct in the advocacy of his principle of division of work, as it is not possible for all members of the staff to do all jobs together at the same time. Moreover, efficacy and usefulness of the job increases if one member of the staff does one thing at any one particularly. Everyone does his or her job individually, but all are oriented towards one common objective, all the time. Doing the work thus, output increases manifold. Such a division of work works very well, particularly in a multifaceted organization.

Like a library, where in total diverse outputs sum up for the overall efficiency of the organization. Let us take the example of catalogue room of a library, according to this principle of Fayol, it is mandated that as one or two people catalogue the books, another person must put call numbers on them and yet another must catalogue the titles while arranging them together and making them ready to be moved to the circulation wing. Once in the circulation wing, someone else there may be entrusted with the responsibility of creating space for their recording, shelving, etc.

This kind of a division of work produces more meaningful and satisfactory work for by the staff in comparison to one person doing a different job one after the other. In effect consequently, every member of the staff is allocated permanent responsibilities and is expected to report to the assigned duty daily.

Nevertheless, as seen in contemporary library practices, some librarians do not comply with Fayol's this principle, rather they keep shuffling the staff from time to time to one or the other duty. Sadly, the age of employees of one department sticking in a particular place, duty or post is no more to be seen, owing to the fast moving pace of the modern-day society. This indicates the fact that existing libraries management practices do not support Fayol's this view any longer and the same can be attributed to the following reasons: First, to begin with, library science does not clearly define specialization in particular areas. For example, this can be clearly seen in the academic titles rendered to professors imparting the discipline of library and information science. Most of them are not associated with any particular library and information science research area by their professorial title in contrast to people associated with other sciences or disciplines like engineering, social science, etc. Similarly, in theory, even at the research degree level, research done by scholars will generally reveal their possible areas of specialization. But, when it comes to ground reality, i.e., while working in any library, it is nowhere to be seen.

Secondly, understanding from practices of the 21st century style of management, in contrast to the principle of specialization, generalization of job design is encouraged and supported. Research done in the service industry indicates how managers in the Western countries strategize job requirements to suit the entire staff which eliminates the requirement core specialization staff to perform. Keeping in view the progression of involvement of machineries, there has been introduction computers, mechanization and digitalization in library also as a result of which, staff is employed on their capability to use this machinery for execution of their any job.

Nevertheless, this does not refute the principle of division of work. While the principle of division of work is still being followed, yet there have been certain modifications keeping the present-day scenario in mind. Now, the staff is trained to work in any division at any time due to the generalization of the work design. Let us take the OPAC system for instance: In the current scene there may not be a requirement of an employee to remain stuck to the cataloguing room throughout

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the day owing to the simplicity of operation of the OPAC system. As a characteristic job design platform, allows staff members of all department to add and/or delete content on the database of library.

Principle 2: Authority

The second principle promulgated by Henri Fayol advocates that managers must have authority so that they can command the people working under them to do their job well and understand the importance of accountable for their doings. Fayol recommends both, formality as well as informal authority to be exercised by managers. The formality lies in the expectation of the organization from its managers which actually means their responsibility towards their duty. On the other hand, the informality means the authority given to the manager in order to get things done in the required fashion in the organization. This authority can be connected to the manager's liberty to command, coach, assign, direct, in order to do his duties well and be successful in achieving the organizational goal. This is to say that both act as checks and balances on the manager so that he does not unnecessarily take undue advantage of the authority conferred upon him. The must be used by him together with his parallel responsibility. Therefore, Fayol was of the opinion that though a manager must be utmost responsible towards his duties, at the same time he should also be given some kind of an authority that backs him up in accomplishment his responsibilities.

The case is not very different in a library set up also. The Librarian-in-Charge is answerable for all that happens in the library and he is entrusted with consistent authority to administer it. Similarly, his seconds-in-command, heads of various departments and unit officers are conferred corresponding authority in their individual capacities. This smoothens the flow of work to a great extent and people understand their job. But many times it happens that in such tight hierarchical set ups the corresponding deputies like, the assistant librarians, library officers, and library assistants, etc., get stuck in a single man idea and direction of the librarian. Unluckily, most heads of departments assume such an arrogance about their position, status, responsibility, and authority that they feel it below their dignity to sometimes mix with and relate with their subordinates, which results in a cold working atmosphere that hampers the ultimate goal of the organization.

Keeping the fact in mind that, mostly the junior staff is involved in the daily practical work of the organization, because of which they acquire new knowledge and skill while experiencing new things. Understandably there needs to be some change made in the second principle formulated by Fayol. Owing to this fact, the stress should no longer be on authority to command juniors rather, adequate stress should be laid on encouraging the lower staff to participate in taking up new initiatives. Current trends show that organizations applying the participatory system of management and empowering their staff instead of following the principle of authority and responsibility are able to achieve their goals faster and better.

Principle 3: Discipline

The third principle of management advocated by Fayol suggests for the need to have unambiguously defined organizational rules and regulations meant to achieve respectable staff discipline and compliance. Fayol seems to have based his this principle on the natural human inclination towards lawlessness. He could foresee the level of organizational chaos that could flare up in absence of non-compliance of staff to lay down guidelines, standards, and rules from management. Following discipline by staff members is a must and has always resulted in controlling the staff positively in organizations. Of late however, this method has not proven to be very fruitful in achieving long-term organizational order and organizational goals. Management researchers have witnessed that organizational activities these days are being managed by peer group participation and other such informal associations.

In the times of Fayol, individual differences amongst staff members of an organization general were the root cause of many organizational breakdowns due to lack of prescribed and obligatory organizational procedures or pathetic and ill enforced codes of practice. In the present day however, these problems seem to be manageable with the help of informal systems of control. Various organizational unions and groups formed by workers and members of staff are getting stronger by the day and most are generally guided by ethical standards. These informal associations somehow seem to be here to stay as they have become very strong and dominating, in fact some of them even have the strength to manipulate the managements to sing to their tunes. Such staff associations also provide an element of the democratization of organizations and government establishments. They motivate their members to be disciplined in their work and oriented towards the organizational goal

Similarly, in libraries also, a parallel informal system of discipline can be adopted. For this to happen the librarians-in-charge need to become less formal in implementing discipline at work. They should avoid the practice of enforcing institutional rules and regulations at any cost. Positive and alert librarians cannot be bothered much by staff rumours, gossip, and other forms of attack which generally spring up in the course of implementing organizational rules and regulations. The librarians can endeavour to achieve the same by experimenting the system of permitting members of staff of the library to form associations or unions. For example, a lively junior member of the staff or a senior staff member of a library can initiate collaboration, harmony, conviction, obligation, and orderliness among all members of the library in order to the benefit the same as an organization. Till the time the senior library management gives its juniors a free hand to be and work, these staff members will make rules that work towards the harmony and success of the library. There is evidence to show that libraries whose staff is happy because of the affection bestowed upon them by their management in terms of visits, celebrations, sharing their bad times, etc., form associations or groups in their libraries that work with a positive outlook and produce positive results.

Principle 4: Unity of Command

According to the fourth principle of Fayol, employees must be commanded by one manager only and they must report to him only. According to this, members of the staff will become accountable to their immediate senior. They will get orders and directions from a single source and no one else will be involved in giving them directions at one particular time this becomes very helpful in avoiding any kind of conflict, whatsoever. The employees take orders from no one else except their direct manager or administrator. Though this principle gives clarity to quite an extent yet, it somehow remains a little ambiguous at the same time. Fayol, while formulating the principle, has failed to be categorical whether he is trying to say that only one senior can order his subordinate or whether two or more people can pass directions to staffs, but not at one particular time. In case the former has to be followed, then this principle of Fayol becomes stringent and thus needs to be modified, particularly in conformity with present realities in most contemporary organizations.

Looking at the prevailing circumstances in generally all organizations in the present times, where team-work is the trend of the day, it simply proposes that every team must have a manager or supervisor commanding the team. And, this coordinator is not the sole or overall manager. Likewise, in some complex establishments, staff belonging to a given work team would likely take orders from various coordinators at a time. For example, the head of the department of finance may pass directives to finance related staff, or the head of the electrical section may give to the related staff and the other way round. Therefore, in big organizations, heads of other departments sometimes, give directions to the each other's staff. Similarly in a library, the head of the cataloguing department may give directions to the administrative staff manning the gate, to not allow any clients to enter the cataloguing workroom. Similarly, the head of the circulation department may at that very time ask the same administrative staff member, manning the gate, to look out for a specific library patron at the exit door. This is an example of two different instructions from two different department heads. In this case the gatekeeper, cannot say that he will not do as directed because he is supposed to take orders only from Chief Librarian or that he has to obey only one order at any one time. The thing being brought out here is that in present day library system, it is not odd for people to take orders from many superiors at the same time, all that needs to be done while executing these orders is a little extra care and some devotion.

Principle 5: Unity of Objective

According to this principle, there must be singularity of plan, there must be only objective and a single head for every plan that needs to be executed. Obviously, organizations function on set objectives. Nevertheless, these objectives must not be misunderstood by divisions and units who have their own particular aims in addition to the overall organizational objective. What needs to be understood

here is that, an organization will, obviously have its principal objective, which needs to be fulfilled, but in addition to that departments also have their own specific goals which also ought to be achieved, but both must not be confused with each other, whatsoever.

The main aim of a library as an institution is to offer information services to their patrons. In addition to that, various departments and units of libraries have their own aims and objectives, which at times do not agree with each other. Nevertheless, the events of each division or department are framed keeping in mind the central objective of the library, which is, providing information services to its patrons. In order to achieve the central aim of the library and attain its own departmental goals every department sets and implements several plans. This negates the original proposal made by Henri Fayol of only one plan to be pursued by only one head. For instance, the job of the library's circulation department is to render loaning of books and other material to users along with registering the patrons making use of the library. This duality of task in one single department does not, in any case, mean that the department will have different heads for different tasks. There is no doubt that different plans will help in accomplishment of different tasks. Thus, one plan must be made for the registration process of patrons and the other to manage the lending process of the library material to patrons and ensuring its timely return. In order to put this into practice there is no need of separation of leadership. Rather, it should be insisted upon by librarians in charge all departments must pursue their goals in an orderly fashion so that there is no need for the staff to be managed by special different heads for execution of every plan.

Principle 6: Subordination of Individual Interests to Organization's Interests

The organizational interests must always be more important than every other interest of any member of staff, any person or any group in the organization. Compulsorily, staff members should let go off all their individual interests in order to achieve organizational goals. Actually what this principle of Fayol propagates is that, organizations should never tolerate any such employee who is not committed to achievement of the organizational goals. All employees must work, only and only, towards achievement of these goals even at the cost of their personal or family interests. Well, this is not a very good way of pursuing organizational goals. It may have been effective in yesteryears but, but it does not hold well any more in the present scenario. In the current times, it has been seen that staff members work better when they are treated as a valuable part of the organization. Secondly, organizations in the contemporary world are amenable to the variation of adjustment. They modify their aims in accordance with situations for which they need their employees also to adjust to the changes as soon as possible. One of best ways to get employees of an organization to adjust and conform to changes in the organization is to invest in its employees. Thus certain benefits must be accorded go members of the staff, like, security of job, timely salary payment, complete

sponsorship, and other grants that increases the happiness quotient of the staff and keeps them satisfied and motivated.

Libraries must not aim towards the implementation of this principle of 'organization over self' as it will lead to frustration amongst the staff. Library managers should work towards making the staff happy at work. Happy and contented workers will always be motivated to work hard in achieving organizational goals. Staff members can be kept happy and motivated in numerous ways. The management can be formally committed towards this end by sponsoring the employees for extra training, undergoing development courses, attending seminars and conferences, etc. Other than this, motivation can be induced by certain informal ways also, for example, giving paid family holidays, clear and unambiguous communication, and elasticity with respect to the personal requirements of staff. Such measures taken by the management makes the staff more productive and committed to the organization.

Principle 7: Remuneration

Members of staff must be paid salaries in accordance with their capabilities and job requirement. The salaries given must be practical for the employee as well as the management. Employees must be paid according to their status and responsibility, for instance, a manager must receive a higher salary than junior staff members. Therefore, a person appointed as a manager must receive a higher pay than his subordinates owing to his responsibilities. It does not really matter whether a subordinate works harder and is more productive than the supervisor. So long a subordinate is not promoted by the management he carries on receiving lesser pay in comparison to his superior. This is what is summarized by Fayol on the subject of remuneration to staff.

Nonetheless, this method to the management of the remuneration system is slowly surrendering to the present-day library management practice. There has been a manifest alteration in the implementation of this principle by virtue of it being arbitrary in nature. There is no doubt that it will not be correct for a junior to get more pay than his senior. That is the reason why, management research scholars have supplemented Fayol's idea with a new change saying that the system of remuneration proposed by him had no scope for encouragement of hard work and productivity. Consequently, the 'performance based pay system' suggested by Wallace and Fay (1988) is what is in vogue these days. This salary scheme supports the notion that a performance scale should be designed by organizations in order to evaluate the work done by employees. As a result of which, industrious members of staff get promoted and become eligible to receive higher salaries whereas, non-productive staff is weeded out.

This system of promotion is being adopted in the current library management system and is proving to be very productive. The only difficulty that some libraries face is that they do not broadcast and/or familiarize their staff with the measurement scale or promotion standards. Employees must be made to understand the

standards and have free access to the document. It has also been seen that many librarians disappoint their industrious employees staff based on frivolous reasons, which hampers the overall development of the library.

Principle 8: Centralization

This principle proposes centralization of decision-making, which means that the right to take decisions and issue orders always remains with the top management. The middle management, converts these decisions into policies and interpret them for the working staff members, who actually implement them. Like other organizations, libraries also apply this principle for the sake of library administration. For example, it is customary for the library head to conduct meetings with assistants various heads of departments in order to formulate general policy recommendations and the seconds-in-command and heads of departments carry these management decisions to their departments where they are ultimately implemented. However, management investigators have come up with another system which is proving to be beneficial for many western organizations. According to this principle units and departments decide and organize the implementation of their decisions depending on their job, control focus, and job essentials.

Implementing such a strategy in libraries may be difficult initially but if given a try, different departments of the library will have the authority to meet on a weekly or monthly basis and to take department related decisions. Afterwards, these departmental decisions can forwarded to the chief librarian information and approval. Such a scheme of decision making encourages innovation and comprehensive thinking among employees at all levels and also reduces the burden of the librarian in dealing with the day to day mundane matters of the library.

Principle 9: Scalar Chain

The principle of scalar chain is a creation of the formal organization system. This is also known by the name of 'hierarchy principle.' According to this principle, all communication in an organization should only be vertical. It advocates the existence of a particular continuous chain of authority in the organization. It does not give much importance to horizontal communication. According to the scalar principle, horizontal communication should only be allowed according to the need of the hour with permission of the manager. This vertical method of organizational communication is the traditional practice in generally all libraries. Under this arrangement, orders and directions begin from the librarian-in-charge and flow down to the deputy librarian, where they go to the heads of departments and finally to various section heads. Most libraries follow this is a four-tier hierarchy. In the current scenario, a horizontal or flat management hierarchal system is supported against the vertical system as proposed by Henri Fayol. The supporters of this view are of the opinion that a horizontal approach helps the organization in taking better decisions and implementing them faster. Understanding the benefits of a horizontal decision making approach it can be said that the same should certainly be implemented in library administration.

In view of the progressive hierarchical changes, along with the new management discoveries of a horizontal organizational hierarchy being better in the process of making and implementing decisions in comparison to the earlier vertical order system, libraries also might have to function on a flat hierarchy system. Nevertheless, this change may not be accepted by librarians all over the world where their juniors and heads of departments are eligible to allowances and other privileges. Yet, we must be understand that to change is the need of the hour. The proposed horizontal hierarchical organizational order is an extremely adaptable system which can cater to the specific needs all kinds of libraries

Principle 10: Order

According to this principle, all libraries must keep all reference and reading material in the library in an orderly fashion. Some staff members must always be on duty to correct the disturbed order in the library at any particular time. Right order of library material means that it must be so placed that everything is easily accessible to the patrons at all times. Let's take the example of library offices' location. In a library the office of the Librarian must be located at such a place that it is first to be accessed so that visitors who have not come with the aim of reading do not disturb the other members of the library. Similarly, the porter stand should be reachable and conveniently placed at the library's entrance.

Actually, libraries must abide by with this principle of order in letter and spirit. It must be seen from an all-inclusive perspective. In reality, today's library infrastructure is in least compliance this principle of order proposed by Fayol. These days, organizations follow an open office system, which is a system in which there is very little or absolutely no privacy for employees. They function in open spaces, on work desks having mere partitions in between. Offices of higher officials also have transparent glass walls and doors.

Many libraries and their officers have also adopted this kind of an office separation system. By this the departmental head is able to observe his staff and users all the time. This leaves very little scope for staff and others to resort to any kind unethical activities, not befitting the sanctity of a library, for example, sleeping, eating, and gossiping in the library premises.

Principle 11: Equity

Equity in the literal sense means fairness. In his next management principle Henri Fayol recommended fairness at the managerial level, towards junior staff. But it seems that the fairness propagated by Fayol makes employees conform with his sixth principle, i.e., subordination of individual interests to organizational interests. This however, does not bring out the desired productivity in today's organizational culture. In today's era, librarians must have an equitable relation with their staff wherein they must not be partial with anyone, treat everybody equally, promote all who are worthy of promotions, and motivate weak employees to produce better results. To have a happy and development atmosphere in the library, librarians

must follow directness and impartiality. Library managers must resolve staff related issues before solving their own matters. In sort, neutrality is the crux of this principle. So, it must be maintained by librarians, not only to benefit the library as an organization, but also for their own betterment. As it has been proven time and again that, impartial managers have always been appreciated and valued by their staff.

Principle 12: Stability of Personnel Tenure

In this principle, Fayol advocates correct kind of people to be recruited so that they be trained and retained in the organization for a long time. This principle is based on the conviction that such employees will serve the organization better due to their knowledge and experience attained while working for the organization. In the current times, however, this is seen as an outdated management approach. Present-day management philosophy professes the recruitment of well qualified and experienced staff. Certain organizations have gone to the extent of de hiring such staff employed in the old fashioned way because of their reluctance to adjust to modern ways of executing work. The idea behind recruiting trained staff is that productive can begin from the very first day of the employee's recruitment.

Fayol also believed in stability of tenure of employees, which means they must be held on to till their retirement. But, due to the culture of mobility of labour, this order does not hold good anymore in most organizations but that is not the case with libraries. Frequent changes in staff is not a good thing for a library's health. Libraries should hold on strongly to this principle of Fayol and try to nurture their staff by on the job training, discussions, meetings, guiding, and encouraging them to attain higher studies. Regular changes in library's staff membership can be detrimental to the library's cultural health as new people are bound to bring in new ethos from other organizations. So, while retaining Fayol's 'principle of stability of personnel tenure' library managers should try to avoid recruiting non-productive and completely raw personnel in the library. Besides, on the job training of both, new and old staff must be an ongoing feature in the library.

Principle 13: Initiative

A good library manager is the one who is creative and always trying to initiate novel ideas. Fayol was well aware of the significance of worthy concepts and initiatives in the growth of any organization. In libraries today, the prevalent condition of absence of novel ideas and initiative among librarians has made the organization of libraries stationary, and outdated. That is why to people do not prefer to go to libraries anymore. Youngsters are seen resorting to the internet for all information as libraries do not offer anything new and interesting. Actually if librarians make an effort they can work towards improving their libraries and attract the young generation in large numbers. Library administrators and managers must instill their juniors with the confidence to generate and cultivate novel ideas, and suggest ways to implement these ideas. Best and most practical must be rewarded for their innovation and effectiveness.

Principle 14: Esprit de Corps

'Esprit de Corps' is a French phrase which means zest and dedication. In Fayol's opinion organizations must always work towards enforcement and maintenance of high self-esteem and harmony amongst their employees. This is a factual requirement, as the very core of existence of an organization is the congregation of people for attainment of a common goal. Therefore, empathy, love for each other, harmony, amity, and joint resolve is utmost in attaining organizational success. It has been very rightly said by someone that 'united we stand, divided we fall'. This saying is aptly applicable to libraries. However, it does not mean that there will be complete agreement and harmony amongst all staff members. Disagreement and fighting is only a natural intrinsic human quality, library managers must strategize in case of dispute amongst staff to make sure that all misapprehensions are removed everyone works towards attainment of common organizational goals of the library.

Check Your Progress

1. Define the second principle promulgated by Henri Fayol.
2. Who is answerable for all that happens in the library?
3. What is the main aim of a library as an institution?

5.3 ADVANTAGES AND DISADVANTAGES OF SCIENTIFIC MANAGEMENT PRINCIPLES OF LIBRARY MANAGEMENT

In this section, you will learn some advantages and disadvantages of scientific management principles of library management.

Advantages of Scientific Management Principles of Library Management

Contemporary library management is a very scientific approach towards organizing and running libraries. This approach has numerous advantages some of which are listed below:

- **Improved client service:** Due to automation of modern libraries, librarians have been relieved of a lot of their workload. Processes like procurement of material, cataloguing and circulation are now automated to a large extent. This allows librarians and their staff members to find ways to provide better service to their patrons by way of innovation and new techniques. The extra time that the administrators get can be utilized in implementing more such programs which may facilitate further smooth functioning of the library and make employees of the library available for attending to reference queries and helping people in their research and findings.
- **Cataloguing improvements:** New systems of automated cataloguing, e.g., MARC (Machine Readable Cataloguing), sanction speedier cataloguing of

all library materials. This does not only give the librarian more time to administer improvements in the customer service area, but it also eases out the process of sharing of materials from one location to another without much problem and in an economical way.

- **Easier access:** Scientific management principles of library management make it accessibility of all books, materials very simple and easy. Computerization of the data makes all books and journals visible to the one searching for a particular material. This process also awards flexibility to the library functioning, thus enhancing the demand of its material.
- **Collections:** By managing the library according to the scientific principles of management, collection process of library material improves thus adding variety and high quality materials to the existing lot of material. It also helps in weeding out timeworn, obsolete and inappropriate books and materials from the library. This gives the library collection a more structured appearance and making it easier to find the right book or material.
- **Lasting effects:** Scientific principles of library management afford a way of formulating the collection to develop into maintainable material which is the need of the contemporary technology-based society. This approach helps libraries in creating an everlasting solution which can resolve their problems which have been existing since time immemorial.

Disadvantages of Scientific Management Principles of Library Management

Like two sides of a coin, scientific principles of library management too have a flip side which is disadvantageous to some extent. Let us now have a look at some of the disadvantages caused due to automation of libraries which is a very prominent feature of scientific management principles.

- **Employee cut-backs:** With the latest system of public library automation, budgets to fund for employees are dwindling by the day. The need for employees is also becoming lesser and lesser. The automation system has replaced human employees as it does the job of scanning books and many other things. The availability of books can be seen just by swiping the library card. It is not difficult for the modern library user to handle library terminals and automated systems. On the other side, it is becoming more and more difficult to find people, who are interested in this field and trained enough to solve all material related queries of clients
- **Closing down of libraries and shorter working hours:** Libraries in most countries are succumbing to economic pressures and closing down. Either libraries are shutting their doors permanently or they have reduced their working hours drastically due to paucity of resources.
- **Reduced book budgets:** An increased budget percentage on hi-tech library systems results in availability of less money to be spent on books and other

library material. Even the books kept on library shelves have a shelf life and at times they are kept in the library only based on the number of times they have been read or issued. According to Ideals.Illinois.Edu.com, 'If academic libraries continue to cut back on their purchase of specialised scholarly books, if they begin to define worth or value in terms of the number of times someone has sought access to it...one could imagine a day when every university would have its own press.' John William Ward, president of the American Council of Learned Societies said, 'The new technology is radically changing the environment in which scholars do their work. The great danger is we will end with a system of scholarly communication which will be technically viable, but not intellectually desirable.'

- **Increasing building and upkeep expenses:** The new automated systems of a library increase its power consumption manifold thus inducing modifications in heating and cooling needs of the place. These needs are rarely actually deliberated upon at the time of installing automated systems. The clatter and heat of the machineries together with the body heat generated from people adds on to the previously planned library budget thus making it difficult for the library to keep up with the increasing monetary demands.

Check Your Progress

4. List any two advantages of scientific management principles of library management.
5. Mention any two disadvantages of scientific management principles of library management.

5.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The second principle promulgated by Henri Fayol advocates that managers must have authority so that they can command the people working under them to do their job well and understand the importance of accountable for their doings.
2. The Librarian-in-Charge is answerable for all that happens in the library and he is entrusted with consistent authority to administer it.
3. The main aim of a library as an institution is to offer information services to their patrons.
4. Two advantages of scientific management principles of library management are as follows:
   (i) Improved client service
   (ii) Cataloguing improvements

5. Two disadvantages of scientific management principles of library management are as follows:
   (i) Employee cut-backs
   (ii) Reduced book budgets

5.5 SUMMARY

- Henri Fayol based his first management principle on the basis of division of work. He is of the opinion that employees of an organization give better performance at work when they are allocated employment based on their fortes.
- For smooth management of library functions also, such a division of work is required.
- The second principle promulgated by Henri Fayol advocates that managers must have authority so that they can command the people working under them to do their job well and understand the importance of accountable for their doings.
- The third principle of management advocated by Fayol suggests for the need to have unambiguously defined organizational rules and regulations meant to achieve respectable staff discipline and compliance.
- According to the fourth principle of Fayol, employees must be commanded by one manager only and they must report to him only. According to this, members of the staff will become accountable to their immediate senior.
- The main aim of a library as an institution is to offer information services to their patrons.
- According to the fifth principle there must be singularity of plan, there must be only objective and a single head for every plan that needs to be executed.
- The organizational interests must always be more important than every other interest of any member of staff, any person or any group in the organization.
- Members of staff must be paid salaries in accordance with their capabilities and job requirement. The salaries given must be practical for the employee as well as the management.
- This principle proposes centralization of decision-making, which means that the right to take decisions and issue orders always remains with the top management.
- The principle of scalar chain is a creation of the formal organization system. This is also known by the name of 'hierarchy principle.' According to this principle, all communication in an organization should only be vertical.

- Equity in the literal sense means fairness. In his next management principle Henri Fayol recommended fairness at the managerial level, towards junior staff.
- A good library manager is the one who is creative and always trying to initiate novel ideas.

5.6 KEY WORDS

- **Division of Work:** The division of work is the course of tasks assigned to, and completed by, a group of workers in order to increase efficiency.
- **Librarian:** A librarian is a person who is in charge of a library or who has been specially trained to work in a library.
- **Unity of Direction:** The principal of unity of direction is one of the 14 administrative principles developed by Henri Fayol. It is a concept found in administrative management theory. The principle provides that there should be only one leader and one plan for a series of activities seeking the accomplishment of the same objective.
- **Remuneration:** Remuneration is considered the pay or other compensation provided in exchange for the services performed; not to be confused with giving, or donating, or the act of providing to.

5.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. How does division of work affect the administration of library and information centres?
2. What are the main principles of organizing management function?
3. What is the principle of unity of objectives?
4. What do you understand by the principle of scalar chain?
5. Mention some advantages and disadvantages of scientific management principles of library management.

Long Answer Questions

1. Analytically examine the consequences of Fayol's fourteen principles of management with a view to underlining their effects to the administration of library and information centres.
2. Explain the fourth principle of Fayol, 'unity of command.'
3. Write a detailed note on Henri Fayol contribution to management.

4. Describe the remuneration principle of management.
5. Discuss centralization and decentralization principle of management.

5.8 FURTHER READINGS

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UNIT 6 SYSTEMS APPROACH: AN INTRODUCTION

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Structure

6.0 INTRODUCTION

In the previous unit, you learnt that the smooth and effective functioning of an organization requires skilled and efficient management. Libraries and information centres are also organizations that need to be managed and run in a manner similar to running any other organization performing in a regular manner. In this unit, you will learn about the systems analysis in library and information systems. This unit will also deal with contingency approach, decision making approach, MBO and POSDCORB.

6.1 OBJECTIVES

After going through this unit, you will be able to:

- Explain systems analysis in library and information systems
- Discuss the various methods of system analysis
- Mention some of the contingencies affecting managerial decisions
- Describe the contingency approach, decision making approach, MBO and POSDCORB

6.2 SYSTEMS APPROACH

The systems approach to management views organizations as systems functioning in relation to their environment. A system is defined as 'a group of interrelated

parts that function as a whole to achieve a common purpose.' All organizational systems operation has the basis of four elements. These are: inputs, transformation process, output and feedback. These various elements are shown in the following diagram.

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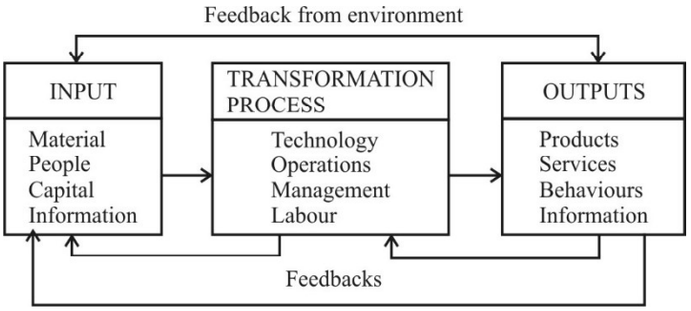

Fig 6.1: *Elements of Systems Approach*

Open and Closed Systems

Systems may be categorized as open or closed. A closed system is a set of interacting elements without any interaction with the outside environment. It has no input from outside in any form. As an example, a battery operated digital watch can be considered as a relatively closed system because once the battery is inserted in it, it does not require any element from outside to operate.

An open system, on the other hand, is the one that is dependent on the outside environment for survival. As an example, a human body as a system, composed of many sub-systems, is an open system since it must depend upon outside input and energy for survival.

All organizations are open systems as they always depend upon the outside environment for feedback and resources and for disposal of the finished product. In the process of transformation of inputs into outputs, the organizations must take into consideration the dynamics of outside environment and must continuously interact with outside variables. For example, when producing and selling a product, the management must analyze, in addition to internal operations, the external factors of resource availability, current technological trends, market trends and social changes.

Main characteristics of a system

1. Every system is comprised of many sub-systems which are continuously interacting with each other.
2. Every system is a part of a larger one. For example, an organization is a system in itself, but also is a part of a larger industrial system which in turn is a part of a social system.
3. Its subsystems are interrelated in such a manner that a change in one variable will affect a change in others.

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4. Every system has a specific purpose to which all its parts and subsystems contribute for achieving that purpose.
5. Each entity of the system receives information or energy from the other parts within the system and from the system's environment.
6. Each entity processes this information or energy in its own way and sends its output to the rest of the system and to the external world.
7. A system has a tendency to remain in equilibrium by maintaining a balance among the various forces operating within and upon it.
8. A system cannot exist in isolation. It must get its inputs from some other system and its outputs become inputs to other systems.

These characteristics clearly indicate the interdependence of systems and sub-systems with other systems and subsystems in the environment. For example, one of the most useful products DDT, a pesticide which had been widely used to protect crops, was banned in America because of its harmful effects on fish and birds and eventually on human beings. DDT production in itself, as a system, could not survive because of its interaction with other systems. Similarly, Harley-Davidson Motorcycle Company, which dominated the American motor cycle market almost, went bankrupt when it did not recognize its relationship with Honda motorcycle that was introduced in America in the late 1950s. American Motors Company did go out of business because it solely relied on the success of Rambler automobiles and failed to interact with the competition. Accordingly, management must recognize not only the need for harmony and synchronization among the sub-systems within the system, such as production, marketing, quality control, personnel and so on, but also the need for adequate interaction with other systems outside such as governmental regulations, customers, suppliers, competitors and so on.

Three other concepts of systems theory are useful to understand. First is the concept of 'synergy'. Synergy simply means that the whole is greater than the sum of its parts. This means that when one company acquires another company then the resulting output is expected to be higher than the sum of the individual outputs of these two companies. There is a saying in India that, 'whi1e one is just a one, two ones make it an eleven'. That is the concept of synergy.

The second aspect is that of 'entropy'. Entropy is the amount of disorder present in any system. Systems survive when they behave orderly. A system which is open, such as an organization, but remains dosed would have no interaction with other systems and would eventually fail. Living systems, if totally isolated would eventually achieve maximum entropy and die. Accordingly, organizations must always be in tune with the environment and keep on interacting with other systems in order to survive and remain vital.

The third aspect, known as 'equifinality' suggests that there may be more than one path leading to the same destination. In dosed systems, a direct cause and effect relationship can be found between the initial condition and the final

state. For example, in the case of a watch, which is a closed system, there is direct and only relationship between the insertion of the battery and the operation of the watch. The watch will not work any other way. In open systems, however, final states can be reached from different starting points and in different ways. The inflexible cause and effect relationships found in physical sciences do not apply to social sciences. Thus, there may not be just 'one' best solution to managerial problems, but there may be many good solutions. For example, the goal of expansion may be achieved by introducing new products or by mergers and acquisitions or simply by greater market penetration by promotion and advertising. Similarly, for example, Dow Chemical and Union Carbide can pursue different strategies and be equally successful chemical industries.

6.2.1 Systems Analysis in Library and Information Systems

The scope of systems analysis has been defined and described in different ways by many scholars. Some feel that it has a fairly narrow scope and other on the other hand feel that the definition of the systems approach covers all that includes the strategy of a new system by way of observing its implementation. As an introduction to library automation, it won't be wrong to consider systems analysis as hypothetically containing the design of a new system—in case of course the examination and assessment of the old system result in an agreement to do so.

As defined by Chapman and St. Pierre, 'the systematic and logical analysis of a problem and the design of a system to correct any of the inefficiencies or errors which exist in the current operations.' According to them, systems analysis could be divided into five steps: appreciating existing techniques, describing necessities, defining inputs of the system, evaluating of techniques being used presently with regard to their increasing needs and lastly, either designing of a new system, proposing of alteration in the present system, or recommending acceptance of the current system after being properly gauged for effectively meeting the requirements. Systems analysis in isolation is not dependent on the usage of a computer.

As stated by Robinson, only systems design and not systems analysis can be argued about keeping a specific area in mind. Nevertheless, it has been pointed out by Becker in one of his writings that, if a library submitting itself to systems analysis has computers to its access, the system analyst will automatically contemplate upon their implementation.

Adelson elucidated the inter-relationship of the systems approach and computers as originating from the fact that generally the systems approach is exercised upon big complications. Many scholars limit the application of systems analysis to technical processing functions in libraries. George Hodowanec, while instructing about technical processes at Drexel University, covers within the range of technical processes those techniques inside the circulation department for example charging systems, undertakings of the procurement department and the serials department, the processes included the department of cataloguing and

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supplementary activities for instance book binding, repairing, and mending tasks. Thus, technical processing can said to be comprising customary organization maintenance undertakings which would comprise, transmission, storing, sequencing, handling, producing catalogue cards, journals, and binding. Such routine functions carried out in libraries on a regular basis are the ones that need to be automated.

It is felt that technical processes need to be automated first because of the involvement of repetition in these tasks or because of these jobs being highly determinative and regulated.

The following are the five steps involved in selection of the most suitable system analysis for the organization.

1. Setting up benchmarks which find out the exact necessities, limitations, and objects of the organization. The criteria, thus arrived at will look at both tangible factors, such as focus on cost; as well as intangible criteria such as morals to be reserved, risk factors and postponement, and also the speed of development that can be sustained as well as accepted by the clientele and members of the staff.
2. Measurement of the credentials of the system including external constraints and demands. It is essential to find out all junctions and activities which may not be present within the system. Here, it is important to understand the difference between physical entities and consistent data.
3. Construction of options which can be supported by the use of representations. These can be non-concrete, for example a flow diagram, or more perceptible, for instance, in the shape of a functioning diagram or imitation of a conceivable clarification.
4. The selected choice must to be followed up, depending on the implementation of the assessment standards to the possible choices. This should be founded on deliberation of both finances and pragmatism. While considering the choice the strong and weak points of both human beings as well as computers must be taken into consideration.
5. Description of the provisions of the system. It is mandatory that all objectives are understood well, an effective approach is put into practice, and there is clarity on targets are clear.

Gechman, in his approach to libraries heads in relation to decision-making duties in library computerization projects, recognized eleven steps. The first three out of these eleven steps are in a way related to systems analysis.

- First among these is instituting the objectives and purposes of the system. According to Gechman this is the most imperative task in the entire effort. The system must be based on a strong foundation and there must be absolute clarity in the establishment of requirements in order for the system to fulfil its users' needs.

- The second is systems analysis itself; in this the general difficulty is described with respect to a computer-aided situation. In this, the greatest serious responsibilities are the conclusion and endorsement of explanation of input and output data. After the knowledge of both, requirements and objectives, provisions for a new system are made, together with reports of any current manual system.
- The third step is formulation of the specification manual which should comprise needs of the recommended new system and should put up before the management of the library for its approval. Only after receiving an approval from the library management, the next eight steps are covered one by one which cover the system design in adequate detail to authorize programming and implementation.

Systems analysis would display that in certain cases decisions taken in the past may have an effect on actions of future, especially in the area of financial limitations. For example, it has been said that a simple decision of setting up new files should never be taken casually as the stored data may be retrieved for use many years later. Moreover, in many library situations it is not easy to get precise cost statistics because of many omissions committed in library processing. This may lead to the availability of only casual figures available for use. In 1967, Covill deliberated upon the stages of development of a library automation system. Although, the definition given by Covill is not a very broad and comprehensive definition of systems analysis, but the initial four stages described by him are apt according to the structure of systems analysis as an introduction to the automation process of libraries. Let us have a look at these phases:

The first phase, study and recording of the current operating system, is deliberated by Covill to come to an end with a problem statement including all those reasons because of which the prevalent system is insufficient and something needs to be done in order to find a solution. A picture of the existing library processes, the same expressed in words and through diagrams charts also need to be included in the problem statement.

The next phase is of establishing a design for the new system to be developed. This is followed by making a plan that will help in smooth implementation of the new design, along with all files, accounts and statements generated, to be handed over to the librarian for assessment. The next step to be taken in this process is taking decisions on paraphernalia and storage of equipment. After this a comparison needs to be made between the present and would be cost and based on that deciding the costs. It is very important to know the present costs because comparative costs help in taking the right decision with respect to in selection of a new system. While the process of consideration of the recommended new system is on, it is important to understand the environment in which the system is going to operate, after which its objectives must be determined. After evaluating all possible alternative systems a comparison should be made to select the best possible

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complete system. After selecting the finest design an accurate cost estimate should be done and the system must be described in detail. The final stage in selection process of selecting the right systems analysis is chalking out and developing a systematic plan for application of the new system, as part of the system design. All documentation should be adequately prepared.

While not precisely giving out a series of techniques to be adopted in systems analysis, Auld has made a mention of certain qualities that a good systems analysis must have in for the process of library automation to be successful. He brought out the significance of good communication as part of successful systems analysis. Nevertheless, he also stressed that a good systems analysis also needs a consideration by the system analysis expert of the entirety of that with which he is working, along with instituting appropriately the connection of every part to all other parts.

Waite presented yet another outlook of the requirement to ensure a successful library automation program. He is of the opinion that successful accomplishment of the initial phases needs to be discussed carefully by all members together with executive management, project management, working librarians and systems engineers. As evident from the above discussions, there have been innumerable views in connection to the classification of stages of development and the steps to be taken while doing the systems analysis before setting up library automation. Different aspects have been emphasized upon by different authors, but if we have a close look, we will be able to understand that, all of them ultimately bring out similar needs for a good system analysis viz., a methodical, reasonable study of the existing operating systems with an unambiguous demonstration of both, good and bad characteristics of the alternative solutions. It can thus be concluded that most catastrophes and complications of the library automation process were a result of excessively hurried preparation and/or a non-existence of strong obligation towards hardware. It has been recommended by experts that to assure achievement of implementation of a successful automation project, the planning (the foremost phase) must be done in a relaxed manner and it must be deliberated over a long period of time. Rather, it should be allocated double the time initially planned as the initial planning is the most significant feature in the institution of automation.

Methods, Tools and Techniques of Systems Analysis

Along with formulating a sound sequence of stages to be adopted in systems analysis, there is also a dire need of methods to be adopted accompanied by the correct tools and techniques to be put into practice. Universally the methods of systems analysis are applicable in the same way whether automation is a likely step or not.

- One of the most extensively utilized methods is flow charting. There are minimum two ways of using the flow chart technique within the context of

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systems analysis. In the first one each step being followed in the prevailing manual system is set down. In the second way of using the flow charting, while designing new systems projected steps to be taken would be recognized. Flow charts have been mentioned by Hammer in the second type where hundreds or thousands of interconnected steps necessary for the computer to achieve the anticipated result are mentioned.

Szeplaki talks about long drawn directions on the way of preparing flow charts with respect to prevailing library operations. In such a circumstance, a flow chart could be any of the following types: step-by-step work flow chart or a document-by-document work flow chart. To complete a task flow chart Szeplaki suggests commencement by fortifying a job description from every particular member of staff related to that area which is currently under study. After that, making use of the job description as a basis, make primary flow charts. Next step would involve interviewing every person, without essentially filling a detailed interview form. There is however no elaborate details rendered by Szeplaki on how to prepare a step-by-step flow chart, but he does give a detailed account on making a document-by-document flow chart. In his opinion, the document-by-document method of preparing flow charts has numerous benefits and the same has been rated higher than him in comparison to step-by-step flow charting. He feels that people taking decisions with respect to the depth and type of flow charting to be carried on in the systems analysis of a possible library automation project should certainly make use of this technique.

- According to Robinson, interviewing is one of the most recognizable techniques of systems analysis. Other techniques are not very well known, for example the structure of decision tables. In the early part of the 1970s, a very noteworthy development in the general field of library automation was seen which included ramifications for systems analysis. Contrary to the era of initial years of automation of libraries, when discussions on steps or techniques to be used in systems analysis before the automation of library were done through individual papers, contemporary times have available for the benefit of people some significant works which combine and associate information with respect to many features of data processing in a library.

  Undoubtedly, these aspects keep undergoing many changes with progression of time, nevertheless, now the techniques of systems analysis have a tendency to be applicable in a more enduring manner. Therefore, it won't be wrong to say that a systems study is an indispensable requirement for designing a successful automated library system. However, an automated system may not essentially the outcome of such a study. It comprises a scrutiny of the stages of analysis, detail on approaches and methods of analysis containing job descriptions, worksheets for the survey of inputs, flow charts, etc.

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Involvement of personnel in systems analysis

After discussing the essential techniques and tools required for setting up a successful systems analysis, let us now understand one extremely important requisite for this purpose, i.e., the people or persons in charge for the accomplishment of systems analysis in a library before the probable automation of one or more technical processing functions of the library. Perhaps, the first name that comes to everybody's mind on thinking of constituting a systems analysis in a library is that of the analyst or perhaps the project director, who originally a librarian having some kind of a training in programming. Various scholars have divergent completely views on this; according to some a systems analyst and a librarian should be two completely different entities, while some experts like Seplaki, Veaner and Leboitz recommend one person performing combined duty of a librarian and an analyst. Supporting the former view, Hammer believes that a qualified analyst is a particular requirement which must be catered to in a specific manner. De Gennaro in one of his writings has opined that at a time when skilled and knowledgeable library systems personnel were not in abundance, it did not really matter whether the individual doing library automation had a predominant background of being a librarian or he was primarily a computer expert. All that these people needed to do was to dedicate themselves to the cause of library automation and move towards acquiring proficiency in that area. Often, outside consultants are used for development of the systems analysis through its different stages. Nonetheless, particular in-house competence is necessary for upkeep of the system set up by experts. Depending on individual experience, it looks like that librarianship is attractive professions which will probably keeping on attracting people with strong data processing backgrounds. These people, who are conversant in both fields, should be in a position to bring the required change in libraries all across the world and revive their lost popularity.

Check Your Progress

1. Define the term 'system?'
2. What are the four elements of organizational systems operation?

6.3 CONTINGENCY APPROACH

The contingency approach to management, also known as situational approach suggests that there is no 'one best way' to manage and organize, but rather that successful managerial decisions depend upon the situations and circumstances in which such decisions are made. Early management contributors like Taylor, Fayol and Weber proposed a set of rules and techniques that were assumed to be universally applicable. Later research showed this premise to be too simplistic. While many of these principles are applicable to most situations, none could be applied to 'all' situations. More recently, management scholars and researchers

determined that virtually an management activity is contingent upon the elements of the situation. This approach requires that managers diagnose a given situation and make decisions relative to the conditions present. For example, it would not be correct to state definitely that students 'always' learn more and better in small classes than in large ones. The teaching and learning effectiveness would certainly depend upon such 'contingency' factors as course content and the teaching style of the instructor. Similarly, 'division of labour' may result in the job being too specialized and may hinder efficiency and productivity. Accordingly, overspecialization of a job may not be desirable in all situations. Accordingly, contingency theory proposes that there are no universal principles applicable to management in general and in all situations but that the nature of these principles and techniques would be contingent upon the situation within which' a management decision has to be made.

Some of the contingencies affecting the managerial decisions, according to Bateman and Zeithaml are as follows:

1. The rate of change and degree of complexity in the organization's external environment.
2. The internal strengths and weaknesses of the organization.
3. The values, goals, skills, and attitudes of managers and workers in the organization.
4. The types of tasks, resources and technology used by the organization. Depending on the type of situation and contingency, the management would devise appropriate strategies to adequately handle the situation.

As the organizations became more complex both in organizational structure as well as the extent of operations, the need for more sophisticated techniques of management arose. The conglomerates by mergers, acquisition, or expansion became sufficiently complicated so that it became necessary to devise new methods of managing that would ensure that the desired results are achieved effectively. Additionally as the patterns of the workforce changed so that they became more aware and educated, it was felt that their participation in the affairs of the organization would be useful both for the workers and the company. That is how the more modern concept of participative management evolved.

This type of management is known as 'Management By Objectives' *or MBO.*

6.3.1 Management by Objectives (MBO)

The ideas behind MBO were advocated and popularized by Peter Drucker, who stressed that 'business performance requires that each job be directed towards the objective of the whole business.' Even though it is comparatively a new area, a lot of attention has been paid to it, notably by John Humble in England and George Odiorne in America.

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MBO is a process by which managers and subordinates work together in identifying goals and setting up objectives and make plans together in order to achieve these objectives. These objectives and goals are consistent with the organizational goals. George Odiorne has explained the concept as follows:

> The system of management by objectives can be described as a process whereby the superior and subordinate managers of an organization jointly identify its common goals, define each individual's major areas of responsibility in terms of results expected of him and use these measures as guides for operating the unit and assessing the contribution of each of its members.

MBO then can also be referred as *Management by Results* or *Goal Management,* and is based on the assumption that involvement leads to commitment and if an employee participates in goal setting as well as setting standards for measurement of performance towards that goal, then the employee will be motivated to perform better and in a manner that directly contributes to the achievement of organizational objectives.

John Humble seems to be highly excited about this new and challenging concept and defines MBO as 'A dynamic system which integrates the company's need to achieve its goals for profit and growth with the manager's need to contribute and develop himself. It is a demanding and a rewarding style of managing a business.'

MBO by definition is a goal-oriented process and not a work-oriented process. Just being busy and doing work is not important, if it does not effectively lead to achievement. It is both an aid to planning as well as a motivating factor for employees. By its proper use, some of the planning errors can be eliminated or minimized. It is a comprehensive system based upon set objectives in which all members participate. These objectives are common objectives for all participants and the extent or rewards for each member would be determined by the degree of achievement. This leads to a fair appraisal system. Additionally, a good MBO plan involves regular and face-to-face superior-subordinate communication and hence it improves the communication network.

The MBO Process

Some of the elements in the MBO process can be described as follows:

1. *Central goal setting.* The first basic phase in the MBO process is the defining and clarification of the organizational objectives. These are set by the central management and usually in consultation with the other managers. These objectives should be specific and realistic. This process gets the group managers and the top managers to be jointly involved. Once these goals are clearly established, they should be made known to all the members of the organization and be clearly understood by them.
2. *Manager-subordinate' involvement.* After the organizational goals have been set and defined, the subordinates work with the manager in setting their individual goals. Such joint consultation is important because people

are much more motivated in achieving objectives that were set by them to start with. The goals of the subordinates are specific and short range and primarily indicate what the subordinate's unit is capable of achieving in a specified period of time. The subordinates must set' goals in consultation with the individuals who comprise his unit. In this manner, everyone gets involved in the goal setting.

3. *Matching goals and resources.* The objectives in themselves do not mean anything unless we have resources and means to achieve those objectives. Accordingly, management must make sure that the subordinates are provided with necessary tools and materials to effectively achieve these goals. If the goals are precisely set then the resource requirements can also be precisely measured thus making the resource allocation easier. However, just like goal setting, the allocation of resources should also be done in consultation with the subordinates.
4. *Freedom of implementation.* The manager-subordinate task force should have adequate freedom in deciding on the utilization of resources and the means of achieving the objectives. As long as these means are within the larger framework of organizational policies, there should be minimum interference by the superiors.
5. *Review and appraisal of performance.* There should be periodic reviews of progress between manager and the subordinates. These reviews would determine if the individual is making satisfactory progress. They will also reveal if any unanticipated problems have developed. They also help the subordinate understand the process of MBO better. They also improve the morale of subordinates since the manager is showing active interest in the subordinate's work and progress. However, the performance appraisal at these intermediate reviews should be conducted, based upon fair and measurable standards. These reviews also will assist the manager and the subordinates to modify either the objectives or the methods, if necessary. This increases the chances of success in meeting the goals and makes sure that there are no surprises at the final appraisal.

Advantages of MBO

Henri Tosi and Stephen Carroll have done extensive work in this area and described some of the pros and cons of MBO. Some of the advantages of MBO are as follows:

1. Since MBO is a result-oriented process and focusses on setting and controlling goals, it encourages managers to do detailed planning. As the planning process is improved, it helps in a better overall management system.
2. Both the manager and the subordinates know what is expected- of them and hence there is no role ambiguity or confusion.

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3. The managers are required to establish measurable targets and standards of performance and priorities for these targets. Since these measurable targets are tailored to the particular abilities of the subordinates, it obtains maximum contribution from them thus providing optimum utility of human resources. In addition the responsibilities and authority of the personnel is clearly established.
4. It makes individuals more aware of the company goals. Most often the subordinates are concerned with their own objectives and the environment surrounding them. But with MBO, the subordinates feel proud of being involved in the organizational goals. This improves their morale and commitment.
5. MBO often highlights the area in which the employees need further training. By taking keen interest in the development of skills and abilities of subordinates, the management provides an opportunity for strengthening those areas needing further refinement thus leading to career development.
6. The system of periodic evaluation lets the subordinates know how well they are doing. Since MBO puts strong emphasis on quantifiable objectives, the measurement and - appraisal can be more objective, specific and equitable. These appraisal methods are superior to trait evaluation which is based upon factors such as cooperation, likeability, self-discipline, loyalty, etc. since they focus on results and not on the same subjective intangible characteristics. This evaluation being more objective can be highly morale-boosting.
7. It improves communication between management and subordinates. This continued feedback helps clarify any ambiguities and it helps in the process of control so that any deviations can be easily and quickly corrected.

Disadvantages of MBO

1. In a classical established structure of our organizations, the authority flows from top to bottom. This creates discipline and better performance. Hence, the top management is usually reluctant to support- the process of MBO in which their subordinates would take equal part. Accordingly MBO can only succeed if it has the complete support of top management.
2. MBO may be resented by subordinates. They may be under pressure to get along with the management when setting goals and objectives and these goals maybe set unrealistically high. This may lower their morale and they may become suspicious about the Philosophy behind MBO. They may seriously believe that MBO is just another of the management's ploy to make the subordinates work harder and become more dedicated and involved.
3. The emphasis in MBO system is on quantifying the goals and objectives. It does not leave any ground for subjective goals. Some areas are difficult to quantify and even more difficult to evaluate.

4. There is considerable paperwork involved and it takes too much of the manager's time. Too many meetings and too many reports add to the manager's responsibility and burden. Some managers may resist the program because of this increased paperwork.
5. The emphasis is more on short-term goals. Since the goals are mostly quantitative in nature, it is difficult to do long range planning because all the variables affecting the process of planning cannot be accurately forecast, due to constantly changing socio-economic and technological environment, which affect the stability of goals.
6. Most managers may not be sufficiently skilled in inter-personal interaction such as coaching and counselling which is extensively required.
7. The integration of MBO system with other systems such as forecasting and budgeting, etc., is very poor. This makes the overall functioning of all systems more difficult.
8. Group goal achievement is more difficult. When the goals of one department depend on the goals of another department, cohesion is more difficult to obtain. For example, the production department cannot produce a set quota if it is not sufficiently supplied with raw materials and personnel.

Suggestions for improving the Effectiveness of MBO

1. It is important to secure top management support and commitment. Without this commitment, MBO can never really be a success. The top managers and their subordinates should all consider themselves as players of the same team. This means that the superiors must be willing to relinquish and share the necessary authority with subordinates.
2. The objectives should be clearly formulated, should be realistic and achievable. For example, it is not realistic for the R&D department of an organization to set a goal of, say, 10 inventions per year. These goals should be set with the participation of the subordinates. They must be properly communicated, clearly understood and accepted by all. MBO works best when goals are accepted.
3. MBO should be an overall philosophy of management and the entire organization, rather than simply a divisional process or a performance appraisal technique. MBO is a major undertaking and should replace old systems rather than just being added to it. Felix M. Lopex has observed, 'When an organization is managed by objectives, it becomes performance oriented. It grows and it develops and it becomes socially useful.'
4. The goals must be continuously reviewed and modified as the changed conditions require. 'The review technique should be such that any deviations are caught early and corrected.

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5. All personnel involved should be given formal training in understanding the basics as well as the contents of the program. Such education should include as to how to set goals, the methods to achieve these goals, methods of reviews and evaluation of performance and provisions to include any feedback that may be given.
6. MBO system is a major undertaking based upon sound organizational and psychological principles. Hence, it should be totally accepted as a style of managing and should be totally synthesized with the organizational climate. All personnel involved must have a clear understanding of their role authority and their expectations. The system should be absorbed totally by all members of the organization.

6.3.2 The Decision-Making Approach

The Decision Theory School believes that management is simply a decision making process, which is a selection of a course of action from several available alternatives. Hence, the central focus of management theory should be the analysis of the decision itself. The basic emphasis of this school is not on people or environment variables influencing behaviour, but on the process of decision making and that all management thought can be built around it. However, even though the process of decision making is an essential skill, it is not the only skill required for effective management.

There are two major drawbacks with this approach. First, most decision models do not and cannot include soft variables or intangible variables such as human attitude and behaviour, evaluation of political trends and the effects of some decisions on the customers or community. Secondly, the actual decision making can be quite easy and straightforward, provided the goals are clearly defined, adequate information is available for decision making, the environment in which the decision will be applicable is accurately predictable and if the decision makers are competent and experienced. Hence, management cannot be limited to simply making decisions. The principal contribution' of this school to the management process is in those problem areas where the relationships of variables are quantifiable and clear and where the parameters can be either directly measured or reliably estimated.

6.3.3 POSDCORB

There are basically five primary functions of management. These are as follows:

1. Planning
2. Organizing
3. Staffing
4. Directing
5. Controlling

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The controlling function comprises coordinating, reporting and budgeting. Hence, if this function can be broken into three separate functions coordinating, reporting and budgeting. Based upon these seven functions, Luther Guelick coined the word POSDCORB, which generally represents the initials of these seven functions. All the primary functions are explained and discussed as follows.

Planning

Planning is future oriented and determines an organization's direction. It is a rational and systematic way of making decisions today that will affect the future of the company. It is a kind of organized foresight as well as corrective hindsight. It involves predicting the future as well as attempting to control the events. It involves the ability to foresee the effects of current actions in the long run in future.

Example: Business planning, project planning, strategic planning (vision, mission), communications plans, research design planning, etc.

Organizing

Organizing requires a formal structure of authority and the direction and flow of such authority through which work sub-divisions are defined, arranged and coordinated so that each part relates to the other part in a united and coherent manner so as to attain the prescribed objectives. Thus, the function of organizing involves determining the activities that need to be done in order to reach the company goals, assigning these activities to the proper personnel and delegating the necessary authority to carry out these activities in a coordinated and cohesive manner. It follows, therefore, that the function of organizing is concerned with:

1. Identifying the tasks that must be performed and grouping them whenever necessary
2. Assigning these tasks to the personnel while defining their authority and responsibility
3. Delegating the authority to these employees
4. Establishing a relationship between authority and responsibility
5. Coordinating these activities.

Staffing

Staffing is the function of hiring and retaining a suitable workforce for the enterprise both at managerial as well as non-managerial levels. It involves the process of recruiting, training, developing, compensating and evaluating employees, and maintaining this workforce with proper incentives and motivations. Since the human element is the most vital factor in the process of management, it is important to recruit the right personnel. This function is even more critically important since people differ in their intelligence, knowledge, skills, experience, physical condition, age and attitude, and this complicates the function. Hence, management must

understand, in addition to the technical and operational competence, the sociological and psychological structure of the workforce.

Directing

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The directing function is concerned with leadership, communication, motivation and supervision so that the employees perform their activities in the most efficient manner possible, in order to achieve the desired goals. The leadership element involves issuing the instructions and guiding the subordinates about procedures and methods. The communication must be open both ways so that the information can be passed on to the subordinates and the feedback received from them. Motivation is very important, since highly motivated people show excellent performance with less direction from superiors. Supervising subordinates would give continuous progress reports as well as assure the superiors that the directions are being properly carried out.

Controlling

The controlling function consists of those activities that are undertaken to ensure that the events do not deviate from the prearranged plans. The activities consist of establishing standards for work performance, measuring performance and comparing it to these set standards and taking corrective actions as and when needed, to correct any deviations. All these five functions of management are closely interrelated. However, these functions are highly indistinguishable and virtually unrecognizable in a job. It is necessary, though, to put each function separately into focus and deal with it.

Check Your Progress

3. What is MBO?
4. What are the five primary functions of management?

6.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. A system is defined as 'a group of interrelated parts that function as a whole to achieve a common purpose.'
2. All organizational systems operation has the basis of four elements. These are: inputs, transformation process, output and feedback. These various elements are shown in the following diagram.
3. MBO is a process by which managers and subordinates work together in identifying goals and setting up objectives and make plans together in order to achieve these objectives.

4. There are basically five primary functions of management. These are as follows:
   - Planning
   - Organizing
   - Staffing
   - Directing
   - Controlling

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6.5 SUMMARY

- Systems approach to management views organizations as systems functioning in relation to their environment.
- A system is defined as 'a group of interrelated parts that function as a whole to achieve a common purpose.'
- A closed system is a set of interacting elements without any interaction with the outside environment.
- An open system, on the other hand, is the one that is dependent on the outside environment for survival.
- Synergy simply means that the whole is greater than the sum of its parts. This means that when one company acquires another company then the resulting output is expected to be higher than the sum of the individual outputs of these two companies.
- The scope of systems analysis has been defined and described in different ways by many scholars.
- Systems analysis would display that in certain cases decisions taken in the past may have an effect on actions of future, especially in the area of financial limitations.
- The contingency approach to management, also known as situational approach suggests that there is no 'one best way' to manage and organize, but rather that successful managerial decisions depend upon the situations and circumstances in which such decisions are made.
- As the organizations became more complex both in organizational structure as well as the extent of operations, the need for more sophisticated techniques of management arose.
- The ideas behind MBO were advocated and popularized by Peter Drucker, who stressed that 'business performance requires that each job be directed towards the objective of the whole business.'

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- MBO is a process by which managers and subordinates work together in identifying goals and setting up objectives and make plans together in order to achieve these objectives.
- MBO system is a major undertaking based upon sound organizational and psychological principles.
- Planning is future oriented and determines an organization's direction.
- Organizing requires a formal structure of authority and the direction and flow of such authority through which work sub-divisions are defined, arranged and coordinated so that each part relates to the other part in a united and coherent manner so as to attain the prescribed objectives.
- Staffing is the function of hiring and retaining a suitable workforce for the enterprise both at managerial as well as non-managerial levels.
- The directing function is concerned with leadership, communication, motivation and supervision so that the employees perform their activities in the most efficient manner possible, in order to achieve the desired goals.
- The controlling function consists of those activities that are undertaken to ensure that the events do not deviate from the prearranged plans.

6.6 KEY WORDS

- **Closed System:** A closed system is a set of interacting elements without any interaction with the outside environment. It has no input from outside in any form.
- **Open System:** An open system is the one that is dependent on the outside environment for survival.
- **Synergy:** Synergy simply means that the whole is greater than the sum of its parts.
- **Entropy:** Entropy is the amount of disorder present in any system.
- **Equifinality:** Equifinality is the principle that in open systems a given end state can be reached by many potential means.

6.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What is the systems approach?
2. Differentiate between closed system and open system.
3. What are the tools and techniques of systems analysis?

4. Mention some of the contingencies affecting the managerial decisions.
5. Identify the advantages and disadvantages of MBO.

Long Answer Questions

1. Discuss the main characteristics of a system.
2. Explain systems analysis in library and information systems.
3. Describe the five steps involved in the selection of the most suitable system analysis for the organization.
4. Discuss the various methods of system analysis.
5. Describe the process of MBO.

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6.8 FURTHER READINGS

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BLOCK - III
COLLECTION DEVELOPMENT POLICY

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UNIT 7 COLLECTION MANAGEMENT

Structure

7.0 INTRODUCTION

In the previous unit, you learnt about the systems analysis in library and information systems. You also learnt about contingency approach, decision making approach, MBO and POSDCORB. In this unit, you will learn about collection management of library material. This unit will also discuss the policy and procedures for print and non-print resources including print and e-journals, and library security.

7.1 OBJECTIVES

After going through this unit, you will be able to:

- Define collection management
- Mention some general principles with respect to library material
- Discuss the challenges in collection and management of e-journals
- Describe the difficulties in collection development in the digital age
- Identify some of the factors that can decrease the security threat to any library
- Discuss the various benefits of application of electronic security devices in libraries

7.2 COLLECTION MANAGEMENT OF LIBRARY MATERIAL

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Identifying the need of a well-stocked and well-patronized library there is an understandably high desire of a distinct policy in relation to collection of library material which must be managed in a scientific way in order to make the right impact. The process of selection of library material therefore must be organized in a specific manner in order to streamline it and ensure transparency in the process. Material available to the patrons of a library is in various forms, e.g., print or non-print and traditional or non-traditional formats. Let us at examine a general library materials selection policy which is practiced by all public libraries in general.

Responsibility for selection of material

The Library Board confers the duty of selecting the library material to the librarian-in-chief who in turn, may or may not delegate this power to other members of the library staff. In some cases, the librarian-in-chief has the availability of professional staff employed primarily for this purpose. The librarian himself or the members appointed by him carry on the selection process remaining strictly within the procedures and strategies laid down in the library material selection policy. All selection thus made are therefore considered Board selections, and the Board generally assumes complete legal accountability for all material thus selected.

General principles with respect to library material

(i) A public library must make available materials in all subject areas, in all possible formats, e.g., print, non-print, media, pictorial, CDs, DVDs, etc. The library must emphasize upon the intellectual and academic requirement of the local public in which it is situated. Besides this the selectors, while procuring the materials, must keep regional interest also in mind. This however does not mean that other material is to be excluded from the list; materials on all subjects must be collected with specific emphasis on that mentioned earlier.

(ii) Specific selection criteria include:

- Author's reputation
- Publisher's standing in the market
- Importance of the matter in relation to the region
- Assessments of appraisals and addition in stock bibliographies
- Cost
- Format

(iii) While all libraries generally prefer to keep works of recognized and well known authors. However, an endeavour should be made by the library selection board to recognize and obtain the works of evolving and not so

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popular authors, imaginative writers, storywriters, composers, and novelists, particularly with respect to local and regional writers.

(iv) In selecting library material the selection committee members of the library must be guided by (and not restricted), a variety of standing bibliographies and reviewing aids:

- Booklist
- Library Journal
- Publishers Weekly
- School Library Journal
- Area Newspapers and Magazines, e.g., Minnesota Reviews
- Public Library Core Collection Catalogues
- Specialized Bibliographies
- In addition, suggestions and requests from members of the public will be considered

Controversial materials

Understanding the wide-ranging and multi-cultured society and the ever changing needs of a multifarious and dynamic age, all libraries must select their materials from a comprehensive range of themes, interests, viewpoints, and palates. Some material may be liked by some patrons and other may be unpopular with others, but it must always be the endeavour of the library to always have the best and latest material on their shelves and in their data banks. Difference of opinions and debates are good and necessary for a free society to develop intellectually; therefore, a public library must never try to 'play safe' by removing any controversial material from its shelves. The general public has a right to pick and choose from the available variety, and that right must be made available to them at all costs. Any patron of the library having any kind of an objection to any particular material available in the library's collections must asked to communicate his/her concerns in writing and the matter should be handled according to the procedure laid out for dealing such situations and such material.

Children's materials

A public library must have materials available for children and for adults and the selection criteria for selection of children's material should also be based on the same principles as that for adults' material. A public library must endeavour to procure books and other superior quality media for children, but should not be done as would be done by parents. Children should have access to all kind of age appropriate material at their disposal when they visit the library. There should no restriction, whatsoever, to any kind of reading, listening, or viewing of any material worthy and attained within the guidelines of the library policy.

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Media/Non-print materials

Media/non-print materials comprise items like DVDs, CDs, computer software, etc. There must be adequate availability of such material, on various subjects, in a public library which should have acquired in conformance with the material acquisition policies laid down by the library. Specific or academic libraries must acquire this material after consulting the teaching staff of all subjects. Selection of media/non-print materials should be done on the following basis:

- Taking into consideration, the variety of media available and its possible use in the library.
- The price of the media/non-print materials being considered for original purchase, replacement needs and addition to the existing collection.
- The type, cost (inclusive of maintenance expenditure) and quality of the paraphernalia needed to use the media
- The staff management or help needed for the using the media to its optimum in the library.
- The everyday difficulties related to circulation control, space necessities and storage settings.

More definitely, media/non-print materials being considered to be bought will be assessed on the following basis:

- General motive, range and readership/viewership
- Significance of the subject matter
- Suitability or durability of the material
- Quality of the production
- Recommendations of faculty after previewing the material (in case of academic libraries)
- Convenience of use
- Format and price
- Publisher's reputation
- Authoritativeness

7.2.1 Acquisition of E-Journals

E-Journals have gradually become the centre of R&D in modern times. Keeping this development in mind, most organizations related to the field of research and development, have started subscribing e-journals. The need of e-journal has been seen and felt in the growing realm of academic libraries also. The explosion of e-resources, network equipment, computer and web technology has expedited this progressive transformation. The number of superior e-journals has been on the rise rapidly and can take the role of an aide to print resources or progressively do the job of their substitutes. E-resources, indisputably, will keep on growing at a

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rapid speed but their older counterpart, i.e., the print substitute still remains the bigger favourite. That is primarily because the unstandardized format of these materials makes them dreary for libraries to manage. That is the reason why, in actuality many matters are still need to be resolved with respect to management of sociological, technological and legal, matters. These matters encompass a plethora of features for instance acquiring, accessing, restricting, patent, protection, software and the user interface. Acquisition of e-journals is not like the acquisition of printed chronicles.

Predefined techniques and strategies which were in vogue for print material, or print as well as e-form are applicable to e-formats. There is a need to be handled these forms in a separate manner. There is a requirement to formulate processes and techniques for the acquirement, accreditation, negotiations, order/ receipts, and control of serials on CD-ROMs, via web for e-journal, so that there can be effective institution and organization in place.

Selection of E-journals

Selection of e-journals is one among the foremost library functions in the field of library material collection. E-journals can be of various types, e.g., free and fee-based journal, it could involve purchasing a subscription or paying a license fee for accession of rights. With respect to library staff concerning the selection of e-journals is concerned, two methodologies fit the criteria: first is format based; and the other is subject based. In the format based methodology, the selection of electronic journals is done by separate staff having expertise in computerization and automated resources which is not the case in selection of regular library material. Contrary to this, in the subject based methodology electronic journals are selected by the same staff who undertake the collection of traditional library material, e.g., a history expert would be involved in selection of history e-journals a Chemistry expert would select the related e-journals and so on. Actually, a library should strike a middle path and make use of a mixed methodology integrating involvement of both, the subject expert as well as the automation specialists.

That is the reason why a three stage process is adopted by most libraries for the selection of e-journals. It is often difficult to identify e-journals due to a lack of good bibliographic control available on the net.

There are five particular acquisition functions with respect to acquisition of fee-based e-journals, such as follows:

(i) Deciding the cost
(ii) Mediating with the seller
(iii) Completion of the license contract
(iv) Encumbering the account
(v) Record of the order

Acquisition of e-journals is done on two approaches:

(i) **Specific library approach:** All libraries are different based on their material, users' needs, functioning methodology, financing sources, information processing, etc.

(ii) **Groupings approach:** In this a number of libraries, having similar needs, form a group to serviced by a commercial publisher with and continuous long supply of e-journals.

7.2.2 Challenges in Collection and Management of E-Journals

Following are the challenges in collection and management of e-journals:

(a) **Difficulty in accessing e-journals:** Access of e-journals is not a simple task as it requires particular amount of technology, some access to vice publisher or aggregator, and creating awareness among patrons with respect to usage of e-journals. Managing access to e-journals is related to the organization and decisive strategies, legal regulations and technical clarifications. Management strategies concerning access to e-journals must contemplate upon confidentiality and liability related matters.

(b) **Costing:** E-journals are priced differently based on the vendor who is supplying or the publisher, as all have different selling strategies. People in the library responsible for subscribing or librarians must be wary of these variations between different pricing structures as these costing structures are always fluctuating. In the modern situation, users prefer accessing e-journals instead of owning them. Actually the most workable way of economizing the usage of e-journals is by congregating groups of libraries in order to afford easy and reasonable access to number of e-journals.

(c) **Difficulty in classification, cataloguing and indexing of e-journals:** All libraries must be sensitive towards emergent criteria related to classification and cataloguing of e-material. Constant efforts are being made to create an organization scheme as an instrument for automatic cataloguing and indexing. The quick growth in the presentation of e-journals has raised a range of some rudimentary cataloguing doubts. Many Internet services, for example, World Wide Web servers have threatened the very existence of serials librarians and forced them to review the customary definition features of serials, particularly with respect to citable matters and their descriptions. The disposal of numerous document setups has brought up doubts related to computer file additions and the number of catalogue records to represent them. The ambiguity regarding record of location and holdings has created doubts in mind of many institutions which are reluctant to include catalogue records for the Internet resources.

(d) **Metadata:** Metadata is a key to the functionality of the systems holding the content, enabling users to find items of interest, record essential

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information about them, and share that information with others. Metadata organizes the available information regarding library materials do that it becomes easy for patrons to locate digital information is available.

(e) **Problem of availability online:** Sometimes publishers are not able to make all issues of their e-journal accessible by electronic means. At the time of selection, however, it should be clarified by the library authorities to the publisher as to how many specific subscriptions are expected in a particular period of time.

(f) **Preparation and support of employees and patrons:** Due to the ever increasing number of e-journals being published and the availability of diverse refined search and retrieval capabilities are the need of the hour. Hence, it is mandatory that skilled people are employed in libraries and present employees must be given adequate amount of training for maximum benefit of the library patron.

(g) **Problem of archiving:** Archiving means preservation of e-journals for future use. The question that comes to fore is that who should be given the responsibility of archiving of e-journals? It could be either done by the publishers or by the libraries themselves or yet another option is of creating a shared archiving at national or district level and providing access to all libraries.

(h) **Licensing publishers and the issue of copyright law:** Keeping in view the problems faced by licensing publishers, license agreement was brought into force. Licensing agreement is a written contract between user and creator of the e-journal which is made keeping many things in mind, for example: specifically allowed use, ascertaining the limit of access, openness of the network, single or multiple uses.

(i) **The problem of copyright:** Copyright of electronic material is an undefined but in this, formation of an easily comprehended legal outline is required for the benefit of publishers and libraries.

Difficulties in Collection Development in Digital Age

The difficulty in collection development in the digital age are as follows:

(1) Difficulty in ascertaining a user-friendly environment

A user-friendly environment is of utmost significance for patrons of a library who are not very comfortable with electronic materials like e-journal. Setting up a wireless local area network popularly known as LAN in the library along with appropriate organization of material is a good way of solving the problem. Use of LAN enables patrons to access the LAN from anywhere within the library, they even have the option of exploring the e-journal with their own appliance like an iPad or PC.

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(2) Difficulty of user training

Up gradation of the skills of the users is very important for effective utility e-journals. Generally all public libraries carry on with free user-training courses which are an effective way of training users for best utility.

(3) Difficulty of digital divide

Contemporary society sees a growing requirement of development of information skills at different places, for instance schools, universities, offices, railway stations and other areas of day to day life. While more and more people are making use of digital information in today's world yet, digital divide also seems to be increasing with each passing day and the same needs to be narrowed down. This digital divide is not just limited to accessing technology, but also extends to frames and information seeking abilities. Thus, in order to accurately narrow down this digital divide, there is a need to broaden the range of skills we address.

(4) Difficulty of classification in libraries

A library classification means a structure used to code and organize library materials based on their subjects. It is a process which streamlines browsing of subject. In a digital library, classification of materials depends on a pre-defined arrangement which advances the precision of information retrieval to a large extent and permits users to go through the material on a subject wise basis.

(5) Difficulty of staff development approach

To greet the future effectively, libraries must give up their current status of static resource centres and move towards becoming energetic instruction centres and provide to their patrons, exploration and learning. In order to achieve this perfect state, many challenges need to be overcome. On the way to accomplishing required changes in opinion and consequences, cooperative planning need to be put into practice to improve upon the present capabilities of the staff members employed in libraries. By doing this, people will start valuing public libraries far more than they do now for academic purposes.

The arrival of digital libraries has been hindered with numerous characteristics like the development of suitable technologies, storage related problems, management of rights, etc. Digital libraries, and all technologies connected to them along with related problems, are still somewhere in their infant stage. There are a very limited number of completely established digital libraries in the entire world. Moreover, every country has a different concept of a digital library and it has even been defined in various ways. However, exploration on digital libraries till now has been centred on the vessels and channels, not much emphasis has been laid on contents. There is no doubt that in a mainly print based customary library background, obtaining the content is a comparatively easy task. But it is quite the contrary when it comes to digital libraries. The unpredictability of digital content

by itself and the unpredictability of obtainability in itself is an ever growing problem in the field of digital libraries.

Important features while considering licensing for electronic resources

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Contrary to print library material, electronic material cannot be bought straight away. This process normally requires a license contract to be made. The license must be revised from time to time in order to notify and maintain the process of evaluation, and also to safeguard the fact that it reveals the outlooks of the selector before purchase based on the information collected and evaluated till now. Whenever possible, a typical classical license agreement which defines the library's rights must be made in maintained for reference. The language of the contract must be clear and simple.

Though all countries have different rules and regulations related to digital licensing, however, the following considerations must be looked while instituting a license.

- Authorized users and sites
- Provision of course packages
- Technique of access
- Recognized records/self
- Payment as per view
- Archiving strategy and permanent
- View, download, and print
- Connecting facility
- Course assets
- Patron/User data
- Accountability for unofficial or unlawful use
- Inter library loan (ILL)
- Content uniformity
- Bibliographic data
- Process of notifications
- Beginning date
- System assimilation
- Procedural support
- Support to customers
- User-friendliness of the web browser
- Certification
- Certain up time
- Resource providers authority to provide access

- Cancellations
- Value for money
- Uniformity with print alike
- Availability
- Drop-out clause
- Payment terms and conditions
- Administrative laws
- Grace period

Check Your Progress

1. Define the term 'e-journal.'
2. What are the five particular acquisition functions with respect to acquisition of fee-based e-journals?

7.3 LIBRARY SECURITY

The rapid development of information and materials imparting information is a consequence of the ever increasing evolution of knowledge. This means that there is an ardent need to consolidate and shape information materials and to make these materials sufficiently secure. Library materials, both physical and digital, need to be safeguarded against avoiding unauthorized access. To stop library resources from being accessed in an unauthorized manner, policies and procedures must be devised by library management and information professionals in order to secure and protect the information resources available in the library. A well-equipped library resource will comprise a healthy and abundant mix of print, audio and video records, digital resources and loads and loads of necessary paraphernalia for accessing data. These resources establish a library collection which provides information to its users. With each passing day library collections are changing quickly because of availability of increased electronic resources. The explosion of digital resources in no way indicates the disappearance of printed resources anywhere in the near or far future. With such an abundant availability of library resources or materials, it becomes obligatory on part of the library to ensure the safety of this material for which many security devices are installed and used. These measures ensure that the resources are neither stolen nor misused. Libraries put into practice many measures to ensure the safety of its material, e.g., employing security staff, physical frisking of patrons visiting the library, etc. Despite the numerous precautions being taken by library managements, library materials are still not safe. Hence, there is necessity for library managers to formulate substantial physical ways of securing library materials. Installation of telecommunication or electronic security systems is one way which can provide a safety and secure to library resources and equipment. To deliver sufficient security by the use of

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telecommunication, electronic systems like alarm systems, access control systems, video surveillance, etc., can be fitted in the library. Taking care of the following aspects however will decrease the security threat to any library:

- **Authenticity:** In order to maintain the security of a library, it is important that all information bearing materials, may it be electronic or physical, are genuine an authentic.
- **Physically securing the library (non-electronic):** Installing physical restrictions in a library is the foremost step in securing library materials.
- **Site design:** Planning of the library site and formulating its landscape design helps in securing the library in the long run. Provision of suitable and clear signs comprising off-site and entrance signs along with on-site signs, such as, well-marked directions, caution signs, parking signs, etc.
- **Library entrance and exit:** At the time of designing a library, care should be taken in securing all entry and exit points to the library. The best is to maintain a single entry point so that the library area could be secured properly and easily. As an additional security measure magnetic theft detection devices could be placed at these points which would an alarm on passing of unchecked library materials through these points.
- **Securing the windows:** Library windows could be secured by use of various security devices like locks, guards, grilles, bars, screens, and films. All windows of the library should be secured by fitting locks and these locks should not be easily accessible or manoeuvrable.
- **Protection of doors:** Security appliances like cylindrical and mortise locks, deadbolts, gates with iron rods, etc., secure the library doors so that no unwanted people can move in and out of the premises. A cylindrical lock is fitted into the knob of the door and a deadbolt lock provides additional protection by enhancing the metal support into the door jam. This system ensures the library's security in absence of personnel, during closed hours of the library.
- **Electronic security:** Burglar alarms, electronic access control and video surveillance, e.g., CCTV cameras or CTv systems, are some electronic security devices which help maintain library security.

Benefits of application of electronic security devices in libraries

- **Ultimate security:** Libraries are used by people of different ages throughout the day. CCTV cameras installed all across the library can be of great help for the safety of patrons while in the premises.
- **Prevention against stealing:** A library is an assemblage of valuable information material which needs to be guarded against theft. A video surveillance system is an excellent option in this regard.
- **Flexibility:** Video surveillance systems can be installed anywhere and thus can secure sensitive or hidden areas in the library.

- **Remote monitoring:** The footage covered by video surveillance cameras can be managed from anywhere through internet, thus they provide the ease of use from even places away from the library.

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Check Your Progress

3. Mention any two factors that can decrease the security threat to any library.
4. What are the benefits of application of electronic security devices in libraries?

7.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Electronic journals, also known as e-journals, and electronic serials, are scholarly journals or intellectual magazines that can be accessed via electronic transmission.
2. There are five particular acquisition functions with respect to acquisition of fee-based e-journals, such as follows:
   i. Deciding the cost
   ii. Mediating with the seller
   iii. Completion of the license contract
   iv. Encumbering the account
   v. Record of the order
3. The two factors that can decrease the security threat to any library are as follows:
   (i) Authenticity
   (ii) Site design
4. The benefits of application of electronic security devices in libraries are as follows:
   - Ultimate security
   - Prevention against stealing
   - Flexibility
   - Remote monitoring

7.5 SUMMARY

- Identifying the need of a well-stocked and well-patronized library there is an understandably high desire of a distinct policy in relation to collection of library material which must be managed in a scientific way in order to make the right impact.

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- The process of selection of library material therefore must be organized in a specific manner in order to streamline it and ensure transparency in the process.
- The Library Board confers the duty of selecting the library material to the librarian-in-chief who in turn, may or may not delegate this power to other members of the library staff.
- A public library must make available materials in all subject areas, in all possible formats, e.g., print, non-print, media, pictorial, CDs, DVDs, etc.
- A public library must have materials available for children as for adults and the selection criteria for selection of children's material should also be based on the same principles as that for adults' material.
- Media/non-print materials comprise items like DVDs, CDs, computer software, etc. There must be adequate availability of such material, on various subjects, in a public library which should have acquired in conformance with the material acquisition policies laid down by the library.
- E-Journals have gradually become the centre of R&D in modern times. Keeping this development in mind, most organizations related to the field of research and development, have started subscribing e-journals.
- The need of e-journal has been seen and felt in the growing realm of academic libraries also.
- Selection of e-journals is one among the foremost library functions in the field of library material collection.
- In order to maintain the security of a library, it is important that all information bearing materials, may it be electronic or physical, are genuine an authentic.
- Library windows could be secured by use of various security devices like locks, guards, grilles, bars, screens, and films. All windows of the library should be secured by fitting locks and these locks should not be easily accessible or manoeuvrable.

7.6 KEY WORDS

- **Bibliography:** Bibliography, as a discipline, is traditionally the academic study of books as physical, cultural objects; in this sense, it is also known as bibliology.
- **Booklist:** Booklist is a reading list of books having some unifying feature.
- **Metadata:** Metadata is a key to the functionality of the systems holding the content, enabling users to find items of interest, record essential information about them, and share that information with others.

7.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

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Short Answer Questions

1. What is collection management?
2. Mention some general principles with respect to library material.
3. Write a short note on digital library.
4. Identify some of the factors that can decrease the security threat to any library.

Long Answer Questions

1. Write a detailed note on e-journal.
2. Discuss the challenges in collection and management of e-journals.
3. Describe the difficulties in collection development in digital age.
4. Explain the important features while considering licensing for electronic resources.
5. Discuss the various benefits of application of electronic security devices in libraries.

7.8 FURTHER READINGS

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BLOCK - IV
MANAGEMENT INFORMATION SYSTEM

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UNIT 8 OVERVIEW OF MANAGEMENT INFORMATION SYSTEM

Structure

8.0 INTRODUCTION

An MIS system is a tech-driven, specialized system which enables the management to get access to required decision-oriented information that can help them to execute an efficient planning for their corporation. It is designed to streamline the process and power management so that profit and performance can be calculated well in advance. The MIS system provides a lot of help to the management by getting them access of accurate and timely information. This helps in meeting the organizational goals in a structured manner.

8.1 OBJECTIVES

After going through this unit, you will be able to:

- Learn about the Management Information System (MIS)
- Understand the importance of work analysis

- Discuss the significance of flow process charts
- Describe network analysis, PERT and CPM

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8.2 MANAGEMENT INFORMATION SYSTEM (MIS) AND DESIGNING

The following definition of MIS was developed by the Management Information System Committee of the Financial Executive Institute.

> An MIS is a system designed to provide selected decision-oriented information needed by management to plan, control and evaluate the activities of the corporation. It is designed within a framework that emphasizes profit planning, performance planning and control at all levels. It contemplates the ultimate integration of required business information sub-systems, both financial and non-financial, within the company.

It is a formal method of collecting timely and accurate information in a presentable form in order to facilitate effective decision making and implementation of these decisions in order to carry out organizational operations for the purpose of achieving the organizational goals.

8.2.1 Why is MIS Important?

It is important to set up effective management information systems for the following reasons.

First, most organizations have grown in size and complexity. This results in management being removed from the scene of operations and hence it must rely on the information provided to them by the line supervisors about any operational problems needing attention. The dynamics of the environment further adds to the complexity of organizational operations. Some of the continuously changing factors affecting the volume and the type of information handled are:

(a) Economic factors: These factors include sudden changes in the economic structure in any part of the world, sudden energy crisis, world-wide inflation rate, higher interest rates, unemployment rate, and changes in GNP and so on. All or some of these factors may affect a given organization, thus requiring the organization to process the information generated by these changes.

(b) Technological changes: These include new technological innovations in such areas as computers, use of satellites in telecommunication, audio-visual teleconferencing and so on.

(c) Social changes: These include shift in work force from blue collar to white collar jobs, higher level of education of workers, computer networking at home, pollution problems, changes in consumer preferences and so on.

(d) Political-legal factors: These include the effect of many new laws which are continuously being enacted and which affect the organizational systems.

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These laws include right to privacy, liability laws, anti-monopoly laws, truth in lending, truth in advertising, minimum wage standard laws and so on.

The second reason for growth in MIS is the need to control management's decisions. More and more, large organizations are decentralizing their operations so that more information is needed about the operations of the unit managers. The performance of all units must be closely monitored and steps must be taken if the performance of any unit is below expectations. MIS can be effectively used for measuring performance and bringing about any necessary changes in accordance with the organizational goals and plans.

The third reason for the rapid growth in the field of MIS is the widespread use of computer capabilities. The computers are becoming more powerful and less expensive to operate. They have large data storage capacities and retrieval of data has become easier and faster. This has made information handling easier.

8.2.2 Developing an MIS

Development of an effective management information system starts with an analysis of the types of decisions to be made and the types of support systems that are available to the managers in an organization. It basically consists of the design phase and the implementation phase.

The design phase

The design phase involves the following steps.

1. ***Identify various decisions that must be made to run an organization:*** Perhaps, the managers can be interviewed regarding their informational needs.
2. ***Set objectives for the system:*** The objectives would depend upon the manager's information needs, the costs associated with the system and the benefits derived from it. The objectives of MIS should be consistent with the mission and objectives of the organizations.
3. ***Prepare a feasibility report:*** The report would emphasize the necessity as well as economic feasibility of developing and implementing the system.
4. ***Prepare a technical report:*** This report contains the actual design including technical information regarding the hardware and software needed. It would also indicate the various components of the system and the methodology of implementing the system.

The implementation phase

Implementation includes the purchases and integration of necessary resources and putting the system into operation. According to Rue and Byars, implementation consists of the following steps:

- Acquiring the necessary facilities, equipment and personnel.
- Training the personnel

- Installing the new MIS
- Testing the new MIS
- Operating the system
- Evaluating the MIS to see if it is doing what it was designed to do

While there may be different approaches to designing an effective management information system, it is necessary to have a central location for processing all the information. This is a kind of 'management information centre'. This centre has all the hardware, software and all the technical help necessary to gather all the information at one location and sort it out so that the managers can find facts and turn these facts into management information.

A management information system basically is a set of procedures that systematically gathers all pertinent data, processes this data into a summarized presentable form of information and presents it to concerned managers so that they can make necessary decisions and take necessary actions based upon this information.

Check Your Progress

1. What is the full-form of MIS system?
2. What are the two phases involved in the development of MIS system?

8.3 WORK ANALYSIS

Work study means study of human work. British Standard 3138: 1969 defined work study as, 'A management service based on those techniques, particularly method study and work measurement, which are used in the examination of human work in all its contexts and which lead to the systematic investigation of all the resources and factors which affect the efficiency and economy of the situation being reviewed, in order to effect improvement.' This means that it is a procedure for understanding and determining the activities of the people, plant and machineries, identifying the factors which affect their efficiency and achieving economy through their optimum utilization.

Work study is a generic term for two inter-dependent techniques, i.e., method study and work measurement.

In the same British standard, method study has been defined as '… the systematic recording and critical examination of the factors and resources involved in existing and proposed ways of doing work, as a means of developing and applying easier and more effective methods and reducing costs'. Method study, therefore, is concerned with the way in which the work is done.

Work measurement is defined by the same British standard as 'The application of techniques designed to establish the time for a qualified worker to carry out a specified job at a defined level of performance'.

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The difference between work study and other productivity improvement techniques is that the latter involve major capital expenditure in plant or equipment. But work study ensures productivity by using existing resources. In work study, the human element is emphasized and importance is given to operation rather than to the technical process.

8.3.1 Objectives of Work Study

The primary objectives of work study are:

1. Effective use of plant and equipment
2. Effective use of human effort
3. Evaluation of human work

If the techniques of work study are not properly applied, they are likely to encounter resistance at all levels. Even trade unions acknowledge that work study provides the following benefits to workers:

(i) Eliminates drudgery, frustration and unhealthy working environment

(ii) Provides opportunity to e workers to increase their earnings (by achieving increased rate of output)

(iii) Strengthens the health of the organization at micro level and the nation as a whole at macro level

In 1952, the International Labour Organization emphasized the importance of work study and consultation and cooperation between employers and workers in its 35th session held at Geneva.

In the following sections you will learn the two techniques, i.e., method study and work measurement.

8.3.1 Methods and Evolution of Standard/Normal Time

Let us now discuss method study.

Method study

As you have learnt, method study is a method for examining, recording and analysing the existing way of doing work and proposing a method for improving the efficiency of a system. There may be unnecessary costs being incurred in the existing methods. In the method study, the reasons for these costs are identified. The critical examination of proposed methods also prevents unnecessary costs in the new jobs.

Objectives of method study

The main objectives of method study are as follows:

1. To identify the proper sequence of production operations
2. To optimize the utilization of machineries

3. To reduce the manufacturing cycle time by reducing idle time of machinery
4. To choose the right kind and amount of materials and reduce the raw material consumption per unit of production
5. To reduce wastages and production of defective products
6. To enhance the tool life and therefore reduce the tool cost per unit of production
7. To allocate work force optimally and reduce idle time of the operator by optimal utilization of human resources
8. To improve the processes and procedures involved in production
9. To improve the working environment in the workplace

The method study procedure

Method study is a scientific and systematic method by which an organization can determine the most appropriate method to manufacture a product. Now, why should an organization study a process? It should study a process to identify delays; reduce transport distances for both materials and labour; economize processes; reduce requirements of processing time; and thereby make the total operation simple. By doing a method study, the organization aims to eliminate any stage or step in the process that does not add any value to the process.

We begin the method study by first making a flowchart for the process.

The basic procedures involved in method study are shown in Figure 8.1.

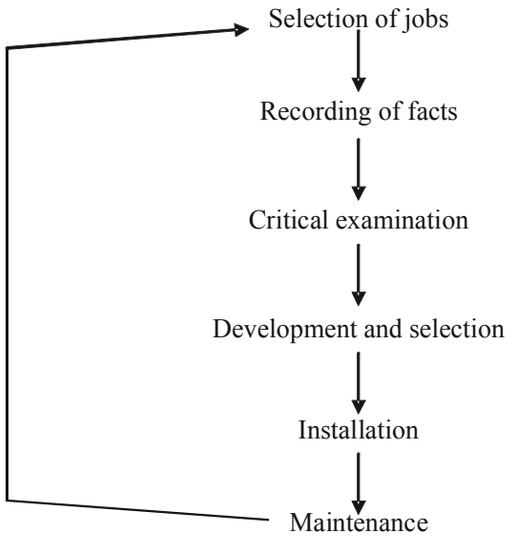

Fig. 8.1 *Flowchart of the Method Study Procedure*

1. Selection of jobs

Selection of a job for which method study is to be done is a managerial responsibility. The considerations for selecting a job could be economic, technical or human.

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(i) *Economic considerations:*

These include operations which could be holding up other production operations, such as:

- Needless movement of workmen and materials over long distances
- Operations that involve great deal of manpower
- Operations that involve poor utilization of men and machines
- Sections or departments from which too many suggestions for improvement are received

(ii) *Technical considerations:*

- Operations that produce a great deal of waste or defectives
- Operations that involve repetitive work
- Complaints that performance standards cannot be achieved
- Operations requiring frequent supervision
- Jobs with incompatible quality
- Operations involving discrepancies in materials and tool performance
- Jobs involving greater number of man hours for checking and rechecking work

(iii) *Human considerations:*

- Workers complain about being overworked
- Poor worker morale
- Frequent accidents and health hazards
- Inconsistency in the earnings of the employees due to overtime

2. Recording of facts

Accurate and precise recording of facts related to a method determines the success of the method study. A method study generally uses the graphical method to record facts such as completion time and labour required in a method. The graphical method uses five symbols to record the facts related to a method. They are:

Fig. 8.2 *Symbols Graphical Method*

(i) ***Operation:*** This symbol indicates that an activity is being done. Generally an operation is any activity that is adding some value to a product. It is a transformation process.

(ii) ***Transportation:*** This symbol indicates that the product, service or worker is moving from one location to another.

(iii) ***Inspection:*** This symbol stands for checking/ observing for quality/ correctness/adherence to specifications, etc.

(iv) ***Delay:*** This symbol indicates that the subject of study (product, service or worker) has to wait before starting the next process.

(v) ***Storage:*** This symbol indicates storage. Sometimes, T or P is written inside the triangle to indicate temporary storage or permanent storage respectively.

The advantages of graphical method over the descriptive method are that:

- It takes less effort and time.
- It helps isolate the valuable areas of a method from the useless areas.
- Critical examination becomes easier and more effective because it is visually clear.

3. Critical examination

Critical examination means analysing the facts related to a method. In critical examination, the facts related to a method should be examined as they are and not as they should be. Each step should be analysed in a logical sequence and hasty decisions should be avoided.

A systematic and methodical questioning process is used to conduct the critical examination. In the questioning process, all the activities whether related to processing, inspection, material handling or any other aspect of a method are recorded in a chart. After recording all the activities involved in a method, each activity is then examined carefully. There are five major factors related to an activity that need to be considered during the questioning process. These factors include:

(i) ***Purpose:*** Analyses whether the selected activity is necessary for completing a method or not.

The kinds of questions asked are – What activity is being done? Why is that activity being done? What will happen if that activity is not done? What else can be done? What should be done?

(ii) ***Place:*** Analyses whether the selected activity occurs at a specified place or not. Questions asked are – Where is that activity done? Why is it done there? What will happen if it is not done at that location and done elsewhere? Where else can it be done?

(iii) ***Sequence:*** Analyses whether the selected activity occurs at specified time and in a specific sequence or not. Questions asked are – When is the activity done? Is the performance of the activity at that time critical

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or can it be done at any time or in any sequence? Could it be combined with some other activity in the process?

(iv) ***Person:*** Analyses whether or not the right person performs the selected activity. Questions asked are – Who does the activity? Why should that person do that activity? Can it be done by someone else? Should the worker possess a high level of skills or will a lower skill level do?

(v) ***Means:*** Analyses whether or not the selected activity is done using proper materials, tools, jigs and fixtures, measuring instruments and gauges. Questions asked are – How is the activity done? Why is it done that way? Is there a better way to do the activity?

4. Development and selection

Development involves an analysis of all the ideas generated during critical examination and implementing these ideas practically. All the ideas generated during critical examination may not be practical. So the organization first needs to isolate the practical ideas from the conceptual ones. The selected ideas are then refined and developed during the development and selection process. The development process comprises three functions: evaluation, investigation and selection.

(i) ***Evaluation phase:*** All the ideas generated during critical examination are evaluated to assess their true value and determine whether they should be pursued or discarded. To isolate the practical ideas from the useless ones, they are first categorized as-

- Useful ideas
- Ideas with technical flaws
- Ideas that cannot be used immediately because of insufficient data or lack of requisite knowledge
- Ideas with more disadvantages than advantages

Ideas which are similar are clubbed. The cost of testing and implementation is estimated

(ii) ***Investigation phase:*** The ideas generated in the evaluation phase are investigated to determine how a suitable idea can be taken up for practical implementation. The investigation phase includes preparing layouts, organizing discussion with personnel from various departments such as design and quality control, making prototypes, conducting trial runs, getting work measurement studies redone from industrial engineering and preparing fresh cost estimates. Every idea is investigated to check its economic and technical feasibility.

(iii) ***Selection:*** The selection stage involves choosing the best possible alternative from the available options. Various factors are taken into consideration such as investment required, production rate expressed in terms of cycle time per unit of product, manufacturing cost per unit of production and physical

effort required for performing the method. Every factor is assigned some points. The points acquired by every factor are added and the alternative that acquires maximum points is selected.

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5. Installation

Implementation of the proposed method is known as installation. The proposal for change in method is presented to the management indicating the sequential steps that must be taken to implement the changed proposal. On receipt of formal approval, the implementation plan is prepared. A demonstration of the proposed method can be held to clear misconceptions and apprehensions. Training of the employees who will use the new methods can also be done.

6. Maintenance

After implementing a method, it is important to monitor the performance of the method. A feedback mechanism is needed to inform the concerned authorities about the results of the monitoring process. The savings accrued by using the new method should be audited to determine whether or not the implementation work is complete. The audit will also reveal additional factors that can enhance profits and then the whole cycle will start again.

The approach followed by the practitioner is also reviewed at this stage.

- Did he follow the effective approach? Does it need any correction?
- Was the implementation process efficient favourable? If not, what changes are required in the approach so that the implementation of future projects is smooth?
- Which methods were used for efficient data collection? Can these methods be used in similar projects in future?

Performance appraisal: The last step in the maintenance stage involves performance appraisal. This helps determine the productivity gains of the proposed method that are evaluated at regular intervals.

As human reactions play an important role in a method study, human consideration forms an important part in selecting a job. Workers should accept changes proposed by the method study. A change which is not fully accepted by the workers is not considered a good change. It is human nature to resist change. Opposition by the workers can be avoided by taking them into confidence. The following points should be considered in order to avoid resistance by the workers:

- Proposed changes should be intimated to the workers in advance because any surprise change is likely to be opposed.
- Approved methods must be properly introduced into the organization.
- Changes should be made slowly so that the organization can easily absorb them. This helps the workers to gradually adapt themselves to the changed methodology.

- Implement the methods in such a way that the entire human resource of the organization is won over.

Work Measurement

NOTES

Work measurement is a technique to find out the time required to do any activity, at a predetermined level of performance, by a qualified worker. In order words, it is a technique to develop time standards for the performance of jobs.

To establish usable standards, the operation must first be trained to do a particular job. These methods analysis and study should provide work measurement.

Objectives of work measurement

The primary objectives of Work measurement are –

1. To establish the standard time for completing a job.
2. To fix the salary of employees and to determine and calculate incentives based on their performance.
3. To estimate the machine and labour requirements for planning and scheduling of production, the time required for jobs and when deliveries are possible, etc.
4. To distribute workload among the workers.
5. To calculate the number of employees needed for various tasks of the organization.
6. To determine the number and nature of machines that a worker can run.
7. To help managements accurately determine the costs incurred in Production.
8. To compare the efficiency of various alternative methods and determining the best alternative among them.
9. To establish standards for the performance of employees and utilization of machinery. This way, substandard workers can be identified.
10. To control costs by uncovering wastages of both machine and labour and thus help to increase the operating efficiency.
11. To track the performance of workers, their training needs, etc.

Techniques of work measurement

There are several techniques for measuring work. The most common are:

1. Time study
2. Work sampling
3. Standard data
4. PMTS – Predetermined motion time studies.

We will now study them in detail.

Time study

NOTES

This method of work measurement is generally used when the work is repetitive. It is a sampling process in which a few observations of a sample are taken. The inferences drawn from the study of the sample are used to determine the time required for the performance of the subsequent cycles by the worker.

First, the job or task selected for time studies is split or broken down into activities. Then each activity is timed separately using devices such as stopwatch.

Some principles are followed in breaking down the job into its activities. These are:

1. Each activity should be of short duration, but at the same time long enough for it to be timed with a stopwatch.
2. The activities of the operator and activities of the machinery should be distinguished. Both should be timed separately.
3. Delays of the operator and the equipment should also be indicated separately.

Several readings need to be taken for each activity. The average of these readings will give the average time for an activity. The average time for each activity of a job is added to get the average time for a job.

The time thus obtained must be 'normalized' to make it usable for all the workers. So a rating factor is used to give the normal time. To take an example, if an operator completes a task in two minutes and it is estimated that he is performing 20 per cent faster than normal, then the performance rating of the operator is said to be 1.2 times or 120 per cent of the normal.

The normal time for the task will be 2 minutes × 1.2 = 2.4 minutes.

So Normal time (NT) = observed performance time per unit × Performance rating.

When an operator is observed for a period of time during which he produces a number of units, then the Normal time is given as -

$$NT = \frac{\text{Time worked}}{\text{No. of units produced}} \times \text{Performance rating} \quad \ldots 8.1$$

Standard time is calculated by adding allowances for personal needs (such as breaks for freshening up or for drinking tea), inevitable work delays (such as lack of material or breakdown of machinery), and worker fatigue (physical or mental), to the normal time.

Standard time (ST) = Normal time (NT) + (Allowances x Normal time)

... 8.2

Note: Allowances may be given in minutes or as a percentage of the normal time

$$ST = NT (1 + Allowances) \quad \text{... 8.3}$$

This equation is most often used in practice.

Work sampling

NOTES

This is another technique for measuring an activity. This method is similar to Time Study in that here also, we observe a portion or sample of the work activity. Inferences are drawn based on the findings in this sample and this is applied for the activity in general.

For example, if a blacksmith is observed 100 random times during a week and it is found that he is making a hammer 30 out of the 100 times, it can be inferred that the blacksmith spends 30 per cent of his time in making hammers.

Note: The time required to make an observation is dependent on the object or activity that is being observed. Many times, only a glance is required to determine the activity, and most of the studies require only few seconds' of observation.

In work sampling, the size of the sample is a major issue. The level of statistical confidence desired in the results is considered before deciding the sample size. The account of observations needed in a work sampling study can be fairly large, ranging from several hundred to several thousand, depending on the activity and level of accuracy required.

The three primary applications for work sampling are:

1. To determine the average time that the machine and labour are idle or running. This is also called 'activity time' for personnel and machinery.
2. To develop a performance index for workers. These performance measures help in performance evaluation of the workers, fixing of pay, bonus, penalties, etc.
3. To fix time standards, that is, the standard time required for a task.

Following is the sequence of activities in doing a work sampling study –

1. Identify the activity for which the study is to be done.
2. Estimate the percentage of time the selected activity takes, to the total time (e.g. the machine is working 80 per cent of the time). These estimates are made by the analyst from existing data, guesswork or a pilot work sampling study.
3. State the degree of accuracy desired in the study results.
4. Determine the particular times when each observation is to be made.
5. Two or three times during the study period, the data collected are examined and if necessary, the required sample size and number of observations to be made are altered.

In a work sampling study the number of observations to be taken is equally divided over the study period. Thus, if 500 observations are to be made over a

period of 10 days, observations are usually scheduled at 500/10, or 50 per day. A specific time may also be assigned for each day's observations.

Standard data

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For jobs in which there are a large number of repetitive operations with similar characteristics, companies often develop standard data through time studies or predetermined data. The advantage of having standard data is that each job need not undergo a time study. Standard data is applied in a similar manner as predetermined motion time data, except on a less detailed level.

For instance, an income tax service may develop standard data on the time required to fill out different tax forms. From this data, it is easy to provide an estimate of the cost for a client based on information about the forms required for the client. Standard data are also useful in estimating times for jobs with different characteristics through regression - type equations.

Standard data is used in the following manner. –

Example: In a warehouse the standard time required to unload 10 Kg boxes from a truck is 2 minutes per box. Due to increasing allowances for fatigue, suppose this goes up by 0.10 minutes for each additional 2 kgs. The standard time for a box of weight 'b' is $2 + 0.10/2 (b – 10)$ minutes.

Therefore, if 50 boxes, each weighing 18kgs are to be unloaded, the standard time required is $50 \{2 + .05 (18 – 10)\} = 50 \times 2.4 = 120$ minutes, or 2 hours.

Having an adequate data base of standard data makes such calculations easy to compute.

Predetermined motion time studies (PMTS)

An alternative to time study is the use of standard times for work elements that have been predetermined from long periods of observation and analysis. The major advantage of this method is that only motion patterns must be known; alternatives may be evaluated prior to actually trying them out. In order for such a system to be universally applied, it is necessary to define a basic set of motions into which any task can be split into.

However, these motions must be refined to account for various degrees of difficulty; for example, lifting a bag of 5 kg is easier than lifting 5 kg of cotton wool, and thus should be expected to take lesser time.

Since it is necessary to apply micro-motion analysis to such systems, these systems are often costly to use. There are a number of different motion time systems. One of the best known and most widely used is methods time measurement (MTM). This system was developed in 1948 from studies of motion picture films of assembly operations.

NOTES

Check Your Progress

3. Define work measurement.
4. What are the primary objectives of work study?

8.4 FLOW PROCESS CHART/DECISION FLOW CHARTS

The flow process chart can also be called the decision flow chart.

Decision-Making Process

The decision-making process involves the following steps:

- Determining the existence of problems and/or opportunities
- Generating the alternative course of action
- Analysing/choosing/selecting a course of action
- Implementing the course of action
- Monitoring, following-up and initiating course-corrective action

The various steps in the decision-making process have been illustrated by Griffin as shown in the following Table 8.1.

Table 8.1 *Various steps in the decision-making process*

	Step	Detail
1.	Recognizing and defining the situation	Some stimulus indicates that a decision must be made. The stimulus may be positive or negative.
2.	Identifying alternatives	Both obvious and creative alternatives are desired. In general, the more significant the decision, the more alternatives generated.
3.	Evaluating alternatives	Each alternative is evaluated to determine its feasibility, its satisfactoriness and its consequences.
4.	Selecting the best alternative	All situational factors are considered and the alternative that best fits the manager's situation is chosen.
5.	Implementing the chosen alternative	The chosen alternative is implemented into the organizational system.
6.	Follow-up and evaluation	At some time in the future, the manager should ascertain the extent to which the alternative chosen in Step 4 and implemented in Step 5 has worked.

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The decision-making process could be represented as shown in the following flow chart:

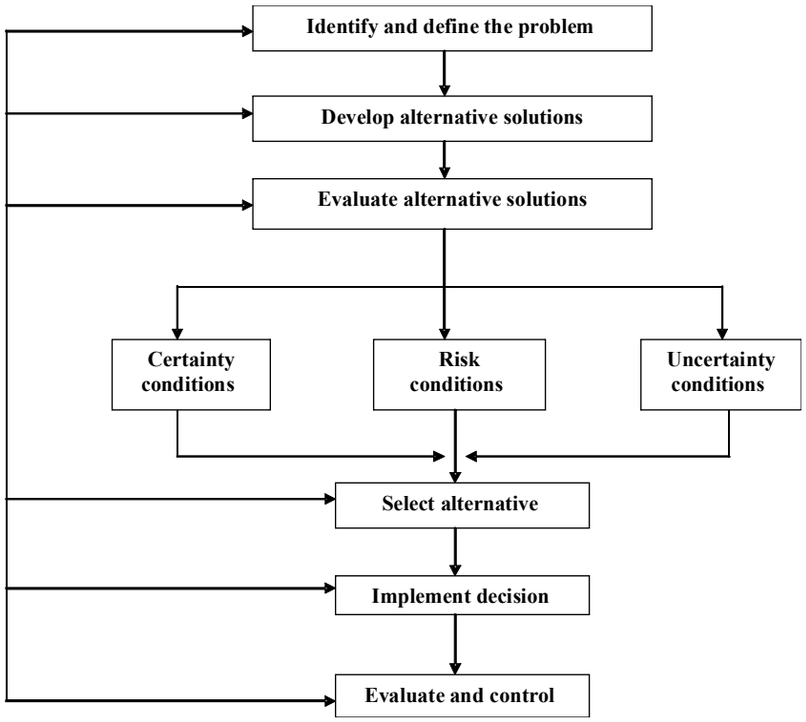


Fig 8.3 *Decision Making Process*

Block Diagram

A diagram which has such a system that the principle functions are represented with the help of blocks is called a block diagram. The blocks in such a diagram are connected through lines which represents the relationships of the blocks. Block diagrams are used on a large scale in hardware design, electronic design, software design and other engineering activities.

Block diagrams are usually used for providing with the less detailed descriptions, being intended to clarify overall concepts having no concern for the details of implementation. A block diagram can be compared to a world map in which major cities may be listed but the minor county roads as well as the city streets may not be mentioned.

Check Your Progress

5. What is a block diagram?
6. What is the use of bock diagrams?

8.5 GANTT CHART

NOTES

The management has at its disposal a number of control techniques, which it can employ depending upon the type of situation that exists. A control technique or tool is a specific method or procedure which deals with the pertinent organizational information in such a manner that the management is able to implement a suitable control strategy in order to assess the performance and growth of the organizational operations.

Control Techniques

Some of the standard control techniques are as follows:

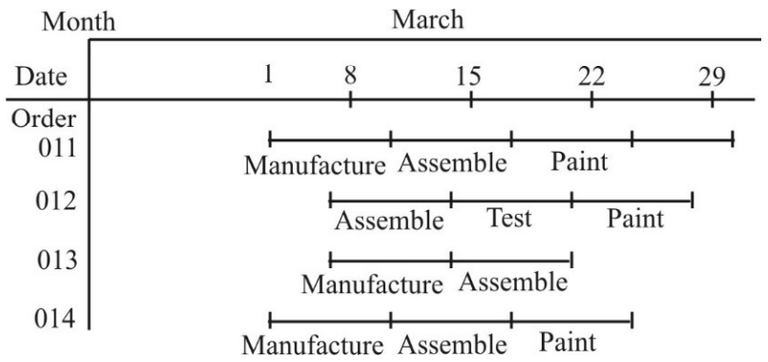
1. Gantt chart
2. Break-even analysis
3. Budgetary control
4. PERT and CPM
5. Human asset accounting

Gantt Chart

Gantt chart is a powerful instrument which aids in planning and control for comparatively simple projects, especially in the area of scheduling manufacturing of a given item. The basic concept involves representation of work progress over a period of time in the form of a bar chart. It is a kind of a graph on which projected and completed phases of manufacturing are plotted in relation to predetermined increments of time.

The increments of time necessary for the desired degree of control are recorded on the horizontal axis of the chart. Various phases of activities or various job orders are recorded on the vertical axis of the chart. The time segments allotted to the performance of each phase of operation are plotted and a record is kept of the progress of the production.

A Gantt chart is exhibited on page …..



An examination of the chart shows that there are four orders being filled each requiring the performance of certain activities. As an example, order 011, the product goes through four operations of manufacturing, assembling the parts together, painting the unit and then testing it. Similarly order number 012, requires the sequential steps of assembling, testing and so on. The first job begins on March 3rd and it is manufactured by March 12th when assembly begins and finishes on March 20th etc. These starting and finishing dates for each operation and the total job are established after a careful analysis of resources available.

The manager can plot the progress through each operation along with the expected time and see at a glance whether the progress is on time, ahead of time or behind time. If there is a deviation from the excepted then this deviation can be investigated and corrective action taken before it develops into a crisis.

The important feature of the Gantt chart is that it facilities control. By continuously comparing the actual performance against the expected performance, it is possible to keep the process under control.

Check Your Progress

7. What is a control technique?
8. What is a Gantt chart?

8.6 NETWORK ANALYSIS: PERT AND CPM

Network scheduling is a technique used for planning and scheduling large projects, in the fields of construction, maintenance, fabrication and purchasing of computer systems, etc. It is a method of minimizing the trouble spots such as production, delays and interruptions, by determining critical factors and coordinating various parts of the overall job.

There are two basic planning and control techniques that utilize a network to complete a predetermined project or schedule. These are Programme Evaluation Review Technique (PERT) and Critical Path Method (CPM).

A project is defined as a combination of interrelated activities, all of which must be executed in a certain order for its completion.

The work involved in a project can be divided into three phases, corresponding to the management functions of planning, scheduling and controlling.

1. ***Planning:*** This phase involves setting the objectives of the project as well as the assumptions to be made. It also involves the listing of tasks or jobs that must be performed in order to complete a project under consideration. In this phase, in addition to the estimates of costs and duration of the various activities, the manpower, machines and materials required for the project are also determined.

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2. ***Scheduling:*** This consists of laying the activities according to their order of precedence and determining the following:
   (*i*) The start and finish times for each activity
   (*ii*) The critical path on which the activities require special attention.
   (iii) The slack and float for the non-critical paths.
3. ***Controlling:*** This phase is exercised after the planning and scheduling. It involves the following:
   (*i*) Making periodical progress reports
   (*ii*) Reviewing the progress
   (*iii*) Analyzing the status of the project
   (*iv*) Making management decisions regarding updating, crashing and resource allocation, etc.

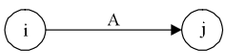
Basic Terms

To understand the network techniques, one should be familiar with a few basic terms of which both CPM and PERT are special applications.

Network: It is the graphic representation of logically and sequentially connected arrows and nodes, representing activities and events in a project. Networks are also called arrow diagrams.

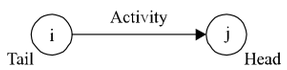
Activity: An activity represents some action and is a time consuming effort necessary to complete a particular part of the overall project. Thus, each and every activity has a point of time where it begins and a point where it ends.

It is represented in the network by an arrow,

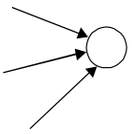


Here *A* is called the activity.

Event: The beginning and end points of an activity are called events or nodes. Event is a point in time and does not consume any resources. It is represented by a numbered circle. The head event called the *j*th event always has a number higher than the tail event, which is also called the *i*th event.



Merge and burst events: It is not necessary for an event to be the ending event of only one activity as it can be the ending event of two or more activities. Such an event is defined as a merge event.



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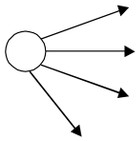
If the event happens to be the beginning event of two or more activities, it is defined as a burst event.



Preceding, succeeding and concurrent activities: Activities that must be accomplished before a given event can occur, are termed as *preceding activities.*

Activities that cannot be accomplished until an event has occurred, are termed as *succeeding activities.*

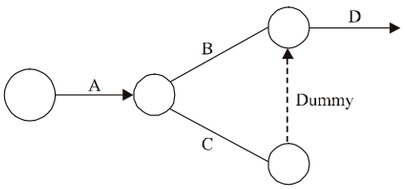
Activities that can be accomplished concurrently, are known as *concurrent activities.*

This classification is relative, which means that one activity can be preceding to a certain event, and the same activity can be succeeding to some other event or it may be a concurrent activity with one or more activities.

Dummy activity: Certain activities, which neither consume time nor resources but are used simply to represent a connection or a link between the events are known as dummies. It is shown in the network by a dotted line. The purpose of introducing dummy activity is:

(*i*) To maintain uniqueness in the numbering system, as every activity may have a distinct set of events by which the activity can be identified.

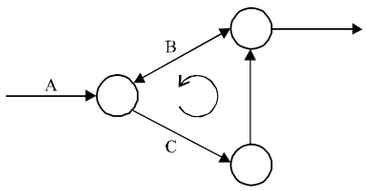
(*ii*) To maintain a proper logic in the network.



Common Errors

Following are the three common errors in a network construction:

***Looping* (*cycling*):** In a network diagram, a looping error is also known as cycling error. Drawing an endless loop in a network is known as error of looping. A loop can be formed if an activity is represented as going back in time.



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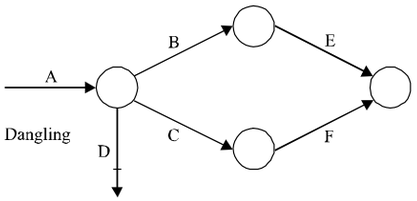
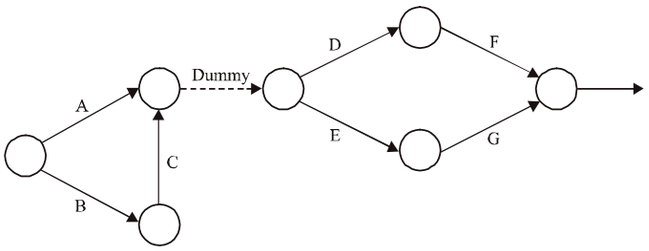
Dangling: To disconnect an activity before the completion of all the activities in a network diagram, is known as dangling.



Redundancy: If a dummy activity is the only activity emanating from an event and can be eliminated, it is known as redundancy.



Rules of Network construction

There are a number of rules in connection with the handling of events and activities of a project network that should be followed.

(*i*) Try to avoid arrows that cross each other.

(*ii*) Use straight arrows.

(*iii*) No event can occur until every activity preceding it has been completed.

(*iv*) An event cannot occur twice, i.e., there must be no loops.

(*v*) An activity succeeding an event cannot be started until that event has occurred.

(*vi*) Use arrows from left to right. Avoid mixing two directions, vertical and standing arrows may be used if necessary.

(*vii*) Dummies should be introduced only if it is extremely necessary.

(*viii*) The network has only one entry point called the start event and one point of emergence called the end or terminal event.

Critical activity: An activity is said to be critical if a delay in its start cause a further delay in the completion of the entire project.

We shall use the following notation for basic scheduling computations.

(i, j) = Activity (i, j) with tail event i and head event j

Tij = Estimated completion time of activity (i, j)

$ESij$ = Earliest starting time of activity (i, j)

$EFij$ = Earliest finishing time of activity (i, j)

$LSij$ = Latest starting time of activity (i,j)

$LFij$ = Latest finishing time of activity (i,j).

Critical path: The sequence of critical activities in a network is called the critical path. It is the longest path in the network, from the starting event to the ending event and defines the minimum time required to complete the project. In the network it is denoted by a double line and identifies all the critical activities of the project. Hence, for the activities (i,j) to lie on the critical path, following conditions must be satisfied.

(*a*) $ESi = LFi$

(*b*) $ESj = LFj$

(*c*) $ESj - ESi = LFj - LFi = tij$

ESi and ESj are the earliest start and finish time of the events i and j.

LFi and LFj are the latest start and finish time of the events i and j.

Critical Path Method (CPM)

The iterative procedure of determining the critical path is as follows:

Step 1 List all the jobs and then draw an arrow (network) diagram. Each job is indicated by an arrow with the direction of the arrow showing the sequence of jobs. The length of the arrows has no significance. The arrows are placed based on the predecessor, successor and concurrent relation within the job.

Step 2 Indicate the normal time (tij) for each activity (i, j) above the arrow, which is deterministic.

Step 3 Calculate the earliest start time and the earliest finish time for each event and write the earliest time Ei for each event i in the . Also calculate the latest finish and latest start time. From this we calculate the latest time Lj for each event j and put it in the ?.

Step 4 Tabulate the various times, namely, normal time, earliest time and latest time on the arrow diagram.

Step 5 Determine the total float for each activity by taking the difference between the earliest start and the latest start time.

Step 6 Identify the critical activities and connect them with the beginning and the ending events in the network diagram by double line arrows. This gives the critical path.

Step 7 Calculate the total project duration.

Note: The earliest start and finish time of an activity, as well as the latest start and finish time of an activity are shown in the table. These are calculated by using the following hints.

To find the earliest time, we consider the tail event of the activity. Let the starting time of the project namely $ESi = 0$. Add the normal time with the starting time, to get the earliest finish time. The earliest starting time for the tail event of the

NOTES

next activity is given by the maximum of the earliest finish time for the head event of the previous activity.

Similarly, to get the latest time, we consider the head event of the activity.

The latest finish time of the head event of the final activity is given by the target time of the project. The latest start time can be obtained by subtracting the normal time of that activity. The latest finish time for the head event of the next activity is given by the minimum of the latest start time for the tail event of the previous activity.

Programme Evaluation and Review Technique (PERT)

The network methods discussed so far may be termed as deterministic, since estimated activity times are assumed to be known with certainty. However, in the research project or design of a gear box or a new machine, various activities are based on judgement. It is difficult to obtain a reliable time estimate due to the changing technology since time values are subject to chance variations. For such cases, where the activities are non-deterministic in nature, PERT was developed. Hence, PERT is a probabilistic method, where the activity times are represented by a probability distribution. This distribution of activity times is based on three different time estimates made for each activity, which are as follows:

(*i*) Optimistic time estimate

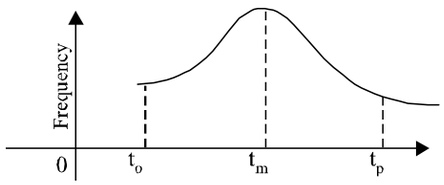
(*ii*) Most likely time estimate

(*iii*) Pessimistic time estimate

Optimistic time estimate: It is the smallest time taken to complete the activity, if everything goes well. There is very little chance that an activity can be completed in a time less than the optimistic time. It is denoted by *to* or *a*.

Most likely time estimate: It refers to the estimate of the normal time the activity would take. This assumes normal delays. It is the mode of the probability distribution. It is denoted by *tm* or *m*.

Pessimistic time estimate: It is the longest time that an activity would take, if everything goes wrong. It is denoted by *tp* or *b*. These three time values are shown in the following figure.



Time distribution curve

From these three time estimates, we have to calculate the expected time of an activity. It is given by the weighted average of the three time estimates,

$$te = \frac{t_o + 4t_m + t_p}{6}$$

[• distribution with weights of 1, 4 and 1, for *to*, *tm* and *tp* estimates respectively.]

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Variance of the activity is given by,

$$?2 = \left[\frac{t_p - t_o}{6}\right]^2$$

The expected length (duration), denoted by to *Tc* of the entire project is the length of the critical path, i.e., the sum of the *tc*'s of all the activities along the critical path.

The main objective of the analysis through PERT is to find the completion for a particular event within the specified date *Ts*, given by $P(Z \times D)$ where,

$$D = \frac{\text{Due date} - \text{Expected date of completion}}{\sqrt{\text{Project variance}}}$$

Here, *Z* stands for standard normal variable.

Check Your Progress

9. What is network scheduling?
10. Define project.

8.7 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The full-form of MIS system is Management Information System.
2. The two phases involved in the development of MIS system is design phase and implementation phase.
3. Work measurement is defined as the application of techniques designed to establish the time for a qualified worker to carry out a specified job at a defined level of performance.
4. The primary objectives of work study are effective use of plant and equipment, effective use of human effort and evaluation of human work.
5. A diagram which has such a system that the principle functions are represented with the help of blocks is called a block diagram.
6. Block diagrams are usually used for providing with the less detailed descriptions, being intended to clarify overall concepts having no concern for the details of implementation.

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7. A control technique or tool is a specific method or procedure which deals with the pertinent organizational information in such a manner that the management is able to implement a suitable control strategy in order to assess the performance and growth of the organizational operations.
8. Gantt chart is a powerful instrument which aids in planning and control for comparatively simple projects, especially in the area of scheduling manufacturing of a given item.
9. Network scheduling is a technique used for planning and scheduling large projects, in the fields of construction, maintenance, fabrication and purchasing of computer systems, etc.
10. A project is defined as a combination of interrelated activities, all of which must be executed in a certain order for its completion.

8.8 SUMMARY

- An MIS is a system designed to provide selected decision-oriented information needed by management to plan, control and evaluate the activities of the corporation.
- It is a formal method of collecting timely and accurate information in order to facilitate effective decision making and implementation of these decisions.
- Most organizations have grown in size and complexity. This results in management being removed from the scene of operations and hence it must rely on the information provided to them by the line supervisors about any operational problems needing attention.
- Development of an effective management information system starts with an analysis of the types of decisions to be made and the types of support systems that are available to the managers in an organization.
- A management information system basically is a set of procedures that systematically gathers all pertinent data, processes this data into a summarized presentable form of information and presents it to concerned managers so that they can make necessary decisions and take necessary actions based upon this information.
- Work study is a generic term for two inter-dependent techniques, i.e., method study and work measurement.
- The difference between work study and other productivity improvement techniques is that the latter involve major capital expenditure in plant or equipment. But work study ensures productivity by using existing resources.
- As you have learnt, method study is a method for examining, recording and analyzing the existing way of doing work and proposing a method for improving the efficiency of a system.

- Method study is a scientific and systematic method by which an organization can determine the most appropriate method to manufacture a product.
- Work measurement is a technique to find out the time required to do any activity, at a predetermined level of performance, by a qualified worker. In order words, it is a technique to develop time standards for the performance of jobs.
- For jobs in which there are a large number of repetitive operations with similar characteristics, companies often develop standard data through time studies or predetermined data. The advantage of having standard data is that each job need not undergo a time study.
- A diagram which has such a system that the principle functions are represented with the help of blocks is called a block diagram.
- The management has at its disposal a number of control techniques, which it can employ depending upon the type of situation that exists.

8.9 KEY WORDS

- **Diagram:** A diagram is a symbolic representation of information according to some visualization technique.
- **Break-Even:** Break-even, often abbreviated as B/E in finance, is the point of balance making neither a profit nor a loss.
- **Examination:** An examination is a formal test that you take to show your knowledge or ability in a particular subject, or to obtain a qualification.

8.10 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Why is MIS important?
2. Write a short note on work measurement.
3. What are the objectives of work study?
4. What are the five major factors related to an activity that need to be considered during the questioning process?
5. What are the techniques of work measurement?
6. What are the three primary applications for work sampling?

Long Answer Questions

1. Explain the phases involved in the development of an MIS system.
2. What are the basic procedures involved in method study?

3. What are the objectives of work measurement?
4. Discuss PERT and CPM techniques of network analysis.

NOTES

8.11 FURTHER READINGS

Evans, G. Edward. 2005. *Developing Library and Information Centre Collections*. New York: Libraries Unlimited.

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UNIT 9 HOUSEKEEPING OPERATIONS

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Structure

9.0 INTRODUCTION

The basic housekeeping functions common to all types of libraries are acquisitions including serials control, cataloguing, circulation and maintenance. Their operations are highly labour intensive routine clerical activities performed by human beings. Contemporary libraries are multifaceted organizations which are run on the basis of numerous processes and functions. Libraries came to be run on Integrated Library Systems (ILS) some years ago. There has not been much change in the fundamental way and procedure of functioning of the traditional ILS.

9.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss housekeeping operations
- Know about license negotiation and rights issue
- Understand technical processing section
- Describe the procedures and methods of maintenance and stock verification

9.2 HOUSEKEEPING FUNCTIONS

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Traditionally, the following are the house keeping functions which have been carried out by libraries and still in vogue:

- Materials acquisition
- Classification and cataloguing
- Interlibrary loan and circulation
- Serials management
- Reference services

All the above mentioned functions performed in a library can be together grouped as the house keeping functions of a library. Let us now understand in brief as to how these functions are carried out in order to run a library on a day to day basis. Every procedure encompasses numerous automatic functions which have been touched upon briefly in the following pages. These explanations convey the significance and meaning of the functions involved in each of these operations. Mostly all libraries perform these functions, however, there may be some variations depending upon regional requirements or specific needs of the people patronizing the library.

9.2.1 Book/Information Resource Selection and Acquisition Section

Out of the numerous housekeeping functions performed by use of integrated library software the first and foremost is the acquisition of library materials for which there is a perfect module in place in the software. This module allows the employees of the library to take care of the following main functions concerning library material acquisition:

- Managing suggestions of the patrons and staff
- Placing or cancelling orders and giving reminders
- Accepting the ordered library material and accessioning it
- Processing bills of lading and issuing payments
- Managing and processing fund control
- Master file controlling like money, financial planning, sellers and publishers

With the help of this module, library staff is able to search the complete database of library materials in order to rule out any duplicate holdings. The acquisitions department of the library is responsible for buying books, documents, and all other collections for the library. All procedures of physical acquisition process are computerized. Other than this, other facilities are also provided and reports made out of the date once endorsed. The acquisition process contains mainly of repetitive work because basically the same information is repeated at different stages beginning from the process of selection of material to the procurement

processes. The process of acquisitions entails a huge amount of record keeping along with overcoming normal problems related to tracking of orders and finding out the time of settlement of claims. The system of manual acquisition includes lot of labour comprising extensive documentation, which ordinarily produces just a restricted amount of management information. Computerized system of acquisition, on the other hand, reduces the amount of paper work and makes a wide variety of reports, which are helpful in good decision- making at different stages of acquisition operation. Acquisition includes all features of the procuring all kinds of library materials by various means. Contemporary library procedures prefer automated acquisition systems due to the following reasons:

- To cut down on manual labour- and paper-demanding work, an integral part of manual acquisitions.
- To maintain and renew info regarding all acquisitions activities.
- To control ordering, claiming and cancellation activities in an effective and efficient manner.
- To give precise and appropriate information related to finances.
- To make available essential management information reports, based on their requirement.

Check Your Progress

1. What is the first housekeeping function performed by the use of integrated library software?
2. What is the benefit of computerized system of acquisition?

9.3 LICENSING NEGOTIATION AND RELEVANT RIGHTS ISSUE

There is a simple technique following which reproductions of original material, available under copyright, can be made available for use in public libraries. There is a legal method following which, without taking direct permission from the owner of the copyright this material can be used commercially for the benefit of library users.

9.3.1 Functioning of a Library License

A license may be purchased for a prescribed fee, which can vary based on the geographical location of the library and its type. Based on the permission granted by the license a single copy of an extract forming a part of the work published may be made for using it commercially. There is however a need to complete all prescribed paper work before actually making the copy. Copies may be made from any book, periodical, magazine or other monthly publication, it should however, be included in the list of the license rights holders. Some licenses allow making

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single copies whereas some have the provision of multiple copy authorization. There are various types of licenses which apply to different kinds of library materials, for example, print materials, DVDs, CDs, e-journals etc. These licenses generally do not cover those materials which are available on the internet, by means of digital subscriptions or on electronic media. This license does not permit the making of a digital copy by scanning or photographing a published work.

Making multiple copies under the library licenses

Making multiple copies of the library material, whether print or electronic media is allowed only with the prior permission of the owner of the copyright, or on purchase of additional license under which a person or an organization is authorized to make further copies.

Indemnity

If the seeker/holder of the license agrees to comply with all terms and conditions laid out in the license they will be indemnified against any claim for copyright violation. However, there are certain conditions laid out in each license which need to be fulfilled in case seeking indemnity and an advance notice also needs to be given to the licensing authority in order to take requisite action. The indemnity may fail if the prerequisite conditions specified in the license are not met.

General

Library licenses are generally governed by local laws of the land and all parties must agree to submit to the particular jurisdiction of the concerned court in respect of any assertion or concern related to the License.

9.4 TECHNICAL PROCESSING SECTION

Technical processing section is a very important department of any library which includes maintenance of catalogues, classification, covering and indexing of books and other library items. This job requires dedicated and qualified team members who have eminent experiences and substantial aptitude to accomplish technical procedures with respect to all library items and information material. In order to accomplish the technical processing services members of this department make use of most recent materials available that the library can afford, Let us have a look at some technical processes in an average library:

Serials Control Management

The difficult task of observance of serials can be simply and efficiently handled by the use of Serial Control module. This module generally takes care of the following functions:

- Prediction, check-in and arrival of issues
- Renewal of old subscriptions and granting new subscriptions

- Propositions and suggestions
- Searching all items
- Management of master database
- Generating reminders
- Management of binding process
- Control over fund and payment
- Generation of reports

Serials management is an essential part of library operations which is taking a more and more complex shape with each passing year. With the advent of electronic journals, Serials Control management has become even more complicated. Serials management has at all times been an area demanding hard manual labour, which needs immense attention so that there is complete accuracy and even the minutest of details is not missed. The advantages of the use of computerization in almost all areas of library operations do not need to be highlighted anymore. Today, librarians and system designers across the world endeavour to apply the power of computerization in order to control one of the most troublesome processes of library administration.

The term 'Serials' represents the publications which are issued in succeeding parts on a recurrent base, generally, but not essentially, at continuously planned breaks and commonly having numerical or sequential designation. The term 'Serials control' denotes those jobs which render support to the procurement and organization of the library's serials collection. Many master files may be used in an automated serials system. Some files for example, members, sellers, financial planning, department, etc. are common to the entire library and are used in various processes like acquisition, cataloguing and circulation systems. These files have on them the data about journals, sellers, publishers, various departments, binding stipulations, budget, money, subject and letters. The automated serials control system has many purposes. Some of the main objectives have been listed below:

- To manage and control subscriptions, claiming and cancellations activities in an operational and well-organized manner.
- To make and maintain correct and judicious record of the serials holdings data.
- To control binding and other related activities in an effective manner.
- To impart financial information in an accurate and timely manner
- To give essential management information reports, on the basis of their requirement
- To cut down on manual labour required in maintenance of manual serials control systems.

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Following are the various functional requirements of an effective automated serials control system:

- Adopting a good and fair selection process
- Preparation of a detailed annual budget
- Easy and simple subscription process
- An orderly process receiving of titles
- Following a clear cut process of approval
- Process for placing and taking new order
- Correct invoice process
- Membership and Receipts Against Membership
- Renewal Process for existing library materials
- Issuance of standing orders
- Process of timely and accurate payments
- Printing accession register
- Title check in process
- Regular communication with vendors
- Periodic reminders to suppliers and publishers
- Title History - Change, Split, Merge, etc.
- Details of title holdings
- Claiming procedure
- Indexing of article
- Following seller licenses and licensing agreements
- Printing invoice register

Circulation Control

The circulation control module is a significant part of library management, which maintains registration of patrons and issue, renewal, return and reservation of documents. In a typical library the function of circulation is of utmost importance and can be seen by everybody. The process of circulation in a library is frequently compared with account control and it involves humongous amount of record keeping and along with that, the staff too has to spend a lot of time towards this. It is extremely important to maintain all records accurately and updated every piece of information immediately after every operation. It can also be said that, circulation control is beneficial provided it is carried out online and maintained in a real-time communicating mode. As defined by experts, circulation encompasses all features of client loan handling and organization, comprising closed reserves, holds, material booking and in-library use of the collection. Computerized backing for controlling circulation enormously improves the ability of the library to quickly and correctly

record loan dealings, to observe these dealings, to record arrival of material that had been lent to clients and to render support to other linked functions of circulation

An automated circulation control system has the following aims:

- To create details related to library's patrons
- To make timely and accurate records of the loan transaction data
- To have effective and operational control over all financial dealings
- Give correct information related to the status of any library material or its loan status and that of the borrower of the material
- To deliver essential statistical and organization reports.

Following are the various functional requirements of an effective automated circulation system:

1. Registration of patrons
2. Collecting library subscription
3. Collecting library deposit
4. Printing and issuing identity cards to members
5. Printing members' Id card bar codes
6. Making a calendar
7. Issuing fresh membership
8. Renewing old memberships (continuation)
9. Issue and Return of library material (Transaction)
   (i) Issuance
   (ii) Return
   (iii) Overdue
10. Use of barcode scanner while issuing or returning library material
11. Renewal of library material
12. Reserving certain library material
13. Giving out reminders to patrons (Recall of a document)
14. Issuing of no-due certificates to members
15. Reporting missing items
16. Reporting lost items
17. Collecting charges with respect to overdue library items
18. Maintenance of library material and equipment
19. Replacement of damaged library material
20. Inter library loan service with respect to borrowing
21. Inter library loan service with respect to lending
22. Maintenance of withdrawal items

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23. Issue and return of loose issues of serials
24. Issue and return of back volumes of serials
25. Sending notices by email to the users

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There is no doubt that every library system has its own unique way of functioning and implementation, but the basic level of functions all libraries remains the same. Generally, an average public or special library may use all or some of the functions mentioned above and there also may be a slight difference in some features but the main housekeeping operations and provision of various types of services in all libraries is basically the same.

Check Your Progress

3. What does the technical processing section of a library include?
4. Why is circulation control module a significant part of the library management?

9.5 STOCK VERIFICATION OF LIBRARY MATERIAL

Stock verification which is also called physical verification of the library material means to occasionally monitor and account for the books and other reading material acquired by the library. Stock verification is an inconsequential feature of librarianship with respect to teachers, scholars and library experts. But in reality stock verification is taken to be a delicate, controversial and undesirable wicked activity. Working librarians are every so often disturbed and apprehensive about the library stock verification process, its consequences and its effects. Many librarians take stock verification to be a professional menace which ought to be done at any cost. Stock verification is usually carried out as a customary activity, without absolute definition of its purposes; therefore the activity of stock verification is normally surrounded by utter confusion. In case of clarity in objectives and procedures of stock verification and accountabilities regarding loss of material is openly itemized, the process becomes clear and simple.

9.5.1 Advantages of Stock Verification

Stock verification may be an activity considered an unwanted activity by most library managers but it has its advantages which are as follows:

- Intermittent stock verification and writing of consequential loss of library material helps in decreasing needless acceleration in book value of assets.
- Stock verification is very helpful in substituting important, valuable and on demand material with latest editions which has been lost or spoilt.
- Stock verification helps in introduction of new methods of stack organization, modifying existing or creating new lending system and other processes.

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- In cases where a library calls back all issued out material for the purpose of stock verification, it gives a chance to its patrons to go through the complete collection after the process. This is contrary to the otherwise prejudice of books less which are not very useful and which keep gathering dust on library shelves throughout the year.
- Stock verification is helpful in reviewing all safety practices already in vogue in case of prevention of loss and damage along with identification of shortages, if any, in the prevailing process of maintenance of library and vigilance.
- Stock verification proves to be beneficial in recognizing and removing old-fashioned books and material. Usually in regular practice of a well-organized library, loss of books on demand only comes to fore during regular working.
- Other supplementary advantages of stock verification comprise recognition of spoiled and torn documents which need repair or rebinding, maintaining shelf list and other records up-to-date, reorganization and clearing of stack and better acquaintance of collection and popular documents by library staff, etc.

9.5.2 Methods of Stock Verification

While discussing the methods of stock verification, it can be stated that the parent body may or may not take help of outside people in the process. The body assigned to carry out the stock taking process and may even decide not to include particular kind of materials in the library. The actual verification methodology is dependent on the prevailing provisions laid out in the design and organization of library records. There are a numerous methods put into use for the implementation of the process of stock verification. The crudest technique is to mathematically tally the number of books and other material which virtually is not of much use. This out dated method entails physical checking and tallying of books on the shelves with the registers being maintained. Other than being burdensome and time consuming this method also needs the presence of the entire bulky register to be around during the entire checking process. Some people have the habit of putting tick or other indication marks on the accession register thus spoiling it beyond repair. Nevertheless, with the beginning of novel ways of duplicating accession registers, now days the original register can be saved from getting damaged.

One more method, based on accession number is also as disadvantageous because that too needs the entire register to be kept while the process is on. In both these methods the concurrent functioning of numbers in dependent on availability of number of duplicates of accession register and in cases where more than one accession register is brought into use the outcomes of checking is required to be combined from various copies of the register. This activity makes the whole experience very long drawn and burdensome.

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In the present period, it has now become possible, due to explosion of computers use, to just punch in the entire lot of accession numbers as and when checked to combine the loss with respect to accession numbers that are missing. The most inexpensive and quick way of punching in accession numbers is by making use of a mobile bar code. By this it becomes very easy to scan accession numbers of all materials from the bar code stickers on them and entering data does not take too much time. Though widely prevalent in the developed countries, bar code system has not yet become very popular in India. The most common and mostly dependable and fast physical method is to verify stock based on shelf list. For this method to be a success there is need of an up-to-date shelf list. All these methods can be used only after closing down of the library.

There is yet another shelf list based method which can be practiced even while the library is open, i.e., the two (book) card system. This method does not require shutting down the library but confirms fairly cheap, fast and reliable stock verification. This method entails use of two book cards of different colours which are readied for every book/document and one of them is kept as shelf list card and the other in inserted in a specially made pocket inside the book. During the process of stock verification these different book cards are switched. By use of this method concurrent working of many batches can be carried out as both, shelf list and documents are kept in the same order and it also has room for correcting stock verification errors some time later.

Thus it can be concluded that after all library stock verification is not just an unwanted evil, as thought by many, it also many advantages which have been discussed above. The stock verification process can be completed very quickly and effectively based on the management of records, degree of work and disposal of equipment and manpower.

Collection Evaluation and Weeding Out

The collection of all library materials forms the basis of learning, acquiring knowledge and performing all research related activities. Library material is a storehouse of learning resources and institutional memory. Every library has a special and specific collection strategy with respect to collection of its material, however there are some generic collection strategies are adopted by mostly all libraries for collection of their material which have been discussed in brief in the following paragraphs. In the contemporary world, due to constant changes and digitization libraries across the globe have to face many constrictions like limited space, paucity of time and funds. In addition to other things collection of library material is also faced by innumerable challenges. Library collections are seen to be physically disintegrating, and the swift change to e-publishing models, and the fast changing technologies seem to be one of the major causes of this crumbling. Other causes of this disintegration are the ever changing requirements and expectations of library users. These changes force library managers to restrain from building or maintaining

collections in equal proportions in all areas. Collection, digitization and maintenance of library stock must be prioritized, keeping in view the requirements of the target library patrons. There is thus a need to curate all kinds of library stock, electronic and print collections.

Categories of Library Stock Collection

Stock in a public library must be equitably distributed to cater to needs of all kinds of people visiting the library. Such a categorization helps in collecting stock which is beneficial to majority of patrons. Following categories of stock collection are generally popular among most public libraries:

- Heritage
- Religion
- Social Sciences
- Language
- Legacy
- Technology and Applied Science
- Arts and recreation
- Self-renewing
- Finite
- Digital collections

Weeding Out

It is very important to keep refreshing all library collections based on the renewed requirements of patrons. Old library stock will make the atmosphere of the library dull and boring, hence it will not only fail to motivate new patrons to the library rather it will dissuade its existing visitors also.

Check Your Progress

5. What is stock verification of the library material?
6. Mention any four categories of stock collection that are generally popular among most public libraries.

9.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The first and foremost housekeeping function performed by the use of integrated library software is the acquisition of library materials for which there is a perfect module in place in the software.

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2. Computerized system of acquisition reduces the amount of paper work and makes a wide variety of reports, which are helpful in good decision-making at different stages of acquisition operation.
3. Technical Processing section of a library includes maintenance of catalogues, classification, covering and indexing of books and other library items.
4. The circulation control module is a significant part of library management, which maintains registration of patrons and issue, renewal, return and reservation of documents.
5. Stock verification of the library material means to occasionally monitor and account for the books and other reading material acquired by the library.
6. Four categories of stock collection that are generally popular among most public libraries are heritage, religion, Social Sciences and language.

9.7 SUMMARY

- Contemporary libraries are multifaceted organizations which are run on the basis of numerous processes and functions.
- Out of the numerous housekeeping functions performed by use of integrated library software the first and foremost is the acquisition of library materials for which there is a perfect module in place in the software.
- The acquisitions department of the library is responsible for buying books, documents, and all other collections for the library.
- All procedures of physical acquisition process are computerized. Other than this, other facilities are also provided and reports made out of the date once endorsed.
- There is a simple technique following which reproductions of original material, available under copyright, can be made available for use in public libraries.
- There is a legal method following which, without taking direct permission from the owner of the copyright this material can be used commercially for the benefit of library users.
- A license may be purchased for a prescribed fee, which can vary based on the geographical location of the library and its type.
- Making multiple copies of the library material, whether print or electronic media is allowed only with the prior permission of the owner of the copyright, or on purchase of additional license under which a person or an organization is authorized to make further copies.
- If the seeker/holder of the license agrees to comply with all terms and conditions laid out in the license they will be indemnified against any claim for copyright violation.

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- Technical Processing service is a very important department of any library which includes maintenance of catalogues, classification, covering and indexing of books and other library items.
- The circulation control module is a significant part of library management, which maintains registration of patrons and issue, renewal, return and reservation of documents.
- Stock verification which is also called physical verification of the library material means to occasionally monitor and account for the books and other reading material acquired by the library.

9.8 KEY WORDS

- **Integrated Library Systems:** It is an enterprise resource planning system for a library, used to track items owned, orders made, bills paid, and patrons who have borrowed.
- **License:** It is an official permission or permit to do, use, or own something (as well as the document of that permission or permit).
- **Indemnity:** It is a contractual obligation of one party to compensate the loss occurred to the other party due to the act of the indemnitor or any other party.

9.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the housekeeping functions carried out by the libraries?
2. Why do contemporary library procedures prefer automated acquisition systems?
3. How does library license function?
4. What is indemnity with respect to library license?

Long Answer questions

1. Why is technical processing section important for library management?
2. What are the main objectives of automated series control system?
3. What are the various functional requirements of an effective automated serials control system?
4. What are the advantages of stock verification? Discuss the methods of stock verification.

9.10 FURTHER READINGS

NOTES

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BLOCK - V
HUMAN RESOURCE MANAGEMENT

NOTES

UNIT 10 PERSONNEL MANAGEMENT

Structure

10.0 INTRODUCTION

In today's complex organizational structure, operating in complex and dynamic economic, political, socio-cultural and technical environment, the most suitable employees are becoming more and more crucial and indispensable assets for effective performance. As a result, the price of poor staffing will be very high, requiring improved manpower planning as an economic necessity. This means that all managers will make sure that all jobs in their responsibility areas are staffed with people who can best perform them. This unit will discuss personnel management in relation to libraries.

10.1 OBJECTIVES

After going through this unit, you will be able to:

- Learn about human resources planning
- Discuss the process of recruitment of personnel

- Describe the methods of training and development
- Know about performance appraisal

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10.2 HUMAN RESOURCES PLANNING

Human resource planning is a process which involves objective and systematic assessment of present and future staffing needs of the organization, identifying the available personnel to satisfy the current needs, forecasting the future demand and supply of workers, formulating staffing strategies with a view to both short range as well as long range strategic plans and continuously monitoring, evaluating and updating these needs and sources of supply.

Human resource planning is important in providing the following direct benefits to the organization.

- It improves the utilization of human resources by helping the management forecast the recruitment needs in terms of both numbers as well as types of skills required and develop ways to avoid or correct problems before they become serious and disrupt operations.
- It helps focus the recruitment efforts on the most likely sources of supply. This will cut down the total cost of hiring and training personnel and reduce costs associated with the hiring practices.
- It makes provisions for replacement or back-up staff from either inside or outside the organization, whenever the need arises, either on a temporary or permanent basis. These available sources of supply are important to identify, especially in the case of any emergencies that might occur.
- It helps achieve an integration of personnel plans with other operating as well as strategic plans, by making available the personnel management information database to other organizational operations.

10.3 STAFFING THE ORGANIZATIONS

The Staffing of an organization for managerial or non-managerial positions consists of four sequential steps: (1) recruitment, (2) selection, (3) training and development and (4) performance appraisal. These steps are described in more detail as follows:

10.3.1 Recruitment

Recruitment is a process designed to attract a qualified pool of job applicants to the organization. It is important to ensure that there is compatibility between the job and the applicant. Before the recruitment efforts can began, the requirements for the jobs to be filled must be clearly specified. These requirements can be established by job analysis, job descriptions and job specifications.

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Once a complete job analysis has been completed and manpower needs have been determined, then management can begin the recruitment process. The recruitment may be internal to the organization or the prospective candidates can be drawn from outside sources. To what extent the internal sources or external sources for recruitment would be used would depend upon the specific environment of the organization as well as its philosophy of operations. Some companies prefer to promote from within for key positions because these persons know the company well. Others prefer to hire from outside because the outside personnel do not know the company so that they can bring some new and fresh ideas into the company.

Internal sources

Internal sources of recruitment are the most obvious sources within the organization itself. Most organizations have procedures for announcing vacancies through bulletin boards, newsletters or word of mouth. Some promotions may be built in the hierarchical structure and take place automatically on the basis of seniority or when a position at the upper level becomes available. Whenever a higher level vacancy occurs, someone from within the organization is upgraded, promoted or transferred to another department or location. Occasionally, a person may be demoted to fill a position.

The internal recruitment process can be very encouraging and motivating for employees since they are assured that they will be preferred over outsiders when the opportunities occur. This reinforces a sense of loyalty among employees for it provides them with an opportunity for advancement. This also helps the management to be assured of the quality of performance of employees since the organization generally keeps a record of the employee performance and progress. Furthermore, internal recruitment is economical in terms of time and money, since all the energies expended in the process of hiring new candidates from outside are saved. Additionally, new employees from outside always have to go through a period of indoctrination during which the contribution of the employee to the organization is limited.

Internal staffing has some drawbacks. First, the promotions may be biased in nature and may be based on nepotism or seniority rather than merit resulting sometimes in unqualified persons in more responsible positions. Secondly, it discourages new blood which may be more innovative and creative, in entering the organization, thus inhibiting change and growth.

External sources

The external sources are varied and many. Most organizations cannot fill their manpower needs from within and hence they must look for outside sources. The outside pool of potential candidates includes:

- **New entrants to work force:** These may be college students who have just finished studies and are entering the job market.

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- **The unemployed:** These are the people who may be temporarily out of a job or may be currently at jobs that are unsuitable to them and who may be looking for better opportunities.
- **Retired experienced persons:** These may be accountants, mechanics, security guards and so on, who have the necessary experience and may be hired as consultants or supervisors.

Some of the sources of external recruitment include:

1. Active files of potential candidates kept at the organization
2. Walk-ins and gate hiring
3. Employment agencies
4. Advertising
5. Colleges, universities and other educational institutions
6. Professional associations
7. Labour unions
8. Military processing units
9. Employee referrals
10. Billboards at community centres
11. Scouting
12. Foreign consulates
13. Open house

10.3.2 Selection

Selection is a process of choosing the right candidate from a pool of applicants. This process is established to achieve a good match between the job requirements and the candidate's skills and motives. A good match results in increased productivity and quality performance. A bad match is extremely costly to the company due to cost of training the candidates, the cost of mistakes made by the candidate and the cost of replacement.

McMurray has listed some comprehensive steps that can be taken in the selection process.

The first step for the management is to be thoroughly familiar with the requirements of the job as well as the qualifications and expectations of the candidate.

The second step is to conduct a preliminary screening interview to have an initial assessment of the candidate's abilities and aspirations.

The third step is the completion of a formal application form which summarily lists a person's background, education, experience and special skills. The information asked for in the application form should be relevant to the selection, factual, legal and not unduly sensitive or too personal.

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The fourth step is to check the candidate's references and seek opinions from his previous employers or instructors if the candidate is fresh out of college.

The fifth step is to give certain tests to the candidate, if necessary, to make judgments about certain specific aspects of the candidate. These tests may be classified in many ways and the type of test given to the candidate would depend upon the type of job required to be filled.

The sixth step is the in-depth interview which is conducted to evaluate the applicant's acceptability in terms of his ability to fit into the company's culture and his "motives" in joining the company.

The seventh step is to establish the applicant's physical health.

The final step is the process of hiring itself. For some responsible executive positions, the management may want to get socially acquainted with the candidate before the final decision is made.

10.3.3 Training and Development

Training and development is the process of developing knowledge, skills and behaviours in people that will enable them to better perform their current and future jobs.

In the past, training and development was primarily oriented towards functional, technical and specific job related skills. In today's business and managerial environment, the training and development programmes stress a broad range of group interaction skills, cross-functional issues, quality issues and diagnostic and problem solving skills.

Training programmes are primarily directed towards maintaining and improving current job performance while development programmes are primarily intended to develop skills for future jobs. According to Stoner and Freeman, both managers and non-managers receive help from training and development programmes, but the non-managers are more likely to be trained in technical skills required for their current jobs and managers are more likely to develop conceptual and human relations skills that are required in future jobs.

Training techniques

There are a variety of training approaches that managers can use. Training can either be on-the-job or off-the-job.

On-the-job training: This method is the most widely used method and it simply means putting the worker on the job under close supervision of a trained instructor. In support, there may be a variety of training aids and techniques such as lecture manuals, procedure charts, sample problems, demonstrations and so on. This training continues until the supervisor is satisfied that the employee can adequately perform the job without supervision.

Off-the-job training: Such training takes place outside the actual work place but attempts to simulate actual working conditions. Also known as "vestibule

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training", such a method does not disrupt the normal operations and also, it avoids "on-the-job" pressures that might interfere with the learning process. Off-the-job training may be conducted in a company class room with lectures, discussions, seminars, case studies, demonstrations and films or it could be undertaken by means of "computer assisted instruction (CAI)", which can both reduce the time needed for training and provide more help for individual training.

10.3.4 Management Development

Management training and development is a learning experience and is primarily undertaken to sharpen the managerial skills, knowledge and ability so that the managers can lead and manage organizations successfully in order to further the organizational objectives.

The management development programmes can be conducted either on-the-job or off-the-job in a similar working situation.

On-the-job-methods

On-the-job methods are usually preferred in management development programmes because it saves production hours and the programme can be more conveniently tailored to the individual. This training is achieved in any of the following ways:

- Coaching
- Job rotation
- Junior board meetings and committees
- Planned work activities

Off-the-job methods

Off-the-job training programs are used outside the work setting. It could he done within the organization at a separate training facility or at an offsite location such as training programmes sponsored by universities or professional organizations such as American Management Association. Some of the off-the-job training techniques are:

- Class room lecture
- Case studies
- Role playing
- Gaming approach
- The in-basket method
- Programmed learning

10.3.5 Performance Appraisal

The evaluation of the performance of employees serves as a basis for judging the contributions and weaknesses of employees so that continuous efforts can be

made to build a stronger and more effective work force. Performance appraisal constitutes a systematic way of evaluating a worker's performance and his potential for development. This continuing monitoring of the performance and periodic evaluation helps in retaining, promotional and retraining policies.

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Performances can be evaluated against some set standards. The formal appraisal plans are designed to meet three objectives. First, performance appraisal provides evidence to justify or validate selections, promotions, transfers or salary increments. Second, the worker learns as to where he stands relative to expectations and whether any changes are required in his behaviour, attitudes, skill or job knowledge. Finally, performance appraisal helps determine what additional training the employee may need.

Methods of performance appraisal

There are a number of performance appraisal methods available and care must be taken to select a method which is most suitable for a given candidate for such appraisal. Some of these methods are more suitable for blue collar workers, others for white collar workers and still other for executives. In addition, the evaluators must be competent in administering these appraisal techniques because some techniques measure productivity while others measure traits and behavioural qualities.

Any performance appraisal method should meet the criteria of reliability and validity. To be reliable, the method should be consistent in yielding the same results over time as well as be independent of the evaluator. For validity it should be unbiased and relevant to job performance factors only.

Check Your Progress

1. What are the four sequential steps involved in the staffing of an organization?
2. Define recruitment.

10.4 PROMOTION

A promotion is the transfer of an employee to a new position which commands higher pay, privileges or status compared with the previous position. A promotion takes place when an employee moves to a position higher than the one formerly occupied. In other words, it is a vertical move in rank and responsibility.

From the above definitions, we can conclude that promotion usually implies several things to the person concerned - higher status, both at work and in the outside community, more pay and fringe benefits, perhaps greater job security and a more senior position from which a person renders better service to his organization. Employees expect to be informed about ladders of promotion, how they can prepare themselves for advancement and what will be expected of them from the higher-rated jobs.

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Types of Promotion

The different types of promotions are described below:

1. **Limited promotion:** It is also known as upgrading. It is the movement of an employee to a more responsible job within the same occupational unit and with a corresponding increase in pay. Thus, upgrading means an increase of pay on the same job or moving to a higher scale without changing the job.
2. **Dry promotion:** It is a promotion as a result of which there is no increase in the employee's pay. Dry promo-tions are given in lieu of increases in compensa-tion. It is usually made decorative by giving a new and longer job title to the employee.
3. **Multiple chain promotion:** It provides for a systematic linking of each position to several other posi-tions. Such promotions identify multi-promotional opportunities through clearly defined avenues of approach exist in the organization.
4. **Up and out promotion:** Up and out promotion leads to termination of services. In this type of promotion, a person must either earn a promotion or seek employment elsewhere.

Bases of Promotion

Different promotion systems are in vogue in a variety of organizations. Of them the following are considered as most important:

1. Promotion based on seniority
2. Promotion based on merit
3. Merit cum seniority promotion
4. Promotion by selection
5. Time bound promotion
6. Temporary promotion

1. **Promotion based on seniority:** Seniority-based promotion systems are based on the length of service of an employee in an organization. Seniority systems put a premium on the length of serv-ice and job experience. In the case of promotion based on seniority, the employees are promoted to higher positions purely based on the length of service irrespective of their qualifications, experience, per-formance and track record of the work. Trade unions prefer sen-iority as a basis of promotion because; by-offs, recalls and discharges are frequently based on seniority. The seniority promotion plan is as old as civilization. In business, however, it is not always dependable as a promotional policy. It survives simply because no better system has been evolved. If the seniori-ty principle is adopted, capable young men will quit to look for better prospects elsewhere. Normally this method of

promotion policy is seen in government services and in services of quasi-governmental organizations. Unless the official has a very poor and bad work record, he is automatically promoted to higher position purely based on his service seniority.

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2. **Promotion based on merit:** Under promotion based on merit, employees are promoted to higher positions purely on their per-formance and work record. Here, the management will look into the qualifications, experience, previous work record, performance capability, etc. The service seniority of the employee would not be considered for promotion. In principle, it is agreed by all that promotion should be based on merit. The use of merit as a basis for promotion causes difficulties because what management regards as merit, trade union may consider as favouritism. Therefore, as far as possible, merit rating should be based on operating facts.

   Promotion by merit method is normally followed in majority of commercial and industrial enterprises, where the main considera-tion is assessment of an employee for promotion based on his efficiency and work performance.

3. **Merit cum seniority promotion:** Promotion based on 'Merit Cum Seniority' would have a blend of the advantages of both the systems discussed above. Both the service seniority and work efficiency will be taken into account in promoting an employee. These two possibly conflicting factors—seniority and merit—frequently pose problems in considering employees for promotion. From the point of view of organizational efficiency, merit seems to be the logical basis of promotion and therefore, management would like it to be the only factor. Trade Unions, want seniority to be considered as the basis for promotion, since it is an objective and impartial method of judging employees for promo-tion. A sound management will pursue a policy of properly balancing these two factors, i.e., seniority and merit. An employee who has service seniority with the desired level of merit and effi-ciency would be given priority in promotion to the next cadre over others having only one of them. Merit cum seniority method has been considered as the best method of promotion as it gives due importance to the skill efficiency and better service record of the employee.

4. **Promotion by selection:** It is a process through which employees are promoted after undergoing rigorous tests and screening. The service records of all the employees due for promotion are screened and scrutinized by a committee appoint-ed for that purpose. The committee will scrutinize the past records, the merit, the qualification and experience of the employees due for promotion to a cadre. Under this system employees with service seniority or better qualifications and experience need not be promoted automatically. The employees are put to various tests and interviews before a final selection is made and some employees are promoted.

5. **Time-bound promotion scheme:** Under this method, employees would be promoted according to the standards of time set for promo-tions to

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higher cadre, subject to the condition that they possess the minimum qualification required for entry into a higher position. Neither seniority nor merit will be considered here. The employees may have to pass some departmental examinations or tests for being considered for such a promotion.

6. **Temporary promotion scheme:** This is also known as officiating promo-tion scheme. Under this method, officials are promoted temporari-ly to higher positions in case there are vacancies and if they are due for promotion. Such temporary promotion is no guarantee for a permanent promotion, though normally temporary promotions are automatically made permanent, if the service of the employee during the officiating period is satisfactory. It is like keeping the employee under some sort of probation at the higher position before he is confirmed.

Check Your Progress

3. Define promotion.
4. What are the types of promotion?

10.5 MOTIVATION

The subject of motivation is one of the most important and widely studied topics in the field of management and organizational behaviour. One of the most frequently used terms among managers is "motivation". The level -of performance is often tied with the level of motivation. Accordingly, work effective managers are concerned about motivation because the work motives of employees affect their productivity and quality of their work.

People differ by nature, not only in their ability to perform a specific task but also in their "will" to do so. This "will" to do is known as motivation. By understanding a person's ability and his motivation, a manager can forecast his performance level. Motivation and ability interact in a multiplicative manner to yield performance, so that :

$$\text{Performance} = \text{Ability} \times \text{Motivation}$$

This means that if either ability or motivation is zero, then the resulting performance is zero. However, people with less ability and stronger "will" may be able to perform better than people with superior ability and lack of "will", because people with high motivation learn to become capable while superior ability may not induce any motivation.

The force of motivation is a dynamic force, setting a person into motion or action. The word motivation is derived from "motive", which can be defined as an active form of a desire, craving or need which must be satisfied. All motives are directed towards goals, and the needs and desires affect or change a person's

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behaviour which becomes goal oriented. For example, if you ordinarily do not want to work overtime, it is quite likely that at a particular time, you may need more money (desire), change your behaviour, work overtime (goal oriented behaviour) and satisfy your needs.

According to Viteles, motivation can be defined as, "Motivation represents an unsatisfied need which creates a state of tension or disequilibrium, causing the individual to move in a goal directed pattern towards restoring a state of equilibrium by satisfying the need".

Motivated people are in constant state of tension. This tension is relieved by drives towards an activity and outcome that is meant to reduce or relieve such tension. The greater the tension, the more activity will be needed to bring about relief and hence higher the motivation.

10.5.1 Individual Motivation and Systems Performance

Motivation alone cannot result in performance. There must be ability on the part of the worker, and the work structure must be conducive to motivation. The work structure can be considered to be comprised of systems where systems are collections of processes and resources and processes are defined as grouped activities that take an input, add value to it and provide an output. Accordingly, one of the prime functions of management is to design and improve the work system with the right activities and the right resources at the right times. To achieve the best performance from motivated employees, management must provide a stable and consistent system that allows them to perform at a high level.

A work system, where the worker is provided with the right and pleasant work environment, is a great motivator for the workers. The right type of job, the right tools to work with, good interaction with peers and superiors, fair system of rewards and incentives are all tied to the desired work behaviour. Structure greatly influences behaviour. For example, a person who casually throws away a chewing gum wrapper on the roadside in New York would not dare to do so in Singapore. Similarly a person who is used to bribing a police officer to get away with a crime in India would not behave in that manner in America where the system strictly punishes the bribe taker and the bribe giver. Accordingly, a well-designed and enforceable system has great influence on motivation and positive behaviour, Deming, a well-known quality oriented thinker, estimated that 94 percent of organizational problems are caused by faulty systems in one form or another. The relationship between performance and motivation with inputs from ability and system can be shown as follows:

10.5.2 Theories of Motivation

Motivations can be studied through several broad approaches. There are "Content theories" which focus on the internal needs that motivate people. The "Process theories" of motivation focus on how people choose certain behaviours to satisfy their needs and how they judge their satisfaction. The "Reinforcement theory"

focuses on the relationship between behaviour and its consequences. The interest here is to manipulate consequences in order to change any undesirable behaviours into desirable ones. These theories are described in greater detail.

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The content theories of work motivation

The content theories have been developed to explain the nature of motivation in terms of types of needs that people experience. They attempt to focus on factors within a person that initiate and direct a certain type of behaviour or check certain other type of behaviour. The basic idea underlying content theories is that people have certain fundamental needs, both physiological as well as psychological in nature and that they are motivated to engage in activities that would satisfy these needs. Thus the nature of the needs establishes the nature of motivation that results in a specific behaviour aimed at reaching the goal of satisfying such needs.

The most popular of the content theories of motivation for the workplace are: Maslow's Hierarchy of Needs theory, Herzberg's Two-Factor theory, Alderfer's ERG theory, and McClelland's Socially Acquired Need theory.

1. Maslow's hierarchy of needs theory

Maslow's "needs hierarchy theory" is probably the most popular content theory of motivation. Abraham Maslow suggested that people have a complex set of exceptionally strong needs and the behaviour of individuals at a given moment is usually determined by their strongest need. He developed his model of human motivation in 1943, based upon his own clinical experience and formulated his theory of hierarchical needs by asking the same question : "What is it that makes people behave the way they do ?" and made a list of answers from which he developed a pattern. His theory is based upon two assumptions. First is that human beings have many needs that are different in nature ranging from the biological needs at the lower level which is the level of survival to psychological needs at the upper extreme which is the level of growth. The second assumption is that these needs occur in an order of hierarchy so that lower level needs must be satisfied before the higher level needs arise or become motivators. Mahatma Gandhi, the Indian leader once remarked that "even God cannot talk to a hungry man except in terms of food"

The Maslow's model is primarily based upon people's inner states as a basis for motivation and the environmental conditions do not play any significant role. Maslow postulates five needs arranged in successive levels. These needs continue to change, resulting in changes in goals and activities. These five needs are arranged in the form of a pyramid as shown:

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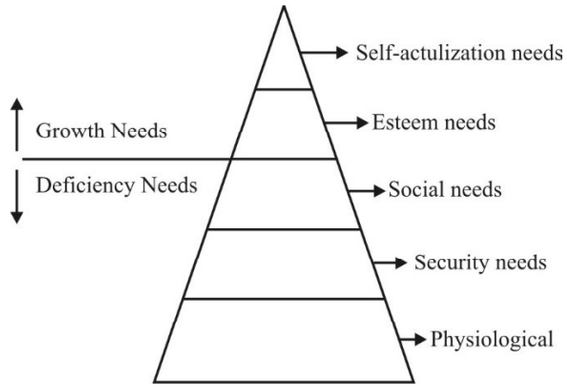

Fig 10.1 *Maslow's Hierarchy of Needs*

The first three level needs at the bottom of the pyramid are known as "deficiency" needs because they must be satisfied in order to ensure the individual's very existence and security and make him fundamentally comfortable. The top two sets of needs are classified as "growth" needs because they are concerned with personal growth, development and full realization of one's potential.

These needs are explained in more detail as follows:

- ***Physiological needs:*** These needs form the foundation of hierarchy and tend to have the highest strength in terms of motivation. These are primarily the needs arising out of physiological or biological tension. They are there to sustain life itself and include the basic needs for food, water, shelter and sex. Sexual need and desire is not to be confused with love which is at the third level. Once these basic needs are satisfied to the degree needed for sufficient and comfortable operation of the body, then the other higher level needs become important and start acting as motivators.
- ***Security and safety needs:*** These are the needs for self-preservation as against physiological needs which are for survival. These needs include those of security, stability, freedom from anxiety and a structured and ordered environment. These safety and security needs are really provisions against deprivation of satisfaction of physiological needs in the future. It also involves a sense of protection against threats and danger of losing the job in the future. In a civilized society such as ours, a person is usually protected from threats of violence or extremes in climate, or fear of material safety, so that the safety and security needs dwell upon economic and job security, life and medical insurance and other protective measures to safeguard the satisfaction of physiological needs in the future which may be unpredictable.
- ***Love and social needs:*** After the needs of the body and security are taken care of, a sense of belonging and acceptance becomes prominent in motivating behaviour. These needs include the needs for love, friendship,

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affection and social interaction. We look for an environment where we are understood, respected and wanted. That is one reason for social "polarization", where people of similar backgrounds and beliefs tend to group together.

- ***Esteem needs:*** These refer to a person's need to develop self-respect and to gain recognition and approval from others which would induce a feeling of self-worth and self-confidence in the individual. It is an urge for achievement, prestige, status and power. Self-respect is the internal recognition. Respect from others is the external recognition, as well as an acceptance and appreciation of one's individuality and his contribution. This internal and external respect would result in self-confidence, independence, status, reputation and prestige. People then would begin to feel that they are useful and have some positive effect on their surrounding environment.
- ***Self-actualization needs:*** This last need, at the top of the hierarchy is the need to develop fully and to realize one's capacities and potentialities to the fullest extent possible, whatever these capacities and potentialities may be. This need is activated as a motivator when all other needs have been reasonably fulfilled. At this level, a person seeks challenging work assignments that allow for creativity and opportunities for personal growth and advancement. This need is for soul searching and is inner oriented. A self-actualized person is creative, independent, content, and has a good perception of reality and he is constantly striving to realize his full potential. Thus, "what a man can be, must be."

Maslow's model is a general model in which all needs interact with each other to some degree. Needs are not necessarily linear nor is the order of needs so rigid. The relative dominance of many needs is variable and is continuously shifting. For example, a self-actualized person may shift his priority to social needs and love needs instead of prestige and status, if suddenly there occurs a vacuum due to loss of a loved one. Similarly, a person may not go to the higher needs even when his lower level needs are satisfied. It is also likely that a well-prepared elite person may decide to join a commune where there is overwhelming emphasis on love and affection rather than climb the corporate leader.

Maslow's theory made management aware that people are motivated by a wide variety of needs and that management must provide an opportunity for the employees to satisfy these needs through creating a physical and conceptual work environment so that they will be motivated to do their best to achieve organizational goals."

2. Herzberg's two-factor theory

Fredrick Herzberg and his associates developed the two-factor theory in the late 1950s and early 1960s. As a part of a study of job satisfaction, Herzberg and his colleagues conducted in-depth interviews with over 200 engineers and accountants

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in the Pittsburgh area. The researchers felt that a person's relation to his work is a basic one and that his attitude towards work would determine his organization related behaviour. The respondents were required to describe in detail the type of environment in which they felt exceptionally good about their jobs and the type of environment in which they felt uncomfortable with their work. Their responses were used to isolate those factors and conditions that produce satisfaction with the job and those factors which produce dissatisfaction. Herzberg named the factors that tend to be consistently related to job satisfaction as motivational factors and factors related to job dissatisfaction as maintenance or hygiene factors.

- ***Hygiene factors:*** The world hygiene is taken from the medical field where it means taking steps to maintain your health but not necessarily improve it. Hygiene factors do not motivate people. They simply prevent dissatisfaction and maintain status quo. They produce no growth but prevent loss. The absence of these factors leads to job dissatisfaction. The elimination of dissatisfaction does not mean satisfaction and these factors simply maintain a "zero level of motivation". For example, if a person indicated "low pay" as a cause of dissatisfaction that would not necessarily identify "high pay" as a cause of satisfaction.

  Some of the hygiene factors are:

  — Wages, salary and other types of employee benefits.

  — Company policies and administrative rules that govern the working environment.

  — Interpersonal relations with peers, supervisors and subordinates. Cordial relations with all will prevent frustration and dissatisfaction.

  — Working conditions and job security. The job security may be in the form of tenure or it could be supported by a strong union.

  — Supervisor's technical competence as well as the quality of his supervision. If the supervisor is knowledgeable about the work and is patient with his subordinates and explains and guides them well, then the subordinates would not be dissatisfied in this respect.

  All the hygiene factors are designed to avoid damage to efficiency or morale and these are not expected to stimulate positive growth.

- ***Motivational factors:*** These factors are related to the nature of work (job content) and are intrinsic to the job itself. These factors have a positive influence on morale, satisfaction, efficiency and higher productivity. Some of these factors are:

  — *The job itself:* To be motivated, people must like and enjoy their jobs. They become highly committed to goal achievement and do not mind working late hours in order to do what is to be done. Their morale is high as evidenced by lack of absenteeism and tardiness.

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— *Recognition:* Proper recognition of an employee's contribution the management is highly morale boosting. It gives the worker feeling of worth and self-esteem. It is human nature to be happy when appreciated. Thus, such recognition is highly motivational

— *Achievement:* A goal achievement gives a great feeling accomplishment. The goal must be challenging, requiring initiative and creativity. An assembly line worker finishing his routine work hardly gets the feeling of achievement.

— *Responsibility:* It is an obligation on the part of the employee to carry out the assigned duties satisfactorily. The higher the level of these duties the more responsible the worker would feel and more motivated he would be. It is a good feeling to know that you are considered a person of integrity and intelligence to be given a higher responsibility. It is a motivational factor that helps growth.

— *Growth and advancement:* These factors are all inter-related and are positively related to motivation. Job promotion, higher responsibility, participation in central decision making and executive benefits are all signs of growth and advancement and add to dedication and commitment of employees.

Herzberg's two-factor model is tied in with Maslow's basic model in that Maslow is helpful in identifying needs and Herzberg provides us with directions and incentives that tend to satisfy these needs.

3. ERG theory

The ERG need theory, developed by Clayton Alderfer, is a refinement of Maslow's needs hierarchy. Instead of Maslow's five needs, ERG theory condenses these five needs into three needs. These three needs are those of Existence, Relatedness and Growth. The letters E, R and G are the initials of these needs.

- ***Existence needs:*** These needs are roughly comparable to the physiological and safety needs of Maslow's model and are satisfied primarily by material incentives. These needs include the needs for sustenance, shelter and physical and psychological safety from threats to people's existence and well-being.
- ***Relatedness needs*:** These needs roughly correspond to social and esteem needs in Maslow's hierarchy. These needs are satisfied by personal relationships and social interaction with others. It involves open communication and honest exchange of thoughts with other organizational members.
- ***Growth needs:*** These are the needs to develop and grow and reach the full potential that a person is capable of reaching. They are similar to Maslow's self-actualization needs. These needs are fulfilled by strong personal involvement in the organizational environment.

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4. McClelland's Theory of Needs

McClelland has proposed a theory of motivation, which he believes is rooted in culture; that is, needs are acquired on the basis of our life experiences. Hence, his theory is also known as "Socially Acquired Needs Theory." He concluded that the most prominent needs are the needs for achievement, affiliation and power. The primary motive is the achievement motive and is defined as a "desire to succeed in competitive situations based upon an established or perceived standard of excellence."

Individuals with a strong need for achievement (n Ach), ask for, accept and perform well in challenging tasks which require creativity, ingenuity and hard work. They are constantly pre-occupied with a desire for improvement and look for situations in which successful outcomes can be directly correlated with their efforts so that they can claim credit for success. They take moderate and calculated risks and prefer to get quick and precise feedback on their performance. They set more difficult but achievable goals for themselves because success with easily achievable goals hardly provides them with any sense of achievement. They derive greater pleasure and excitement from solving a complex problem than from financial incentives or simple praise.

The need for affiliation (n Aff) is related to social needs and reflects a desire for friendly and warm relationship with others. Individuals tend to seek affiliation with others who have similar beliefs, backgrounds and outlook on life. Individuals with a high "n Aff" tend to get involved in jobs that require a high amount of interpersonal interaction and relations such as jobs in teaching and public relations. Similarly, nurses, social workers and clergy are examples where high "n Aff" is an attribute.

The need for power (n Pow) is the desire to affect and control the behaviour of other people and to manipulate the surroundings. Power motivation when applied positively results in successful leaders and managers who prefer democratic style of leadership. Power motivation, applied negatively tends to create arrogant autocratic leadership. Executives, political leaders and military officers are examples of positions where high "n Pow" is usually an asset.

10.5.3 Process Theories of Work Motivation

While "need theories" of motivation concentrate upon "what" motivates people, the "process theories" concentrate upon "how" motivation occurs. These theories identify the variables that go into motivation and their relationship with each other. Some of the prominent process theories are Vroom's Expectancy Model, Equity Theory and Goal-Setting Theory.

1. Vroom's expectancy model

The expectancy model is based upon the belief that motivation is determined by the nature of the reward people expect to receive as a result of their job

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performance. The underlying assumption is that a man is a rational being and will try to maximize his perceived value of such rewards. He will choose an alternative that would give him the most benefit. People are highly motivated if they believe that a certain type of behaviour will lead to a certain type of outcome and if such outcome is consistent with their personal preferences.

According to this model of motivation, the person's level of effort (motivation) depends upon:

- ***Expectancy:*** The worker must be confident that his efforts will result in better productivity and that he has the ability and resources to perform the task well.
- ***Instrumentality:*** The worker must be confident that such high performance will be instrumental in getting the desired rewards.
- ***Valence:*** The worker must value these rewards as desired and satisfactory.

Their relationship is multiplicative in nature, so that :

Motivation = Expectancy X Instrumentality X Valence

or $M = (E \times I \times V)$

As the relationship suggests, the motivational force will be the highest when expectancy, instrumentality and valence are all high and there is no motivation if the value of any of these three elements is zero.

The management must recognize and determine the situation as it exists and take steps to improve upon these three factors of expectancy, instrumentality and valence so that they achieve the highest value of these factors individually and this will lead to high motivation on the part of the worker.

2. Equity theory

Equity theory is based on the assumption of some researchers that one of the most widely assumed source of job dissatisfaction is the feeling of the employees that they are not being treated fairly by the management or the organizational system. For example, let us assume that there are two professors up for promotion and both of them have similar backgrounds and academic achievements. If one gets the promotion and the other does not, the professor being denied promotion will feel that the politics of the system was not just and that he was unfairly treated. This would result in job dissatisfaction to some degree. This dissatisfaction is due to the result of comparison with the professor who got the promotion. Suppose further that none of the two professors got the promotion and one of them felt that he deserved it. This would also be a cause for dissatisfaction.

Hence 'Equity theory' has two elements. First, the workers want to get a fair reward for their efforts. This "exchange," meaning reward for their efforts is similar to any other exchange. For example if you want to buy a new car for $15000, you want to make sure that you get the best car for this price. You would

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be happy if you considered this exchange of money with the car as fair. Similarly, if you put in more efforts into your work, you expect to get more rewards out of it. Second, you would compare your rewards with the rewards of others who put in similar efforts. In the above example, if you bought the new car from a car dealer for $15,000 you are happy with the purchase except when you find out that another person bought the same car from the same dealer for $ 14,000. In this case, you would be dissatisfied with the purchase because of comparison with the other purchaser.

Accordingly, "Equity theory" is based upon the recognition that employees are not only concerned with the rewards that they receive for their efforts but also with the relationship of their rewards with the rewards received by others in similar situations. They make judgment of equity or inequity between their input and outcomes and the inputs and outcomes of others. For comparison purposes, the inputs can be considered as efforts, skills, education, experience, competence and so on, and outputs can be considered as salary levels, recognition, pay raises, promotion, status and other privileges. When such inequity exists, whether it is real or perceived, employees will feel uncomfortable about it and will tend to take steps that will reduce or eliminate this inequity. These steps may result in lower or higher productivity, improved or reduced quality of output, protests against inequity and so on.

Equity theory proposes that under-rewarded employees tend to produce less or produce products of inferior quality than equitably rewarded employees and over-rewarded employees tend to produce more or produce product of higher quality than equitably rewarded employees.

This must be realized that inequity exists when people are either underpaid or overpaid for similar efforts. However, they are more willing to accept overpayment by justifying such overpayment rather than taking steps to reduce this inequity and making the input-reward ratio more equitable. As formulated by Adams, Equity theory comprises of the following postulates:

- Perceived inequity creates a feeling of resentment and tension within individuals.
- The extent of this tension reflects the magnitude and type of inequity.
- Individuals will be motivated to take steps to reduce this tension.
- The greater the extent of perceived inequity, the greater is the strength of such motivation.

There are a number of steps a person can take in order to reduce the tension caused by perceived inequity. This must be understood that inequity exists only in the perception of the individuals. It may or may not be real. If people are satisfied in spite of any inequity that might exist or if they can justify such inequity by one way or another, then in their own perceptions, such inequity does not exist.

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3. Goal-setting theory

Goal setting theory is a relatively applied approach to motivation and is based upon the assumption that the type as well as the challenge of the goal induces motivation in the individual to achieve such goal. The theory, as proposed by Edwin Locke, studies the processes by which people set goals for themselves and then put in efforts in order to achieve them. The quality of performance is generally shaped by how difficult and how specifically defined the goal is. General goals, such as "do your best" do not lead to accurate performance appraisal and proportionate rewards. Specific goals are clear and tend to give a clear direction to the worker, resulting in improved performance. Similarly, difficult goals, once accepted, lead to higher quality performance.

- ***Goal specificity:*** A specific goal identifies the target in quantitative terms. This would enable the worker to evaluate his performance and judge as to how he is doing relative to the goal. For example, if a worker is producing 50 units a day, which is the average output, then he may set his goal of 60 units per day, to be achieved within 10 days. The worker can evaluate his output each day and decide whether he is adequately moving towards that goal.
- ***Goal difficulty:*** Difficult but feasible goals provide more challenge than easy goals. Reaching an easy target is not competitive and hence hardly exciting. This is particularly true for high need achievers. Goal commitment is independent of whether the goal is set by the worker himself or is assigned by superiors, but depends upon expectations of success and degree of success achieved. Commitment would also depend upon provisions of rewards for goal achievement.

The most important element of goal setting theory is the acceptance of goal by the workers. Of course, the best way to have the goal accepted by workers is to let them set their own goals within the general organizational frame work. Assigned goals are equally acceptable if these goals are consistent with personal aspirations of workers. Acceptance becomes easier if the workers are encouraged to participate in the goal setting process. Goal acceptance can-also be facilitated if the management demonstrates a supportive attitude towards subordinates regarding goal achievement.

There is evidence that goal setting, as outlined, improves performance about 90 percent of the time and that comparatively high achievers set comparatively more difficult goals and are much more satisfied with intrinsic rewards rather than extrinsic rewards.

Check Your Progress

5. What are the most popular content theories of motivation for the workplace?
6. Give names of some prominent process theories.

10.6 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

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1. The staffing of an organization for managerial or non-managerial positions consists of four sequential steps: (1) recruitment, (2) selection, (3) training and development and (4) performance appraisal.
2. Recruitment is a process designed to attract a qualified pool of job applicants to the organization.
3. A promotion is the transfer of an employee to a new position which commands higher pay, privileges or status compared with the previous position.
4. The different types of promotion are limited promotion, dry promotion, multiple chain promotion and up and out promotion.
5. The most popular of the content theories of motivation for the workplace are Maslow's Hierarchy of Needs theory, Herzberg's Two-Factor theory, Alderfer's ERG theory, and McClelland's Socially Acquired Need theory.
6. Some of the prominent process theories are Vroom's Expectancy Model, Equity Theory and Goal-Setting Theory.

10.7 SUMMARY

- In today's complex organizational structure, operating in complex and dynamic economic, political, socio-cultural and technical environment, the most suitable employees are becoming more and more crucial and indispensable assets for effective performance.
- The Staffing of an organization for managerial or non-managerial positions consists of four sequential steps: (1) recruitment, (2) selection, (3) training and development and (4) performance appraisal.
- Recruitment is a process designed to attract a qualified pool of job applicants to the organization.
- Internal sources of recruitment are the most obvious sources within the organization itself. Most organizations have procedures for announcing vacancies through bulletin boards, newsletters or word of mouth.
- The external sources are varied and many. Most organizations cannot fill their manpower needs from within and hence they must look for outside sources.
- Selection is a process of choosing the right candidate from a pool of applicants. This process is established to achieve a good match between the job requirements and the candidate's skills and motives.

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- Training and development is the process of developing knowledge, skills and behaviours in people that will enable them to better perform their current and future jobs.
- Management training and development is a learning experience and is primarily undertaken to sharpen the managerial skills, knowledge and ability so that the managers can lead and manage organizations successfully in order to further the organizational objectives.
- The evaluation of the performance of employees serves as a basis for judging the contributions and weaknesses of employees so that continuous efforts can be made to build a stronger and more effective work force.
- A promotion is the transfer of an employee to a new position which commands higher pay, privileges or status compared with the previous position.
- The subject of motivation is one of the most important and widely studied topics in the field of management and organizational behaviour.
- While "need theories" of motivation concentrate upon "what" motivates people, the "process theories" concentrate upon "how" motivation occurs. These theories identify the variables that go into motivation and their relationship with each other.

10.8 KEY WORDS

- **Promotion:** Promotion refers to the advancement of an employee's rank or position in a hierarchical structure.
- **Recruitment:** Recruitment refers to the overall process of attracting, short-listing, selecting and appointing suitable candidates for jobs (either permanent or temporary) within an organization.
- **Motivation:** Motivation is the reason for people's actions, willingness and goals. Motivation is derived from the word motive which is defined as a need that requires satisfaction.

10.9 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the direct benefits that human resource planning provide to an organization?
2. What are the two sources of recruitment?

3. What are the various methods of performance appraisal?
4. Write a short note on Maslow's model of hierarchy of needs.

Long Answer Questions

1. Describe the steps involved in staffing of an organization in detail.
2. What are the steps involved in the selection process?
3. What are the different bases of promotion?
4. Discuss the different theories of motivation.

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10.10 FURTHER READINGS

Evans, G. Edward. 2005. *Developing Library and Information Centre Collections*. New York: Libraries Unlimited.

Evans, G. Edward. 1983. *Management Techniques for Librarians*. New York: Academic Press.

Gorman, G.E. 2003. *International Yearbook of Library and Information Management 2003- 2004 Metadata Applications and Management*. London: L.A.

Kishan, Kumar. 2007. *Management of Libraries in Electronic Environment*. Delhi: Har-Anand Publications.

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UNIT 11 FINANCIAL MANAGEMENT OF LIBRARIES

Structure

11.0 INTRODUCTION

Every private library has its own methods and resources of collecting funds to carry on with the library administration in a smooth way. Therefore, the availability of stocks and the services delivered in a library are dependent on the monetary ability of every library. On the contrary, public libraries, nevertheless, are administered by way of more or less similar kind of management. Public libraries get some part of their finances from the government and balance is mustered up from other common resources.

11.1 OBJECTIVES

After going through this unit, you will be able to:

- Understand the sources of library finance in different types of libraries
- Discuss budgetary techniques and methods
- Describe costing library process, functions and services
- Learn about report writing and library statistics

11.2 SOURCES OF PUBLIC LIBRARY FINANCE

A public library is open to all members of the society of which it is a part. These libraries are generally funded from public sources e.g., tax money. Most countries of the world have public libraries and undoubtedly, they are a vital part of an educated and well-read society. The mandate of public libraries is to be of service

to the general public by fulfilling their information needs. Besides providing educative and informative material, public libraries also give to their patrons, material for common entertainment and leisure reading. These libraries render services at no cost, like, providing books of general interest, newspapers, magazines and children's books, this gives encourages literacy and interest towards reading. Public libraries also have a provision as per which, the users are allowed to take books and other library materials on a temporary basis. The reference material available in public libraries proves to be very beneficial for research scholars. Modern day public libraries also provide their patrons with computer and internet access.

Financial management

Financial management is an essential component for running any organization. It helps in planning several undertakings which are generally dependent on the availability of finances. Therefore, it is very important for any library and its management to acquire elementary knowledge of library finance, library expenditure, budgeting and accounting. According to the various definitions of financial management, it can be called as the study of ideologies and applications that form a part of financial operations of an organization. Libraries being not very different from an organization also adopt these practices of financial management. Financial management is concerned with numerous characteristics of acquisition, distribution and utilization of funds, other than this it chalks out activities like balancing the income with overheads. Moreover, the overall control and assessment of financial matters also lies within the sphere of financial management. It is actually the responsibility of the library's parent organization to manage financial issues like fund raising, fund investment, preparing and approving library budgets and other such matters related to finance. A library ought to evaluate its own financial needs; prepare its own budget for various activities; management and spending of funds within the stipulated time frame; maintaining accounts and preparation of financial Statements and reports.

Public library finance

Public libraries provide a resource which helps in the education and literacy of a place. Moreover, it also provides a place for leisure reading. Most towns and cities provide their population with a public library, and the ones not having a permanent infrastructure, avail these services by a mobile library. All authorized residents of a particular area enjoy the right to free use of the public library situated in that area. These libraries depend on several sources for funding, such as, Government funds, aid from the state and local municipalities and private donations. Each of these will be discussed in brief below. The amount of funding is subject to the location of the library. Normally, the maximum funding to a public library is provided by the municipality. There are funds collected from sources such as, taxes, library fines, and other ways of generating revenue which are used for various purposes in the library. On the State and national level, funding is decided by allocation of budget, and strategic decisions taken by the authorities. These funds are used to buy books and other library material, pay employees, plan and implement

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library expansion, and afford other needed support services. Now let us have a look at some of the library funding sources in a little detail:

1. Government Sources

These sources are filled by funds from central and state governments and other local authorities. In developed countries, public libraries are fully funded by the government but in India, there is only a partial funding done by state government or the local bodies. Funds are allocated as per the budgetary provisions.

2. Library Tax

Some states in India have proper library legislation, as per which they are authorized to levy a library tax in addition to the numerous other taxes. This tax is used by public libraries.

3. Subscription

Library subscription is supposed to be the main source of income of most public libraries. But a public library system ought to provide free service to all members of the community based on the funds provided the government. Anyway, defeating the very purpose of free provision of public libraries, in India members of public libraries pay a subscription for being its members, thus this constitutes as the main source of library funding.

4. Income Generated by the Library

Other ways in which library funds are generated are as follows:

- Income from any special events
- Interest on investments
- Compensation by patrons for any loss or damage to library material
- Overdue payment by patrons
- Income produced by sale of old newspapers and waste materials
- Rents for library spaces

5. Gifts and Donations

Some private sponsors and charitable organizations provide funds to public libraries. These kinds of donations may not be available on a permanent basis but they are generally quite useful, especially sometimes to construct a particular facility or gather a specific collection in the library. Sometimes these institutions give gifts, like private book collection of a great personality, etc.

Thus, it can be seen that public libraries, have the financial support of various organizations and many means of mustering up funds. The main support however, in most countries remains fixed budget grants from the Government. Sadly, this is not the case in India, as a result of which, the public libraries in India are not equipped with adequate funding. Like other developed countries, in our country

too the Government should take up this responsibility on itself. Minor library expenses, however, can be met by funds raised by library tax and other such sources discussed above. Other than this, the local authorities also must be involved in wellbeing of public libraries and help in adding to the public library funds. Income from the other sources for example, library subscription, fines, gifts, etc. is generally insufficient which cannot be taken as the main source of income.

Check Your Progress

1. What is the main source of income of most public libraries?
2. Mention any two ways by which library funds are generated.

11.3 LIBRARY BUDGET

A budget is a process that involves preparation and planning of the organization's monetary dealings, financial control and all related actions and processes. A formal presentation of the financial planning of an organization is called a budget. A Budget is the written account of revenue and spending of the entire year. It includes all things of work which need to be implemented over a definite time period, sometime in the future. An all-inclusive budget, made keeping in mind the entire institution is also called as master budget. A library is an organization having an estimated and expected inflow and outflow in the entire year. By virtue of it being just an estimate, there is always lot of scope for alteration and changes. Financial budgets are usually made on yearly basis. A budget is the key feature of any library's financial management. In fact, this is a statement of the library's income and expenditure for the year. Besides, it also serves as a device to control, communicate, coordinate, evaluate and motivate.

Purposes of Library Budget

- The general intention behind library budgeting is to plan various stages of library processes.
- Organize events of library's numerous departments and to guarantee operative control on them.

Over and above this, libraries have some specific purposes also which are as follows:

- To forecast and envisage future services of the library.
- To forestall the future monetary condition of the library and its up-coming funds requirements in order to keep the library absolutely lively and up-to-date.
- Coordination of the endeavors of library's various departments for achievement of common goals.
- To enhance the competence of processes of different departments.

- To different departmental heads accountable for different jobs.
- To control library's funds in an effective manner.

Factors Affecting Budget

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All libraries cannot follow a similar form of budgeting, every library's budget depends upon the following factors:

- Size of the library gatherings, number of employees
- Place or location
- Types of the library services being provided
- Types of patrons

Methods of Preparing a Library Budget

There are many methods of making a library budget, some of which are traditional and have been in use for a very long time, yet others are more innovative and recently adopted into library administration. Let us have a look at them:

1. ***Line by line item budget:*** While preparing line by line budgets, the objects of the payments are separated line by line, and divided into wide classifications like, books and periodicals, pays and grants, apparatus and other paraphernalia, eventualities etc. And these broad categories are further divided into sub-divisions.
2. ***Lump sum budget:*** In this kind of a budget preparation, a specific sum of money is allotted to the library. This gives the library the freedom to choose how to allocate that amount to different groupings.
3. ***Formula budget:*** In formula budget there is a provision of predetermined standards for allocating money to different departments. It is very easy to prepare this type of a budget.
4. ***Program me budget:*** A program me budget is not individualistic, rather, it is concentrated on the activities planned by the library.
5. ***Performance budget:*** This technique of preparing a budget is quite similar to programme budget it emphasizes upon performance instead of programmes.
6. ***Planning programming budgeting system:*** PPBS method is an ideal combination of both, program budget and performance budget, and is concentrated on planning.
7. ***Zero based budget:*** This method is based on the similar concept as PPBS but is only concentrated on present activities.

11.3.1 Costing Library Process, Functions and Services

The general notion amongst people is that the cost of establishing a running a library is always related the assigned budget, which gives the yearly distribution of

particular amount of money for particular objectives. This budget can be called merely representative as, in most cases, the budget does not include numerous expenditures, like opportunity costs, due to the exigency of their nature. Furthermore, a moderately novel concept called, "value maintenance," must be taken into consideration. Very few articles or writings deal with the costs involved in running a library, as most of them are focused operating budgets. Let us now have a look at the costing processes, functions and services in libraries.

Overall, public library budgets are very wide-ranging, as they function independently and ought to be accountable, for example, they include expenditures like, convenience services and cleaning costs, which are rarely included in a library budget. Some specific libraries at times do not prepare a direct budget, and thus the costs incurred by them are paid by their parent organizations from different sources. Budgets of some academic libraries sometimes include endowment for employee benefits, and in some other instances these are charged to a central fund. Whatever may be the style of a library budget, there will always be variations which make the estimation of total costs incurred in the library a very complicated issue, and nevertheless, it is vital to understand these costs.

- ***Building and maintenance costs***

One of the most significant costs which is not generally indicated directly in library budget is that related to the building and its paraphernalia. Utility costs, heating or cooling systems, lighting, power etc. are some such examples which might have been made a part of the institutional budget, as an overhead expenditure. Owing to the huge size of libraries and their long functioning hours and tremendous numbers of visitors visiting their premises each day, there is no doubt in the fact that the costs of maintaining the buildings will be very high. Other costs related to maintenance of library buildings include:

- o Major and minor infrastructural repairs
- o Equipment and utilities maintenance costs
- o Sanitization and cleaning costs
- o Insurance, repayment of funding for new apparatus
- o Personnel security and safety costs
- o Calamity preparedness costs

- ***Growth costs***

Like any other organization, it is only natural for a library to grow. Nevertheless it is not easy to predict the rate at which a library will grow. There have been some attempts in the past by various library managers to, kind of, control a library's growth in order to stabilize the size of a library. These efforts may bear fruits smaller libraries where the main requirement is to provide material only for teaching purposes, i.e., academic libraries and not research. In larger libraries, however, this may not be possible owing to the variety of needs and widespread clientele.

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Some libraries also have to bear transfer costs related to too much reliance on delivery of documents. The costs linked to ever changing infrastructure needs are rarely included in an existing budget.

- ***Electronics and other hi-tech paraphernalia***

Modern-day libraries provide the service of long-distance electronic information transfer which costs heavily. The cost of provision of such a service generally ignores costs like the actual telecommunication cost, staff training costs, and the heavy costs incurred for installing the equipment. Usage costs, of equipment like telephones, recorders etc. have not yet appeared openly but it is certain that they will be developed soon sometime in the future either as an effort to monitor usage or for the purpose of cost recovery.

- ***Cost recovery***

Although libraries are meant to be free facilities available for the use of all yet it has been pointed out by some scholars that this approach is rather misleading, because everything costs money and the grants merely suffice so extra expenditure has to be somehow managed, in order to maintain a particular standard. The question that however arises is that who should pay, and where will the money come from? Should all transactions made be charged overhead or should there be a provision for them through a central budget? There seems to have been some sort of ad hoc planning done by all libraries at their individual levels, by which they are able to muster money as and when possible.

Cost Benefit Analysis in Libraries

In the modern era, calculation and assessment in library management is of utmost importance. It is an open secret that all kinds of libraries are dealing with issues like quick increase of knowledge, literature explosion, price boom, mounting demand of users, different user needs and reducing budgets etc. To deal with these complications different ways and means are being adopted by librarians all over the world. In this period of declining monetary resources and growing requirements for accountability, libraries in the world face the test of demonstrating and enumerating their value to their fund resources and patrons. With respect to academic and special libraries, library managers ought to prove the worth of their library to the parent organization in order to safeguard the flow finances required for their functioning. As financial experts consider contending significances and assign restricted resources, they require tangible proof of how the library backs the strategic objectives of its parent institution. Other than this, they also require proof which helps them weigh the worth of new directions. Library managers and administrators take budgeting decisions concerning the library, hence they may be expected to prioritize their products and services focusing on the ones which prove to be most effective in fulfilling the mission of the parent organization.

Due to financial crunch, library managers take the help of management tools like Cost-Benefit Analysis (CBA) which prove worth of the collections and services being provided by the library and along with that they justify the expenses of the library. Usually every person make use of the CBA techniques (consciously or unconsciously) once in lifetime to making decisions. For instance if a person wants to buy something, he will estimate the cost of that thing and then compare its cost with the benefits accruing from it. He will buy that thing if the benefits are more than the cost, and if otherwise he will not buy the item.

CBA is an essential characteristic of management which helps in taking decisions. In the process of CBA, total cost involved with respect to equipment, resources and manpower have to be considered along with the value of all the paybacks such as, economy of cash, labor and time needs to be calculated. If the benefits outweigh the complete cost, it means that the proposed system is appropriate and in case of the converse being true, it should be understood that the system is not appropriate. Thus, it is absolutely necessary to do a CBA in libraries rather than blindly adopting other methodologies. Library is a non-profit organization, so the cost and benefits of the activities done or service imparted there is not an easy task. There are innumerable intangible constituents which form a part of library's operations. To check the economic viability of the proposed project, the cost/benefit ratio it must be ascertained that the benefits are greater than all costs.

The Objectives of a Cost-Benefit Analysis (CBA)

- The main objective of cost-benefit analysis is to help decision makers in taking appropriate decisions by providing accurate information.
- It is helps in determining the selection of main projects to be undertaken.
- It maximizes the performance level by best possible application of resources.
- Determining whether specific alternatives have benefits more than the cost.
- Making service standards better.
- Enabling self-evaluation and self-actualization.
- Finding out whether alternative projects are socially lucrative or not.

Different methods of conducting cost-benefit analysis

Following are the different methods of carrying out Cost Benefit Analysis:

- Present Value Analysis
- Net Benefit Analysis
- Pay back Analysis
- Net Present Value
- Return on Investment (ROI)
- Internal Rate of Return (IRR)

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Procedure for conducting CBA

A CBA entails the following steps to find out if a project is worthy or not.

1. Identification of the costs and benefits that will accrue from a particular library project or program.
2. Measurement of costs and benefits in same currency so that they are stated in same units which are comparable with possible substitute uses of incomes.
3. Inclusion of dimensions of time in the assessment, because rather than examining the costs and benefits of only the current economic year it is required to be judged for the complete life of the project.
4. Concluding if the first steps produce major social benefits.

Steps involved in determination of costs and benefits

1. Identification of costs and benefits of books and journals
2. Classification of different costs and benefits for analysis
3. Select an assessment method
4. Interpretation of the results of the analysis
5. Taking action

Classifications of costs and benefits

While processing a CBA it is very important to categorize costs & benefits of the project. They may be:

1. **Tangible or intangible:** Tangibility means the measurability of the costs or benefits. For example an expenditure of cash for a particular thing or activity is called a tangible cost; purchase of books and salaries of employees are examples of tangible costs. These can be easily identified and measured. On the other hand there are costs which though are known to be present but somehow it is difficult or impossible to measure their financial value for instance morale of the staff or reputation of the library image is intangible cost.
2. **Direct or indirect costs and benefits:** Purchase of library material is a direct cost as it can be accounted for directly. Expenditures like insurance, conservation, heat, air conditioning etc. though are tangible costs yet it is difficult to determine the proportion of each attributable to a particular activity so they are indirect costs
3. **Fixed or variable costs and benefits:** Some costs and benefits do not vary in spite of the usage of the system, these are called fixed costs, whereas variable costs keep changing and are incurred on a weekly or monthly basis.

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11.3.2 Library Statistics

The word 'statistics' is derived from Latin word "status" and it means a method of dealing with computable information concerning acquisition, examination, demonstration and explanation of data. It is a division of mathematics that seems to have begun in the eighteenth century. Statics is actually a representation of facts and figures either presented either in tabular or other forms. It is considered to be a significant decision making tool in an organization. Library statistics helps to determining the library's growth. It aids library managers compare previous library activities with the ongoing activities and draw conclusions on betterment of activities. This way library administrators can control all happening of the library. Another benefit of library statistics is that it helps the librarian in assessing the performance of library staff. Library reports are drafted based on these statistical reports and they are even preserved for future reference. Daily, weekly and monthly diaries and quarterly reports are all sources of formulating library statistics.

Check Your Progress

3. What is a budget?
4. What is the full-form of CBA?

11.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Library subscription is supposed to be the main source of income of most public libraries.
2. Two ways in which library funds are generated are income from any special events and interest on investments.
3. A budget is a process that involves preparation and planning of the organization's monetary dealings, financial control and all related actions and processes.
4. The full-form of CBA is cost-benefit analysis.

11.5 SUMMARY

- Every private library has its own methods and resources of collecting funds to carry on with the library administration in a smooth way.
- A public library is open to all members of the society of which it is a part, these libraries are generally funded from public sources e.g., tax money.
- Financial management is an essential component for running any organization. It helps in planning several undertakings which are generally dependent on the availability of finances.

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- Public libraries provide a resource which helps in the education and literacy of a place. Moreover, it also provides a place for leisure reading.
- A budget is a process that involves preparation and planning of the organization's monetary dealings, financial control and all related actions and processes.
- There are many methods of making a library budget, some of which are traditional and have been in use for a very long time, yet others are more innovative and recently adopted into library administration.
- The general notion amongst people is that the cost of establishing a running a library is always related the assigned budget, which gives the yearly distribution of particular amount of money for particular objectives.
- In the modern era, calculation and assessment in library management is of utmost importance. It is an open secret that all kinds of libraries are dealing with issues like quick increase of knowledge, literature explosion, price boom, mounting demand of users, different user needs and reducing budgets etc.
- Due to financial crunch, library managers take the help of management tools like Cost-Benefit Analysis (CBA) which prove worth of the collections and services being provided by the library and along with that they justify the expenses of the library.
- The word 'statistics' is derived from Latin word "status" and it means a method of dealing with computable information concerning acquisition, examination, demonstration and explanation of data.

11.6 KEY WORDS

- **Subscription:** An arrangement to receive something, typically a publication, regularly by paying in advance is called subscription.
- **Budget:** A budget is a financial plan for a defined period of a year. It may also include planned sales volumes and revenues, resource quantities, costs and expenses.
- **Tangibility:** Tangibility means the measurability of the costs or benefits.

11.7 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the sources of public library finance?
2. Why is financial management important for an organization?

3. Write a short note on public library finance.
4. What are the factors affecting library budget?

Long Answer Questions

1. Discuss the major library funding sources in detail.
2. What are the purposes of a library budget?
3. What are the methods of preparing a library budget? Discuss.
4. What are the different types of costs included in a library budget?
5. What are the objectives of Cost-Benefit Analysis?

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11.8 FURTHER READINGS

Evans, G. Edward. 2005. *Developing Library and Information Centre Collections*. New York: Libraries Unlimited.

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UNIT 12 BUILDING AND SPACE MANAGEMENT OF LIBRARY AND INFORMATION CENTRES

Structure

12.0 INTRODCUTION

Libraries were developed in the past as an institution to safeguard and maintain the available chronicled knowledge. During those times, information was documented in the form of clay tablets, known as cuneiform. Medieval period saw the arrival of the austere libraries in which knowledge and scholarly work was kept. The period of Renaissance witnessed the invention of printing and the expansion of learning by way of dissemination of information and philosophies. This indicated the appearance of various kinds of libraries. The enlargement of educational institutions initiated a gigantic increase in the establishment of libraries as a part of the parent institution. These libraries became the seat of achievement of the organizational goals of study, teaching, learning and research. Other than providing a plethora of informational materials and services, a library (academic, special or public) also offers a peaceful atmosphere for learning and research. A library, whether part of an educational institution or a stand-alone public library, is the source of learning and research. It enjoys a distinctive position on campus as it characteristically and tangibly signifies the educational centre of an institution. The architectural appearance and positioning of a library reveal the exclusive heritage and customs of the institution that they form a part of.

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12.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the building and space management of library and information centres
- Understand the doctrines of library space design and management
- Describe the principles of a good library building
- Know about Indian and international library standards

12.2 INTRODUCTION TO LIBRARY MANAGEMENT

A good library building is anticipated to offer flexible space for learning and customary rooms for reading which inspire erudition and learning. In the modern era, there is a complete change in the information house as there is a movement from print to electronic resources. A traditional library is being replaced by the concept of a virtual library. The new system of learning is virtual, disseminated, problem solving, pupil-oriented, hence there is a need to reshape library services in order to have the desired effect. Seeing these developmental changes many questions occur to the mind which need to be pondered upon by librarians and information patrons to answer. For instance: Is there still a need of physical libraries in the present age where information can be accessed electronically and is available at a click? What lies hidden in this revolutionary change with regard to the creation and design of the library space? The model change in information resources from print to electronic and a shift from manual services to electronics, demands a serious scrutiny of the notions, ideologies and structures of library space and building infrastructure.

12.2.1 Doctrines of Library Space Design and Management

Space is an extremely imperative conception in designing and planning libraries as a place. The three basic elements that need to be considered and connected in provision and maintenance of library are role, usability and appeal. So, in order to make sure that any building works well, these elements must be incorporated in different degrees. To make any space achieve its aim, whether in a library, office or home, it is essential to comprehend how people feel about that space and how they carry on with their work in that space. This psychological data helps in providing or rearranging space in order to make that space work better for people and people work better within that space. Consequently, there is need of a proper body of people to ascertain the physical requirements of a good library. Cohen and Cohen (1979) wrote that the interior design aspect such as furniture and equipment layouts, people and material traffic patterns, workflow, lighting, acoustics, and even colour affect how users and staff work in the library. Inner design of a library building and its management regulate, significantly, the degree of

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approachability of materials and attentiveness of users of the library. A noiseless and adequately lit space makes it easy for people to muse in the library in comparison to a continuously noisy and poorly lit place.

The following elements frame the mandatory prerequisites of a good library space:

- Enough room for library material and further expansion or accumulation of collections.
- The library must be comfortable or socially usable for patrons as well as members of staff.
- Patrons of the library must find it inviting and appealing and there must be enough space for the staff to move about and do their job.
- The library should have an aesthetic appeal.

A library housed in an ugly and ill kept building will only repel people from entering. The librarian and other library staff must organize the library in an appealing fashion so that it attracts maximum patronage.

12.2.2 Principles of a Good Library Building

A modern day library must function on these principles: openness, multifunctional, flexibility and artistry. Sinclair (2007) gave out five guiding principles to a successful library; open, free, comfortable, inspiring and practical.

1. Openness

A library must have the capability to provide free, appropriate and quick services to its patrons. So, a library building's design must take into consideration the efficacy of space and place. The modern librarianship, in contrast to the old closed access has shifted to open access. Reading areas in the library should be provided easily seen and accessible having open piles with large space.

2. Multifunctional

A good library building must have the capability to provide multiple functions in association with recent improvements in formats of documents, reading techniques, document delivery methods and the varied library activities. It must offer assortment of informational materials for instance printed books, audio-visual resources, electronic alternatives and internet services. There must be enough space to house these materials and also provide an excellent study, teaching, learning and research environment for several groups of library patrons.

3. Flexibility

The building of a library must be designed in such a manner that it is able to accommodate any future changes in the structure and services of the library. The institution of modern information technology has initiated restructuring of library facilities and organization into the traditional library form. In order to fulfill this

present-day advance in the library information systems and reader services, the newly constructed library buildings adopt the principles of flexibility.

4. Artistry

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Aesthetic appeal is a significant feature of a library building. Nothing much can be done to the poorly constructed libraries but during the construction of a new library building attention should be paid to the beauty of the place as much as it is given to the representation of knowledge and culture. There should be a balanced combination of such features as outer appearance, inner layout, creative design and natural surroundings.

Check Your Progress

1. What are the three basic elements that need to be considered and connected in provision and maintenance of library?
2. Mention the principles on which a modern day library should function.

12.3 ACADEMIC LIBRARIES AS LEARNING ENVIRONMENT

An academic library is instituted in an educational institution to satisfy the teaching, learning and research needs of the students, teachers and other members of the organization. Other than providing help to the above mentioned members of the organization academic libraries also render support to research scholars in accomplishment of their ends. Jucevicien and Tautkbiciene (2003) are of the opinion that in the modern times, learning not only takes place in a class room, but it happens at all those places where pupils have an access to information sources. That means that learning can happen outside the formal organization for example in an office, domestic environment, museums, libraries, clubs etc. Adeogun (2008), while contemplating on the developing university library services in a developing environment, noted the novel roles and services that have arisen for academic librarians with respect to the teaching/learning programmes. The wealth of information resources makes the library a potential learning environment in an educational institution. A good academic library must offer multifunctional atmosphere inside the library space.

12.3.1 Hybrid Library

Cannell (2007) is convinced about library to be used as a place to search for books or other e-resources, getting help to complete academic or research tasks, utilize e-learning resource, revel research and get together. Library is an appropriate place for students, scholars and people seeking information to gear up for exams, read and research. People are able to utilize books and electronic information at the same time. A library provides space for varying purposes for example sound

proof rooms, study rooms for research or experimentation, rooms for serious work and group work/assignment. Thus, the modern day library which provides such multifarious opportunities can safely be termed as 'hybrid library, which caters to numerous academic needs of people and provides an appropriate environment for the same.

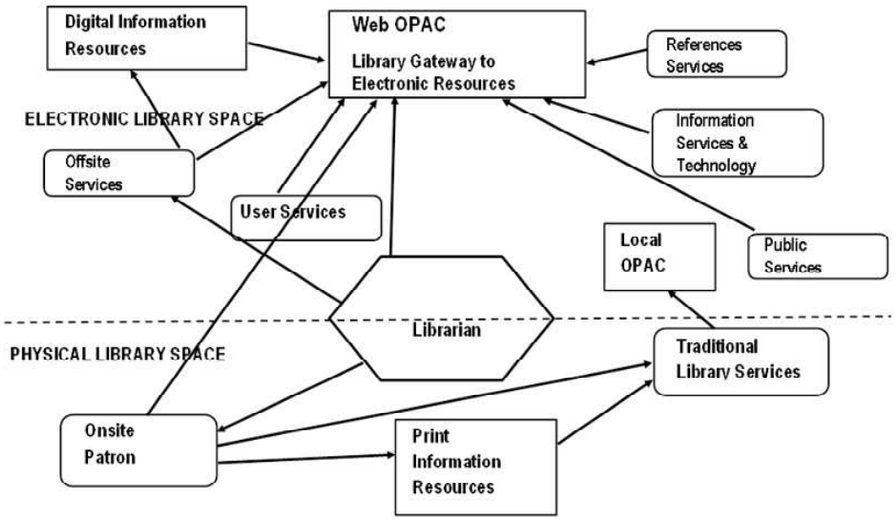

Fig 12.1 *Hybrid Library*

12.3.2 Model of Hybrid Library

Adeogun (2008), Sens (2009) emphasized that an academic library should develop an environment for students to work together, enjoy companionship, get involved in healthy discussions, generate and contest ideas, experience learning and discovery in a number of meaningful ways and only an appropriately designed library building can support these kind of activities.

Facilities for differently abled in libraries

Library is a seat of learning for people of all ages and kinds. While mostly people have different intellectual needs but their physical requirements are more or less similar unless they are physically or mentally disabled. Such people are known as differently abled and they have special physical or mental needs. A good library must cater for such people and all library materials should preferably be reachable for all people with disabilities. There are however, numerous ways to accomplish this goal. Libraries should procure talking books, newspapers, magazines; video/ DVD books with subtitles and/or sign language; books in Braille; books printed in large font; easily reachable electronic books; books that are easy to read and understand; tactile picture books or other non-print materials. Let us now have a closer look at how some of the specific disabilities can be catered for in libraries:

1. Library services for visually impaired people

Visual impairment is of two type, i.e., partial and complete. The library needs of people with either must be catered for, for them to make as good use of the library other person without disability. These people must be provided with books printed in large font, audio books, books printed in Braille, optical aids, Computer files of text, audio magazines and newspapers etc.

2. Library services for hearing impaired

Like visual impairment, hearing impairment may also be either complete or partial. Depending on the type of hearing impairment suitable library materials must always be available in order to serve their intellectual needs. People with hearing disability must be provided with like access to all programs and services which the other people enjoy. A good library must be equipped with books and brochures on sign language, dictionaries of sign language; vocabulary reading materials; videos with sub-titles; closing caption videos; films and videos with Loop system; telecommunication devices etc.

3. Library services for people with intellectual disabilities

The needs of people having mental or cognitive disabilities are different from those having physical impairment. While planning the institution of a library, needs of people with cognitive disabilities must be catered for. Every library must provide a fundamental collection of library materials encompassing a wide array of material as an essential part of the library collection.

4. Library services for physically disabled people

People having physical disabilities may require help in undertaking normal of the physical activities involved in using the library. Their special needs to access computers at the library can be catered for by using special software like: voice recognition; word prediction; screen enlargement, software for converting print documents, scan and read programs, text highlighting and advanced reading in different formats etc.

5. Provision of electronic books

Electronic books have gained immense popularity in the recent past. They are a particularly stimulating progress for people with disabilities as their credentials make them perfect for discovering alternative forms of access. E-books are especially beneficial for people with disabilities, because their needs are catered for in a very simple yet effective way.

6. Digital accessible information systems (DAISY) format

DAISY has become the primary specialist typical format to be used while creating available varieties for the print impaired. A file created in this format is basically an

xml based e-book format produced by the daisy association, an organization which symbolizes libraries for people with print disabilities. A book in daisy format can be called a package of digital files having the inclusions: one or many digital audio files comprising a human or pre-recorded combined description of a part of or the entire source text; a marked-up file comprising part or complete text; a management file to relate patterns in the text file with time points in the audio file; and a navigation control file.

Check Your Progress

3. What is a hybrid library?
4. What is the full-form of DAISY format?

12.4 LIBRARY STANDARDS

The two sets of guidelines applicable for public libraries in India are:

- IFLA/UNESCO joint publication called 'The Public Library Service IFLA/ UNESCO Guidelines for Development (IFLA publication 97)' and
- Bureau of Indian Standard (BIS) publication called 'Public Library: Guidelines.'

The former provides details of services and facilities to be provided by a public library whereas Bureau of Indian Standard or Public Library. Guidelines are a generally related to the administrative structure and governance of a public library in India. The BIS also lists some other Indian standards concerning libraries. These are standards on design of library buildings, specifications for library furniture and fittings including metal shelving racks, wooden shelving cabinets and library lighting. There are some more guidelines provided by the National Knowledge Commission's Working Group on Libraries (WGL). These are largely related to innovation of libraries and their services in the country.

12.4.1 Basic Norms to be followed in Public Libraries

IFLA/UNESCO Guidelines for Development (2001) draws out basic principles and guidelines to be adopted in order to run a fruitful public library system in a country. These guidelines have been categorized under six main heads:

- Role and purpose of public library
- The legal and financial frame work
- Meeting the needs of the users
- Collection development
- Human resource and
- Management and marketing of public libraries

A public library is a regionally established facility fulfilling intellectual needs of the local public and functioning within the framework of the community. Based on the location of the library, following guidelines have been formulated to give assistance to librarians in various locations to cultivate an operational public library service keeping in mind needs of the local community.

12.4.2 Library Standards for Different Libraries

1. Rural libraries

As regards norms for rural public libraries in India, the following minimum configuration must be adopted in order to cater to the basic needs of the village:

Space - 1000 sq.ft.

Number of books – 6000

Periodicals and newspapers – 10

Reading seats – 25

Internet workstations – 5

The collection must also have audio visual material e.g., CDs and DVDs. The library must be able to provide some fundamental services depending on regional needs like lending, reference, Xeroxing, skill development training programmes like personality development and communication, social events, children's section, training to users, etc.

2. Urban library

An urban library in a municipal city, town or district must be built based upon the number of residents of the place. The following least arrangements are however mandatory:

Space - 5000 sq.ft.

Number of books - 10,000

Periodicals and newspapers – 50

Reading seats – 50

Internet access points- 10

Other than catering for basic library services, urban libraries must have some extra activities and services which should have been designed in view of the requirements of the local community. Existing library buildings must be given a refurbishment in order to attract more and more patrons towards them. All libraries must have a provision of clean toilets, safe drinking water and space to park vehicles (for patrons as well as staff).

The overall atmosphere of a library is extremely important to boost a person's intellectual capability. An attractive exterior, an appealing interior with up-to-date

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and comfortable furniture, attractive and accessible fittings, a pleasant and creative design with appropriate signage are important components of an ideal public library.

According to IFLA/UNESCO guidelines, library services must be bodily reachable to all members of the community. For this, there is a requirement of a well-constructed library building, decent reading and learning facilities along with appropriate equipment and convenient hours suitable for different library users. The place where the public library is situated and its service outlets are very important factors. These should not be very far from public transport locations and city centres frequently visited by the general public for example cultural centres, commercial centres and shopping centres. Whenever possible a public library must share its premises with other public institutions like art galleries, museums and community centres.

3. Library services for differently abled

Library services for the differently abled have been discussed at length in the chapter above. Let us have a quick look at the basic needs fulfilment of differently-abled people in libraries:

- Availability of books and other documents in Braille
- Availability of library staff to read out to visually impaired patrons
- Availability of audio material in form of CDs, DVDs etc.
- Construction of ramps for wheel chair accessibility
- Construction of special toilets
- Construction of special reading corners for wheelchairs to fit in comfortably
- Easy access for all patrons with different needs to the entire library
- Availability of special library materials for ready reference of people with special needs

4. Norms for modernization

National Knowledge Commission Working Group has suggested a Library Charter for every library for the projection of their aims. i.e., dissemination of knowledge; to provide service in order to enable creation of new knowledge; to enable best use of knowledge by all strata of society and to ensure availability of need based relevant intellectual data to all patrons of the library. All public libraries must be equipped with good, high speed internet access. Minimum 2 and maximum 15 internet stations specially related to occupational and educational opportunities should be made available, based on the number of staff members and patrons of each individual public library. According to IFLA/UNESCO Guidelines, public libraries are equipped with a prospect to assist people in being a part of this global convention and to lessen the so called 'the digital divide'. Libraries can accomplish this by making information technology available for public access, by educating about basic computer skills and by joining in programs to counter illiteracy.

5. Setting standards of public libraries

In a place like a public library which is utterly information intensive, there is a need to be sensitive to the requirement of application of standards so that uniform practices and measures are adopted which can be shared with other libraries also. Likewise, if the uniform standards are known to one particular public library, other libraries can benefit by making use of similar standards. I accordance with the guidelines provided by IFLA/UNESCO, keeping the objective of implementation of a countrywide library organization and support strategy, regulation and strategic planning must also describe and encourage a national library network founded on approved service standards. The library and information science standards thus set will be able to achieve the following purposes:

- Bibliographic control
- Exchange of bibliographic records
- Description of bibliographic items

In the contemporary ICT period, standards enable communication between various library systems to facilitate access and resource sharing of among different libraries. The set standards ensure achievement of compatibility and interoperability between equipment, data, practices and procedures for the purpose of universal availability of information. Moreover, standardization has made it possible for libraries to set their goals towards achieving Universal Bibliographic Control which is founded on the principle of cataloguing or doing a work only once in the source country and which is recorded and made available to different libraries all across the world. Following measures can be adopted by public libraries for maximum effectiveness:

- Make common use of their print and electronic library material and resources and databases
- Have combined buying contracts for information services
- Give encouragement to willing common development and expansion of information resources and expertise

Following are some information technology related standards which must be complied by all library managers:

- Z39.50 (Resource sharing protocol); ODMA (Application to interface seamlessly with document management client);
- MARC 21 (Format for bibliographic data);
- ISO-ILL (Inter Library Loan);
- Dublin Core (metadata Scheme);
- OAI-PMH (The Open Archives Initiative Protocol for Metadata Harvesting); and
- OWL (standard for ontology).

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Check Your Progress

5. What is IFLA/UNESCO Guidelines for Development (2001)?
6. What are the two sets of guidelines applicable for public libraries in India?

12.5 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. The three basic elements that need to be considered and connected in provision and maintenance of library are role, usability and appeal.
2. A modern day library must function on these principles: openness, multifunctional, flexibility and artistry.
3. The modern day library which provides multifarious opportunities can safely be termed as 'hybrid library, which caters to numerous academic needs of people and provides an appropriate environment for the same.
4. The full-form of DAISY format is digital accessible information systems (DAISY) format.
5. The two sets of guidelines applicable for public libraries in India are IFLA/UNESCO joint publication called 'The Public Library Service IFLA/UNESCO Guidelines for Development (IFLA publication 97)'.
6. IFLA/UNESCO Guidelines for Development (2001) draws out basic principles and guidelines to be adopted in order to run a fruitful public library system in a country.

12.6 SUMMARY

- A good library building is anticipated to offer flexible space for learning and customary rooms for reading which inspire erudition and learning. In the modern era, there is a complete change in the information house as there is a movement from print to electronic resources.
- Space is an extremely imperative conception in designing and planning libraries as a place. The three basic elements that need to be considered and connected in provision and maintenance of library are role, usability and appeal.
- A modern day library must function on these principles: openness, multifunctional, flexibility and artistry. Sinclair (2007) gave out five guiding principles to a successful library; open, free, comfortable, inspiring and practical.

- An academic library is instituted in an educational institution to satisfy the teaching, learning and research needs of the students, teachers and other members of the organization.
- Library is a seat of learning for people of all ages and kinds. While mostly people have different intellectual needs but their physical requirements are more or less similar unless they are physically or mentally disabled.
- DAISY has become the primary specialist typical format to be used while creating available varieties for the print impaired.
- IFLA/UNESCO Guidelines for Development (2001) draws out basic principles and guidelines to be adopted in order to run a fruitful public library system in a country.
- A public library is a regionally established facility fulfilling intellectual needs of the local public and functioning within the framework of the community.

12.7 KEY WORDS

- **Library Management:** Library management is a sub-discipline of institutional management that focuses on specific issues faced by libraries and library management professionals.
- **Standards:** *Standards* are guidelines or rules for products, processes, test methods, or materials. These are created to produce a level of uniformity, interchangeability, reliability, or means of comparison.
- **Doctrine:** *Doctrine* is a codification of beliefs or a body of teachings or instructions, taught principles or positions, as the essence of teachings in a given branch of knowledge or in a belief system.

12.8 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the following elements frame the mandatory prerequisites of a good library space?
2. Discuss the principles of a good library building in detail.
3. Explain the model of hybrid library.
4. Write a short note on digital accessible information systems (DAISY) format.

Long Answer Questions

1. Discuss the ways by which some of the specific disabilities can be catered for in libraries.

2. What are the basic norms to be followed in public libraries?
3. What are the library standards for urban and rural libraries?

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12.9 FURTHER READINGS

Evans, G. Edward. 2005. *Developing Library and Information Centre Collections*. New York: Libraries Unlimited.

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BLOCK - VI
ELECTRONIC LIBRARY AND TOTAL QUALITY MANAGEMENT

UNIT 13 MANAGEMENT OF ELECTRONIC LIBRARIES

Structure

13.0 INTRODUCTION

Owing to the advancement of information technology, most libraries across the world are changing their modes from print to digital. Library is a place which provides right kind of information to a user depending on his requirement and objective. In today's world when most libraries have shed their traditional garb and moving towards digitalization, the work of disseminating right information to the right person has become even more challenging. The new era digital library is also known as electronic library, in which the entire information is stored in digital form and it can be accessed by means of a computer.

13.1 OBJECTIVES

After going through this unit, you will be able to:

- Discuss the management of electronic libraries
- Describe the job description of an IT manager
- Evaluate the role of IT in libraries
- Understand the importance of technology development for libraries

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13.2 ELECTRONIC LIBRARIES

According to E.A. Fox, a digital or electronic library may be defined as the 'New way of carrying out the functions of libraries encompassing new types of information resources, new approaches to classification and cataloguing, intensive use of electronic systems and networks and dramatic shifts in intellectual, organizational and electronic practices.'

13.2.1 Characteristics of an E-Library

An electronic library requires digital equipments. As the name suggests it is not purely computerized but a balanced amalgamation of customary data and modern media collection. This means that digital libraries comprise both, paper as well as electronic material. Let us have a look at the characteristics of a typical electronic library:

1. An electronic library is mainly constituted of electronic documents, which can be used only for reference, the rights of this digital material cannot be shared with anyone.
2. An electronic library consists of digital objects, like text documents, audios, videos, images, and other multimedia constituents.
3. There is a possibility of accessing an electronic library remotely from any place other than the original site of the library.
4. An electronic library supports both, formal as well as informal learning processes.
5. An electronic library offers old, latest, rare and expensive material

13.2.2 Management of E-Library

The electronic library is a user-based library service which provides the users with a complete electronic connect to the information that they require. Management of an electronic library however is very different from managing a customary library. "Factors such as distance from users, specific product/service delivery mechanisms, technology, and organization must be planned and managed differently, but the underling concepts of customer focused management are not profoundly changed" (Powell, 1994, p. 260). There are many difficulties faced by managers of electronic library services, but the three main problems faced by them are: recovery of cost, matters related to copyright, and training. In this modern electronic era, librarians must ensure a way to recover the constant costs spent on equipment being used in running the electronic library by way of increased funding or charging patrons. While copyright matters are taken care of, no copy written material can be made a part of electronic library. Library managers must make a constant effort to train the staff thoroughly which requires good amount of money and time. Nevertheless if they are able to bring about this change effectively, it can

prove to be the most important thing to guarantee the success of an electronic library. These matters must be looked into at any cost, so managers of electronic libraries need to think again and bring about required changes in traditional management strategies. With the purpose of bringing about this change and handling these matters with other problems and efficaciously managing electronic libraries, managers must make use of latest tools and innovative technologies.

Check Your Progress

1. What does an electronic library consist of?
2. What is an electronic library?

13.3 JOB DESCRIPTION OF AN IT MANAGER IN A LIBRARY

Digital resources are the main components of electronic libraries and their managers must adhere to the following steps while planning the design and management of electronic libraries. Following few points summarize the general job description of a public library IT manager in brief:

1. While planning the infrastructure of an electronic library, the IT manager of the library must well understand the need for IT apparatuses, comfortable and good looking furniture, ample airy and accessible space etc. He or she must adhere to all pre requisites needed for smooth functioning of an electronic library.
2. To run an electronic library successfully, the IT manager must understand that its information resource planning needs to be done thoroughly to avoid any glitches in the future.
3. There should be absolute clarity on the methods and techniques used by the IT manager for accessing information from the data base.
4. The IT manager should have a sound information resource development plan in place clearly stating the methods to be adopted for this purpose.
5. The IT manager must ensure selection of skilled and dedicated man power under him in order to run the electronic library successfully.
6. Running an electronic library entails involvement of large sums of money. Though it is not in the direct charter of duties of an IT manger of an electronic library to muster funds yet he or she can provide addition support for good financial back up by suggesting innovative electronic means.

13.3.1 Challenges Faced by Managers of Electronic Libraries

Let us discuss the challenges faced by managers of electronic libraries:

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1. Specially trained staff

Knowledgeable and skilled staff is the foremost prerequisite of an electronic library. The staff must be well equipped with the technical knowhow for controlling digital equipment along with digital information. Only a technically proficient and professional skilled staff can keep the electronic library up-to-date with the latest implementations new activities. The knowledge and skills of the staff must be brushed up at regular intervals for better functioning of the electronic library.

2. Workable financial backing

An electronic library requires financial support for proper management of digital information and providing immediate access to its users. Funding electronic libraries is a very common problem faced by electronic library managers. It is just not possible to manage, transfer, and disseminate information effectively in the absence of adequate funds.

3. Retrieval of digital information resources

For users to obtain necessary information from electronic libraries, an efficient retrieval system needs to be in place. Where, textual information resources are simple and straightforward digital information search may be subject to extensive research. However it may have been retrieved, the information must be delivered to the user.

4. Protection of intellectual property rights

Complying with the copyright and intellectual property rights matters is a big challenge for all library administrators. The library experts have to carry on long and serious discussions with publishers in order to devise some way out in this aspect which is profitable to all i.e., users, publishers and authors.

5. Management of rights and access control

A good electronic library in the real sense not only needs an organized collection of online computerized contents, but there is also a need for the contents to be accessed and distributed in a comprehensive manner throughout the world. Generally all sellers of online digital material support password authentication for the sale of their products. Tools like CGI scripting/proxy servers permit a subscribing organization to verify users from its server and then pass them through to sellers after confirming their authentic legal status.

6. The problem of bandwidth

Products such as text, pictures, graphics, photographs, video clips, sound, etc. make up the content of an electronic library and such content requires intensive use of bandwidth. In countries like India which are not yet completely developed, higher use of network for transmitting data by more people will put additional load on network traffic.

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7. Preservation problems

For effective creation, manipulation dissemination of electronic data, preservation of access to this information remains a daunting. Till the time, preservation of electronic information is undertaken in an orderly manner the available information will become inaccessible due to frequent changes occurring in on the technological platform on a continual basis.

13.3.2 Evaluation of Technology Assessment

Though all libraries (digital and physical) function with the sole aim of providing information to various people, yet there is a significant difference in the requirements and functioning of a digital library vis-a-vis a typical conventional library. The same has been brought out in brief in the preceding paragraphs.

Equipments used in Digital Library

For an electronic library to function properly and serve its patrons in the best possible manner use of following digital equipment has been recommended by experts:

- Self service scanners for books and other documents
- Digital signage using HD media player and LCD or LED computer screens
- Digital lockers
- Ozone chambers for deodorization of e-books
- Special equipment for delivery of books within the library
- Latest issues of periodicals and journals
- Usage of QR codes
- Space for 3D creations
- Studio or another suitable place for various recordings

Infrastructure of a Digital Library

There is no denying the fact that the content needs of a specific digital library may be special and pertinent to a particular field but all digital libraries generally operate well if they have the following infrastructure to serve their patrons. The implementation of this infrastructure however may be done after deliberation, with the concerned librarians, information professionals, IT professionals, hardware / software / network professionals, management professionals, with the help of non-technical professionals and others concerned with or affected by the electronic library.

- Ideology, manuscript creation, literature search
- Latest and updated hardware and software
- Creation of self help software

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- Individual desks with personalized systems for individual study
- Group study corners for group research work
- Acquisition of material
- A system of cataloguing and indexing data
- Preservation of all e-material
- Free and easy access or dissemination of data
- Availability of remote access to data

Services of an Electronic Library

A general electronic library must ensure the following services to its users:

- Renewal of loans, reservation of books or payment of library fees using prescribed or worthy software.
- Log in portals to access electronic resources of the library even by means of remote logging for the purpose of gathering information or drawing/ submitting e-books by using the user account (directly or remotely).
- Providing useful online resources on wide ranging subjects.
- There should be a provision of e-guides providing online information.
- Provision of online guidance and chat service.

Staff of a Digital Library

A library staff must have competencies in two sectors viz., competency with respect to professional skills and focus personal attributes. The professional creating and managing electronic data for digital libraries must be equipped with the following:

Professional Skills

- Optical character recognition (OCR)
- Cataloguing and metadata
- Imaging technologies
- Indexing and DB technology
- Markup languages, including HTML, SGML, and XML
- Programming
- Web technology
- User interface design
- Project management

In addition to the above cited professional skills, and keeping in mind the fast moving digital world, library staff personnel must also be equipped with the following personal skills:

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- Capacity to learn constantly and quickly
- Abiding public service perspective
- Skill at enabling and fostering change
- Flexibility
- Propensity to take risks
- Good interpersonal skills
- Capacity for and desire to work independently

Developments in Electronic Libraries

There is no doubt that the electronic library environment is full of challenges for every librarian and library manager, but there is no denying the fact that there are ample opportunities available in the present day scenario which can help bring about progressive changes in this environment thus advancing it even further. The following opportunities in electronic library management can lead these libraries to greater technological development:

- Electronically saved information can be immediately accessed so that high demand and frequently used items are always available to the user.
- Provision of links for accessing bibliographical tools.
- Improved manipulation of text and images.
- It is now very easy to duplicate digital resources.
- Better and improved ways of preserving delicate and valuable original data and abundance in availability of copies for access.
- Less burden or reduction in cost of delivery.
- Extensive distribution of unique collections by providing enhanced resources encourages use.
- Simultaneously use of a single information resource by more than one user at one time.
- Provision of timely access.
- Availability of more physical storage space.
- Concurrent integration of different media by providing adequate support to and creating multimedia information resources
- No damage to pages because of high use.
- Support to different libraries for the purpose of resource sharing by provision of effective and smooth access to materials held far off.
- Possibility of maintaining an electronic archive of resources which have been accessed in the past.

- Possibility of formation of library consortium or consortia of access to bibliographic databases, abstracts, full text journals and even e-books online, by spending only a nominal amount.

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Check Your Progress

3. Mention the two sectors in which a library staff must have competencies.
4. What is the full-form of OCR?

13.4 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. An electronic library consists of digital objects, like text documents, audios, videos, images, and other multimedia constituents.
2. The electronic library is a user-based library service which provides the users with a complete electronic connect to the information that they require.
3. A library staff must have competencies in two sectors viz., competency with respect to professional skills and focus personal attributes.
4. The full-form of OCR is optical character recognition.

13.5 SUMMARY

- Owing to the advancement of information technology, most libraries across the world are changing their modes from print to digital.
- An electronic library requires digital equipments. As the name suggests it is not purely computerized but a balanced amalgamation of customary data and modern media collection.
- The electronic library is a user-based library service which provides the users with a complete electronic connect to the information that they require.
- Digital resources are the main components of electronic libraries and their managers must adhere to the following steps while planning the design and management of electronic libraries.
- Knowledgeable and skilled staff is the foremost prerequisite of an electronic library. The staff must be well equipped with the technical knowhow for controlling digital equipment along with digital information.

- A good electronic library in the real sense not only needs an organized collection of online computerized contents, but there is also a need for the contents to be accessed and distributed in a comprehensive manner throughout the world.
- Though all libraries (digital and physical) function with the sole aim of providing information to various people, yet there is a significant difference in the requirements and functioning of a digital library vis-a-vis a typical conventional library.
- There is no denying the fact that the content needs of a specific digital library may be special and pertinent to a particular field but all digital libraries generally operate well if they have the following infrastructure to serve their patrons.
- A library staff must have competencies in two sectors viz., competency with respect to professional skills and focus personal attributes.

13.6 KEY WORDS

- **Copyright:** Copyright is a legal right, existing in many countries, that grants the creator of an original work exclusive rights to determine whether, and under what conditions, this original work may be used by others
- **CGI script:** A CGI script is any program that runs on a web server.
- **Digital Library:** A digital library, digital repository, or digital collection, is an online database of digital objects that can include text, still images, audio, video, or other digital media formats.

13.7 SELF-ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. What are the characteristics of an e-library?
2. Write a short note on the management of e-library.
3. What are the equipments used in digital libraries?

Long Answer Questions

1. Write a summary of the job description of an IT manager of a public library.
2. What are the challenges faced by the managers of electronic libraries?
3. What are the services provided by an e-library? Discuss.

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13.8 FURTHER READINGS

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UNIT 14 TOTAL QUALITY MANAGEMENT

NOTES

Structure

14.0 INTRODUCTION

A core definition of total quality management (TQM) describes a management approach to long–term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work. Total Quality Management (TQM) describes a management approach to long-term success through customer satisfaction. In a TQM effort, all members of an organization participate in improving processes, products, services, and the culture in which they work. Total quality management can be summarized as a management system for a customer-focused organization that involves all employees in continual improvement. It uses strategy, data, and effective communications to integrate the quality discipline into the culture and activities of the organization. Many of these concepts are present in modern Quality Management Systems, the successor to TQM.

14.1 OBJECTIVES

After going through this unit, you will be able to:

- Understand the concept and definition of Total Quality Management
- Discuss about Operations Management Systems

- Learn about Inventory planning and control
- Describe Open Access - Technology Management

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14.2 TOTAL QUALITY MANAGEMENT: CONCEPT, DEFINITION AND ELEMENTS

Let us begin by defining total quality management.

14.2.1 Concept and Definition

Total quality management is a real and meaningful effort by an organization to change its whole approach to business to make quality a guiding factor in everything the organization does. It stresses a commitment by management to have a continuing drive towards excellence in all aspects of products and services.

An organization known as Total Quality Forum, which is a consortium of business and academic leaders, defined total quality in 1992 as follows.

> "It is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. TQ is a total system approach (not a separate area or programme), and an integral part of high-level strategy. It works horizontally across functions and departments involving all employees, top to bottom, and extends backwards and forwards to include the supply chain and the customer chain."

Elements

The major ingredients in TQM are:

1. **Strategic commitment:** A vital element of any total quality management programme is the commitment of top management to the success of the programme. Such commitment is important for several reasons. First, the organizational mission and goals must change to include quality as a high priority goal. This can only be done by top management. Second, the organization culture must change so that all persons in the organization recognize quality as the ultimate goal of their efforts. Third, pursuit of total quality requires some high capital expenditure which can only be authorized by top management. Hence, quality improvement necessarily requires commitment from top management.
2. **Employee involvement:** TQM requires that all employees be involved in every step of the production process. Studies have shown that a high degree of worker involvement reduces the number of quality problems'[13]'. Most of the quality problems have to do with materials and processes and these problems can only be eliminated by serious and sincere commitment of all workers who understand the shortcomings of the system.

Techniques for building employee involvement include:

- Building communication networks with open channels including all employees
- Supportive supervisors
- Delegating responsibility to people who are closer to the theatre of operations
- Developing a highly motivational workforce
- Formal techniques such as quality circles

A quality circle is a small group of employees, including workers and supervisors who volunteer to meet regularly to solve work related problems. Their suggestions and recommendations are taken very seriously by the top management.

3. **Technology:** New forms of technology are very useful in TQM programmes because of precision and consistency that the new advanced equipment creates in the products. Automation, computers and robotics perform the jobs more accurately than people and make fewer mistakes. This results in better quality products. Hence, investment in higher-grade machines capable of doing jobs more precisely and reliably is justified as the quality of the output is highly improved.
4. **Materials:** The output cannot be of high quality unless the input is also of high quality. All raw materials for production and all finished goods for final assembly are acquired from outside suppliers. Accordingly, it is necessary to have a kind of partnership with suppliers. Many firms have increased the quality requirements they impose on their suppliers as a way of improving the quality of their own products. Suppliers are often involved with buyers as members of quality improvement teams. Such partnership is crucial in some industries. Most automobile manufacturers, for example, depend on suppliers for more than 70 percent of the parts they use in their automobiles.
5. **Methods:** Methods are operating systems used by the organizations during the actual transformation process. Improved methods result in improved quality. Methods can be improved by methods analysis, which focuses on how a task is accomplished. How a task is done makes a difference in performance, safety and quality. Methods engineers are charged with ensuring that quality and quantity standards are achieved efficiently and safely. American Express Company has found ways to cut its approval time for new credit cards by more than half.

Check Your Progress

1. Define total quality management.
2. What is a quality circle?

14.3 OPERATIONS MANAGEMENT SYSTEMS

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Operations management is the management of activities specifically related either directly or indirectly to the organization's production of goods and services. Goods are in the form of physical units such as soap, candy bars, computers and so on, while services are meant to provide some form of assistance such as dry cleaning service, banking facilities, medical services, accounting services and so on. Both the products as well as services involve a process of conversion from inputs to outputs. In the case of material output, it is the technology that converts raw materials into finished useable goods, and in the case of services, it is the managerial knowledge and ability that assist in the conversion. Operations management is used in both types of these businesses.

Operations management involves efficiently managing the transformation process from input of people, materials, tools and money to output of goods and services. In other words, operations management is the performance of activities entailed in selecting, designing, operating, controlling and updating production and service systems. For example, a hospital as a system would use operations management techniques to facilitate admission of patients, efficient scheduling of operating rooms and diagnostic equipment, and billing of services to patients and so on.

14.3.1 Systems of Operations Management

Production systems or manufacturing systems convert inputs into goods that have a physical form. This value addition can happen in any of the ways. Depending on the kind of manufacturing process adopted for converting the input into output, we can classify them into certain major groups. Let us now learn about each of these systems:

1. Continuous production system

It involves continuous or almost continuous physical flow of material. It makes use of special purpose machines and produces standardized items in large quantities. The processes usually operate round-the-clock to maximize utilizations and to avoid expensive and time-consuming shutdowns and start-ups.

2. Process production

The name is derived from the way materials move through the process. This system is used for manufacturing items for which the demand is continuous or high. Here, a single raw material can be transformed into different kinds of products at different stages of the production process. Examples include petroleum refining – different fractions, viz. kerosene, gasoline, etc., are recovered during the process of fractional distillation and steel making (e.g., integrated steel plants of SAIL).

3. Mass or flow production

Few types of products are manufactured in large quantities. The volumes are high and products are standardized which allows resources to be organized around particular products. Standardization of products, processes, materials, machines and uninterrupted flow of materials are the main characteristics of this system. It lies between process production and batch production. Examples include automobiles, appliances, computers, etc.

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Check Your Progress

3. What is operations management?
4. What does production systems of manufacturing systems do?

14.4 TOOLS AND TECHNIQUES FOR IMPROVING QUALITY

Total quality management requires a never-ending process of continuous improvement. The end goal is perfection which is never achieved but always sought. The concept of continuous improvement has become the cornerstone of the Japanese approach to production. The Japanese use the term "Kaizen" to describe the ongoing process of continuous improvement.

While the concepts of continuous improvement and total quality management require a complete overhaul of management philosophy and organizational culture, managers can rely on several specific tools and techniques for improving quality. Some of the approaches and methodologies for quality improvement are discussed as follows:

Benchmarking: Benchmarking is the continuous process of comparing a company's strategy, products and processes with such other similar organizations which are the best in that class in order to learn how they achieved excellence and then setting out with changes in strategies, products, and processes to match them and then surpass them. A benchmark demonstrates the degree to which the customers of other similar organizations are satisfied. It identifies an organization whose operations are so superior that it enjoys the highest degree of customer satisfaction. The goal is to beat such an organization in performance. The benchmarking process usually involves the following steps:

- Identify a critical area in your own organization that needs improvement.
- Identify some other organization which excels in quality in that area.
- That organization would then become your benchmark for that area for improvement. Study the organization carefully and especially its benchmark activity.

- Analyze the data so gathered from the benchmark organization and compare it with your own activity.
- Improve the critical area at your own organization.

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Selecting an industry leader provides an insight into what successful competitors are doing. It also allows organizations to set realistic and rigorous new performance targets based on what they learn from industry leaders. Benchmarking also provides a vehicle whereby products and services are redesigned to achieve outcomes that meet or exceed customer expectations. Since the employees take pride in their organization being the "best", it further motivates them to do their best to continue to be the best.

- **Outsourcing:** Outsourcing is the process of subcontracting operations and services to other firms that specialize in such operations and services and then do better. Since there are a number of operational and administrative functions that an organization is involved in, it is quite possible that some of these functions are not being performed in an optimal manner because of lack of resources or expertise. If such inefficient areas can be identified and outsourced, the organizations can realize a higher quality service or operation.
- **Speed:** Speed refers to the time needed by the organization to get something accomplished without sacrificing its quality. An organization which produces faster, distributes faster and adapts to new way of doing things faster will be ahead of competition. One recent survey identified speed as the number one strategic issue confronting managers in the 1990s. .
- **Quality Function Deployment (QFD):** The quality function deployment defines the relationship between the customer's desires and the products supplied. Defining this relationship clearly is the first step in building a world-class production system. Then the products and processes can be built with features desired by the customers.
- **Taguchi Technique:** Named after a Japanese engineer, Genichi Taguchi, this approach is built around three concepts namely quality robustness, quality loss factor and target oriented quality. *"Quality robust"* products would continue to retain quality even in adverse manufacturing and environmental conditions. Taguchi's idea is to remove the "effects" of adverse conditions instead of removing the causes. Removing causes can sometimes be very costly and time consuming, and hence it may be cheaper and faster to remove such effects.

  The *"quality loss function"* (QLF) identifies all costs connected with poor quality including the costs of customer dissatisfaction, warranties and services, scraps, waste and repairs and possibly some social costs. The quality loss function is defined as:

  $$L = D^2C$$

where;

L = Loss

D = Deviation from the target value C = Cost of avoiding the deviation

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D^2 shows that the farther the product is from the target value, the more severe the loss.

"Target-oriented quality" is philosophy of continuous improvement to bring the product up to the most realistic but high quality target.

- **Flow diagrams:** A flow diagram serves as a visual representation of a system or a process and it allows one to see the flow of steps in a process from the beginning to the end and serves as a kind of a road map for locating and solving problems for improving quality.
- **Pareto analysis:** Vilfredo Pareto, a nineteenth century economist suggested that 80 percent of the problems are the result of only 20 percent of the causes. Pareto analysis organizes errors, problems or defects so that attention can be focused on the most important problem areas. The idea is to classify these problems according to the degree of their importance so that the most important problems can be resolved first. The 80-20 rule, as stated above, suggests that by removing 20 percent of the causes, 80 percent of the errors can be removed. For example, if 80 percent of machine breakdowns come from 20 percent of the machines then attention should be focussed on these 20 percent machines.
- **Cause-and-effect diagrams:** The cause-and-effect diagrams offer a structured approach to problems solving. These are also known as "fishbone diagrams" because of their shape. The diagrams help organize problem solving efforts by providing several layers of categories that may be factors in causing problems. The four major such categories are methods, manpower, materials and machines. Each category can then provide more information about specific causes of problems in that category. A simple fishbone diagram may be as follows.

  Let us take an example of the problem of a dissatisfied airline passenger to illustrate this technique. Each bone in the fishbone structure represents a possible source of error.

  When such a chart is properly built and in detail, then the possible quality problems are highlighted and proper steps can be taken to solve these problems to the customer's satisfaction.
- **Statistical process control:** Statistical process control is primarily concerned with managing quality, rather than improving quality. It consists of a set of statistical techniques that can be used to monitor quality. It involves control charts which are graphic presentations of data over time and sets acceptable limits, both upper as well as lower, of acceptable quality.

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It monitors standards, makes measurements and takes corrective action as a product or service is being produced. Samples of process outputs are taken and analyzed and if they are within the acceptable limits, the process is considered to be under control. The variation of the quality measurements within the acceptable limits must be random. However, if there is a pattern of movement in one direction or the other or if the values fall outside the control limits then the process is not considered to be under control and corrective actions are taken to bring the process back under control.

Check Your Progress

5. Mention the term used by Japanese to describe the ongoing process of continuous improvement.
6. Define benchmarking.

14.5 INVENTORY PLANNING AND CONTROL, AND INVENTORY CONTROL MODEL

Inventory refers to the goods or materials available for use by a business. It is a stock of materials that are used to facilitate production or to satisfy customer demand. These inventories in the form of raw materials, work-in-process and finished goods must be adequately managed and controlled. Carrying of inventory is a necessity, and proper planning and control of inventories reduces the level of stock to minimum desirable. These inventories are necessary for the following reasons:

- Inventories help in the smooth production of the end product. Lack of availability of parts and materials when needed can disrupt the production process.
- The customer is served better and his goodwill obtained when the item required by the customer is in the inventory and is ready to be shipped.
- Inventory serves as a hedge against uncertain lead time. A lead time is the time gap between ordering and receiving goods. If this lead time is long or uncertain, then it is necessary to keep adequate stock of inventory as a buffer against shortages.

Inventory control is concerned with systematic acquisition, storage and recording of materials in such a manner as to furnish the desired degree of service to the operating departments and to the customers at the lowest cost. Inventory control models are designed to achieve a balance between the risk of being out of stock and the cost of carrying excess inventory. While the cost of being out of stock is comparatively intangible in terms of loss of customer goodwill and potential sales, the inventory carrying costs are fairly quantifiable.

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There are basically two types of costs associated with inventories. These are the ordering costs and carrying costs. The ordering costs are associated with time, effort and money involved in ordering the inventory items. The inventory carrying costs are the costs associated with holding the items in storage for future use. Some of the carrying costs are: the cost of capital tied -up, insurance premiums on inventory, possibility of obsolescence, possible pilferage of stock, deterioration and damage to goods, storage space costs and storage labour costs.

Economic Order Quantity (EOQ) Method of Inventory Control

The economic order quantity (EOQ) method is a procedure for balancing ordering costs and carrying costs so as to minimize total inventory costs. The total inventory cost associated with a particular order of items is given as:

Total inventory cost = ordering cost + carrying cost

The objective is to balance these costs and order such quantity as to minimize the total inventory cost. The more items are ordered per order, the less will be the ordering cost because there will be fewer number of orders in a given period of time and the ordering cost is the same irrespective of the number of items ordered. However, it will increase the carrying costs. Similarly, more frequent orders will increase the ordering costs but reduce the inventory carrying costs. The following graph depicts the economic order quantity that would minimize the total cost.

Using basic calculus, a mathematical model can be developed to calculate such economic order quantity. Such economic order quantity can be calculated by the following established formula.

$$EOQ = \sqrt{\frac{2\ (\text{Ordering cost})\ (\text{annual demand})}{\text{Carrying costs}}}$$

This model is based on the following assumptions:

- The annual usage of the item is known and is constant.
- Material when received comes in all at once and instantly.
- The ordering cost is independent of the size of the order.
- No quantity discounts are considered.
- The inventory time cycle starts with a quantity q and ends with quantity zero so that the average inventory carried is q/2. The usage of items over this time cycle is constant.

ABC Inventory Method

Since there are a variety of items and each item may have different value and different need, it may be useful to categorize items of inventory according to the degree of control needed. The ABC inventory method classifies the inventory items into three categories according to unit costs and the number of items in the inventory. These are:

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- A - This category of items has small number of items with high unit value and accounts for about 70 percent of the total monetary value of the inventory used. These items are kept under tight control and accountability.
- B - Items in this group represent the next 20 percent of the dollar value of the inventory usage. These items, though less valuable, do represent substantial investment and are kept under moderate control.
- C - Items in this group are less expensive and may require less frequent attention.

According to Peter A. Alcide, the classification of items can be determined as follow:

> "Multiply the cost of the item by how often the item is used in a specific period of time. Then, list all items in order of the total dollar amounts. Items representing 70 percent of the total dollar amount constitute the A group, the items constituting the next 20 percent would come in the B group and the remainder would be in C group".

Just-in-time Inventory Method (JIT)

The JIT philosophy of manufacturing and purchasing was initially developed at Toyota Motor Company in Japan in the mid-1970s. The Just-in-Time approach to inventory situations requires that arrangements be made to provide materials when exactly needed, thus eliminating the need for keeping inventories. The system is mainly used to eliminate inactive production inventory through delivery to the production line, of parts and supplies exactly when they are needed, thus managing with "zero inventory".

This approach requires a highly synchronized and dependable timing. This concept when applied effectively is a highly cost saving device. This strategy avoids investing large amounts of money in inventory holdings. It also avoids consuming large area of warehouse space and shop floor space as well as extensive paper work and follow-up that is required to keep track of the inventory. However, in this approach, an extreme degree of coordination is required. In addition, it requires that:

- All independent groups cooperate fully with each other.
- The suppliers must ensure satisfactory quality of their supplies, since there is no safety stock to draw from in case the shipment from the supplier is rejected.
- The delivery must be "just-in-time", because no buffer stock is available.
- Equipment must perform reliably.
- Daily schedules must be realistic and the employees must be skilled and dependable.
- A good, clear and effective communication system, a team spirit and participative management style are extremely helpful.

Evidence suggests that just-in-time delivery arrangement have produced substantial benefits for U.S. companies. In a survey conducted in 1986, inventory turnover increased by an average of 97 percent, delivery promises kept increased from 67 percent to 83 percent and scrap costs declined by 40 percent.

NOTES

Check Your Progress

7. What does inventory refer to?
8. What are the two types of costs associated with inventories?

14.6 QUALITY AUDIT

Quality management standard (QMS) is a set of standards especially designed to ensure the production of quality products. These standards are also revised from time to time. Some of the popular standards are ISO 9001 for quality and ISO 14001 for environment. These are described below.

The ISO 9001:2008 Standard

During the 1980s, the boom in international trade created a need for the development of quality standards universally. In this backdrop, the International Organization for Standards (ISO) developed the ISO 9000 as the first set of standards for quality management. By receiving ISO 9000 certification, companies demonstrate that they have met the standards specified by the ISO and have gained global acceptance. These standards are now used by more than 9, 51,000 businesses in 175 countries worldwide.

This ISO 9001:2008 standard has four elements:

- **Responsibility of management personnel:** It is the responsibility of the management personnel to look after and ensure the right quality system according to the international standards and customer requirements.
- **Management of resources:** Management should be aware about their resources such as people, infrastructure and work environment. Managements utilize all these resources to improve quality systems in the firm.
- **Realization of exact product:** Management should realize the exact product and what the customers want. They should know about areas such as sales processes, design and development, purchasing, production or service activities.
- **Measurement, analysis and improvement:** It is the process of taking feedback from various customers and checking whether you have satisfied customers by carrying out other measurements of your system's effectiveness.

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Advantages of ISO 9001:2008

- Continuous control on various business activities, processes and major decisions
- Ensures the technical specifications to maintain quality of the products Increased customer satisfaction
- Regulation of successful working practices
- Control on risk management
- Improved profits for the organization
- Improved organizational efficiency

Disadvantages of ISO 9001:2008

- Increased costs implementing the certification
- Considerable time spent in implementing
- Overcoming opposition to implementing change from within the business

ISO 14000:2004–Environmental Management System

Standardization of the quality created as a need of quality in the organization; thus, for evaluating environmental responsibility in 1996, the ISO introduced new standards known as ISO 14000. This standard deals with the environmental issues and liabilities associated with operations and product standards. ISO 14001 requires implementation of an environmental management system that complies with the defined internationally recognized standards. These standards specify requirements for establishing an environmental policy, determining environmental aspects and impacts of products/activities/services, planning environmental objectives and measurable targets, implementation and operation of programs to meet objectives and targets, checking and corrective action, and management review.

ISO 14001 gives benefits from environmental point of view and helps control on environmental disaster. It has some benefits of being registered such as:

- As this is an internationally recognized standard for environmental management system, the company's product has high value and demand in the market.
- In this competitive world, sustainability of company increases.
- For many companies, their competitors are seeking registration, and their customers are beginning to demand conformance to ISO 14001, so many registered companies require that their suppliers also comply with the ISO 14001 standards.
- By establishing and maintaining an environmental management system that meets the standards established by ISO 14001, companies will be

implementing a strong and effective environmental management program which reduces violations, fines and negative publicity.

- With a greater interest in green manufacturing and more awareness of environmental concerns, ISO 14000 may become an important set of standards for promoting environmental responsibility.

NOTES

Check Your Progress

9. What is quality management standard?
10. What is the main proposition of ISO 14001?

14.7 LIS RELATED STANDARDS: RESOURCE MOBILIZATION, OUTSOURCING, LIBRARY CONSORTIA AND OPEN ACCESS

Let us now discuss resource mobilization.

Resource Mobilization

Public libraries experience reduction in library resources because of insufficient funds and economic declines. All library resources viz., human resource, equipment resource, information materials and purses undergo this problem. The condition has been very bad since the 1990s that is the time which was categorized by quick expansion in Information and Communication Technologies and has had an effect on all sectors of society including libraries. Public libraries of the country are determined to organize, assemble and afford access to an ever-developing collection of information for a growing number of patrons in an environment of mounting financial restraints. These libraries are manned by highly skilled and educated staff. In order to provide good service to patrons, public libraries need to fortify present materials, and be equipped with modern electronic technologies.

Therefore, there is a need to implement new methods in order to find a solution to the financial problems of the public libraries. Resource mobilization seems to be a good alternative for enhancing the availability of library resources in order to provide better library services to patrons. Resources can be mobilized based on the available opportunities. There are abundant opportunities that libraries can be used by libraries to mobilize their resources, let us have a look:

1. Resource mobilization through resource sharing

Scarce resources can be mobilized by libraries by accessing and utilizing resources not existing with them from other libraries in remote sites. Consequently academic materials, bibliographic databanks, cataloguing information, CD/DVD databases and proficiency can be shared, by means of services like interlibrary loans and library consortium.

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2. Professional public relations programs

Public relations have been defined as an organized endeavour or action shaped or done primarily to augment prestige or goodwill for any person or organization. Generally, public relation activities are carried out by use of the media through newspapers, TV, periodicals etc. Today, when the social liability of libraries has increased manifold, through the medium of circulars, pamphlets, newspaper ads, television advertisements and web pages the libraries library can create more and more awareness about their services in the society and muster up financial backing, which is required to keep these services existing and available.

3. Mobilizing local support

The existing tendency is to mobilize support from regional organizations such as private, public or non-governmental. That is the reason why all such organizations must come together to navigate development by joining hands with each other.

4. Mobilizing various contributions

Various contributions made to libraries by individuals and organizations may not be limited only to money, they could be in any form for example, time, ideas, labour and political action. People can be a library's ultimate resources providing service as dedicated board members, helpers, alumni, etc. they could be placed within the local community or living in foreign lands. Other groups of people who can prove to be beneficial for the library are parents of students and alumni; faculty; and staff members.

5. Fund raising

Mobilize resources of raised funds works very well for library services development. As pointed out by Kiondo, American and European countries commonly use fund raising a means of mobilizing funds, but this practice is not yet in vogue in developing countries like India. Fund raising for libraries needs to be based on accurate research and planning. Before beginning a fund raising operation it is vital to deliberate upon the public image and plans of the library for development. Besides this, the availability of required staff members, time and funds to support such a campaign must also be evaluated. Study into potential contributors must be done effectively. A case report, telling the library's needs, objectives, resources, institutional plans etc. must be prepared. Libraries across the world must contemplate upon this method of resource mobilization.

6. Donor funding

This is an important area that requires close attention by the information professionals in Africa. Funds from donor can be acquired through writing project proposals. The information professionals should learn and acquire Skills in project write-ups so as to take advantage of this strategy. The proposal should have a detailed project description including the qualification of the organization requesting

funds, a timeline budget and information on staffing and project evaluation. The proposal should also conform to interest of donors at that particular time. Through this strategy it is also possible to acquire funds for staff training. For example, SNAL has been able to secure funds from NORAD and VRIL through this strategy.

7. Fee-based services

According to UNESCO Public Library Manifesto, "The public library shall in principle be free of charge. The public library is the responsibility of local and national authorities. It must be supported by specific legislation and financed by national and local governments. It has to be an essential component of any long-term strategy for culture, information provision, literacy and education." Nevertheless this opinion has been challenged by the monetary constriction faced by libraries across the world. There is an increasing apprehension amongst library managers today that the value of providing free intellectual services to patrons by libraries is being ignored by most libraries in order to run these libraries efficiently. That is the reason why library managers today, in a proliferation of fees charged for services, are trying to mobilize their resources.

8. Resource mobilization on the web

Public libraries can devise ways of mobilizing resources on the web. The library can mobilize resources on the cyberspace by guaranteeing a strong public image for themselves which heightens their profile and presence. Aware of the library's presence and its contribution to the society and the importance of the library in the society, people will feel obliged to support it by various means.

Outsourcing

Libraries have always been outsourcing some of their services to external agencies. This means that libraries tie up with organizations or people from outside to render some service on a permanent or contractual basis. Outsourcing is the latent tool to reduce overall costs incurred and make the quality of library services better. The trend of outsourcing services to external agencies started around 25 years ago and is prevalent in many libraries across the world. Ever since, outsourcing has become an essential part of all types of the libraries. It won't be wrong to call outsourcing a strategic library management tool.

Following services are generally outsourced by libraries:

- Binding and book repair
- Indexing and abstracting
- Cataloguing
- Cataloguing card production Photocopying
- Collection development services:
- Book pockets, book cards, borrower's tickets

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Purpose of using outsourcing:

- To do justice to primary undertakings
- Dearth of mandatory qualified staff
- Development of the quality of library services
- An endeavour to continuously improve upon library services
- Introduction of new services
- Cutting down of manpower
- Conservation of time and energy
- Reduction in staff responsibilities
- External expert services are far better in comparison
- Enhancement in user's satisfaction.

Benefits of Outsourcing

- Greater revenue generation and better returns on investment.
- Reduced labour cost and better generation of economics of scale.
- Better access to knowledge base for improved innovation.
- More time for librarians, empowering them to concentrate on core requirements.
- Outsourced activities happen at a faster speed and there is better quality of delivery.
- Reduction cash outflow and enhancement of resource utilization.
- Improvement in library services.
- Growth in library's planning, application and assessment processes.
- Availability of specified tools for the job, without having to spend on them.
- Outsourcing guarantees appropriate resource utilization, in fact experienced work force, better technology and outstanding infrastructure are employed in a productive manner.
- Outsourcing ensures minimization of libraries' problems.

Disadvantages of Outsourcing

- Likely loss of control over a library's activities.
- Complications concerning quality and completion time.
- Sometimes benefits and results accrued from outsourcing are far lower than expected.
- Problems related to variation in lingual accent.
- Long term contracts may not be able to deliver due to rapid change in conditions.

- Outsourcing of work may pose a threat to the existing library staff members.
- Outsourcing of library work may result in demotivating the permanent staff of the library, thus rendering them inefficient.
- Menial job contracts like dusting and cleaning of the library may be discontinued without prior notice, causing inconvenience to the library's permanent staff and its patrons.
- Large scale outsourcing narrows down the scope for other library workers.
- Quality maintenance of outsourced jobs is s big problem.

Library Consortia

Library Consortium is a partnership of a group of libraries which congregate together in order to realize common objectives. According to Webster Dictionary: An agreement, combination, or group (as of companies) formed to undertake an enterprise beyond the resources of any one member, a consortium is an association of two or more individuals, companies, organizations or governments (or any combination of these entities) with the objective of participating in a common activity or pooling their resources for achieving a common goal. A Consortium can also be called a group of organizations that come organized with one another in order to accomplish a common aim that can be achieved by co-operation and resource sharing. For a consortium to be successful there needs to be absolute clarity of the mutual goal. A library consortium may be formed at a local, regional, state, national and inter institutional level. In the present era of digital information, accessibility to resources is considered to be of more significance than its collection. On forming a consortium patrons of libraries get the advantage of broader access to electronic resources at reasonable cost. A library consortium equipped with collective resources of different institutions available works to be very beneficial in addressing and resolving problems like handling, consolidating and archiving the electronic resources.

Advantages of Consortia

Library consortia have the following advantages:

- This kind of an association offers every institution the capacity to share resources without foregoing the uniqueness of any member of the library.
- Members of the Consortia have an access to an extensive base of electronic resources at a considerably lower cost.
- Improved library services are delivered with stress upon availability of new electronic resources inclusive of databases and services provided through the internet and World Wide Web.
- Better services delivered to users.
- Better comprehension of laws related to copyright.
- Electronic Journals are safe from theft and can be stored in very little space.

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Disadvantages of Consortia

- Consortia are not cost effective as they require high investments required for licensees.
- Undependable cable links and inadequate bandwidth cause a lot of problem
- Nonexistence of printed copy of journals can be problematic
- Obsolete technology is of no use
- It is difficult to maintain uniform standards
- Insufficient knowledge
- Fear of loss
- It is difficult to resolve copyright matters arising during the formation of consortia
- Lack of cooperation and reluctance in participation

Types of Consortia

The various types of consortia, usually based on different models developed in India are as follows:

- **Open consortia:** Open consortia is a flexible type of consortia which the members can join or leave at their free will.
- **Closed group consortia:** This type of consortia is formed within a defined group, it gets formed by relationship and partnership among like libraries.
- **Centrally funded consortia:** A centrally funded consortium is completely dependent on the parent body.
- **Shared-budget consortia:** In a shared budget consortium participating libraries make an initiative, get together in order to form the consortium.
- **Publisher initiatives:** In Consortia formed on the basis of initiatives taken by publishers, participating library members get a heavy discount.

Examples of E-Journals Consortia India

1. INDEST – AICTE Consortium (http://paniit.iitd.ac.in/indest/)
2. UGC INFONET (http://web.inflibnet.ac.in/info/ugcinfonet/ugcinfonet.jsp)
3. FORSA Consortium (Astronomy and Astrophysics Libraries)
4. (http://www.iiap.res.in/library/forsa.html)
5. CSIR Library Consortium

   http://www.niscair.res.in/ActivitiesandServices/MajorProjects/majproj.htm#ejournalconsortia)
6. ISRO Library Consortium
7. IIM Library Consortium

8. HELINET (Rajiv Gandhi University of Health Sciences, Karnataka) (http://www.rguhs.ac.in/hn/newhell.htm)
9. ICMR Library Consortium

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Open Access

Traditional fee-centred publishing models divide worldwide intellectual journal literature into several digital reserves under the protection of numerous security systems which limit access to users having license. The scene of worldwide learning cannot be imagined if this information was freely available to all. Without considering the fact whether seeker of information is a student or faculty member at Harvard or an inconspicuous college, or an Indian or American. Imagine the state of information availability if, instead of being knotted in limiting licenses inhibiting its use, journal literature was permitted to be used on fulfilment of just a few common-sense conditions. The concept of Open access (OA) to information gives this promise. Of course, there are numerous trials and tests in involved in the endeavour to achieve this courageous dream. There is no doubt that OA has noteworthy consequences with respect to libraries, particularly academic libraries. While considering open access, as a way of information availability, electronic resources library managers, are faced by numerous questions such as: What is open access? What is the difference between open access and free? What does a Creative Commons License, mean which is used by some open access providers? What does an e-print mean? How many types of e-prints exist? What does self-archiving mean? In how many ways can e-prints be made publicly available? What is the meaning of an OA journal? How many different types of open access journals exist? How can open access journals be made available free of cost? How are open access materials searched? What makes open access so desirable?

Let us try to find answers to these questions by understanding the concept of Open Access

Characteristics of Open Access Material

- Open Access literature is available free of cost.
- Open Access literature is available online.
- Open access literature is available online.
- Negligible distribution expenditure, after meeting the first copy production costs, are essential for feasibility of open access existence.
- The proliferation of open access has been possible due to the Internet, the Web, and related digital publishing developments.
- Open access literature is scholarly and royalty free and only deals with unpaid educational works.
- OA literature comprises published and unpublished journal articles.

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Added advantages of Open Access

The biggest benefit of open access material is that academicians, intellectuals, research scholars and other users have no requirement to seek permission to use open access literature of their choice. Over and above this, they don't even have to make any payments. This condition is a drastic change from conservative publishing, which is restricted by copyright provisions, deterring publisher license contracts, and permissions payments. The assessment of the future of Open Access with respect to Libraries can have three hypothetical consequences:

- The OA movement fails,
- The OA movement succeeds, or
- The OA movement triumphs only succeed partially, creating in an assorted academic system of communication which partly has traditional elements and is partly made up of open access publishing.

Most scholars are of the opinion that the third development is the one which is most likely to happen, and that is the scenario in which contemporary libraries are working. Following key factors decide the degree of success of the open access concept:

- Law-making, fund backing agency, employer and other directives that require open access;
- Maintainable business models for open access journals, inclusive of nonprofit journals;
- A commitment by big educational institutions and other organizations to institute, sufficiently fund, recruit employees, and activate long-lasting digital sources and records;
- A positive campaign to win over scholars in order to get their support

Effect of Open Access on Libraries

A full open access will have a great impact on library's strategies, techniques, and services because implementation of this will remove the barriers of both, price and permission:

- Electronic journals would be owned by libraries, which will not be merely licensed.
- Libraries will own the right to archive the electronic journals for life without ever having to seek special permission or make any kind of payments.
- In case of publishers failing to migrate older content, for example the back runs of journals, to new media and formats in compliance with technological changes, libraries would have the right to do so on their own.
- Access and usage will not be restricted by password, IP address, usage hours, institutional affiliation, physical location, limit simultaneous users, or payment capability.
- Users will be free to lend and copy digital articles on their own terms.

- Teacher and professors will be able to donate digital literature and software without violation of their licenses.
- The use of OA material would be considered as non-trespassing use, and there will be legal permission to do that supported by right kind of technology.
- This will save any consortia individual institutions from having to negotiate for prices or licensing conditions.
- All users, the ones who have objection to cookies or registration and the ones who don't, will enjoy similar access rights. There will be a possibility of anonymous inquiries also.
- There will be no need for anyone to cancel a subscription because of paucity of funds or unacceptable licensing conditions.
- Researchers will have uninterrupted supply of research material without any gaps whatsoever.

Check Your Progress

11. What is outsourcing?
12. What is library consortium?

14.8 TECHNOLOGY MANAGEMENT

According to Gaynor 'technology management is a procedure of operation that enhances human resources and business assets by rearranging the relationships between the technology functions of an organization. Here, we need to integrate science, engineering, research, development and manufacturing in order to meet the operational goals of the business in an efficient and effective manner. Managing means management of all technology operations from initiation of concept through commercialization of the product'.

The various issues interconnected with managing technology are: technology strategy, forecasting and assessment of technology, technology transfer, Research and Development (R&D); process and product technology, HRM and Innovative capabilities, and technology project management.

The invention of the wheel set technology management into motion. It has now become organized and methodical. It encompasses several interconnected issues that start from planning of policy at the national level to planning of strategies at the firm level and grab the attention for decisions and actions at small and higher levels.

The national level of technology management, also called macro technology management, includes:

- National level planning for the development of technological capabilities
- Identification of areas (sector wise) where development is required
- Decision making (make or buy)

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- Directing and coordinating institutions
- Designing of control policy

Micro technology management involves technology management at the firm or project level. It includes:

- Responding to competitors who are using technology as a strategic weapon
- Integrating technology strategy into the overall corporate strategy
- Identifying and evaluating technological options and innovations and the factors relating to their success and failure
- Directing research and development itself, including determination and definition of project feasibility
- Monitoring and planning technological obsolescence and replacement

Both macro and micro-technology management seek to raise economic efficiency.

According to Solomon, 'technology management is the capacity of a firm, a group or society to master management of the factors that condition technical change so as to improve its economic, social and cultural environment and wealth'.

Technology Managers

A technology manager is the person in an organization who is responsible for planning, coordinating, and directing technology-related activities of the organization. They help determine the technology goals of an organization and are responsible for implementing the appropriate systems to meet those goals.

Following are a few roles and responsibilities of technology managers that help the concerned organizations in many ways:

- developing safe transaction platforms
- designing better inventory supply systems
- streamlining medical databases
- initiating automation of bank transactions
- mapping transportation schedules

Dimensions of Technology Management

There are many factors that make up the technology development framework. Following are six broad dimensions into which these factors are grouped:

1. **Objectives**
   (a) Productivity gain
   (b) Self reliance
   (c) International trade gain

(d) Needs satisfaction

(e) Technological independence

2. Decision Criteria

(a) Maximizing positive effects

(b) Minimizing negative effects

3. Time

(a) Short range perspective (1-5 years)

(b) Medium range perspective (5-10 years)

(c) Long range perspective (10-20 years)

(d) Perspective range (>20 years)

4. Constraints

(a) Technological level of constraints

(i) Knowledge (ii) Skill

(iii) Science (iv) Information

(b) Resources

(i) Human beings

(ii) Facilities

(iii) Material

(iv) Finance

(v) Energy

(c) Late starters

(d) Management capabilities

5. Activities

(a) Assessment

(b) Planning

(c) Transfer

(d) Adaptation

(e) Research and Development

(f) Monitoring

(g) Control

6. Mechanisms

(a) Awareness measures

(b) Science culture creation

(c) Education and training

(d) R & D institution building

(e) Scientific and technological policies

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Check Your Progress

13. Define technology management?
14. Who is a technology manager?

14.9 ANSWERS TO CHECK YOUR PROGRESS QUESTIONS

1. Total quality management is a real and meaningful effort by an organization to change its whole approach to business to make quality a guiding factor in everything the organization does.
2. A quality circle is a small group of employees, including workers and supervisors who volunteer to meet regularly to solve work related problems.
3. Operations management is the management of activities specifically related either directly or indirectly to the organization's production of goods and services.
4. Production systems or manufacturing systems convert inputs into goods that have a physical form.
5. The Japanese use the term "Kaizen" to describe the ongoing process of continuous improvement.
6. Benchmarking is the continuous process of comparing a company's strategy, products and processes with such other similar organizations which are the best in that class in order to learn how they achieved excellence and then setting out with changes in strategies, products, and processes to match them and then surpass them.
7. Inventory refers to the goods or materials available for use by a business.
8. There are basically two types of costs associated with inventories. These are the ordering costs and carrying costs.
9. Quality management standard (QMS) is a set of standards especially designed to ensure the production of quality products.
10. ISO 14001 gives benefits from environmental point of view and helps control on environmental disaster.
11. Outsourcing is the latent tool to reduce overall costs incurred and make the quality of library services better.
12. Library Consortium is a partnership of a group of libraries which congregate together in order to realize common objectives.
13. Technology management is a procedure of operation that enhances human resources and business assets by rearranging the relationships between the technology functions of an organization.

14. A technology manager is the person in an organization who is responsible for planning, coordinating, and directing technology-related activities of the organization.

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14.10 SUMMARY

- Total quality management is a real and meaningful effort by an organization to change its whole approach to business to make quality a guiding factor in everything the organization does.
- Operations management is the management of activities specifically related either directly or indirectly to the organization's production of goods and services.
- Operations management involves efficiently managing the transformation process from input of people, materials, tools and money to output of goods and services.
- Total quality management requires a never-ending process of continuous improvement. The end goal is perfection which is never achieved but always sought. The concept of continuous improvement has become the cornerstone of the Japanese approach to production.
- Selecting an industry leader provides an insight into what successful competitors are doing. It also allows organizations to set realistic and rigorous new performance targets based on what they learn from industry leaders.
- Inventory refers to the goods or materials available for use by a business. It is a stock of materials that are used to facilitate production or to satisfy customer demand.
- The economic order quantity (EOQ) method is a procedure for balancing ordering costs and carrying costs so as to minimize total inventory costs.
- Quality management standard (QMS) is a set of standards especially designed to ensure the production of quality products.
- Libraries have always been outsourcing some of their services to external agencies. This means that libraries tie up with organizations or people from outside to render some service on a permanent or contractual basis.
- Library Consortium is a partnership of a group of libraries which congregate together in order to realize common objectives.
- According to Gaynor 'technology management is a procedure of operation that enhances human resources and business assets by rearranging the relationships between the technology functions of an organization.

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14.11 KEY WORDS

- **Consortium:** A consortium is an association of two or more individuals, companies, organizations or governments with the objective of participating in a common activity or pooling their resources for achieving a common goal.
- **ISO:** The International Organization for Standardization is an international standard-setting body composed of representatives from various national standards organizations.

14.12 SELF ASSESSMENT QUESTIONS AND EXERCISES

Short Answer Questions

1. Write a short note on the concept of total quality management.
2. What are the major ingredients of total quality management?
3. What are the approaches and methodologies required for quality improvement?
4. Why are inventories necessary? Give reasons.

Long Answer Questions

1. Discuss different inventory methods in detail.
2. What are the benefits and disadvantages of outsourcing?
3. What are the advantages and disadvantages of consortium?
4. What are the different dimensions of technology management?

14.13 FURTHER READINGS

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