



KARNATAKA STATE OPEN UNIVERSITY

MUKTHAGANGOTRI, MYSORE –570 006

MASTER OF LIBRARY AND INFORMATION SCIENCE

M.Lib.I.Sc - 4

Management of Information Resources

BLOCK - 1

M.Lib.I.Sc - 4

Management of Information Resources

Block

1

Information Resource Management

Unit – 1

Information Resource as an asset. Principles of Information Resource Management

Unit - 2

Archival Resources Management

Unit – 3

Difference between Information Management and Knowledge Management.

Unit - 4

Roles of Libraries and Librarians in KM

SLM Course Design Committee

Prof. D. Shivalingaiah Vice-Chancellor, Karnataka State Open University, Mukthagangothri, Mysore – 570 006.		Prof. Jagadeesha Dean (Academic), Karnataka State Open University, Mukthagangothri, Mysore – 570 006.	
Course Writer		Block/Unit No	
Ayesha Taranum Associate Manager- Information Services, HCL Technologies, Capital Market Services Bangalore – 560 042		Block 1 Units 1-4	
		Course Revised by	
		Shilpa Rani N R Chairperson Department of Studies in Library and Information Science Karnataka State Open University, Mukthagangotri, Mysuru-570006	
Editorial Committee			
Chairman		Prof. S.N. Hegde Director, School of Sciences, Karnataka State Open University, Mukthagangotri, Mysuru-570006.	
Member (External)		Dr. N. S Harinarayana Senior Lecturer Dept. of Library & Information Science University of Mysore, Mysore-570 006.	
Member Co-ordinator		Shilpa Rani N R Chairperson Department of Studies in Library and Information Science Karnataka State Open University, Mukthagangotri, Mysuru- 570006	
Publisher			
Registrar, Karnataka State Open University, Mukthagangothri, Mysore - 570 006.			
Developed by Academic Section, KSOU, Mysore Karnataka State Open University, 2018. All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from the Karnataka State Open University. Further information on Karnataka State Open University Programmes may be obtained from the University's office at Mukthagangothri, Mysore-570 006. Printed and Published on behalf of Karnataka State Open University, Mysore-570 006 by Registrar.			

M.Lib.I.Sc - 4 : Management of Information Resources

Block – 1 : Information Resource Management

Block Introduction

The key to making good decisions is good information. When looking for information on companies and issues outside of their own organizations, today's managers and knowledge workers go online. In today's competitive environment every activity carried out in any organization or institutions comes under scrutiny based on the source from where information is obtained. This is important to make sure it pays its way for the business or educational preferences. This is particularly true for non-core activities, such as the provision of information and library services in many organizations. How can information professionals make sure their unit provides good value to their business? This module helps in understanding the concept of information, the usefulness of information and the various ways of using information as a strategic asset. It helps in understanding the ten ways to add value for a successful future. The value of information, its identification, use and impact are discussed.

This block provides an introduction to the concept of information management. It intends to help the student understand the need for use of information and the importance of information management. It gives an overview and understanding of the issues involved in the management of information assets in organizations. The topic of Information Resource Management is dealt here in the context with the current IT environment. The principles of Information Resource Management (IRM) are discussed in detail, giving a perspective of the role of librarian in the ever-changing field of information management. A checklist of various terms used in IRM is provided in the appendix.

It has long been the responsibility of libraries and archives to assemble, organize, and protect documentation of human activity. The ethic of preservation as coordinated, conscious management, however, is a more recent phenomenon. Librarians and archivists--like the clerks and scribes who went before them--have increased the chances that evidence about how we live, how we think, and what we have accomplished will be preserved. Traditional preservation, as responsible custody, works only when this evidence has a physical form; when the value of the evidence exceeds the cost of keeping it; and when the roles of evidence creators, evidence keepers, and evidence users are mutually reinforcing

Digital materials are especially vulnerable to loss and destruction because they are stored on fragile magnetic and optical media that deteriorate rapidly and that can fail suddenly from exposure to heat, humidity, airborne contaminants, or faulty reading and writing devices. This block looks into issues related to archival resource management. It discusses the core competencies that a library needs to address the preservation of digital material.

Prof. V G Talawar

MLISc – 4
Management of Information Resources

Block – 1
Information Resource Management

Unit – 1
**Information Resource as an asset. Principles of Information
Resource Management**

- 1.1 Introduction to information**
- 1.2 The strategic role of information**
- 1.3 Information as an asset**
- 1.4 Information management**
- 1.5 Information resource management**
- 1.6 Information resource management system**
- 1.7 Principles of information resource management**
- 1.8 The role of new information manager**
- 1.9 Information management, librarianship and information science**
- 1.10 Check your progress**
- 1.11 Summary**
- 1.12 Glossary**
- 1.13 Questions for self study**
- 1.14 References**

1.0. Objectives

The main objectives of this unit are:

- ❖ To know the strategic role of information
- ❖ To understand Information as an asset
- ❖ To understand Information resource management
- ❖ To know the Principles of information resource management
- ❖ To study the role of new information manager

1. INTRODUCTION TO INFORMATION

Information as a concept bears a diversity of meanings, from everyday usage to technical settings. Generally speaking, the concept of information is closely related to notions of constraint, communication, control, data, form, instruction, knowledge, meaning, mental stimulus, pattern, perception, and representation.

Many people speak about the Information Age as the advent of the Knowledge Age, the information society and so on. Even though informatics, information science and computer science are often in the spotlight, the word "information" is often used without careful consideration of the various meanings it has acquired.

Information is a term with many meanings depending on context, but is as a rule closely related to concepts as meaning, knowledge, instruction, communication, representation and mental stimulus. Simply stated, information is a message received and understood. In terms of data, it can be defined as a collection of facts from which conclusions may be drawn. There are many other aspects of information since it is the knowledge acquired through study or experience or instruction. But overall, information

is the result of processing, manipulating and organizing data in a way that adds to the knowledge of the person receiving it.

Information is defined as useful data for a particular analysis or decision. What is useful is both specific to the task and the knowledge of the decision maker. In analysis and decision making much information is processed data.

Our everyday use of the word, and our intuition that there is such a thing as information, may both be helpful and distracting in understanding what various professionals mean when they use the term.

Helpful, because we appreciate that information is a quantitative concept (the combined telephone directories of a whole country contain more information than that for a single one of its cities). Because it gives us a notion of information as an additive concept (the telephone directories for the separate regions together form the whole stack). And because it makes us familiar with the idea that information can be stored and can be transmitted.

Distracting, because the everyday use of the term has all sorts of associations with knowledge, useful information, meaningful information. But just like other words such as energy, force, heat, acceleration, when hijacked by science, the term information too acquired a specialised meaning that is both narrower and wider than the everyday one.

It should be pointed out that the purpose for collecting data and their potential usefulness as information are not identical. For example, much data collected for administrative purposes by the government is used by academics for analysis. To some extent science is turned around. Because proprietary rights and privacy greatly limit observations of the political economy, academics when examining a data file collected for administrative purposes ask what questions can this data base resolve. Thus data can become information for a large number of analysis other than was the intent of the creators of the data base.

With the advent of multimedia documents files in data bases, these too can become information for particular types of studies. For example, all data released by corporations whether as numerical data or multimedia corporate reports are analyzed by investment analysts.

An important point concerning information is that information is generally a small subset of the data which could be collected in a data file. Consider buying an automobile. Observations could be made to the limit of the Heisenberg uncertainty principle on the position and motion of every atom. The potential buyer could be supplied with the exact composition of the paint and detail specification of every component on the car. Besides the details of the design the potential buyer could be supplied with all the production details and every test report. Such a huge data file would totally overwhelm most buyers and might well confuse rather than illuminate their analysis for possible purchase.

The relationship between information and knowledge needs to be clarified. The knowledge of behavior possessed by the analyst determines what data is information and what data is unintelligible noise. As in the example above, most consumers have the knowledge to meaningfully interpret only a tiny fraction of all the possible data that could be assembled concerning an automobile. Effective decision making requires the analyst to cull the information from the data with low cost.

The purpose of defining information as useful data is that it centers on the conflict between privacy and other social concerns such as efficiency. From an economic perspective the issue is “what is the social value of the information to the analyst versus what is the social value of not being able to obtain the information?”

1.2. THE STRATEGIC ROLE OF INFORMATION:

Establishing the Strategic Role of Information is defined as a two stage process:

(1) A research and investigation phase that gives you the information you need; and

(2) Articulating your mission and strategy.

This two stage process is further described in the succeeding sections.

a) Assess the Attitudes of Users towards Information:

The first phase requires an assessment of the attitudes of users to information and how much they are willing to help develop it further. Some of the strategic decisions whose successful outcomes depend on the availability of good information include:

- Market selection and targeting;
- New investments;
- Location of factories and offices;
- New product development and launch;
- Pricing and promotion.

Find out how these decisions are made, what information is used, and from where it is sourced. You may already have data from feedback on how the information you have supplied has helped such processes. Has your organisation recently had successes or failures that could be directly attributed to good or bad information? From these investigations you can determine areas of high information leverage where you could play a role. Identify the linkages between information and results. This should then be a cornerstone of your strategy. Use every opportunity to let people, especially senior managers, know about it.

b) Identify Users Real Needs

This is the first of the marketing guidelines. It is essentially about market research. Therefore use the methods used by researchers - surveys, interviews, usage analysis. You already have users. Find out how they use your output and again what **results** and **benefits** they achieve. One particularly useful way of teasing this out (used, by the way, to justify office automation systems) is to ask what would happen if you did not offer that service.

Getting to senior management users and non-users is an important strand of this activity. You must also learn about their real needs, not the ones they may initially express. Some of these may be psychological needs such as "I want to impress our senior management team with the range of authoritative information I have at my disposal". Too often, information audits approach this activity from the wrong end by asking lots of questions about "information". The starting point should be discussion of a person's role, their organisational context, and what their critical activities and decisions are.

c) Segment Your Market

This is the keystone of every marketing strategy - grouping customers into segments with common sets of needs. Too often, information unit providers offer a homogenous service to all. This tends to create averaging, of a mediocre service to everybody, rather than an excellent service to some.

Typically segments may be based on departments, product lines, or industries served. However, one attractive method of segmentation relies on the distinctively different needs of senior managers involved with strategic decisions, field sales people, and people in headquarters functions, such as product development and marketing. By defining a few distinct segments you can develop different service approaches and perhaps different resources and their pricing. This will overcome the common pitfalls of a common approach that leads to conflicts between the 'urgent' and important'.

d) Create a Unique Product

Although you are offering a service, it has many features of a product - a look and feel, a function, and often a tangible manifestation (printed or electronic output). Therefore, you need to think in ways of how to make this output more attractive. Your users can buy information elsewhere (and probably do). Your challenge is to customize and add value. Ways of adding value to generic information are shown in Table 1.

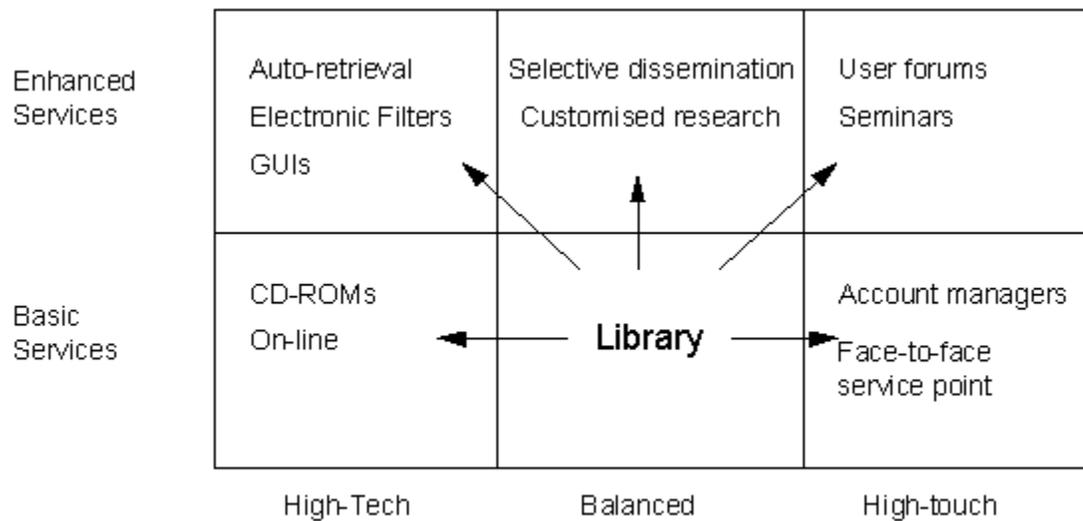
Table 1 - Ten Aspects that Add Value to Information

TIMELINESS	Currency. Information is perishable. Different information has different half lives ('sell by dates'). Some degrades rapidly
ACCESSIBILITY:	Easy to find and retrieve - no long-winded searches, good 'hits'
USABILITY:	Ease of use; user can manipulate to suit application
UTILITY:	Is suited and usable for multiple applications
QUALITY:	Accurate, reliable, credible, validated
CUSTOMISED:	Filtered, targeted, appropriate style and format; needs minimum processing for specified application
MEDIUM:	Appropriate for portability and ongoing use
REPACKAGING:	Reformatted to match onward use
FLEXIBILITY:	Easy to process; can be used in different ways
REUSABILITY:	Can be reused; ideally extra use should refine its quality; the more people that can access and use, the better.

e) Broadening the Scope of Services Offered

A second aspect of improving the service to your customers is to broaden their scope. Look beyond the normal services of a library. Can you get in-house experts to add analysis and comment? Can you organise events around specific themes with outside speakers. Technology can also play an important part. It lets you reach more users effectively, and can reduce your information handling time. Increasingly it makes sense to let users have direct on-line access to information and even to encourage their use of external on-line services. Figure 1 shows a framework of the options to consider for broadening the scope of services offered.

Figure 1 - Framework for information services development



A word of caution, though, is not to undertake activities that can be done as effectively by others or by the users themselves (such as ordering specialist books and journals). You need to package your activities as a set of products that are unique and distinctive. Articulate what this uniqueness is. An example might be your knowledge and access to sources that lets you offer 'one-stop shopping'.

f) Sales and Marketing

There is no getting away from it. A successful information unit will sell and market its services. It will have promotional fliers that also serve to inform and educate users. It may well have its own identity and logo. It should also get out and meet customers at their events, such as a sales meeting or the in-house annual research conference. As well as helping the 'selling' it also gains valuable input that helps you develop and improve your services.

Pricing is another aspect of marketing that needs careful attention. Gone are the days when you can continually offer your services for free. Information is valuable - let your clients appreciate that! One approach that can be very effective in a sizeable unit, is to allocate different professionals as 'account managers' for different client groups. This helps their own personal development as they will learn to represent the whole of the information unit and not just their own specialist activity.

g) Evaluation and Feedback

Evaluation and feedback will help you fine tune your product offering, and your marketing strategy. It also links back to the first marketing phase, that of research, thus completing the management loop. Three simple but effective ways of gaining feedback are:

- include a feedback sheet with every item you send out; keep it short e.g. 2-3 questions, such as asking how they used the information provided, and how much time and money it saved;
- maintain a call log (even easier with a computerised client data-base); use it to analyse the pattern of demand and identify any patterns over time; and
- publish the results; it generates even more feedback and also maintains visibility.

h) Exploit Technology

One of the best ways to leverage scarce resources is to let technology (and your users) do some of the work for you! Many information professionals will already use information technology quite extensively. However, there are certain developments that you need to keep abreast of, and offer opportunities for off-loading work:

- sales and marketing administration packages to improve client service
- multimedia and its potential for demand publishing as an alternative to purchasing hard-copy journals
- PC information retrieval packages, such as 'Idea List' that users can use themselves
- the Internet and its search and retrieval tools
- electronic mail for mass distribution and information centre newsletters
- computer conferencing as a means of gaining feedback and developing plans and turning information into intelligence

The great benefit of today's technology is that it allows access to library collections from the user's desk top (the 'virtual library'). Networks allow you to promote and deliver your services more easily throughout your organisation, and to draw on outside resources. It could well be, if you are in a large organisation, that there are multiple information units, rather than a single central one. Networking allows access to common material, pooling of resources and greater opportunities for mutual help and support.

i) Selective Outsourcing

One of the current management fashions is that of outsourcing - contracting out of specialist, non-core activities to outside providers. Its attraction is that outside specialists can offer a broader range of skills and knowledge, and generally at a lower cost.

However, before outsourcing organisations must think very carefully about what to retain and what to divest. Some recent lessons from the IT world are instructive.

Whereas facilities management, systems development and upgrading systems are typically outsourced, what tends to be retained in-house are:

- policies e.g. for buying
- standards and quality assurance
- infrastructure
- user requirements identification
- user support
- some development

Despite its attractions recent research has surfaced several problems:

- outsourcing suppliers are not inherently more efficient
- many of the promised savings have not materialised
- the interface with users can revert to one of 'contracts' rather than one of 'relationships'

- there is no shared profit motive: extra costs for one party mean extra profits for the other
- information needs are idiosyncratic not homogenous

Generally, the more 'commodity-like' the service on offer, the better it is as a candidate for outsourcing. On the other hand the more organisation specific or strategic it is, the more the arguments favour retention in-house. Even with outsourcing it is necessary to retain some specialist information skills to select and manage the external contractors.

j) Building Partnerships

Building effective partnerships with clients and suppliers is paramount. There are several means by which partnerships with the business can be strengthened. They operate at three levels:

Organisation level - the reporting structure can have a positive influence. An information unit that is a corporate function, rather than embedded within one department is generally better positioned. Also treating it as a separate profit centre. The strategic influence is increased when the head of the information unit report to a member of the board - in my case it was the director of marketing and strategy.

Teams - there should be teams and task forces that bring information professionals together with business managers. If the account manager approach is adopted, ensure that the information professional becomes an integral part of one of the clients management teams. Also why not have user representatives on your own management team.

Individual - opportunities to improve partnership occur when individuals develop good working relationships with each other. One way of achieving this is through co-location e.g. of an information professional into a user department, or of secondments, say for six months, between a business unit and the information unit.

k) Develop Hybrid Skills

Although you may have trained as an information professional, to bring improved benefits to the business you will need to broaden your skills i.e. become something of a 'hybrid'. A hybrid manager has a mixture of business knowledge and general management skills as well as that of their specialty. Some of the key skills they possess are:

- knowledge of the industry in which the organisation operates
- awareness of business issues and pressures
- organisation's 'know-how' and 'know-who'
- communication skills
- inter-personal skills

Therefore, one need to develop these skills to be a right information resource manager. This can be achieved by management training, going to industry events and courses.

1.3 INFORMATION AS AN ASSET:

The area of IRM stresses upon information as a resource just as any other resource viz., human resources and financial resources in organizations. Information is a resource with a final value established according to information quality criteria (novelty, reliability, precision, etc.), potential, and effectiveness of its application. Information Resource Management is the engine that is driving the information economy. It is having and will continue to have a profound impact on business management, competitive advantage and productivity. Information resource management is an integral part of corporate strategies and can be used by organizations to gain competitive advantages in their markets. IRM and the management of information resources affect all functional areas and all management levels of an organization.

Following are some of the guidelines for understanding information as strategic asset.

1. Understand the role of Information.

Information can add value to your products and services. Improved information flows can improve the quality of decision making and internal operations. Yet many managers do not fully understand the real impact of information - the cost of a lost opportunity, of a poor product, of a strategic mistake - all risks that can be reduced by using the appropriate information.

2. Assign Responsibility for Leading your Information Resource Management Initiative.

Developing value from information resources is often a responsibility that falls between the cracks of several departments - the user departments in different business units and corporate planning, MIS units or librarians.

3. Develop Clear Policies on Information Resources

Policies for ascertaining information needs, acquiring and managing information *throughout its life cycle*. Pay particular attention to ownership, information integrity and sharing. Make the policies consistent with your organisational culture.

4. Conduct an Information Audit (Knowledge Inventory).

Identify current knowledge and information resources (or entities), their users, usage and importance. Identify sources, cost and value. Classify information and knowledge by its key attributes. Develop knowledge maps. As knowledge management gains prominence, this is sometimes called a knowledge inventory "knowing what you know".

5. Link to Management Processes.

Make sure that key decision and business process are supported with high leverage information. Assess each process for its information needs.

6. Systematic scanning.

Systematically scan your business environment. This includes the wider environment - legal and regulatory, political, social, economic and technological - as well as the inner environment of your industry, markets, customers and

competitors. Provide selective and tailored dissemination of vital signs to key executives. This goes beyond the daily abstracting service provided by many suppliers.

7. Mix hard/soft, internal/external.

True patterns and insights emerge when internal and external data is juxtaposed, when hard data is evaluated against qualitative analysis. Tweak your MkIS system to do these comparisons.

7. Optimize your information purchases.

You don't have to *control* purchasing, but most organisations do not know how much they are really spending on external information. By treating consultancy, market research, library expenses, report and databases as separate categories, many organisations are confusing media with content.

8. Introduce mining and refining processes.

Good information management involves 'data mining', 'information refining' and 'knowledge editing'. You can use technology such as intelligent agents, to help, but ultimately subject matter experts are needed to repackage relevant material in a user friendly format. One useful technique is content analysis, whose methods have been developed by Trend Monitor International in their Information Refinery, and are used in our analysis services. The classifying, synthesising and refining of information combines the crafts of the information scientist, librarian, and business analyst and market researcher/analyst. Yet many organisations do not integrate these disciplines.

9. Develop Appropriate Technological Systems

Continual advances in technology increase the opportunities available for competitive advantage through effective information management. In particular, intranets, groupware and other collaborative technologies make it possible for more widespread sharing and collaborative use of information. Advances in text retrieval, document management and a host of other trends in knowledge

management technologies have all created new opportunities for providers and users alike.

10. Exploit technology convergence.

Telecommunications, office systems, publishing, documentation are converging. Exploit this convergence through open networking, using facilities such as the World Wide Web, not just for external information dissemination but for sharing information internally.

11. Encourage a Sharing Culture

Information acquires value when turned into intelligence. Market Intelligence Systems (MkIS) are human expert-centred. Raw information needs interpretation, discussing and analysing teams of experts, offering different perspectives. This know-how sharing is a hall-mark of successful organisations.

1.4 INFORMATION MANAGEMENT

As is discussed earlier, information is a term with many meanings depending on context, but as a rule is closely related to concepts such as meaning, knowledge, instruction, communication, representation, and mental stimulus. There are many other aspects of information since it is the knowledge acquired through study or experience or instruction. But overall, information is the result of processing, manipulating and organizing data in a way that adds to the knowledge of the person receiving it. The term 'Information Management' can be defined by examining the following processes:

Information and knowledge creation: Scholars, research & development, analysts, writers, reporters, editors, software developers, inventors, consultants.

Information production: Service bureaus, printers, broadcast studios, film production studios, advertising agencies, and data-entry services.

Information dissemination: Telephone companies, newspapers, publishers, radio and TV stations, libraries, news services, databases, Internet providers, bulletin board systems, satellite downlink facilities, fax, e-mail.

Information organization: Indexers, bibliographers, compilers, abstractors, clipping services, catalogers, search engines, industry yearbooks and annuals, trade show organizers.

Information diffusion: Workshops, conferences, listservs, news groups, professional organizations, education institutions, customer services.

Information utilization: Information brokers, decision support services.
Information preservation: Archives, museums, newspapers of records, copyright and patent offices, libraries.

Information destruction: Censors, restorers. In order to successfully manage information, the above subsystems must be part of a fully developed information infrastructure. Lets take a closer look at the information transfer cycle.

‘Information management’ is thus defined as the process of handling information acquired from one or many different sources in a way that it optimizes access by all who have a share in that information or a right to that information. The process of information handling or information management as we call it has evolved over the past years, influenced by the changes in the society and the technological trends in the knowledge society. Means and sources of information have changed with the times, so has the role of library and information scientist.

During the early part of 1970's, maintenance of information was largely limited to files, file maintenance and life cycle management of paper and a small number of other media. The growth of information technology during the 70's saw the change in the role of information management putting it into a new light. It graduated to a higher level which required expertise and no longer remained a simple job performed by anyone. An understanding of the technology and the theory behind it became necessary, as information was ever more stored via electronic means. By the late 1990's when information was regularly disseminated across computers and other electronic devices,

information managers found themselves tasked with increasingly complex devices. With the latest tools available, information management has become a powerful resource for organizations.

'Information management' is also defined as the process of planning, budgeting, organizing, directing, training and controlling associated with organizational information. IM includes the management of information per se and related information resources, such as personnel, equipment, funds, and technology. Distinguishing between "information" and "information resources" is crucial for at least two reasons:

1. Confusion about the differences between information and its manifestations is squandering the information resources of many organizations, leading to ineffective information processes. That is the desired end of information processes are being confused with the means. Of vital concern, many organizations are confusing expression of information needs with the design of computerized information systems.
2. It is important to distinguish between information and its related resources because many of the information-related issues, which are faced by organizations, have to do precisely with the choice of available information resources. Starting with a choice of medium (e.g., computer) is inappropriate until one clearly grasps what information is needed. The medium is the message most writers about IM maintain, that the choice of information resources is a secondary matter, which should be preceded by a determination of what information is actually needed.

Information management is a topic of most importance to many organizations. During the mid-80's, scholars agreed on a consensus that collection of ideas is worth considering and perhaps implementing. IM is relatively new and rapidly evolving activity and is separately recognized aspect of management. Although the fundamental ideas of IM have fairly wide currency, the implementation of IM is not evident in many organizations as yet. IM appeared in coherent form leading to a few pioneering organizations putting it into action. Like any set of recommended principles for management, the implementation of IM requires understanding, acceptance, decision-

making, and finally implementation by managers. The roles and attitudes of managers -- especially senior managers -- are critical to the successful application of IM ideas. IM requires enterprise-wide changes of organization, information responsibilities, policy, and procedures, the changes are pervasive, they take some time to fully implement, and the benefits can only be fully realized in the long run -- five years or more. What we need to remember is, however that Information Management is forever ---there is little point of pursuing this approach from a short-term point of view. 'Information management' is an umbrella term that encompasses all the systems and processes within an organization for the creation and use of corporate information. In terms of technology, information management encompasses systems such as:

- Web content management (CM)
- Document management (DM)
- Records management (RM)
- Digital asset management (DAM)
- Learning management systems (LM)
- Learning content management systems (LCM)
- Collaboration
- Enterprise search

Information Management system incorporates the following subsystems: information dissemination systems, information technology, communications systems, and content providers into a potent mix of information services and information management systems.

Information management is, however, much more than just technology. Equally importantly, is the business processes and practices that underpin the creation and use of information. It is also about the information itself, including the structure of information ('information architecture'), metadata, content quality, and more. Information management encompasses people, process, technology and content. It is important to address each of these aspects to succeed. Implementing information technology solutions in a complex and ever-changing organizational environment is not an easy task. The challenges inherent in information management projects mean that new approaches need

to be taken, if they are to succeed, with focus on the organizational and cultural changes required to drive forward the improvements.

This requires a step-by-step approach to implementing solutions that starts with addressing key needs and building support for further initiatives. A focus on adoption then ensures that staff actually uses the solutions that are deployed.

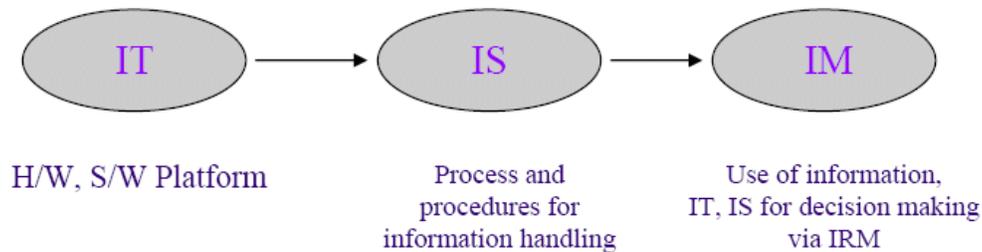
1.5. INFORMATION RESOURCE MANAGEMENT:

Information resource management emphasizes maximizing the value of information assets through the efficient, effective control of those assets. Information Resource Management (IRM) as an idea was propounded by Forest W. Horton and Cornelius F. Burk, which indicated the shift in library philosophy from “warehouse” to “where house”. This paradigm shift appeared in the activity of collection development and management of the library, thereby enforcing a change in the operation of the library. This also brought to focus the requirements of the users, which in the context of the present day are best described as: “Right information in the right place, in the right format and at the right time”. Keeping this in mind, the goals of IRM are defined as “Get the right data to the right person at the right time” and implement preeminent information architecture.

IRM is defined as management (planning, organization, operations and control) of the resources (human and physical) concerned with the systems support (development, enhancement and maintenance) and the servicing (processing, transformation, distribution, storage and retrieval) of information for an enterprise.

Information Resource Management (IRM) treats information as an organizational asset to be managed like other organizational assets (e.g. revenue, land, facilities, etc). IRM is concerned with managing the organizational resources involved in creating, storing, processing, transporting, accessing, presenting, managing, and disposing of information. IRM means conscious planning, organization, and oversight of the information resources. It is the foundation for managing data, information, and knowledge to maximize the quality, usability and value of their information resources

Information Resource Management can be broadly divided into two components: Information as an economic resource and IT as a tool for management. It also includes Information science, Knowledge Management, Information Policy, Information Economics and Social intelligence.



Information Requirements and Resources

Assessing information requirements is part of an organization's vision and goals. Before information need is established, an understanding of the role of technology in achieving strategic objectives is important. For example, if the organization is expanding locally or globally, this will affect information requirements.

If an organization takes an aggressive market position as some of the telecommunications companies have done recently as they invest in foreign telecom companies, new organizational responsibilities and structures will emerge. This type of strategic action creates new opportunities for facilitating the flow of information throughout the organization. However, this also requires management to understand the organizational implications for restructuring the information-resource requirements. The result should be an information resources policy.

Information management requires the following from managers:

- Implementation of policies and strategic plans
- Coordination of technology acquisition and integration
- Appropriate, accurate, and timely information

- Capability to segment and repackage information
- Access to internal and external databases that can be merged and packaged

Critical point for consideration is that the above information functions must be perceived from the user's perspective. The organizational commitment to information management that information needs is well articulated, and information policies are integrated in the organizational vision is necessary. Equally important is accountability. Information resources and assets have to be rigorously evaluated and measured as to their utility and productivity of the organization or institution. The question should be: to what extent has information management contributed to the organizational well-being and added value?

In this context information is viewed as a valuable resource that requires capital investment in human as well as technological resources. More importantly, it requires information handling capabilities and an ability to manage these complex resources. Forest Woody Horton and Donald Marchand stress that in an internationally competitive environment increased market share and productivity gains come from optimizing the organization's information assets. The need is to recognize information and knowledge as "true" corporate assets. Thus, an information management system has to move beyond providing access and distribution to information. The key to productivity lies in the generation of new knowledge, which can be measured, for example, by the increase in new patents, as well as by the acceptance (diffusion) and utilization of information.

The Association for Information Management (ASLIB) – Information Resource Management (IRM) network is a special interest group focused specifically on the management of information resources. It was created in 1992 by a small group of like-minded individuals who wanted to explore the issues around managing information as a resource. In order to give the network a focus from the start, one of the groups, Nick Willard devised a model (now known as the Willard Model). Horton's views expressed at Aslib meetings for the first time made information and

related processes and people prominent. It gave a new professionalism to the activities carried out as information resource management. The trend took a definite shape when Nick Willard proposed a model based on traditional resource management principles. The model eventually became known as 'The Willard Model'.

The objectives of this model are:

- To initiate and encourage the development of Information Resources Management (IRM) concepts and practices within organizations.
- To promote the awareness and understanding of IRM among senior managers and information professionals by providing a forum for discussion and exchange of experience.
- To support the adoption of IRM policies and procedures as sound business practice.

The idea of IRM gave information - and along with it the information profession - respectability those present felt they had fought for long and hard, but had never quite achieved. The Willard Model identifies five key elements of IRM:

IDENTIFICATION	The discovery of information resources and the recording of their features in an inventory
OWNERSHIP	The establishment of responsibility for the upkeep of an information resource
COST AND VALUE	Assessment of the cost of an information resource and its value to the organization
DEVELOPMENT	The further development of an existing information resource to enhance its value to the organization
<i>EXPLOITATION</i>	The processes, which may allow a resource to generate further value through conversion into an asset or a saleable commodity

Information resource management is required for enterprise effectiveness, as a service and a stewardship for the society. The need for IRM arises when unmanaged, mismanaged and poor quality information seeps in and harms the society and the economy of the society on a larger scale. For example, the public sector can harm private citizens and businesses that the Government must protect. All elements impacting the effectiveness of information resources must be planned. These are defined as follows:

IRM Element	Definition	Examples
Business Process; Application	Ordered series of activities those accomplish a business function.	Payroll E-mail
Applications Portfolio	The organized collection of processes you have or need to run your business.	A collection of packaged software and in-house-written programs to track funding requests and project successes
Data	What you need to know to conduct and manage your business.	For a person: address, telephone number For a project: total budget, amount spent so far
Data Architecture	How data is organized; how data stores are interrelated.	Payroll data in SQL server Customer names linked to addresses Data distribution to local sites
Information Resource Delivery and Support	IT services and products provided commonly; how applications are created; skills, methodologies, tools.	Contract developers use structured analysis and design techniques to write programs using the C language 24 hour help desk
User Self-Service	What users can do for themselves including skills and tools.	Spreadsheet Database reporting program Training class in MS Word

Technology Infrastructure	Computers, networks, and communications to enable and maintain the technological environment.	PC's connected to a server over a Network Communication line to a remote office
Socio-Political Organization	Policies and other factors governing Behavior. Organization, people, and culture.	Structure of the organization Who creates and approves IT policies. User comfort level with computers

Roles in Information Resource Management

Data Administration: Planning, Analysis; Identification and monitoring of the content of corporate databases; Control of standard definition for data elements; Define and enforce naming conventions; Implement data administration tools such as repository and modeling products.

Database Administration: Physical Design and Operational Use; Definition of physical databases using logical design; Analysis of data volumes and space requirements; Performance tuning of databases; Execution of backup and recovery functions for databases; Verification of integrity of databases.

Application Development: Systems Design and Implementation: Creation of programming routines and screen formats that address the use of data discovered in the logical modeling and business requirements phase; Testing of all components of the application in conjunction with the database; Interaction with designated users.

The coordination of Data Administration, Database Administration and application development skills, talents, roles and responsibilities will enable an organization to realize the goal of proper management of its information resource.

1.6 INFORMATION RESOURCES MANAGEMENT SYSTEM

The Information Resources Management System can be viewed as a framework within which aims to accomplish the management of data resources in an orderly and systematic fashion. Without the system, the process might proceed, but in a disjointed, ad

hoc, and difficult-to-control fashion. The challenge of the system is to gather data and information resources and use them effectively and efficiently in the service of man's decision-making and problem solving needs. The system, then, challenges the designer, the user, the data suppliers and providers, and others with a role to play to ensure that the system is a positive force and not a cause for obstruction, delay, procrastination or disincentive.

The information resources management system is a very special kind of system. The two key dimensions of information management are -the communications process and the management of "hardware" which is used to handle data. Considerable attention must be given to the information process itself, in flow-chart fashion, because such an understanding is essential to the organic construction of the information resource management system. Later at each stage of the resource process begin with planning information requirements. Appendix should be constructed and consulted where necessary.

Let us review some definitions first. The term information system is most often defined at two different levels. At the highest level, it is often taken to represent the combined network of all communication methods within overall organization. At the lowest level- and as most commonly defined- the term is used to define a single network of information-processing steps associated with a particular operation or set of related operations. The phrase information-processing steps is taken to embrace the successive stages of collection, recording, processing, transfer, storage, retrieval, dissemination and, in some cases, disposal.

Next, the term resource management system includes all methods and procedures for collecting and processing information on a particular resource (i.e., men, money, machines, or what is relevant to our subject here, information itself) and formatting the data in a manner in which is useful for management. In the jargon of both business and government, very often the phrase "men, money, and machines" is used as convenient shorthand phrase to refer to resources used by organizations to accomplish their missions. But information itself is usually left out, unfortunately.

Bearing these key terms and their definitions in mind, it may be useful next to review what we are not talking about here. With respect to the term information system, for example, we are not talking about one-time, non-recurring collections of data and information. A one-time report, for example, although it might cover such subjects as crisis management, research and development management, intelligence management, marketing management, or investment management, is an information product or service.

The key word is one-time. A reporting system is certainly an information system. Instead, by the term information resources, we include all information sources, services, products, and individual information systems, which are functionally oriented to some aspects of the organization's operations and activities. For example, we would include under this definition of information resources all personnel information systems, payroll information systems, marketing information systems, manufacturing information systems, and so on. It is central to our understanding we recognize that we are concerned both with the substance and the content of these functionally oriented information systems and with a profile of their identity, location, purpose, use, and other key attributes. But it will not be crucial to understand the organic functioning of each of these individual information systems; we need merely to see and understand where they fit in our overall scheme of information resources management.

This latter point has given rise to no end of confusion. As soon as one begins to talk about information resources management to certain audiences, the dilemma of distinguishing between information substance or content and information on information confronts us. The information scientist has a nice phrase for this distinction. He refers to "information on information" as the information meta-system or simply metadata.

Why do we need an information resources management system?

There are a number of reasons. First, in today's modern organization, information resources are scattered, compartmentalized, fragmented, and spread throughout the organization/institutions and subordinate units. Indeed, any organization which takes information resources management seriously finds it absolutely essential, as a first step in

bringing its resources under control, to conduct a thorough, systematic, and comprehensive inventory of its detailed data on hand, profiling each information source, service, product, and system, can we undertake a rationalization and begin the long and difficult task of constructing some kind of management system. Let us be clear. Some might take the position that we need only to add up all of the organization's information and then label that collection "the information resources management system." Not only does that approach get us nowhere, it simply won't work. What it does is present a hodgepodge of incompatible, inconsistent, and overlapping information streams. Those streams must be carefully juxtaposed to uncover overlaps and duplication, both at the macro-data element level, and at the micro data element level.

1.7 PRINCIPLES OF INFORMATION RESOURCE MANAGEMENT:

Information as an enterprise resource Enterprise for the public sector means not only the internal organization, but also the 'extended enterprise' of those who depend on their information. As a business – not technical – resource, the organization must manage information in ways that are similar to how it manages its other resources, like financial and human resources. Information management is defined as 'the application of sound management principles, processes and practices to data and information as a strategic resource of the enterprise'. Management processes include: planning, organizing and staffing, leading and directing, controlling and exploiting the resource for benefit.

Information is, in fact, a 'super' resource. Information is required to manage every other resource (financial, human, materials, and facilities and equipment). Banks, for example, do not manage money – they manage information about the money in people's accounts. Try taking your cheque book in and asking your bank: 'Can you please show me my money?'

Information Management (IM) is the enterprise-wide planning, budgeting, organizing, staffing, directing, training and controlling of information. IM includes the management of various information resources: carriers of information such as documents or electronic media; departments which provide information services and either computer-based or traditional information systems.

First information not Information Resource: The need for information itself should precede consideration of what form of information resource --media, technology, organization or system -- is appropriate to provide the information.

Planning for Information: Planning of all kinds should consider the needs for information. IM considers the mission, goals, and objectives of the organization to identify those information needs, which are most important, that is, strategic information needs.

Centrality of Information Resources: Information resources may be considered to be central and critical to the exploitation of all other resources. IM should be considered equally important as human resources management, financial management, or management of physical assets.

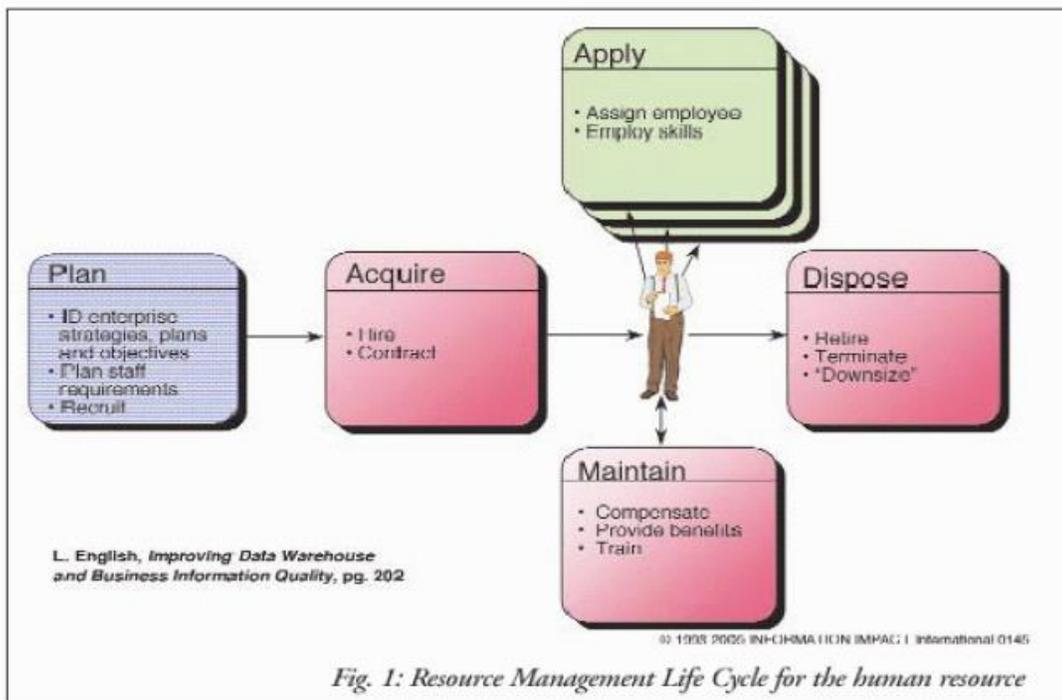
Organization-wide: IM seeks to maximize the value and harmonize the use of information across the organization. IM determines which resources should be managed on an enterprise-wide basis and which should be distributed or decentralized.

Leadership in establishing an IM program: The head of the organization/institute or an officer responsible for all information resources (sometimes called the Chief Information Officer --CIO) should set the direction.

Information Life cycle: IRM seeks to manage information resources throughout their lifecycle: acquisition, deployment, use and disposal. It is necessary to draw up a plan for the entire life cycle.

Information Roles: IRM seeks to define and plan the informational roles of individuals and units throughout the organization and to affix responsibility for stewardship of information resources.

Every resource is managed by the universal Resource Management Life Cycle illustrated in Fig. 1, is as applied to the human resource.



Information policies: Like financial policy and human resource policy, information policies are required to guide personnel in the correct handling and capture of information;

Enterprise-wide glossary of business terms: Business terms must be defined in a single glossary available to all employees. Some business terms will have different definitions based on the context. ‘Volume’, for example, means ‘the amount of space taken up by something’ in a physics context, and ‘the loudness of sound, measured in decibels’ in an audio or health and safety context. If a business term used in a data definition is not defined, the data definition is not defined precisely.

All entity types and data elements are clearly, completely and correctly defined: Required so information producers know the correct values to create and knowledge workers know the meaning of the data they require; Business rules are clearly, completely and correctly defined: Required so information producers know any constraints on the data, and application and database developers know how to implement quality controls;

Enterprise strength data models and database designs: These are designed to support the enterprise, not just a business area.

Contracts or agreements for data from other organizations have information quality warranties: Data purchased or received from other organizations should have quality standards for accuracy, completeness and clear, precise definition of the meaning of the data;

Managers must be held accountable for information quality: Just as managers are accountable for their budgets and staff, they must also be held accountable for the quality of information produced by their business area to their downstream 'information consumers' in other areas.

Training in information management and information quality is required for all: The organization and the staff most importantly have to be trained effectively. Before you can hold people accountable, they must have training so they know how to provide quality information.

The application of the principles of IM can be as diverse as the operations of the organizations themselves. It is impossible to devise a set of questions, which can cover every contingency. It is therefore necessary to ask seekers of knowledge to briefly state important actions, taken by themselves or other senior colleagues, which put the principles of IM into practice. It is possible that this kind of information will prove to be too sketchy, and therefore telephone or in-person interviews may be required.

1.8 THE ROLE OF NEW INFORMATION MANAGER

Information management is about getting the right information, in the right format, at the right time, to the right person, at the best cost, at the best place, for the right action. To accomplish this information manager must be able to:

- Diagnose information needs
- Read and monitor the information environment
- Understand new technology
- Develop and implement services
- Customize services
- Be user oriented

- Support end-user activities
- Perform information audits
- Evaluate systems, services, personnel
- Communicate the value of information
- Create effective information policies

Good information managers are obsessed with obtaining high quality information for their clients. They excel in assessing information and information systems. They have self-confidence, subscribe to a code of ethics, and must have the ability to withstand external pressure from a variety of interest groups. Finally, the key objectives of information management are:

- Improved communications
- Improved access to internal and external databases
- Improved information processing
- Increased information flow
- Increased document preparation and information repackaging
- Increased utilization of information for decision-making
- Improved information resources management

Information managers are a blend of engineers, information brokers, information intermediaries, as well as managers of information resources. The global information economy requires new knowledge, skills, and tools as well as a different set of attitudes. The print world is being replaced by the digital world. This shift requires new approaches, new models, and new thinking; and that is the challenge before us.

Following are the information functions define the role of the information manager and provide the manger with a basis for initiatives in the allocation of resources, the acquisition of technology, training of staff, design of subsystems, and evaluation of the effectiveness of an information management plan.

Information creation: The creation of new knowledge through scientific practices and methods, in research labs, doctoral work, through writing, painting, filming, etc.

Information dissemination: The distribution of information via a variety of channels and in a variety of formats over a period of time. Information is widely distributed but not necessarily used.

Information production: The physical act of producing a book, CD-Rom, Web page, or online journal article.

Information organization: Creating access point such as cataloging or Indexing systems. Access can be physical as libraries do or online access via a network.

Information diffusion: The acceptance of new information and the integration of that information into the knowledge that already exist in a person's intellect.

Information utilization: The effort to accept and apply information in a decision-making process. Information can be partially or fully utilized.

Information preservation: The policy commitment to store and preserve human artifacts in all formats and provide access.

Information destruction: The deliberate attempt to destroy what has been created.

1.9 INFORMATION MANAGEMENT, LIBRARIANSHIP AND INFORMATION SCIENCE:

Perhaps understandably, the educational sector of the library and information field has been quick to seize upon the idea of information management. What then are the relationships between information science, librarianship and information management? A librarian might legitimately argue that the profession has always been concerned with the management of information resources. It would be more difficult, however, to argue that the management involved has always had a sound economic basis. It would also be difficult to prove that the management of these resources has had a beneficial effect upon society, the academic institution, the business firm, or the other organizations in which the librarian has been employed - whatever -the professional belief may be.

Similarly, the information scientist (whether s/he or is a very different animal from the special librarian is still unclear) may argue that the management of internal organizational resources such as research reports, central registry, laboratory notebooks, etc., has always been a feature of his or her work. Both might argue that they have been involved with the use of information technology for many years before the personal computer began to make its impact in the world of business and commerce.

All of these arguments may be supportable, and may reflect the truth of the situation but this is still some way from claiming an identity between these fields of practice and what is now called information management. Clearly, there are contributions from the fields of librarianship and information science which have been and which ought to be made to information management. Just a moment's thought will be sufficient to identify these: the librarian/information scientist is likely to be more aware of the following kinds of issues than others, because of the specialized training s/he has received and because of the nature of the work:

Information needs: the librarian/information scientist ought to be more aware of the need to consider the needs of the information user in the design of systems. Certainly, we have probably been responsible for more research studies in this area than any other contributors to information management. This may be a short-term position, however, as the determination of needs becomes an accepted part of the curriculum in computer science and in the reality of systems design;

Data and document record formats: libraries have been in the vanguard of the computerization of databases (although they are usually called catalogues) and this has resulted in a great deal of expertise in the design of record formats and a greater awareness than usual of the problems of complex records with free-field and textual data. Again, these ideas are now represented in other curricula, particularly in computer science;

Vocabulary control in databases: virtually no other profession has the same kind of experience as librarianship and information science, from Dewey to the present day;

External information resources: while the records manager may have more experience of the handling of internal records, and the computer manager may have more experience of the handling of data, there is no competitor to the librarian or information scientist in this field. How far the use of online databases by the end-user may generalize this specialized knowledge is open to question, however;

General IT awareness: The incorporation of information technology into the curricula of departments of library and information studies has resulted in graduates with a very broad IT awareness. However, there is more to Information management than librarianship or information science.

1.10. Check your progress

1. Information Resource Management (IRM) as an idea was propounded by..... Ans:- Forest W. Horton and Cornelius F. Burk.

2. Information Management (IM) is the enterprise-wide planning, budgeting, organizing, staffing, directing, training and controlling of information.
(True/False)
Ans:- True

3. What is Data Administration?

Ans:- Planning, Analysis; Identification and monitoring of the content of corporate databases

4. Define IRM.

Ans:- management (planning, organization, operations and control) of the resources (human and physical) concerned with the systems support (development, enhancement and maintenance) and the servicing (processing,

transformation, distribution, storage and retrieval) of information for an enterprise.

5. Two components of IRM are.....

Ans:- Information as an economic resource and IT as a tool for management.

1.11 SUMMARY:

Information is becoming a strategic resource. It is an exciting prospect for the information professional to add real value to information and contribute more directly to an organisation's strategic decision making. A number of guidelines that help to develop this new strategic role have been outlined. These are based on experiences of various experts from professionals in the service/customer orientation industry. They are development processes that rely on activities beyond basic information service provision. Properly implemented these guidelines should improve the strategic positioning and visibility of information units, enhance client satisfaction, be cost effective, and help to anticipate opportunities and threats. Above all, they will work towards securing the prosperous future of the in-house information unit.

The role of information assets in enhancing organizational effectiveness is based on seven themes. These themes were: value of information and its measurement; impact of the concepts of knowledge management and intellectual capital; acquisition and use of information and the embedding of good practice; relevance of these questions to other industry sectors; identification of attributes of information assets; information assets and organizational effectiveness; and the impact of identification and measurement of information assets on the perceptions of senior managers. Three questions any information manager needs to ask is:

1. Are the organization's resources being spent wisely?
2. Is the right information being collected?
3. Is the information collected leading to good decisions?

The right 'use of the information and control systems and compliance with pre-defined goals, objectives and best practices may not necessarily achieve long-term organizational competence. This is the world of 're-use,' 're-engineering', 're-cycling' etc, which challenges the assumptions underlying the 'accepted way of doing things.' This world needs the capability to understand the problems afresh given the changing environmental conditions. Knowledge management focuses on 'doing the right thing' instead of 'doing things right.'

The information age requires information management for an organization's second most important resource next to its people. Without managed information, public sector agencies waste time and taxpayers' money hunting and chasing information, verifying and fixing it, or performing work around so that they can serve their citizens. Agencies can increase their effectiveness, as well as their stewardship to their citizens, by applying sound management principles to their information resource.

With effective training the information manager can be expected to function in a professional manner, i.e., fully motivated, up-to-date, effective in performance, and so on. While interest groups may form, and societies such as the Society for Information Management may flourish, however, it is unlikely that a new 'profession' will emerge. That, too, has its educational implications: there is something very secure about preparing people for an established profession - they have an inherently conservative character which encourages stability in educational programmes.

1.12Glossary

Information dissemination: The distribution of information via a variety of channels and in a variety of formats over a period of time. Information is widely distributed but not necessarily used.

Information production: The physical act of producing a book, CD-Rom, Web page, or online journal article.

Information organization: Creating access point such as cataloging or Indexing systems. Access can be physical as libraries do or online access via a network.

Information diffusion: The acceptance of new information and the integration of that information into the knowledge that already exist in a person's intellect.

Information utilization: The effort to accept and apply information in a decision-making process. Information can be partially or fully utilized.

Information preservation: The policy commitment to store and preserve human artifacts in all formats and provide access.

1.13 Questions for self study

1. What is information? Explain strategic role of information.
2. Discuss the guideline for understanding information as an asset.
3. Define 'information management' and describe various tasks involving the management of information resources.
4. Describe the role of new information manager.
5. What is information resource management? Discuss the principles of information resource management.
6. Write short notes on the following:
 - a) Information resource management system
 - b) Information management, Librarianship and Information Science
 - c) IRM Elements
 - d) Information as an asset

1.14 References

1. Nonaka, Ikujiro *The knowledge creating company*, Harvard Business Review, pp96-104 (Nov-Dec 1991)
2. Drucker, Peter E. *The coming of the new organisation*, Harvard Business Review, pp45-53 (Jan-Feb 1988)
3. Quinn, James Brian *Intelligent enterprise: a knowledge and service based paradigm for industry*, The Free Press (1992)
4. Skyrme, David J. *From hybrids to bridging*, Research and Discussion Paper RDP92/2, Oxford Institute of Information Management, Templeton College, Oxford (Jan 1992)
5. Lacity, Mary C. and Hirschheim, Rudi *Information systems outsourcing: myths, metaphors and realities*, John Wiley (1993)

6. Skyrme, David J. 'Developing successful marketing intelligence: a case study', *Management Decision*, Vol 28, No. 1, pp 54-61 (1990).
7. Earl, Michael and Skyrme, David J. 'Hybrid managers - what do we know about them?' *Journal of Information Systems*, Vol 2, pp 169-187 (1992).
8. Charles Oppenheim , Joan Stenson, Richard M.S. Wilson , 'Studies on Information as an Asset III: Views of Information Professionals', *Journal of Information Science*, Vol. 30, No. 2, 181-190 (2004)
9. Horton (F.W) *Information Resources Management: Concept and cases*, 1979
10. James Robertson, 10 principles of effective information management: http://www.steptwo.com.au/papers/kmc_effectiveim/index.html
11. Schneyman (A.H.). *Organizing Information Resources*. *Information Management Review*, Summer 1985, pp.35-45.
12. R. (McLeod) and Brittain-White (K.). *Incorporation of IRM Concepts in Undergraduate Business Curricula*. *Information Resources Management Journal*, 1(1), 1988, pp. 28-37.
13. Burk (C.F.) and Horton (F.W). *InfoMap: A Complete Guide to Discovering Corporate Information Resources*. Englewood Cliffs. Prentice hall : New Jersey, 1988.
14. Kerr (J. M.). *The IRM Imperative*. John Wiley and Sons : New York, 1991.
15. O'Brien (J.). *Management Information Systems: A Managerial End User Perspective*. Homewood, Illinois: Richard D. Irwin, Inc., 1990.
16. Aslib IRM Network. <http://www.irm.org.uk/irmnetpublic/framework.htm>
17. Hoven (John Van den). *Information Resource Management: Foundation for Knowledge Management*. *Information systems Management*, 18, (2), 2001, p. 80.
18. Atkociuniene (Zenona). *Information resource management: manager of data, information, and knowledge*.
<http://www.hb.se/bhs/seminar/semDOC/atkociuniene.htm>
19. Willard (Nick). *Information resource management*. *Aslib Information*, 21(5), 1993.

Unit – 2
ARCHIVAL RESOURCE MANAGEMENT

2.0 Objectives**2.1 Archival Concepts****2.2. How to develop Archives****2.3.Digital Repositories****2.4.Digital Preservation****2.5.Issues and Challenges****2.6 Check your progress****2.7. Summary****2.8. Glossary****2.9.Questions for self study****2.10. References**

2.0 Objectives

The main objectives of this unit are

- ❖ To know Archival Concepts
- ❖ To understand how to develop Archives
- ❖ To know the Digital Repositories
- ❖ To understand Digital Preservation
- ❖ To understand Issues and Challenges of Archives

2.1 ARCHIVAL CONCEPTS:

Preserving and protecting information is one of the core functions of libraries. This core function has seen rapid change in the way information has been created and disseminated. The entire life cycle of information management, has had an impact. The rapid growth in the creation and dissemination of digital objects by authors, publishers, corporations, governments, and even librarians, has emphasized the speed and ease of short-term dissemination with little regard for the long-term preservation of digital information. However, digital information is fragile in ways that differ from traditional technologies, such as paper or microfilm. It is more easily corrupted or altered without recognition.

Literary works often disappear without a trace, and preserving any text can be complicated by conflicting, incomplete, or inaccurate sources, not to mention the nuances lost as language and cultural contexts change over the years. Overall, however, posterity has been well served by the medium of print and the institution of the library.

While there are traditions of stewardship and best practices that have become institutionalized in the print environment, many of these traditions are inadequate, inappropriate or not well known among the stakeholders in the digital environment. Originators are able to bypass the traditional publishing, dissemination and

announcement processes that are part of the traditional path from creation to archiving and preservation. Groups and individuals who did not previously consider themselves to be archivists are now being drawn into the role, either because of the infrastructure and intellectual property issues involved or because user groups are demanding it. Librarians and archivists who traditionally managed the life cycle of print information from creation to long-term preservation and archiving, must now look to information managers from the computer science tradition to support the development of a system of stewardship in the new digital environment.

To provide continuous digital information service, one should not only have current information sources, but should also have the historical information sources. Preserving these collections is an inherent challenge. To preserve digital information, information on digital hardware and software configuration will require regular "refreshing" or migration to more current systems.

The persistence of digital information resources is an important factor for any digital library development. Addressing the preservation and long-term access issues for digital resources is one of the key challenges facing libraries and information centers today. In order to make sense of the high heterogeneity that exists among digital resources, a growing body of research has attempted to deal with the problems associated with the volume and nature of information on the Web and to look into ways to achieve consensus on a standard.

What are archives?

In the course of daily life, individuals and organizations create and keep information about their personal and business activities. Archivists identify and preserve portions of this recorded information that have lasting value. These records -- and the places they are kept -- are called "archives." Archival records take many forms, including correspondence, diaries, financial and legal documents, photographs, and sound recordings. Records in an archival institution also are called "archives." A building in

which an archival institution is located also is often referred to as an "archives."
"Archives" is a collective noun.

Archives are documents created by a person or organization in the course of business and preserved because of their continuing value. Archives contain original documents rather than published works. Due to the unique nature of the archival collections, these documents can not be checked out as books in the library. People find archival materials by using a finding aid. Materials to be looked at are retrieved for the researcher to use at the repository. Because there are so many documents in each collection, documents are usually not catalogued individually. Instead, the collection is organized into descriptive chunks called series and subseries.

Archives refers to a collection of records, and also refers to the location in which these records are kept. Archives are made up of records which have been created during the course of an individual or organization's life. In general an archive consists of records which have been selected for permanent or long-term preservation. Records, which may be in any media, are normally unpublished, unlike books and other publications. The highest level of organization of records in an archive is known as the fonds. Archives are distinct from libraries insofar as archives hold records which are unique. Archives can be described as holding information "by-products" of activities, while libraries hold specifically authored information "products". The word 'archives' is the correct terminology, whereas 'archive' as a noun or a verb is related to computer science.

Archival institutions can be termed either "archives" or "manuscript repositories" depending on the types of documentary material they contain and how it is acquired. "Archives" traditionally have been those institutions responsible for the long-term care of the historical records of the organization or institution of which they are a part. Many archives are public institutions responsible for the records of continuing value of a government or governmental body. The National Archives of the United States and the Public Archives of Canada are examples of public archives at the national level. Public archives also may be found at every other level of government, including state or

province, county, and municipal levels. Nonpublic or nongovernmental archives care for the records of any other institution or organization of which they are a part. Church archives, for example, administer the historical records of a religious denomination or congregation. University archives are responsible for records of the university's administration. Archives acquire historical material through the action of law or through internal institutional regulation or policy.

"Manuscript repositories" are archival institutions primarily responsible for personal papers, artificial collections, and records of other organizations. Manuscript repositories purchase or seek donations of materials to which they have no necessary right. They therefore must document the transfer of materials by deed of gift or by other legal contract.

The distinctions between archives and manuscript repositories can be precisely stated, yet few archival institutions are simply "archives" or "manuscript repositories." Most archives hold some personal papers or records of other organizations. Even the National Archives of the United States is responsible for a small group of donated personal papers and nongovernment records. Similarly, many manuscript repositories serve as the archives of their own institutions. In recognition of this, the term "archives" gradually has acquired broader meaning for some archivists and is used by them in reference to any archival institution. This trend has been accelerated by the use of the word "archives" or "archive" in the names of some institutions that in the past might have been termed "manuscript repositories."

What is the Open Archives Initiative?

The Open Archives Initiative (OAI) is an attempt to build a "low-barrier interoperability framework" for digital archives (aka "institutional repositories") containing digital content (aka "digital libraries"). It allows people (Service Providers) to harvest metadata (from Data Providers). This metadata is used to provide "value-added services", often by combining different data sets.

Initially, the initiative has been involved in the development of a technological framework and interoperability standards specifically for enhancing access to e-print archives, in order to increase the availability of scholarly communication; OAI is, therefore, closely related to the Open Access movement. The developed technology and standards, though, are applicable in a much broader domain than scholarly publishing alone.

The OAI technical infrastructure, specified in the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH), currently in version 2.0, defines a mechanism for data providers to expose their metadata. This protocol mandates that individual archives map their metadata to the Dublin Core, a simple and common metadata set for this purpose.

Who Uses Archives? Archives provide firsthand information about the past. They are valuable to museum researchers, scholars, students, journalists, lawyers, and others who want to know about people, places, and events in the past.

Archives in the Museum supply information to staff and other researchers about the artifacts the Museum collects and the historical themes that it studies and interprets. This information reaches broader audiences through exhibitions and publications. All state governments, and many local governments, universities, businesses, libraries, and historical societies, maintain archives. Archivists identify, organize, and preserve archival records. They also assist users of archives to locate needed information.

The most frequently used archival terms are those that describe documentary materials and archival institutions. Documentary materials can be characterized as "records," "personal papers," or "artificial collections" on the basis of who created and maintained the documents and for what purpose. Records are documents in any form that are made or received and maintained by an organization, whether government agency, church, business, university, or other institution. An organization's records typically might include copies of letters, memoranda, accounts, reports, photographs, and other

materials produced by the organization as well as incoming letters, reports received, memoranda from other offices, and other documents maintained in the organization's files.

2.2 HOW TO DEVELOP ARCHIVES

Set your priorities: Each archive is unique with its own priorities, goals and problems. A religious archive, a government archive, a hospital archive, a non-governmental society or club archive, an oral history project, will all have specific differences in the way they are set up, remembering for whom they exist. Decide what your priorities ought to be in setting up the archives for which you are responsible, what you are able to do in relation to time, budget, ability and facilities available – what is best for you and your constituency in your situation.

Develop a Strategy: This means that you develop a collection strategy. To do this it will be necessary to work with other institutions to ensure a full coverage of all archival materials. Find out what other centres hold and decide on collection strategies together, develop your own specialty that is related to your institution, your distinct collection, your history or bias. Focus your collection. This is more valuable than an indiscriminate collection of materials. But ensure that somewhere all areas are covered. Do not throw out anything because it does not fit with your particular focus or speciality. It must be saved somewhere. Work out a pattern with other repositories of historical materials. As an example a national repository may say that all materials held must be by or about national people or concerns. Will you limit your institutions archives only to those materials which are about your institution or the governing body? – or will you also include materials which place that story in its context, both historical and social?

Content of the archive: This is equally a question that relates to the holdings in your library as a whole. The people who use your library or archives are preparing themselves for work within a particular community, which is found within a particular region, and must reflect this. It may mean that you will need to identify key gaps in both library holdings and archival collections, that you will need to develop a programme for

reconstructing the focus of the materials held and set about a policy of aggressive re-acquisition. You may need to work through publishers to encourage the publication of materials with local focus, or set up exchanges through which you can have access to some materials.

2.3 DIGITAL REPOSITORIES

How are digital materials different?

A recent Research Libraries Group (RLG) Survey noted: "Digital materials, regardless of whether they are created initially in digital form or converted to digital form, are threatened by technology obsolescence and physical deterioration." The challenges in maintaining access to digital resources over time are related to notable differences between digital and paper-based material:

- **Machine Dependency:** Digital materials all require specific hardware and software in order to access them.
- **The speed of changes** in technology means that the timeframe during which action must be taken is very much shorter than for paper. Timeframes during which action needs to be taken is measured in a few years, perhaps only 2-5, as opposed to decades or even centuries we associate with the preservation of traditional materials. Technology obsolescence is generally regarded as the greatest technical threat to ensuring continued access to digital material.
- **Fragility of the media:** The media digital materials are stored on is inherently unstable and without suitable storage conditions and management can deteriorate very quickly even though it may not appear to be damaged externally.
- **The ease with which changes** can be made and the need to make some changes in order to manage the material means that there are challenges associated with ensuring the continued integrity, authenticity, and history of digital materials.

The implications of allocating priorities are much more severe than for paper. A digital resource which is not selected for active preservation treatment at an early stage will very likely be lost or unusable in the near future.

The nature of the technology requires a life-cycle management approach to be taken to its maintenance. A continual programme of active management is needed from the design and creation stage if preservation is to be successful. This in turn leads to much more involvement both within and between institutions and changing roles.

The above issues are all interconnected and mean that a radically different approach is required in managing digital materials than for paper-based materials, one in which action needs to be taken, and planned for, at regular intervals. Retrospective preservation of digital materials is at best costly, possibly prohibitively so for any but the most highly valued, and at worst impossible. While concrete cost examples are few, it is widely acknowledged that the most cost-effective means of ensuring continued access to important digital materials is to consider the preservation implications as early as possible, preferably at creation, and actively to plan for their management throughout their lifecycle.

What digital materials are being produced?

Digital materials range from relatively simple, text-based files (e.g. word processing files), to highly sophisticated web-based resources which fully exploit the benefits of the technology (e.g. combining sound with images, the ability to link to other resources, the ability to interrogate the data). There have been numerous projects to digitize collections of texts and images, primarily to utilize digital technology to improve access to these materials, which would otherwise require a visit to the holding institution.

Who needs to be involved?

Because of the nature of digital materials, as outlined above, the ability to preserve access to them well into the future depends upon the involvement of a wide range of stakeholders. Principal among these are the creators of digital content, whose involvement in their preservation might involve, for example, consideration of standards in terms of format and media, and ensuring enough documentation is available to enable their management by others. Another key stakeholder will be institutions which act as long-term repositories for digital materials. They must establish an ongoing dialogue with creators and a pro-active approach to potential future accessions.

The nature of digital technology dictates that it is not feasible simply to hand over stewardship of the resource at some point in the future, without having managed it sufficiently to facilitate management by whatever repository has accepted long-term

preservation responsibility. Large institutions involved in creating digital materials may most sensibly be the ones which retain them over time, thus ensuring maximum return on the initial investment of creation. Co-operative models for long-term preservation might include a number of organisations, some of which may have experience in ensuring the preservation of paper-based materials and seek logically to extend this remit to their digital counterparts, while others may specialize in particular subject areas and/or particular types of digital materials.

All public institutions such as archives, libraries, and museums need to be involved in applying their professional skills and expertise to the long-term preservation of digital materials, just as they have taken a role in the preservation of traditional materials.

For some organisations, it may prove more cost-effective to contract all or part of their digital preservation responsibilities to a third party. Nevertheless, staff will need to be sufficiently aware of digital preservation issues, particularly as they relate to legal, organisational and contractual problems, to manage these third party contracts effectively.

Whatever model is adopted for the long term, it will need to involve the cooperation and participation of all who have an interest in creating, acquiring and making accessible, digital materials.

How much does it cost?

Digital preservation is essentially about preserving access over time. This makes it virtually impossible neatly to segregate costs which are only for digital preservation from costs which are only about access. Access costs are significant because both the technology and user expectations advance at a very rapid rate. The initial technical infrastructure costs required for creating and/or acquiring digital materials and providing access to them are substantial. It makes sense to consider means of protecting this investment from the outset.

Preservation costs are expected to be greater in the digital environment than for traditional paper collections based on four interrelated factors:

1. The need actively to manage inevitable changes in technology at regular intervals and over a (potentially) infinite timeframe.
2. The lack of standardisation in both the resources themselves and the licensing agreements with publishers and other data producers, making economies of scale difficult to achieve.
3. The as yet unresolved means of reliably and accurately rendering certain digital objects so that they do not lose essential information after technology changes.
4. That for some time to come digital preservation may be an additional cost on top of the costs for traditional collections unless cost savings can be realised. Institutions with responsibility for both digital and traditional collections, such as deposit libraries, face the most difficult challenge, as they need to balance resources equitably between two quite different requirements. These institutions are also more likely to have a higher priority on long-term preservation as opposed to short-term access. There is scope for shared cost models and these may prove to be the most cost-effective in the long term.

While there is understandable concern that the costs of preserving digital materials will be high, it is equally important to consider the costs and implications of not preserving them. The costs of recreating a digital resource may be much higher than that for preserving it; further, the opportunity to do so may no longer exist. An increasing dependence on both digitally produced and accessed information means that there is a rapidly growing body of digital material for which there are legal, ethical, economic and/or cultural imperatives to retain, at least for a defined period of time and, in some cases, forever. If active steps are not taken to protect these digital materials, they will inevitably become inaccessible within a relatively brief timeframe.

Increasingly, resources are being created for which there is no analogue equivalent. These "born digital" materials utilize the technology to provide a level of convenience and functionality which is not possible in the analogue environment. For

example, dynamic databases which are constantly updated, to produce large scale mapping or on demand publications, are continuing to proliferate. These utilize the technology very effectively for current access but pose considerable challenges in terms of the ability to maintain access to them over time and also the ability to compare data at different points in time.

Both digital surrogates of analogue originals and "born digital" resources will ultimately pose similar challenges in terms of ensuring their continued survival, though the latter may be considered the most vulnerable as there is no analogue original if they are lost. In general, the more complex the materials, the more challenging it will be to ensure that they remain accessible and retain the same functionality over time.

2.4 DIGITAL PRESERVATION

It is now common knowledge that digital information is fragile in ways that differ from traditional technologies, such as paper or microfilm. The fact that information is increasingly stored in digital form, has led to an accelerated search for effective methods of managing electronic information resources. The huge and ever expanding multiple sources of information on the Web normally contain special formatting and are produced with a variety of software in different versions. If the original digital resource is not "born digital", it may be a digital representation or digital surrogate of the physical medium, e.g. a page of text, an object, a painting, a photograph, a sculpture, a song, a movie, etc.

Digital storage media have shorter life spans, and digital information requires access technologies that are changing at an ever-increasing pace. Some types of information, such as multimedia, are so closely linked to the software and hardware technologies that they cannot be used outside these proprietary environments [Kuny 1998]. Because of the speed of technological advances, the time frame in which we must consider archiving becomes much shorter. The time between manufacture and preservation is shrinking.

The persistence of digital information resources is an important factor for any digital library development. Addressing the preservation and long-term access issues for digital resources is one of the key challenges facing libraries and information centers today. In order to make sense of the high heterogeneity that exists among digital resources, a growing body of research has attempted to deal with the problems associated with the volume and nature of information on the Web and to look into ways to achieve consensus on a standard.

Digital preservation encompasses its share of problems. Important amongst them are: capture (reading data from old physical media or harvesting web sites), provenance, metadata, data management, long-term storage, availability, disaster prevention, multiple data types (scientific data, video), protecting intellectual property, and other similar issues. Obsolescence of media formats and data formats is the most demanding problem while preservation of bitstreams can be mastered by using well-known techniques.

Within this focus of digital document formats, it is worthwhile to consider what constitutes successful preservation. For documents on paper, preservation of the physical material implies that the content can be viewed, if sometimes under restricted access. Digital works are unlike paper in that the preservation of the material itself, the data files, is trivially accomplished, once the documents have been initially collected, by successive copying. However, viewing of digital documents is complex. Beyond a few text-based formats such as ASCII text, document formats are severely if not entirely unreadable without decoding by specialized software. Digital documents often include time-based content such as sounds, video, and animations. Digital documents often contain active elements such as forms, scripts, and plug-ins. In the context of scientific data and software, which parallel documents with embedded programs, it rightly pointed out that the distinction between the two is “rapidly blurring” and that “data and software preservation targets are not separate, but should be assumed from the beginning to be largely inseparable”. Similar arguments could be made for research systems in general and any other document system with idiosyncratic concepts. Preservation of a viewing capability is especially problematic if the software is proprietary, the software runs only obsolete hardware, and the data formats are not public.

And viewing is not enough. More is expected of digital documents than paper. Users expect to copy and paste text, images, videos, and other content types. Institutions, web sites, and individuals all expect to search the contents of documents (this function is so fundamental it is being built into next-generation operating systems).

For some users, text-to-speech and automatic Braille generation are essential. Companies and researchers want to perform text mining and automatic language translation. People want to convert documents to the format of their choice, such as for handheld devices with small screens. Researchers want to infer the semantic structure of documents, utilizing all the information the document contains, everything from layout coordinates to style sheets (if any) to explicit semantic structure (if any). Users want to add hyperlinks and annotate, even if the document format does not support those

concepts. We can expect the future to be increasingly demanding as new applications are invented that rely upon potentially any aspect of document content.

2.5 ISSUES AND CHALLENGES

Technical Issues

During the life cycle of digital resources, there are a series of processes that require various sets of hardware and software infrastructures. Similarly, as described in the metadata creation workflow, there is a series of managed activities that determine the appropriate hardware and software technologies to be used at each step of the preservation metadata creation process. These include:

- Identifying the appropriate metadata creation tool,
- Appropriate means for creating a metadata repository database,
- Appropriate indexing and harvesting software and search engines to use,
- Designing several interfaces for field searches and related considerations.

Preservation of library and archives resources shall not come at the expense of usability. The goal of preservation reformatting is to permit ongoing access to that portion of the information embodied in source materials that has been identified as essential to their continued usefulness for articulated purposes. This goal may be facilitated by:

- *collaborating with primary user communities* to define the goals of preservation reformatting projects and programs
- *open standards*: selection of formats that lend themselves to ready distribution and widespread use
- *intellectual control and other publicity*: creation of quality catalog records in order to render materials easy to find; participation in union listings; distribution of reports and announcements that introduce target audiences to preserved collections
- *specifications for handling source materials*, which can range from "no change tolerated" to "alter as needed" (e.g., clean, repair, disbind) based

on the level of access mandated for the original material following reformatting

Preservation faces new challenges in the digital environment. Many issues flow from the need for specific computer hardware and software to see digital information. For example, the information on a computer disk cannot be understood unless there is also the right computer, disk drive, operating system, and software to use it.

The storage media for digital materials can also be short-lived. Magnetic materials such as floppy disks and magnetic tape deteriorate in a very short time compared to the life of paper. However the greatest challenge is that technology changes quickly, which means that a CD-ROM lasts over a hundred years but there may no longer be a computer to read it. Computer hardware and software changes frequently and has limited backward compatibility.

Other challenges include publications on the Internet that disappear and change without warning and digital manuscripts that are easily lost, altered or deleted.

A pro-active approach is needed with the preservation of digital materials; they will not survive if they are neglected. The methods that are used by libraries to preserve digital collections can be categorized as follows:

- Active prevention
 - Handling & storage
 - Standards for creation and management
 - Preservation metadata
 - A consistent approach to digital preservation across the BL
- Strategies
 - Persistent storage and backups
 - Migration
 - Emulation

2.6. Check your progress

1. Historical/Government records related to an organization are maintained in

(i) Archives (ii) Museums (iii) Repositories (iv) Government libraries

Codes:

(A) (i) and (ii) are correct (B) (ii) and (iii) are correct (C) (i) and (iii) are correct (D) (ii) and (iv) are correct

2. Archives and record management in the development of a global information society and the preservation of its memory first taken place in the year.....

Ans. 2002 in WSIS.

3. Transformation of traditional libraries to hybrid/digital libraries is

(A) Crisis Management

(B) Re-engineering

(C) Change Management

(D) Project Management

4. Reinterpretation is a digital preservation strategy where curator intends to

(a) Upgrade file formats (b) Upgrade storage mechanism **(c)**

Recreate a work (d) Upgrade operating system

5. Which of the following is true about migration preservation strategy?

(a) Migration is not related to the viewing problem (b) Migration is related to the viewing problem (c) Migration requires comprehensive documentation (d) Migration does not have a technical origin

2.7. SUMMARY

Standards for creating digital objects and metadata description, which specifically address archiving issues, are being developed at the organization and discipline levels. Regardless of whether acquisition is done by human selection or automated gathering software, there is a growing body of guidelines to support questions of what to select, the extent of the digital work, the archiving of related links and refreshing the contents of sites. Standards for cataloging and persistent, unique identification are important in order to make the material known to the archive administration. A variety of metadata formats, content rules and identification schemes are currently in use, with an emphasis on crosswalks to support interoperability, while standardizing as much as possible. Issues of storage and preservation (maintaining the look and feel of the content) are closely linked to the continuous development of new technologies. Current practice is to migrate from one storage medium, hardware configuration and software format to the next. This is an arduous and expensive process that may be eliminated if emulation strategies are developed among standards groups and hardware and software manufacturers. Access mechanisms, being hardware and software based, have their own migration issues. In addition, there are concerns about rights management, security and version control at the access and re-use stage of the life cycle.

While there are still many issues to be resolved and technology continues to develop a-pace, there are hopeful signs that the early adopters in the area of digital archiving are providing lessons-learned that can be adopted by others in the stakeholder communities. Through the collaborative efforts of the various stakeholder groups -- creators, librarians, archivists, funding sources, and publishers -- and the involvement of information managers, a new tradition of stewardship will be developed to ensure the preservation and continued access to our scientific and technological heritage.

2.8. Glossary

Archive: Individuals and organizations create and keep information about their personal and business activities

OAI: Open Archives Initiative

OAI-PMH: Open Archives Initiative Protocol for Metadata Harvesting

2.9. Questions for self study

1. What are archives? How do you develop them?
2. How are digital materials different? and how are they preserved?
3. Discuss the issues involved in preservation of digital documents.
4. Write short notes on the following:
 - a) Open Archives Initiatives.
 - b) Cost involved in digital preservation.
 - c) Archival concepts.

2.10. References

1. Archives and Records Management: Bibliographies, Weblinks, and Professional Organizations -<http://www.archives.gov/research/alic/reference/archives-resources/termin>
2. Digital versus print as a preservation format - expert views from international comparator libraries - <http://www.bl.uk/about/collectioncare/digpres1.html>
3. From Talking to Doing: Digital Preservation at the British Library: Helen Shenton, http://www.rlg.org/en/page.php?Page_ID=255
4. Introduction to preservation and access levels concepts: <http://www.archives.gov/era/pdf/preservation-and-access-levels.pdf#search=%22INTRODUCTION%20TO%20preservation%20of%20data%22>
5. Requirements for Digital Preservation Systems: A Bottom-Up Approach -
6. David S. H. Rosenthal, Thomas Robertson, Tom Lipkiss, Vicky Reich, Seth Morabito
7. <http://www.dlib.org/dlib/november05/rosenthal/11rosenthal.html>

8. Collection-Based Persistent Digital Archives - Part 1: Reagan Moore, Chaitan Baru, Arcot Rajasekar, Bertram Ludaescher, Richard Marciano, Michael Wan, Wayne Schroeder, and Amarnath Gupta -
<http://www.dlib.org/dlib/march00/moore/03moore-pt1.html>
9. A Metadata Approach to Preservation of Digital Resources: The University of North Texas Libraries' Experience by Daniel Gelaw Alemneh, Samantha Kelly Hastings, and Cathy Nelson Hartman -
http://www.firstmonday.org/issues/issue7_8/alemneh/index.html
10. Best Practices for Digital Archiving: An Information Life Cycle Approach - Gail M. Hodge
11. <http://www.dlib.org/dlib/january00/01hodge.html>
12. What is digital preservation? -
<http://www.oclc.org/education/conferences/presentations/2001/preservation/chapman.htm>

Unit - 3

Difference between Information Management and Knowledge Management

3.0 Objectives

3.1. Introduction

3.2.Differences Between Information Management And Knowledge Management

3.3.Why Is Information Management Important?

3.4.Who is Involved In Information Management?

3.5.The Role Of Information In Modernizing Government

3.6.Outcomes From Effective Management Of Information

3.7.Information Categories

3.7.1Structured Data

3.7.2.Unstructured data

3.7.3.Library And Reference Information

3.7.4.Web-Based Information

3.8.Scope Of Information Management

3.9 Information Management Also Means:

3.10.What is Records Management?

3.11.What is Archives Management?

3.12.Information Management also means:

3.13.What are the Benefits of Information Management?

3.14.Examples of Organizations that have benefited from IM?

3.14.2Reduce uncertainty

3.14.3Add value

3.14.4.Create value

3.15.What are the Difference Between Data, Information and Knowledge?

3.16.Knowledge management

3.17.Whate are the Difference Between Information Management and Knowledge Management?

3.18.What is an Information Strategy?

3.19.What is Information Architecture?

3.20.What is the Role of IT in IM?

3.21.What is the Hardest Part of IM?

3.22. Check your progress

3.23 Summary

3.24 Glossary

3.25 Questions for self study

3.26 References

3.0 Objectives

- The main objectives of this unit are:
- To know what is Information Management?
- How important is Information management?
- Who is involved in Information management
- What is Knowledge ?
- What is Knowledge management?
- Role of IM in government

3.1. Introduction

In this unit you will be studying about the concepts of Information Management and Knowledge Management and how they are similar or different from each other, you will also learn about the concept of knowledge, what is records management, information architecture, role of IT in IM so on and so forth

3.2. Difference between Information Management And Knowledge Management

Information and information technology play a vital role in daily life of people to day. Library and information professionals' role in the information age is changing very rapidly. From conventional tasks like collection and acquisition to, capturing, organizing, manipulating and accessing information. In all these activities, information technology is used as an intermediary between the producers and users of information. Information can be considered as a “thing”, an entity to be captured, organized, manipulated and

retrieved. Information management is a “process”, requiring mechanisms to distribute, access, and use information, often among people in a group or organization, and also intermediated by information technology.

Information is important to individuals, but also central to collaborative groups, organizations (business, education, and government), communities and society. Compiling and networking have vastly expanded access to information in these social contexts. Information is widely distributed, alphabetically organized, and overwhelmingly plentiful. (1).

Information management is an interdisciplinary field. It collects and combines skills and resources from librarianship and information science, information technology, records management archives and general management. It focuses on information as a resource, independently of the physical form in which it occurs. Books and periodicals data stored on local or remote computers microforms, audiovisual media and the information in people’s heads comes within its scope. Some of the main topics IM practitioners are concerned with are:

Classification and coding

Subject indexing

Construction and use of thesaurus and controlled vocabularies

Cataloguing and indexing by name, places and events.

Database design and data structures

Physical storage of books and records, in paper and electronic form

Storage of photographic and digitized images

Information audits: reviews of an organization’s information resources

Documentation of museum objects, both for management purposes and as a resource for scholarship. (2)

Barbara Laffan (2) quoted IM as - "Information Management describes the means by which an organization efficiently plans, collects, organizes, uses, controls, disseminates and disposes of its information, and through which it ensures that the value of that information is identified and exploited to the fullest extent."

Information management also describes the means by which an organization efficiently plans, collects, creates, organizes, uses, controls, disseminates and disposes of its information, both structured records and unstructured information; and through which it ensures that the value of that information is identified and exploited to the fullest extent, both in support of its internal operations and in adding value to its service delivery functions. (3)

3.3. Why Is Information Management Important?

Information is now recognized as one of the most important assets of any organization. In public sector organizations, a large proportion of the administrative budget is typically spent on information handling activities of one kind or another. Information is needed at all levels of government to support business functions and assist in the achievement of business aims and objectives, and it serves as evidence of the way government operates and the transactions it carries out.

3.4. Who is Involved In Information Management?

Following are the people involved in Information Management :

The owner of the information, who is responsible for a specific item of information and accountable for its accuracy, availability and security

The custodian of the information, who is responsible for maintaining the underpinning IT and service delivery facilities

The user, (within and outside the organization), whose access and use of the information are specified by the owner and enforced by the custodian where appropriate.

3.5.The Role Of Information In Modernizing Government

Most of the Modernizing Government programme and the Information Age Government initiative depend on public sector organizations taking a fresh approach to the management and exploitation of their information assets. For example:

Electronic service delivery to the public and to businesses requires the public sector to rethink its approach to information handling, and to disseminate and collect information

in innovative ways - through third-party delivery channels, through government portals, and through new media such as kiosks and digital TV

The requirements of joined-up government, and the development of cross-cutting programmes, call for much wider sharing of information within the public sector - such as through the facilities of the Government Secure Intranet (GSI)

The shift to evidence-based policy-making and better research, and the emphasis on managing organizational performance and improving risk management, will place new demands on the ability to exploit relevant and reliable information sources, and on facilities for data processing and modeling

The requirement to become more forward- and outward-looking will lead to much greater use of the resources of the GSI and the Internet by those involved in management, planning, communications and policy work; public sector users will need to learn how to exploit the vast information resources of the Internet to the benefit of public sector business.

3.6. Outcomes From Effective Management Of Information

Information is a key resource of the organization, together with people, finances and material assets. Information is a business issue. Through effective management of the organization's information resources and information systems, corporate managers can:

Add value to the services delivered to customers

Reduce risks in the business

Reduce the costs of business processes and service delivery

Stimulate innovation in internal business processes and external service delivery.

3.7. Information categories

The information owned by the organization, and external information to which it has access, comes in a variety of forms with common use of digital formats for storage and communication.

3.7.1. Structured Data

Data held in databases is typically used to support operational activities and business transactions. Databases hold structured records containing details about the subjects of interest to the business, such as individual customers, financial holdings, companies, buildings and other resources inside and outside the organization.

3.7.2. Unstructured data

These may include images, photographs, maps, videos and sound recordings. In the public sector, many of these documents in paper format are held in Registry files and will form part of the public record. The Public Record Office has issued guidance on the management of electronic records in government, and all departments are required to achieve electronic records management by 2004.

3.7.3. Library and Reference Information

Increasingly, libraries now provide access to a variety of digital information sources including external library catalogues, commercial databases, on-line information retrieval services and Internet services.

3.7.4. Web-Based Information

Nearly every public sector organization now operates a web site for the dissemination of information and, in many cases, for establishing two-way communication with the public

3.8. Scope of Information Management

Four areas of management are included within the scope of information management:

Management of information resources. All the information resources discussed earlier need to be managed. The governance of information in the organization must ensure that all these resources are known and that responsibilities have been assigned for their management

Management of information technology. The management of the IT which underpins the organization's information systems is typically the responsibility of the 'supply-side'

function, managed within the organization or delivered through an external service provider. The management of the organization must be able to operate as an 'Informed Customer' for the IT-based products and services it needs and acquires management of information processes. All business processes will give rise to operations involving one or other of the information resources of the organization. The processes of creating, collecting, accessing, modifying, storing, deleting and archiving information must be properly controlled if the organization is to exercise satisfactory governance of its information resources management of information standards and policies. The organization will need to define standards and policies for its information management. These will typically be developed as an element of its IS strategy. Management policies will govern the procedures and responsibilities for information management in the organization; technical policies and standards will apply to the IT infrastructure, which supports the organization's information systems.

The main information management activities are:

Analyzing the business

Defining information needs

Constructing an information inventory

Identifying information surplus and deficiencies

Maintaining a catalogue/index of information content

Measuring the cost and value of the organization's information

Noting and aligning specialist skills

Exploiting the potential of the organization's information.

Some policies and processes for IM:

Electronic document management (EDM) – how information is created, accessed and shared across workgroups

Electronic Records Management (ERM) - ensuring that your organization complies with the Public Record Office's requirements

3.9. Information Management Also Means:

All records convey information, but not all sources of information are records. The process of planning, controlling, and using the information resources of an organization in support of its business is known as 'Information Management'.

Information Management is the planning, control, and exploitation of the information resources of an organization in support of its business. Also known as information resources management.

It is often assumed that information management concerns only information and data created by computers. However, the most effective information management system manages all information, regardless of medium and format.

3.10. What is Records Management?

Records management is the task of ensuring that recorded information, paper and electronic, is managed economically and efficiently. Records management controls the creation, maintenance, use, and disposal of records so that the right records are provided to the right person at the right time.

Records management is that area of general administrative management concerned with achieving economy and efficiency in the creation, maintenance, use, and disposal of the records of an organization throughout their entire life cycle and in making the information they contain available in support of the business of that organization.

When a records management system works well, the information contained in records can be readily retrieved. The disposal of unneeded records and the retention of valuable information can be managed effectively, and space, facilities, and resources can be used efficiently and economically.

3.11. What is Archives Management?

Archives management is the area of management concerned with the maintenance and use of archives. The archival institution serves government by protecting public records

and making them available for use; it serves the public by ensuring that citizens' rights and responsibilities are documented clearly and accurately. It is thus a cornerstone of a democratic society. It is also one of the central cultural institutions in a nation, serving as a center for research and a guardian of the nation's memory.

3.12. Information Management also means:

Information management is the harnessing of the information resources and information capabilities of the organization in order to add and create value both for itself and for its clients or customers.

Information management is the management of organizational processes and systems that acquire, create, organize, distribute, and use information. We adopt a process view of information management. In this view, IM is a continuous cycle of five closely related activities:

- Identification of information needs;
- Acquisition and creation of information;
- Organization and storage of information;
- Information dissemination;
- Information use.

The idea underlying IM is that just as an organization purposefully and systematically manages its human resources or financial assets, it should do likewise for its information resources and processes. All the classic functions of managing an organizational activity apply to IM as well: defining goals, providing leadership, developing policies, allocating resources, training staff, evaluation and feedback.

3.13. What are the Benefits of Information Management?

Generally speaking, there are four kinds of benefits from managing information strategically:

Reduce costs;

Reduce uncertainty or risks;

Add value to existing products or services;

Create new value through new information-based products or services.

3.14. Examples of Organizations that have benefited from IM?

3.14.1. Reduce costs

The US Government's Paperwork Reduction Act of 1980 (amended and enacted as law in 1995) identified two specific objectives: "to minimize the paperwork burden," and "to minimize the cost to the Federal Government of the creation, collection, maintenance, use, dissemination, and disposition of information." The PRA provided the impetus and framework for many US government agencies to manage their information more efficiently.

3.14.2 Reduce uncertainty

For pharmaceutical companies, the development of new drugs is a very risky process. Successful pharmaceutical companies like Merck and Glaxo control uncertainty by managing information flow and use across its information-intensive activities of new drug discovery, development (clinical trials and approvals), and marketing: information from each activity is used to guide and focus the other activities.

3.14.3. Add value

Amazon.com adds value by leveraging information about its customers with information about its products. It has introduced a number of innovations that make shopping at Amazon convenient and efficient: one-click shopping, associate programs, personalized recommendations, comparison-shopping, and purchase circles.

3.14.4. Create value

American Airlines developed Sabre, an online reservation system that did not exist before, but which soon became the most common method of buying and selling air tickets. Sabre took the data from what were originally straight forward inventory control and order entry systems and converted them into a new kind of highly profitable service used by agents for planning and booking trips.

Many examples of organizational benefits from managing information effectively combine all four of the above dimensions.

3.15. What are the Difference Between Data, Information and Knowledge?

Consider a document containing a table of numbers indicating product sales for the quarter. As they stand, these numbers are Data. An employee reads these numbers, recognizes the name and nature of the product, and notices that the numbers are below last year's figures, indicating a downward trend. The data has become Information. The employee considers possible explanations for the product decline (perhaps using additional information and personal judgment), and comes to the conclusion that the product is no longer attractive to its customers. This new belief, derived from reasoning and reflection, is Knowledge.

Thus, information is data given context, and endowed with meaning and significance. Knowledge is information that is transformed through reasoning and reflection into beliefs, concepts, and mental models.

3.16. Knowledge management

Knowledge management is a key aspect of information management. Essentially, it is about making information usable, so that some form of action can be taken on the basis of that knowledge. Knowledge management comprises:

Intellectual capital (knowledge assets held by the organization, including the expert knowledge of individuals)

Computer-supported collaborative work (ways of facilitating exchange of knowledge amongst working groups)

Employee empowerment (ways of enabling individuals to benefit from the organization's collective knowledge)

3.17. What are the Differences Between Information Management and Knowledge Management?

Information management is the harnessing of the information resources and information capabilities of the organization in order to add and create value both for itself and for its clients or customers.

Knowledge management is a framework for designing an organization's goals, structures, and processes so that the organization can use what it knows to learn and to create value for its customers and community.

A KM framework involves designing and working with the following elements:

Categories of organizational knowledge

(tacit knowledge, explicit knowledge, cultural knowledge)

Knowledge processes

(knowledge creation, knowledge sharing, knowledge utilization)

Organizational enablers

(vision and strategy; roles and skills; policies and processes; tools and platforms)

IM provides the foundation for KM, but the two are focused differently. IM is concerned with processing and adding value to information, and the basic issues here include access, control, coordination, timeliness, accuracy, and usability. KM is concerned with using the knowledge to take action, and the basic issues here include codification, diffusion, practice, learning, innovation, and community building.

3.18. What is an Information Strategy?

An Information Strategy describes the overall direction and general framework in which the organization's information resources and processes should be managed so that the organization would achieve its most important goals.

An Information Strategy typically consists of the following:

IM goals and objectives that are well aligned with the organization's mission and vision

IM principles that articulate desirable outcomes and form the foundation for developing information policies

One or more areas of strategic focus: this could be some critical information content; common information to be shared; some information-intensive process; or new information-based products or services.

3.19.What is Information Architecture?

In the context of an Information Strategy, Information Architecture is a set of models, definitions, rules, and standards that give structure and order to an organization's information so that information needs can be matched with information resources.

Information Architecture defines:

What types of information exist in the organization?

Where the information can be found?

Who are the creators and owners of the information?

How the information is to be used?

Information Architecture may contain several of the following:

A model or representation of main information entities and processes;

Taxonomy or categorization scheme;

Standards; definitions and interpretations of terms; directories or inventories; resource maps and description frameworks; designs for developing information systems, products, services.

3.20.What is the Role of IT in IM?

IT builds the technical information infrastructure that facilitates the efficient processing and movement of data, files, and messages. The IT infrastructure provides access to applications, databases, and mail and communication services that enable the organization to perform its work with accuracy, reliability, and speed.

Users expect IT to be an integral part of any IM plan. IT tools and platforms today have the power, versatility, and ease-of-use to support information work in ways that are increasingly sophisticated.

However, good information technology does not equal good information. Good information is information that people want or need, and that they are willing to accept and use.

3.21.What is the Hardest Part of IM?

The largest challenges to implementing an IM plan are: people, culture, and politics. People's information behaviors and preferences are hard to change. People also vary in

their attitudes toward and familiarity with IT. An organization's norms, reward systems, and general style of working may affect IM efforts. Groups and individuals may hoard information for political or other reasons.

Getting people and departments to share information is hard because sharing information and knowledge takes time and effort, and requires trust and mutual respect. Most organizations do not reward one employee for solving another employee's problems, nor do they allocate time and support for information-sharing activity.

3.24. Check your progress

1. What is Electronic document management (EDM)?

Ans:- Information is created, accessed and shared across workgroups

2. What is Records Management?

Ans:- Records management is the task of ensuring that recorded information, paper and electronic, is managed economically and efficiently.

3. What is Archives Management?

Ans:- Archives management is the area of management concerned with the maintenance and use of archives.

4. What is an Information Strategy?

Ans:- An Information Strategy describes the overall direction and general framework in which the organization's information resources and processes should be managed so that the organization would achieve its most important goals.

5. What is Information Architecture?

Ans:- Information Architecture is a set of models, definitions, rules, and standards that give structure and order to an organization's information so that information needs can be matched with information resources.

3.24. Summary

In this unit various issues relating to Information Management are discussed with a special emphasis on Knowledge management Aspects which are essential for understanding IM and Km are covered. Important concepts like records management, archives management and information architecture are discussed .After reading this unit student s will be able to get a complete overview of what is IM and KM .They will also be able to differentiate between Information Management and Knowledge Management.

3.25. Glossary

Information Management: Information management is the harnessing of the information resources and information capabilities of the organization in order to add and create value both for itself and for its clients or customers.

Records Management: Records management is the task of ensuring that recorded information, paper and electronic, is managed economically and efficiently. Records management controls the creation, maintenance, use, and disposal of records so that the right records are provided to the right person at the right time.

Knowledge Management: Knowledge management is a framework for designing an organization's goals, structures, and processes so that the organization can use what it knows to learn and to create value for its customers and community.

Archives Management: Archives management is the area of management concerned with the maintenance and use of archives. , Information Architecture:

Information Architecture: Information Architecture is a set of models, definitions, rules, and standards that give structure and order to an organization's information so that information needs can be matched with information resources.

3.24 Questions for self study

1. What is Information management?
2. What is Knowledge management?
3. What is archives management?

3.26 References

1. "Berkeley University, School of Information." 18th Mar. 2006.
[http://www.sims.berkeley.edu: 8000/admissions/learning/info_management.html](http://www.sims.berkeley.edu:8000/admissions/learning/info_management.html)

2. "Willpower Information Information Management Consultants" 18th Mar. 2006.
<http://www.willpowerinfo.co.uk/infoman.htm>

3. "Information management" 18th Mar. 2006.
[http://www.ogc.gov.uk/sdtoolkit/deliveryteam/briefings/businesschange/info_mgmt.html
#a61](http://www.ogc.gov.uk/sdtoolkit/deliveryteam/briefings/businesschange/info_mgmt.html#a61)

4. Stephen, Denning, *The Springboard: How Storytelling Ignites Action in Knowledge-Era Organizations*. London, Butter worth October 2000.
World Development Report: Knowledge for Development (World Bank, 1998-99, Washington D.C).

Unit - 4

Role of Libraries and Librarians in Knowledge Management

4.0 Introduction

4.1 Objectives

4.2 Role Of Libraries And Librarian In KM

4.3. Is Information Management The Domain Of Librarians And Libraries?

4.4.What Knowledge Management Projects Can Information Professionals Pursue?

4.4.1.To create knowledge repositories

4.4.2.To Improve Knowledge Access Transfer

4.4.3.To enhances the knowledge environment.

4.5.Knowledge Management Defined

6.5.1.Knowledge Resources Management:

4.5.2.Resources Sharing And Networking

4.5.3.Information Technology Growth

4.5.4.User Services

4.5.5.Human Resource Management

4.5.6 A Digital Librarian Is Also A Knowledge Manager?

4.5.7.Collection Development Role

4.5.8.Resources Organization Role

4.5.9.Bibliographic Instruction Role

4.5.10.Reference Service Role

4.6. Check your progress

4.7 Summary

4.8 Glossary

4.9 Questions for self study

4.10 References

4.0. Objectives

- ❖ The Main Objectives of this unit are to:
- ❖ To discuss the role of today's librarian in KM
- ❖ To enumerate the different functions a KM librarian can perform
- ❖ To highlight how IM is an important function of the KM librarian in the digital library age.
- ❖ A Digital Librarian Is Also A Knowledge Manager?

4.0 Introduction

In this unit we will be studying about the role of libraries and the librarian in knowledge Management. Different role of a knowledge management librarian are discussed. The issues relating to traditional libraries are correlated with that of the role of a knowledge management librarian. Similarities between various services from the traditional set to the digital environments are drawn. Considering the rapid changes taking place in the information technology, the way in which today's KM librarian has to coordinate with different people in an organization are presented.

4.2. ROLE A OF LIBRARIES AND LIBRARIANS IN KNOWLEDGE MANAGEMENT

In the rapidly changing Information and Knowledge Era (IKE), knowledge is the most vital factor, in the development and growth of both individuals and organizations. Knowledge and Information are the basic assets invested in the personal and corporate growth of individuals and established businesses. The knowledge and information assets are available in the form of databases, knowledge bases, and filing cabinets and in the minds of people and access organizations. Very often one part of the organization repeats the work of another part, simply because, they are not aware of what is going on in the other parts. Therefore it is important to know what are the organization's knowledge assets and how to manage and make the best use of these assets to reap maximum returns.

The concept of 'Knowledge Management' became popular towards the end of the 20th century. It is the corporate world that first recognized the importance of knowledge in the 'global economy' of the 'knowledge age', because, application and the use of knowledge enables businesses to gain competitive advantage. The applications of the knowledge management have spread to many organizations, which include the government agencies, research and development, departments, universities etc.

4.3. IS INFORMATION MANAGEMENT THE DOMAIN OF LIBRARIANS AND LIBRARIES?

The role of librarian in the knowledge era is changing. Librarians have worked as documentation officers, information officers etc. Now these information professionals have to recast their role as knowledge professionals. In other words, librarians need to function as knowledge workers.

Information management has been the domain of librarians and libraries. Librarians and information professionals are trained to be experts in information management related activities such as searching, selecting, acquiring organizing and preserving, repackaging, disseminating and serving. A 'knowledge professional' has more visible and front-end roles to perform. They are less of custodians and gatekeepers of information and more of a co-worker and jointly hold the reins of knowledge management with the users and technology experts. Knowledge work is characterized with variety and exception rather than routine function. Library and information professionals with very high level of technical skills and expertise are best suited to partner with technology experts, to participate in formulating knowledge policies, structures, processes, and systems that will nurture organizational learning. Knowledge professionals should be able to extract, filter and disseminate vital external knowledge. They also will design and develop work group application suits that are effective platforms for knowledge management. They have to work side by side with users in collecting and analyzing strategic intelligence, and to act as trainers and

consultants who transfer knowledge gathering and research skills through out the organization (8)

Many a times the position of ‘Chief Information Officers’ (CIO) in most of the organizations are generally held by information technologists instead of librarians. In fact, most of the work of CIO’s has to do with developing and managing IT infrastructure and systems, not the managing of information per se (10)

With the libraries and information professionals growing interest in knowledge management, many questions have been raised in their minds about the difference between information and knowledge, between information management and knowledge management, as to who should be in charge of information and knowledge management; would librarian and information professionals with appropriate education and training in the library and information science be most suitable for the position of “Chief Knowledge Officer” (CKO) in their organization ; and what the libraries can do in implementing knowledge management.(8)

4.4. WHAT KNOWLEDGE MANAGEMENT PROJECTS CAN INFORMATION PROFESSIONALS PURSUE?

Davenport, etal (1998) in their study of a number of KM projects have presented broad categories of KM activities.

4.4.1. To create knowledge repositories:

In this job, a KM professional with LIS background can store both knowledge and information in documentary form. These repositories can be of the following types.

- (i) Those, which include external knowledge, such as competitive intelligences.
- (ii) Those, which structured internal knowledge, such as research reports and product oriented marketing materials, such as techniques and methods.
- (iii) Those that embrace informal, internal or tacit knowledge, such as discussion databases that store ‘know-how’.

4.4.2.To Improve Knowledge Access Transfer:

This task is all about laying more stress on connectivity, access and transfer. Using technologies such as videoconferencing systems, document scanning and sharing tools and telecommunications networks.

4.4.3.To enhances the knowledge environment. In this function a KM professional will aim at creating a highly conducive environment for effective knowledge creation, transfer and use. This relates to tracking organizational norms and values concerning knowledge such as:

- (i) To increase awareness, on sharing knowledge embedded in client relationship and engagements.
- (ii) To provide awards for contribution to organization's structured knowledge base.
- (iii) To Implement decision audit programmes in order to assess whether and how employees were applying knowledge in key decisions.
- (iv) To recognize that successful knowledge management is dependent upon structures and cultures.
- (v) To manage knowledge as asset and to recognize the value of knowledge to an organization.

4.5. KNOWLEDGE MANAGEMENT DEFINED

According to Jan Duffy (5) it is “a processes that drives innovations by capitalizing on organizational intellect and experiences”. Gartner Group defines it as “a discipline that promotes an into grated and collaborative approach to the process of information asset creation, capture, organization, access and use”(11/1).

Following are the knowledge management processes proposed by P Galagan(7):

- Generating new knowledge
- Accessing knowledge from external sources.
- Representing knowledge in documents, databases, Software and so forth

- Embedding knowledge in processes, products or Services.
- Transferring existing knowledge around an organization.
- Using accessible knowledge in decision-making.
- Facilitating knowledge growth through culture and incentives.
- Measuring the value of knowledge assets and the impact of knowledge management.

4.5. KNOWLEDGE MANAGEMENT IN LIBRARIES

With the emergence of knowledge economy and the digital age, all types of libraries are undergoing drastic change. The new face of the 21st century libraries is that of a learning and knowledge center for their users.

As learning organizations, libraries need to provide a strong leadership in knowledge management. If the business organization look at knowledge management as for competitive advantage, must libraries (public, academic and research libraries) with an exception of corporate libraries, special libraries and knowledge enter, have altogether a different out look. The goal of the libraries to expand the access to knowledge for their users. Charged with this mission the libraries have to aim at their knowledge management goal high.

Here are some examples of key access, where the libraries can offer knowledge management related library services.

4.5.1. Knowledge Resources Management:

Knowledge is growing in an exponential manner. This knowledge is available in different formats-printed to electronic and digital form. Libraries have to develop strategies to enhance their resources access and sharing in here of their organization mission. Faced with restricted funds, technology, Staff and Space, Libraries must careful study the needs of their users and learner to develop co-operative acquisition plans to meet the growing information needs of their users. According to Hwa-Wei Lee(10)

“The changing concept from ownership to access” and from ‘just in case’ to “Just in time” should be the goal of a sound development strategy.

There is an urgent need to encourage the growth of integrated online the public access catalog (OPAC). With both internal and external resources. Both printed and other formats of knowledge sources should be developed and maintained. Relevant Websites and knowledge Sources should be regularly searched and related from the Internet and included in OPACs by hard links. A system for reviewing and updating resources should be maintained.

Besides collating information, explicit knowledge libraries must develop different measure of capturing and archiving the tacit knowledge, which is of importance to their users, then organization and to the internal operations of the libraries. The Website of the libraries must function like a portal for all sources of selective and relevant knowledge and information irrespective of explicit or tacit, on site or remote and in all formats.

In the present digital and networked knowledge age, the size of information resources on the web is growing exponentially. It is hard to guess how many web pages are on the internet new web pages are added easy second. Lee (10) in her article ‘ knowledge management and the role of libraries ‘ inter alia says the number of internet hosts is close to 2 billion and is growing at a very fast speed of say 25% from 1/2001 to 1/2002. Most of the frequently used search engines have also expanded their index sizes by leaps and bounds. As per the 2004 search engine watch report, Goggle claimed to have indexed 8.1 billion Web pages; MSN; 5.0 billion Web pages; Yahoo 4.2 billion Web pages and Ask Jeeves 2.5 Web pages. In a 1999 study by Lawrence and Giles (9), each search engine may cover only 15% of the Web resources at any given time. Combined coverage of search engines is estimated at 42 % of the relevant resources (11). It is also quite frustrating that most of the hits in tens and thousands of searches are irrelevant. One has to browse and comb large number of findings order to find few relevant pieces of information. With the use of advanced artificial intelligence tools to surf net and select, find, arrange classify and automatically deliver the needed information to each user based on his/her special interests and needs. Universities and research/development organizations are reservoirs of knowledge. These explicit and tacit assets should be inventoried, archived, indexed, frequently updated and made accessible in digital form.

To day the traditional methods of cataloguing and classification are fairly adequate to handle the finite number of books, focus web and documents, but are inadequate to beds with the most fin journals and documents but are inadequate to handle digital information in large electronic databases on the Internet. Using the Dublin Core Metadata the Cooperative Online Resources Catalog (CORC) has been a new approach to capture web information by Co-operative efforts. Other ways such as data measuring, text meaning, Content management, search engine, spidering programmers, natural language searching, linguistic analysis, semantic net works, knowledge extraction, concept yellow pages, and such techniques in information visualization as two dimensional or there dimensional knowledge mapping etc. have been a part of recent developments in knowledge systems management.

4.5.2. RESOURCES SHARING AND NETWORKING

Traditionally, libraries are in the practice of resources sharing and networking. These are greatly expanded by the rapid development of computer and telecommunication and net working and digital technologies since 1960's. In the USA it is very common for libraries to be member of several consociate.

The CORC project of OCLC is useful for the participating libraries to cooperatively capture digital resources of all types, describe them in a standard format and make them easily searchable by users.

However, the success of most of the resources sharing ventures depends to a large extent on the total co-operation of the participating member libraries without any motives. The onus of encouraging resources sharing and networking depends on large libraries.

4.5.3. INFORMATION TECHNOLOGY GROWTH

To facilitate the working and implementation of knowledge management, a well designed and operational knowledge system should be in place the effectiveness and efficiency of the system depends on the latest information technology tools and techniques used. In this respect the library director must consider himself as the chief

knowledge officer of the whole organization and should work together with the CIO, heads of the planning department, the computer and information technology centers, human resources management department, the finance department etc. to design and develop such a system. A knowledge management system of this kind must be created on the existing computer and information technology infrastructures, including upgraded Internet, extranet and available software programs to facilitate the capture, analyses, organization, storage and sharing of internal and external information resources for effective knowledge exchange among users, resource persons (faculty, researchers and subject specialists, etc.), publishers, government agencies, business and industries and other organizations via multiple channels and layers. In the recently develop information technologies such as data ware housing, data mining, content management, knowledge extraction, knowledge mapping, groupware, and information visualization, etc.

4.5.4. USER SERVICES

The ultimate goal of the knowledge management is to provide the users different types of quality services, so as to enhance the communication, use and creation of knowledge. The services need to be tailor made and user friendly. The needs of the users can be assessed looking into the registration details, service, and circulation and at the same time various types of cooperative work and resource sharing. The latest example of the present OCLC – Online Computer and Library Center and Ohio Link (Ohio Library and Information Network). The CORC project in particular should be useful for libraries to cooperatively capture digital resources of all types, describe them in standard format, and make them easily searchable by users.

The success of most of the resource sharing and networking projects are largely the result of the full cooperation and participation of all the member libraries. Large libraries must take the lead in such endeavor, provided, there is enough support from the government and funding agencies. Experiences show that library cooperation and resource sharing have benefited all libraries, regardless of size and specialties. Inter library loans; frequently asked reference queries, and the use of e- journals and digital

resources etc, The results of the studies can be used in the planning and redesigning of library services. The users must be taken to confidence.

Traditional manual services like “new publication alert” and “selective dissemination of information”, which libraries have been offering can now be created automatically by employing the “push technology” with utmost care and conveniences. Each library user can also create his/her virtual “my library” enabled by library system and networks for collecting and organizing resources for personal use and to stay informed of new resources provided by the library. Today library users are web users; expect customization, interactivity and customer support. “ User focused” approach as against “library focused” approach would be relevant in the present scenario(3).

4.5.5. HUMAN RESOURCE MANAGEMENT

The library staff is endowed with practical knowledge and skill. Regular library users are also experienced users aware of how to use various information resources. Inputs for effective indexing, updating and searching of electronic databases may be obtained from them. The knowledge and accumulated experience of library staff member from the intellectual assets of any library and should be valued and shared. Knowledge sharing with in the organization must be encouraged by way of rewards and incentives. The tacit knowledge of the library staff may be shared through writing, publishing, lecturing, tutoring or mentoring by appropriating, recognizing and rewarding. The organization culture that emphasizes cooperation, sharing and innovation can only be established by strong leadership and commitment from the library director and shared vision by the library staff. As a learning organization libraries should allocate annual funding to provide continuing education and staff training to all the staff members. Care must to take to prevent knowledge turning obsolete.

Libraries must also allow the transfer of knowledge from the experienced staff to the new staff “Mentoring system “must be used to make the new staff at home and comfortable in the libraries. Informal meetings, seminars, brown bag sessions where staff can interact and exchange “lessons learnt”, “best practices” and other specific

experience and knowledge should be shared at regular intervals and at convenient time must be adopted. Special interest groups and chat rooms can be created through intranet. Since many valuable experiences have been accumulated over time, libraries should pay attention to favorable working conditions and environments, which will contribute, to better staff retention.

4.5.6 A DIGITAL LIBRARIAN IS ALSO A KNOWLEDGE MANAGER?

The role of library professionals has undergone a drastic change in the digital environment. The role of a 'digital librarian' in the new environment has provided new opportunities to serve the user community. We can draw a few parallels to the traditional roles of librarians in the digital era for instance conventional roles like collection development, resource organization; bibliographic instructions have found new meaning in this age of knowledge management. Knowledge management is one model for the changing role of a library in the digital library scenario. The new information environment has many effects on the user community, some of which cannot be anticipated. In order to ease the transition the knowledge managers were created.

What a library professional does is organize and tag information; create metadata; navigate the data ware house; create information and people locators; Provide context rich information in reply to short term requests; Use internet tools to manage information space; Define locator concepts and operations to allow software knowledge agents to built (6).

A knowledge manager works in coordination with the Corporate Information Services (CIS) to tailor and profile information specific to the department domain, in effect to broken industry and consortia information, corporate knowledge and history, and customer products for the technical staff.

The responsibilities of a knowledge manager are well defined. The traditional roles of the librarian are represented and modified to take advantage of the new technologies and tools and to better meet the information needs of the staff.

4.5.7. COLLECTION DEVELOPMENT ROLE

In a corporate organization the external resources are largely on fee or subscription basis. It is the case with electronic resources also. The Corporate Information Services handle the negotiations of corporate wide licenses and purchase of on line resources. The knowledge manager can take active part in the selection and evaluation of the services by bringing thorough understanding of the research interests and projects of the individual departments.

The other way of looking at the present day digital libraries in comparison with the conventional libraries is that they have access to a wealth of free information through the Internet. The knowledge manager adds to corporate resources by establishing pointers to reliable sites, abstracting contents and putting these resources together in a easily, navigable format. Professional and technical list serves and news groups are identified and monitored so that upcoming trends, product reviews and new resources can be noted and forwarded to interested parties. This close monitoring is more easily accomplished on a department level where the research and work falls into a focused domain, making the new variety of resources feasible.

4.5.8. RESOURCES ORGANIZATION ROLE

The knowledge manager is involved in resource organization in two ways.

- (i) Organization of specific resources within the department.
- (ii) Through the establishment of a collection reflecting the domain knowledge and the creation of a hyper linked document for the collection which functions as a gateway to related resources. The gateway would have embedded links to electronic resources and provider location and summary information to other types of resources. Equally important is that, the knowledge manager plays a part in the design efforts of corporate information infrastructure by participating with members of the information sciences and in information search and retrieval as well as working with this information services team.

4.5.9. BIBLIOGRAPHIC INSTRUCTION ROLE

Another significant role the knowledge manager plays is teaching the user community how to use tools of the digital library to locate information. In the present environment, the technical staff, design and evaluation such tools on regular basis and hence require little in the way of instruction and the focus has been on promotion of new resources and sharing of valuable sites.

4.5.10. REFERENCE SERVICE ROLE

The modern enables of the conventional reference service are the latest communication tools like email, which in a way are the root of most of the discussion of electronic reference services, which often emphasize the difficulty of conducting a reference interview.

The advantage of using e - mail, as a communication tool is that the knowledge manager is able to deliver the information rather than articulating the information needs. Specific requests such as particular articles or literature search are made via email but majority of the requests come out of meetings and from personal interests. The knowledge managers responds to the user community via email, through the creation of linked web pages, or by placing a response in public folders or electronic in baskets.

4.6. Check your progress

1. What is knowledge management?

Ans:- “A processes that drives innovations by capitalizing on organizational intellect and experiences”.

1. Knowledge and Information are sometimes used synonymously and interchangeably.(True/False)

Ans:- True

3. Association for Information Management is located in.....

(a) Rome (b) Washington (c) Paris **(d) London**

4. Cooperative Online Resources Catalog (CORC) is a project of OCLC. (True/ false)

Ans:- True

5. What is Resource sharing?

Ans:- Two or more institutions coming together for co-operative acquisition and sharing resources.

4.7 Summary

The role of library professions has evolved as a knowledge manager, which is part of the function of a digital librarian. The general roles of a knowledge manager in a digital library environment are similar to the traditional roles like, collection development, resource organization, bibliographic instruction and reference service. A knowledge manager or digital libraries can facilitate the transition that the user community is facing the users are suppose to be equipped to handle the transition faced in the digital library environment.

In this unit we have studied how to day the role of libraries is changing very rapidly and how the professional role of librarian has evolved from a site specific librarian to a off site / knowledge base librarian .the different role of the present day KM librarian are discussed in comparison with the Conventional librarian. Also the way in which he /she has to work in cooperation with other people in the organization are discussed.

4.8. Glossary

Knowledge Management: Managing both explicit and implicit knowledge available in organizations and with the intellectual capital. According to Jan Duffy it is “a processes that drives innovations by capitalizing on organizational intellect and experiences”.

Digital Librarian: Librarian who is in charge of the web based services and electronic resources. His role is to deal with knowledge both explicit and implicit. The role of a 'digital librarian' in the new environment has provided new opportunities to serve the user community.

Corporate Information Services (CIS): Corporate Information services are a type of service offered in corporate sector. A knowledge manager works in coordination with the Corporate Information Services (CIS) to tailor and profile information specific to the department domain, in effect to broken industry and consortia information, corporate knowledge and history, and customer products for the technical staff.

Information and Knowledge Era (IKE): IKE is an era where all human endures are based on information and knowledge base and processes .In this era , knowledge is the most vital factor, in the development and growth of both individuals and organizations

4.9 Questions for self study

1. IS A DIGITAL LIBRARIAN IS ALSO A KNOWLEDGE MANAGER?

4.10. References

1. Bair, Jim.(1999). "Knowledge Management is about Cooperation and Context,"

2. Cohen, Suzanne and Others, "Personalized Electronic Services in the Cornell University Libraries," D-Lib Magazine 6,no.4:1-2. Available online from <http://www.dlib.org/dlib/april100/mistlebauer/04mistlebauer.html>

3. Davenport et al, (1998) "successful knowledge management projects"
Sloan Management Review 39(2), 43-57

4. Davis, Kevin. "The Changing Role of the Business Librarian." 22nd Feb. 2006.
<http://www.destinationkm.com/articles-default.asp?ArticleID=93.htm>

5. Duffy, Jan. (1999). "Harvesting Experience: Reaping the Benefits of Knowledge."
Prairie Village, KS: ARMA International. Also from her article, "Knowledge Management: To Be or Not to Be?" Information Management Journal 34,no.1: 64-67.

6. Flynn, Kathleen M. "The Knowledge Manager as a Digital Librarian: An Overview of the Knowledge Management Pilot Program at the MITRE Corporation." 22nd Feb. 2006.
<http://csdl.tamu.edu/DL95/papers/flynn/flynn.html>
7. Galagan, P. (1997). "Smart Companies (Knowledge Management)" Training and Development 51, no.12:20-25.
8. Kim, Seonghee. "The role of knowledge professionals for knowledge management" <http://www.ifla.org/IV/ifla65/papers/042-115e.htm> Visited on 24/02/2006
9. Lawrence, S. and Giles, C.L. (1999). "Accessibility of Information on the Web," Nature 400:107-109.
10. Lee, Hwa-Wei. "Knowledge Management and the Role of Libraries." 22nd Feb. 2006.
[http://www. Knowledge Management and the Role of Libraries. htm/](http://www.KnowledgeManagementandtheRoleofLibraries.htm/)
11. [http://www.isc.org/index.pl? Ops/ds/host-count-history.php](http://www.isc.org/index.pl?Ops/ds/host-count-history.php)



KARNATAKA STATE OPEN UNIVERSITY
MUKTHAGANGOTRI, MYSORE –570 006

MASTER OF LIBRARY AND INFORMATION SCIENCE

M.Lib.I.Sc - 4

**Management of Information
Resources**

BLOCK - 2

M.Lib.I.Sc - 4
Management of Information Resources

Block

2

KNOWLEDGE MANAGEMENT & HUMAN RESOURCE MANAGEMENT

Unit-5

Definition of Knowledge Management. Need for KM

Unit-6

Knowledge Management Models

Unit-7

Human Resource Planning

Unit-8

Human Resource Management, Leadership, Motivation, Training And Development

SLM Course Design Committee

Prof. D. Shivalingaiah Vice-Chancellor, Karnataka State Open University, Mukthagangothri, Mysore – 570 006.		Prof. Jagadeesha Dean (Academic), Karnataka State Open University, Mukthagangothri, Mysore – 570 006.	
Course Writer	Block/Unit No	Course Revised by	
Dr. Khaiser Nikham Reader Dept. of Library & Information Science, University of Mysore, Mysore -06	Block 2 Units 1-4	Shilpa Rani N R Chairperson Department of Studies in Library and Information Science Karnataka State Open University, Mukthagangotri, Mysuru-570006	
Editorial Committee			
Chairman		Prof. S.N. Hegde Director, School of Sciences, Karnataka State Open University, Mukthagangotri, Mysuru-570006.	
Member (External)		Dr. N. S Harinarayana Senior Lecturer Dept. of Library & Information Science University of Mysore, Mysore-570 006.	
Member Co-ordinator		Shilpa Rani N R Chairperson Department of Studies in Library and Information Science Karnataka State Open University, Mukthagangotri, Mysuru- 570006	
Publisher			
Registrar, Karnataka State Open University, Mukthagangothri, Mysore - 570 006.			
Developed by Academic Section, KSOU, Mysore Karnataka State Open University, 2018. All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from the Karnataka State Open University. Further information on Karnataka State Open University Programmes may be obtained from the University's office at Mukthagangothri, Mysore-570 006. Printed and Published on behalf of Karnataka State Open University, Mysore-570 006 by Registrar.			

M.Lib.I.Sc – 4 : Management of Information Resources
Block – 2 : Knowledge Management & Human Resource Management

Introduction

This block consists of four Units, which introduces you to general aspects of knowledge management it uses in libraries and librarians.

“Definitions of Knowledge Management; Need for Knowledge Management”. Several definitions put forth by experts in the field are discussed and the need for KM in libraries is emphasized. Also presents the roadblocks /problems in KM. “Difference between Information Management and Knowledge Management”. A detailed description of what is IM and KM are presented. “Knowledge Management Models” deals with the important model of Knowledge management. And also presents a state of the art report on Knowledge management models. “Role of libraries and librarians in knowledge management”. Indicates how the traditional librarian has to cope with the modern role in the digital library age.

Prof. N B Pangannaya

MLISc – 4: Management of Information Resources
Block – 2 : Knowledge Management

Unit - 5

Definitions of Knowledge Management. Need for Knowledge Management

- 5.0 Objectives
- 5.1 Introduction
- 5.2 A Brief History of Knowledge Management
- 5.3 What is knowledge Management?
- 5.4 Business Strategies Relating to Knowledge Management
- 5.5 What is Knowledge?
- 5.6 Definitions of Knowledge Management
- 5.7 Why Do We Need Knowledge Management?
- 5.8 The Need for Knowledge Management
- 5.9 Operational Characteristics of Knowledge Management
- 5.9.1 Knowledge is Human Capabilities
- 5.9.2 Knowledge Acquisition is a Dynamic Process
- 5.9.3 Knowledge is Generated
- 5.9.4. Knowledge is Elaborate
- 5.9.5 Knowledge About Work is Best-acquired Through Work
- 5.9.6 Dialogue is Knowledge
- 5.9.7 The Challenge of Team Management
- 5.10 Traditional Approach to Knowledge Management
- 5.10.1 Problem of Context
- 5.10.2 Problem of Dialogue

5.10.3 A Computer Mediated Approach to Team Knowledge Management

5.11 Knowledge Management and Computer Conferencing

5.11.1 Team Computer Mediated Knowledge Management: Case Example

5.11.2 Role and Use of Computer Conferencing

5.11.3 Concurrent Use of Knowledge Management

5.11.4 Later Reuse of Knowledge Management

5.12.1 Context

5.13 Structure

5.13.1 Structuring Knowledge by the Team That Created it

5.13.2 Structuring of Knowledge for Later Team

5.13.3 Hyper Linked Structure

5.13.4 Hyper Linked Policies and Skills

5.14 Team Knowledge Management and Work by Wire

5.15 Roadblock to Knowledge Management Solutions

5.16 Categorization of Knowledge Management Approaches

5.16.1 Mechanistic Approach to Knowledge Management

5.16.2 Cultural / Behaviorist Approaches to Knowledge Management

5.16.3 Systematic Approach to Knowledge Management

5.17 Check your progress

5.18 Summary

5.19 Glossary

5.20 Questions for self study

5.21References

5.0 Objectives

- ❖ The objectives of this unit are to:
- ❖ Define the concept of Knowledge Management
- ❖ Need for knowledge Management
- ❖ The concept of Knowledge
- ❖ Strategies for KM

5.1.Introduction:

In this unit we will be discussing about the various conceptual definitions and meaning of knowledge Management. The need for knowledge management is described. The idea of how knowledge is an organizational resource is well explained. Business strategies relating to KM are also well presented. A number of definitions of KM are given along with the meaning of the concept of knowledge.

5.2 A brief history of knowledge management

An overarching theory of knowledge management has yet to emerge, perhaps because the practices associated with managing knowledge have their roots in a variety of disciplines and domains. A number of management theorists have contributed to the evolution of knowledge management, among them such notables as Peter Drucker, Paul Strassmann, and Peter Senge in the United States. Drucker and Strassmann have stressed the growing importance of information and explicit knowledge as organizational resources, and Senge has focused on the "learning organization," a cultural dimension of managing knowledge.

Chris Argyris, Christopher Bartlett, and Dorothy Leonard-Barton of Harvard Business School have examined various facets of managing knowledge. In fact, Leonard-Barton's well-known case study of Chaparral Steel, a company that has had an effective knowledge management strategy in place since the mid-1970s, inspired the research documented in her *Wellsprings of Knowledge — Building and Sustaining Sources of Innovation* (Harvard Business School Press, 1995).

Everett Rogers' work at Stanford in the diffusion of innovation and Thomas Allen's research at MIT in information and technology transfer, both of which date from the late 1970s, have also contributed to the understanding of how knowledge is produced, used, and diffused within organizations. By the mid-1980s, the importance of knowledge (and its expression in professional competence) as a competitive asset was apparent, even though classical economic theory ignores (the value of) knowledge as an asset and most organizations still lack strategies and methods for managing it.

Recognition of the growing importance of organizational knowledge was accompanied by concern over how to deal with exponential increases in the amount of available knowledge and increasingly complex products and processes. The computer technology that contributed so heavily to superabundance of information started to become part of the solution, in a variety of domains. Doug Engelbart's Augment (for "augmenting human intelligence"), which was introduced in 1978, was an early hypertext/groupware application capable of interfacing with other applications and systems. Rob Acksyn's and Don McCracken's Knowledge Management System (KMS), an open distributed hypermedia

tool, is another notable example and one that predates the World Wide Web by a decade.

The 1980s also saw the development of systems for managing knowledge that relied on work done in artificial intelligence and expert systems, giving us such concepts as "knowledge acquisition," "knowledge engineering," "knowledge-base systems, and computer-based anthologies.

The phrase "knowledge management" entered the lexicon in earnest. To provide a technological base for managing knowledge, a consortium of U.S. companies started the Initiative for Managing Knowledge Assets in 1989. Knowledge management-related articles began appearing in journals like Sloan Management Review, Organizational Science, Harvard Business Review, and others, and the first books on organizational learning and knowledge management were published (for example, Senge's *The Fifth Discipline* and Sakaiya's *The Knowledge Value Revolution*).

By 1990, a number of management consulting firms had begun in-house knowledge management programs, and several well-known U.S., European, and Japanese firms had instituted focused knowledge management programs. Knowledge management was introduced in the popular press in 1991, when Tom Stewart published "Brainpower" in *Fortune* magazine. Perhaps the most widely read work to date is Ikujiro Nonaka's and Hirotaka Takeuchi's *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* (1995).

By the mid-1990s, knowledge management initiatives were flourishing, thanks in part to the Internet. The International Knowledge Management Network (IKMN), begun in Europe in 1989, went online in 1994 and was soon joined by the U.S.-based Knowledge Management Forum and other KM-related groups and publications. The number of knowledge management conferences and seminars is growing as organizations focus on managing and leveraging explicit and tacit knowledge resources to achieve competitive advantage. In 1994 the IKMN published the results of a knowledge management survey conducted among European firms, and the European Community began offering funding for KM-related projects through the ESPRIT program in 1995.

Knowledge management, which appears to offer a highly desirable alternative to failed TQM and business process re-engineering initiatives, has become big business for such major international consulting firms as Ernst & Young, Arthur Andersen, and Booz-Allen & Hamilton. In addition, a number of professional organizations interested in such related areas as benchmarking, best practices, risk management, and change management are exploring the relationship of knowledge management to their areas of special expertise (for example, the APQC [American Productivity and Quality Council] and ASIS [American Society for Information Science]).

5.3 What is knowledge management?

Knowledge Management is based on the idea that an organization's most valuable resource is the knowledge of its people. Therefore the extent to which an organization performs well will depend, among other things, on

how effectively its people can create new knowledge, share knowledge around the organization and use that knowledge to best effect.

Many of us simply do not think in terms of managing knowledge. But we all do it. Each of us is a personal store of knowledge with training, experiences and informal networks of friends and colleagues whom we seek out when we want to solve a problem or explore an opportunity. Essentially, we get things done and succeed by knowing an answer or knowing someone who does.

Fundamentally, knowledge management is about applying the collective knowledge of the entire workforce to achieve specific organizational goals. The aim of knowledge management is not necessarily to manage all knowledge, just the knowledge that is most important to the organization. It is about ensuring that people have the knowledge they need, where they need it, when they need it - the right knowledge, in the right place, at the right time.

Knowledge management is unfortunately a misleading term - knowledge resides in people's heads and managing it is not really possible or desirable. What we can do, and what the ideas behind knowledge management are all about, is to establish an environment in which people are encouraged to create, learn, share and use knowledge together for the benefit of the organization, the people who work in it, and the organization's customers (or in the case of the NHS, patients)

Barclay and Murray define knowledge management as a business activity with two primary aspects:

Treating the knowledge component of business activities as an explicit concern of business reflected in strategy, policy, and practice at all levels of the organization.

Making a direct connection between an organization's intellectual assets — both explicit [recorded] and tacit [personal know-how] — and positive business results.

In practice, knowledge management often encompasses identifying and mapping intellectual assets within the organization, generating new knowledge for competitive advantage within the organization, making vast amounts of corporate information accessible, sharing of best practices, and technology that enables all of the above — including groupware and intranets. That covers a lot of ground. And it should, because applying knowledge to work is integral to most business activities.

Knowledge management is hard to define precisely and simply. That's not surprising. How would a nurse or doctor define "health care" succinctly? How would a CEO describe "management"? How would a CFO describe "compensation"? Each of those domains is complex, with many sub-areas of specialization. Nevertheless, we know "health care" and "management" when we see them, and we understand the major goals and activities of those domains.

5.4. Business strategies related to knowledge management

As you explore other explanations of knowledge management — Bo Newman's Knowledge Management Forum is a good starting point — you'll detect connections with several well-known management strategies, practices, and business issues, including

Change management

Best practices

Risk management

Benchmarking

A significant element of the business community also views knowledge management as a natural extension of "business process reengineering," a fact underscored by the recent announcement that John Wiley's Business Change and Reengineering will become Knowledge and Process Management in March, 1997. See (<http://www.mgmt.utoronto.ca/~wensle/journal1.htm>)

There is a common thread among these and many other recent business strategies: recognition that information and knowledge are corporate assets, and that businesses need strategies, policies, and tools to manage those assets.

The need to manage knowledge seems obvious, and discussions of intellectual capital have proliferated, but few businesses have acted on that understanding. Where companies have taken action — and a growing number are doing so — implementations of "knowledge management" may range from technology-driven methods of accessing, controlling, and delivering information to massive efforts to change corporate culture.

Opinions about the paths, methods, and even the objectives of knowledge management abound. Some efforts focus on enhancing creativity — creating new knowledge value — while other programs emphasize leveraging existing knowledge.

5.5.What is "knowledge"?

Aren't we managing knowledge already? Well, no. In fact, most of the time we're making a really ugly mess of managing information. In practice, business writers often use the terms information and knowledge interchangeably.

Let's choose a simple working definition:

Knowledge has two basic definitions of interest. The first pertains to a defined body of information. Depending on the definition, the body of information might consist of facts, opinions, ideas, theories, principles, and models (or other frameworks). Clearly, other categories are possible, too. Subject matter (e.g., chemistry, mathematics, etc.) is just one possibility.

Knowledge also refers to a person's state of being with respect to some body of information. These states include ignorance, awareness, familiarity, understanding, facility, and so on.

There are many thoughtful and thought-provoking definitions of "knowledge" — including the important distinctions Gene Ballinger et al. make in "Data, Information, Knowledge, and Wisdom". Nevertheless, Nickols provides a good, sensible, functional definition, and it is sufficient for our purposes.

Nickols' two kinds of knowledge parallel Michael Polanyi's often-quoted distinction between explicit knowledge (sometimes referred to as formal knowledge), which can be articulated in language and transmitted among individuals, and tacit knowledge (also, informal knowledge), personal knowledge rooted in individual experience and involving personal belief, perspective, and values. (Polanyi, Michael. *The Tacit Dimension*. London:

Routledge & Kegan Paul. See also Karl E. Sveiby's online description, "Tacit Knowledge."

In traditional perceptions of the role of knowledge in business organizations, tacit knowledge is often viewed as the real key to getting things done and creating new value. Not explicit knowledge. Thus we often encounter an emphasis on the "learning organization" and other approaches that stress internalization of information (through experience and action) and generation of new knowledge through managed interaction.

In the opinion of the editors of Knowledge Praxis, quibbles about fine distinctions in the meaning of knowledge are just not very important. It doesn't matter whether a written procedure or a subject matter expert provides a solution to a particular problem, as long as a positive result is achieved. However, observing how knowledge is acquired and how we can apply knowledge — whether tacit or explicit — in order to achieve a positive result that meets business requirements ... that's a different and very important issue.

5.6. Definitions of Knowledge Management

"Knowledge Management caters to the critical issues of organizational adaptation, survival, and competence in face of increasingly discontinuous environmental change.... Essentially, it embodies organizational processes that seek synergistic combination of data and information processing capacity of information technologies, and the creative and innovative capacity of human beings."

KM is: 'Knowing what you know and profit from it' and 'Making obsolete what you know before others obsolete it.' Some 'textbook' definitions of knowledge management

For those of you not averse to a bit of hype, the following selection of 'textbook' definitions might be of interest: "Clinical knowledge management means enhancing the identification, dissemination, awareness and application of the results of research relevant to clinical practice in health and social care." Jeremy Wyatt.

"The creation and subsequent management of an environment which encourages knowledge to be created, shared, learnt, enhanced, organized and utilized for the benefit of the organization and its customers." Abell & Oxbrow, TfpI Ltd, 2001.

"Knowledge management is a process that emphasizes generating, capturing and sharing information know how and integrating these into business practices and decision making for greater organizational benefit." Maggie Haines, NHS Acting Director of Knowledge Management.

"The capabilities by which communities within an organization capture the knowledge that is critical to them, constantly improve it, and make it available in the most effective manner to those people who need it, so that they can exploit it creatively to add value as a normal part of their work." BSI's A Guide to Good Practice in KM.

"Knowledge is power, which is why people who had it in the past often tried to make a secret of it. In post-capitalism, power comes from

transmitting information to make it productive, not from hiding it!" Peter Drucker.

"Knowledge management involves efficiently connecting those who know with those who need to know and converting personal knowledge into organizational knowledge." Yankee Group.

"Knowledge Management is not about data, but about getting the right information to the right people at the right time for them to impact the bottom line." IBM.

The capabilities of an organization to create new knowledge, disseminate it throughout the organization, and embody it in products, services and systems. Nonaka & Takeuchi, 1995.

The capabilities, by which communities within an organization capture the knowledge that is critical to them, constantly improve it and make it available in the most efficient manner to those people who need it, so that they can exploit it creatively to add value as a normal part of their work. Royal Dutch/Shell.

Knowledge Management is a relatively young corporate discipline and a new approach to the identification, harnessing and exploitation of collective organizational information, talents, expertise and know-how. Office of the e-Envoy, 2002.

The attempt to recognize what is essentially a human asset buried in the minds of individuals and leverage it into a organizational asset that can be

accessed and used by a broader set of individuals on whose decisions the firm depends. Marshall, Prusak & Shpilburg, 1996.

The collection of processes that govern the creation, dissemination and utilization of knowledge. Newman, 1991.

Knowledge is a human faculty, not something that can be 'managed', except by the individual him/herself. A better guidance for our thinking is therefore phrases such as "to be knowledge focused" or to "see" the world from a "knowledge perspective". To me Knowledge Management is: The Art of Creating Value from Intangible Assets. Karl-Erik Sveiby, 1996.

Knowledge management is the explicit and systematic management of vital knowledge and its associated processes of creating, gathering, organizing, diffusion, use and exploitation. It requires turning personal knowledge into corporate knowledge than can be widely shared throughout an organization and appropriately applied. David J Skyrme, 1997.

Knowledge management is essentially about facilitating the processes by which knowledge is created, shared and used in organizations. It is not about setting up a new department or getting in a new computer system. It is about making small changes to the way everyone in the organization works. There are many ways of looking at knowledge management and different organizations will take different approaches. Generally speaking, creating a knowledge environment usually requires changing organizational values and culture, changing people's behaviors and work

patterns, and providing people with easy access to each other and to relevant information resources.

In terms of how that is done, the processes of knowledge management are many and varied. As knowledge management is a relatively new concept, organizations are still finding their way and so there is no single agreed way forward or best practice. This is a time of much trial and error. Similarly, to simply copy the practices of another organization would probably not work because each organization faces a different set of knowledge management problems and challenges. Knowledge management is essentially about people - how they create, share and use knowledge, and so no knowledge management tool will work if it is not applied in a manner that is sensitive to the ways people think and behave.

That being said, there are of course a whole raft of options in terms of tools and techniques, many of which are not new. Many of the processes that currently fall under the banner of knowledge management have been around for a long time, but as part of functions such as training, human resources, internal communications, information technology, librarianship, records management and marketing to name a few. And some of those processes can be very simple, such as: providing induction packs full of 'know how' to new staff; conducting exit interviews when staff leave so that their knowledge is not lost to the organization; creating databases of all publications produced by an organization so that staff can access them from their desk; providing ongoing learning so that people can constantly update their knowledge; encouraging people with a common interest to network with each other; creating electronic filing systems that can be searched in a number of ways, making the information much easier to

find; redesigning offices to be open plan so that staff and managers are more visible and talk to each other more; putting staff directories online so that people can easily find out who does what and where they are; creating intranets so that staff can access all kinds of organizational information and knowledge that might otherwise take a great deal of time and energy to find.

5.7. Why do we need knowledge management?

Knowledge management is based on the idea that an organization's most valuable resource is the knowledge of its people. This is not a new idea - organizations have been managing 'human resources' for years. What is new is the focus on knowledge. This focus is being driven by the accelerated rate of change in today's organizations and in society as a whole. Knowledge management recognizes that today nearly all jobs involve 'knowledge work' and so all staff are 'knowledge workers' to some degree or another - meaning that their job depends more on their knowledge than their manual skills. This means that creating; sharing and using knowledge are among the most important activities of nearly every person in every organization.

It is easy to see the importance of knowledge in the health sector. As clinicians, managers and other practitioners, we all rely on what we know to do our jobs effectively. But...

Do we know everything we need to know or are there gaps in our knowledge? Of course there are. Medical advances are being made all the time so there is always new knowledge to be learned. Government policies are constantly evolving, as are management practices. The current modernization programme requires us to let go of what we knew and to learn and apply new knowledge. Changing doctor-patient relationships are requiring us to revisit our whole approach to the provision of healthcare. And of course every new patient that comes through our door brings a potential new learning opportunity.

Do we share what we know? The NHS is made up of over a million individuals in hundreds of organizations, each of which have their own knowledge. Is the knowledge of individuals available to the whole organization? Is the knowledge of organizations available to the whole NHS? Not at present. How many times have we lost valuable knowledge and expertise when a staff member moves on? How many times have we 'reinvented the wheel' when we could have learned from someone else's experience? How many times have patients suffered as a result of the 'postcode lottery'?

Do we use what we know to best effect? Not always. In the NHS Plan, the NHS was described as "a 1940s infrastructure operating in the 21st century". Clearly our knowledge has not always been applied to best effect (for a variety of reasons) and we have fallen behind the times. How many times have we had an idea about how a process or an activity could be improved, but felt we lacked the time or resources to do anything about it? How many times have we had an idea that might help our colleagues, but we keep quiet because our colleagues might not appreciate us 'telling them

how to do their job'? How many times have we implemented a new initiative, only to find we reverted back to the 'old way' a few months later? Perhaps we have had insights about how our patients' needs could be better met, but there was no forum for us to share and explore those insights so we just forgot about it.

These are just a few examples:

Almost everything we do in the NHS is based on our knowledge. If we do not constantly update and renew our knowledge, share our knowledge, and then use that knowledge to do things differently and better, then our people, our organizations, our patients and the general public will ultimately suffer. We know this because it has already happened. As The NHS Plan (2000) affirms, in spite of our many achievements, the NHS has failed to keep pace with changes in our society and has become "a 1940s system operating in a 21st century world". What can transform that, along with the current investment and modernization programmed, is harnessing the vast collective knowledge of the people working in the NHS, and using it to best effect. That is why we need knowledge management

5.8. The need for knowledge management

The increasing use of electronic group collaboration tools to support teamwork has fueled interest in the ways by which what goes on when people use those tools can be captured, stored, and re-used by others. Called 'knowledge management', this is important for enterprises whose principal currency is knowledge, rather than physical or financial resources. These are enterprises who have always been wholly devoted to knowledge work, such as consultancies; a growing number of enterprises who discover that knowledge of how to produce products is as salable as

the products themselves; and any enterprise who realizes that its knowledge is an asset to be managed.

The ability of enterprises to manage knowledge as an asset (and provide a return on investment and potentially revenue) is seen by strategies such as Agility (1) as the key to survival in a global business environment in which the efficiencies of mass production of commodity goods have been successfully exported to low-wage economies.

The core issue of knowledge management is to place knowledge under management remit to get value from it - to realize intellectual capital. That intellectual capital can be regarded as a major determiner of the difference between a company's book price and the total value of its stock. For a successful company, this difference can be considerable, representing the difference between the way the company is seen by accountants and by the market. For example, there is a great difference between the book price and share value of recently launched biotechnology companies, whose market value is clearly based on their knowledge assets, rather than traditional capital.

However, while the world of business is experienced in managing physical and financial capital, companies have difficulty in finding cost-effective solutions to simple practical questions concerning knowledge, such as:

"We have four people in Boston who know how to solve this problem. How can we get them to help our team in Korea?"

"People are leaving the company with a lifetime's experience. How can we capture and re-use that?"

"We had a team that did a successful proposal for aerospace five years ago. Why did they make the decisions they did? How did they deal with the customer? What made the team tick?"

"How do we start learning from our experiences and help our people stop repeating others' mistakes?"

"We're involved in an exciting project with four other companies. How can we all learn how these virtual teams tick?"

"Needs change often these days and we're always bringing new people into projects. How can we get them up to speed and contributing quickly?"

While there are no categorical or perfect answers to any of these questions, a powerful set of solutions involves one of the electronic collaboration tools used for today's distributed group work, as will be explored in this paper. These solutions address three current trends that are making knowledge management especially significant today:

Need (post-industrial, knowledge-based commerce),

Awareness (growth of interest in virtual teaming and knowledge management),

Accessible technologies (electronic collaboration tools).

This combination makes now a defining moment for organizational computing. By understanding these challenges, then appreciating the capabilities of available technologies, and then knowing how to build virtual teaming skills and create knowledge management strategies, enterprises can seize this moment and dramatically increase their ability to compete into the next century.

Why do we need to manage knowledge? Ann Macintosh of the Artificial Intelligence Applications Institute (University of Edinburgh) has written a

"Position Paper on Knowledge Asset Management" that identifies some of the specific business factors, including:

Marketplaces are increasingly competitive and the rate of innovation is rising.

Reductions in staffing create a need to replace informal knowledge with formal methods.

Competitive pressures reduce the size of the work force that holds valuable business knowledge.

The amount of time available to experience and acquire knowledge has diminished.

Early retirements and increasing mobility of the work force lead to loss of knowledge.

There is a need to manage increasing complexity, as small operating companies are trans-national sourcing operations.

Changes in strategic direction may result in the loss of knowledge in a specific area.

To these paraphrases of Ms. Macintosh's observations we would add:

Most of our work is information based.

Organizations compete on the basis of knowledge.

Products and services are increasingly complex, endowing them with a significant information component.

The need for life-long learning is an inescapable reality.

In brief, knowledge and information have become the medium in which business problems occur. As a result, managing knowledge represents the

primary opportunity for achieving substantial savings, significant improvements in human performance, and competitive advantage.

It's not just a Fortune 500 business problem. Small companies need formal approaches to knowledge management even more, because they don't have the market leverage, inertia, and resources that big companies do. They have to be much more flexible, more responsive, and more "right" (make better decisions) — because even small mistakes can be fatal to them.

5.9. Operational characteristics of knowledge

There is no easy way to usefully define a concept as complex as knowledge. One-liners remain feebly abstract ("Knowledge is useable information"), encyclopedic treatises dismay the reader with detail. Here we will pragmatically define knowledge in terms of those operational characteristics that we must appreciate if we are to capture, store and utilize knowledge to sound business ends.

5.9.1. Knowledge is a human capability

The authors regard knowledge as a human capability rather than a property of an inanimate object such as a book or computer record. We see knowledge as a personal capability like a skill, experience, or intelligence: a capability to do or to judge something, now or in the future. This capability can be acquired by an individual as a result of reading, seeing, listening to, or feeling (physically or emotionally) something. What is read, seen, heard or felt is not the knowledge; rather it is the medium through which knowledge may be transferred. Note that one says "Here's the information you wanted about" but not "Here's the knowledge

about ...". In our language we recognize that knowledge is the result of a personal transform.

5.9.2. Knowledge acquisition is a dynamic process

The above distinction is important. It means that "knowledge management tools" don't really manage knowledge, but help capture, organize, store and transmit source material from which an individual may acquire knowledge. Whether an individual does acquire knowledge from a source depends on a dynamic interaction in which two factors are important here:

The similarity between the person's context (their situation, history and assumptions) and the context described,

The degree of congruence between how the material is structured and how the structure of the domain appears to the reader.

Hence we see the acquisition of knowledge (and especially business knowledge) as highly dependent on two very subjective constructs: context and structure. A report that transfers knowledge to one person may not transfer it to another if they do not share sufficient context with the author to understand what is described or cannot employ the material in way in which it is structured.

5.9.3. Knowledge is generative

Having knowledge means having an appreciation at the level of a map or a web, rather than a non-dimensional data point, or a one-dimensional fact. It means one can explain, explore and apply interpolations and abstractions. Most importantly to have knowledge means that one can generate new appropriate statements about a subject, not just reproduce

the statements that were received. (To be a licensed London black cab driver, candidates have to pass an examination, which takes two to three years' preparation. The examination tests their ability to describe the location of every street and major building in Greater London, and to construct the best route from any place to any other place under different traffic conditions. London cabbies call this qualification "The Knowledge".)

5.9.4. Knowledge is elaborate

While one talks of "a piece of information", one refers to "a body of knowledge". That "body" is an extensive, organized set of information. It comes in large packets. Knowledge does not come in SoundBits. It's transferred through courses or books, or acquired through experience. The expectation is that people acquire knowledge (learn) over days or weeks rather than minutes and hours.

5.9.5. Knowledge about work is best acquired through work

Knowledge about work can be best acquired (learned) through work itself. A whole field of learning, ethno methodology, has grown up around the superiority of learning-in-work. Knowledge acquired in work comes without the abstraction and restructuring required presenting it in a lecture, book, film or cassette. One less translation means one less layer to deconstruct to map the knowledge to the individual's own perspective. London cabbies learn by driving the streets of London on motorbikes.

5.9.6. Dialogue is knowledge

For centuries, books have been published for the explicit purpose of letting others acquire knowledge. Today, enterprises publish great amounts of

material internally and externally about their methods and products. We call this publication knowledge.

There exists, however, another type of knowledge, which is accessible to the modern business: dialogue knowledge. Dialogue knowledge is entailed in what people communicate to each other in the course of their work. It comprises formal and informal communication and includes any accompanying materials. Modern collaboration tools, and especially computer conferencing, allow what people write and send to each other to be stored, and that stored material becomes a rich base from which people can acquire knowledge.

This paper focuses on dialogue, not publication. While published knowledge is important, and indeed dominates current discussions of intranets, it is an information management rather than a knowledge management issue. Today's challenge is to capture knowledge from what people say and do as part of their day to day work and to make it accessible to others.

5.9.7. The challenge of team knowledge management

With increasing emphasis on knowledge-based business rather than production-based business, management is seeking ways to get that knowledge under management remit. The goal is to manage this aspect of the enterprise in the same way as its physical and financial assets. Charged with this are the new roles of "knowledge managers" or "chief learning officers," with responsibility for creating the environment and process for dealing with knowledge as a corporate asset.

Typically the knowledge management process involves:

Capture

Organization and Storage

Distribution, or better, Sharing

Application or Leverage

Central to current concerns is the issue of team knowledge management. Teams, ascribed as the powerhouse of the effective enterprise, are more intractable from a knowledge management point of view than individuals. By their very nature teams create a great deal of new knowledge, which as such is of high value to the enterprise. However, the knowledge of how and why they created what they created is more difficult to get at than an individual's knowledge, since it exists in a number of different people, and also in their continuous interaction, a small proportion of which is usually recorded.

In the following sections we will look more closely at team knowledge management in relation to both a traditional approach, and a new computer-mediated approach.

5.10. Traditional approach to team knowledge management

Knowledge management has always been with us in the sense that enterprises have wished to capture and document process, for purposes of quality, automation, or to create documented methodologies. While routine work may be adequately captured for the purposes of quality or automation, enterprises often set out to capture non-routine work processes in documented methodologies. These are an explicit exercise in knowledge management, getting the knowledge from "people who have done it" documented and available across the enterprise. There are

however major problems with documented methodologies: context and dialogue.

5.10.1. Problem of context

If the methodology is too strongly related to a particular context then it may fail to be seen as relevant to another context. For example, many development process innovations are applicable across a wide set of products. But if the development process is documented wholly within the paradigm of, say, hardware development, it may not be useful for teams developing software. If the author moves too far in the other direction, however, the methodology becomes too abstract and too generic, and it becomes hard to relate it to any practical situation.

5.10.2. Problem of dialogue

The second problem with methodologies is that they typically only document the explicit, or formal task elements of a process. Rarely is the tacit, or informal, process, which actually took place documented. Hence they do not capture the dialogue, telling of the dynamics, uncertainties, insights, interactions and deliberations, which made the process successful. While they may set down the 'what' of a process, they usually fail to set down the 'why' of its steps. Even if authors try to capture the 'why', such methodologies are written after the event, when people have forgotten the informal process and the 'why'.

Thus they fail to capture the reality of 'how'. The subsequent user of a methodology then either needs to spend time with someone who was involved in the documented process, or get that person into the new team. Much of the hardest-won and highest-value operational information about

the process still resides in the heads of people who were personally involved, and remains un-captured, unshared and unapplied by others.

5.10.3. A computer-mediated approach to team knowledge management

Against this picture of the problems of post-hoc, documented methodologies successfully to manage knowledge, we want to discuss another strategy for knowledge management. This is based on capturing as much as possible of the reality of the work as the team who did it did it. In this approach, the knowledge is captured as it is created using the same tools as used in the work. Knowledge about the work can be used as soon as it is shared in the work. And it is immediately applicable to any other work where it fits.

5.11. Knowledge management and computer conferencing

Our background is over twenty years' experience in equipping enterprises to adopt and make the most effective use of electronic collaboration tools: email, voice mail, and computer, audio and video conferencing. We address the behaviors, methods, approaches and protocols which are required if these tools are to support the work of distributed groups and teams. The application has always been the creation, capture, sharing and application of organizational knowledge.

Recently, our companies partnered to develop the WORKING BY WIRE SM TM program, a true "virtual service" delivered electronically worldwide, that equips distributed team members to "work together apart". Going beyond the usual level of tool skills, WORKING BY WIRE addresses the behaviors, methods, approaches and protocols required to

support distributed teamwork. A full description of WORKING BY WIRE is viewable at <http://www.knowab.co.uk/wbw>.

Our central focus has always been the process historically known as computer conferencing. Invented roughly twenty years ago, computer conferencing has an impressive history of supporting work, social and educational activities. Today this technology-based process is mature as a key enabler of the virtual, online teamwork undertaken by today's distributed, knowledge-based enterprises. This tested communications capability is also known as online conferencing, bulletin boards, discussion forums, and threaded discussions. [List of alternative names for computer conferencing updated March 2002.]

Computer conferencing has special significance for knowledge management for the simple reason that when a team uses computer conferencing to collaborate, a permanent, shareable, record of what they write and send to each other is created. That record captures the knowledge that the team created and applied to its work, and is the basis for managing the team's knowledge. This permanent shareable record is not created when people use collaboration tools such as telephone, email, or audio and video conferencing. As one experienced user said- "These tools leave no footprint."

Use of computer conferencing to achieve team knowledge management is described in the following case example.

5.11.1. Team computer-mediated knowledge management: case example

Five years ago we were involved in a major proposal made by an international information and communications systems company to a US aerospace manufacturer. The proposal covered all the office, design, manufacturing and support systems for the life cycle of new commercial aircraft. New integrated, concurrent development techniques were to be applied to its development. We were involved in the proposal in two roles. Firstly, we were recruited to create proposal material showing how online, distributed work could accelerate the customer's concurrent development process. Secondly, we took on the role of creating process for the concurrent working of the proposal team itself, which eventually numbered 140 people across eleven US states and six countries.

5.11.2. Role and use of computer conferencing

We chose computer conferencing as the process to integrate the proposal activities, which lasted four months. We designed the conferencing and collaboration environment (the electronic, virtual workspace) to achieve the following.

Enable cross-functional collaboration amongst the ten specialist skill groups comprising the proposal team (e.g. Project Management Group, Technology Groups, Training Group, Work Process Group, etc.), allied account teams, and (our) partner companies.

Demonstrate to the customer that conferencing would support concurrent development (in their context, development of an aircraft, in our immediate context, development of a proposal) in an extremely compressed timeframe.

Co-ordinate team activities that were geographically distributed and reduce the cost and inconvenience of contributors' travel to the proposal HQ. (Only about 25% of the team ever traveled to the proposal HQ and

we calculated that the electronic workspace saved approximately \$150,000 in travel costs.)

Arrangements for computer conferencing were specifically designed and implemented to support these goals in accordance with principles and protocols for managing distributed online work, structuring conferences, and creating appropriate user expectations and behaviors.

If you had looked at the electronic workspace at the height of the proposal development, you would have seen:

On the Project Manager's instruction and example, over 90% of the team's communication was taking place within computer conferences, or copied into the computer conferences. Person-to-person email within the team was restricted to exceptional circumstances.

Everyone was using the overall Project Management computer conference, in which all-major events; positions and issues were reported, as well as all notes of meetings with people in the computer or the customer company.

Each of the ten skill groups was working virtually within its own computer conference but browsing other groups' conferences.

Members of each skill group were cross posting notes they felt they were important to other groups' conferences.

Material from all conferences was being used to create the emerging proposal document.

5.11.3. Concurrent use of knowledge

What we helped to create for this proposal was a system for concurrent knowledge management. The team generating the knowledge was the team that used the knowledge in their work, managing it as they went

(borrowing terminology from electronic publishing, the team was the "prosumer" (producer and consumer) of its knowledge).

Specialist knowledge from within the ten skill groups was created by individuals, from their individual locations across the USA and Europe, and shared concurrently with the rest of their group and the team as a whole.

That knowledge was immediately reviewed and applied within the particular skill group and was available for impact assessment across the whole team.

Discussions about how to proceed at critical points was team-wide, and final decisions were recorded for all to read.

However, no one on the team would have recognized the term "knowledge management" at the time. There was no concern about the specter of "knowledge sharing", since they needed to share knowledge to get the work done. All they knew was that the electronic workspace helped them progress their work and remain connected to their colleagues, without continually having to travel.

5.11.4. Later re-use of knowledge

What happened after the proposal was submitted is a telling story. Senior management created a task force (mostly of people not previously involved) to take the final proposal document and generalize it into a proposal template for aerospace bids - similar to the process of documenting methodology discussed earlier.

This was not a success. The resulting document was more of a testament to the efficiency of the Replace All word processor function than an item of usable intellectual capital. The result of the proposal work was still there, but it was not on its own accessible. It contained little context for the proposal (which in fact had a two year history); its structure was set for the original customer and could not be made generic without losing its logic; and nothing in it gave any clue as to why the team had chosen any of the solutions they proposed.

Soon after, however, we ourselves became involved in an engagement with another aerospace customer, this time in Europe, as part of a team proposing the means by which online work could support a concurrent development strategy. One of the first things we did was to open the computer conferencing archive that had been created by the earlier proposal team. The following happened:

The new team read the conferences. They understood not only the details of the proposal the original team had created, but why they had done it, and what went on while they were doing it. From the captured dialogue they could identify with the decisions, the dialogue, and the emotions that were flowing at critical points.

They were able to abstract key points from the captured process of the earlier proposal. These were both points that they already knew they needed answers to, and also points they didn't know they needed answers to.

They were able to contact people whose expertise was apparent from the recorded conferences, and consult with them about the new proposal.

They were able to place the generalized aerospace proposal template in context, and were able skillfully to pick and modify items which were relevant to their proposal.

5.12. Managing team knowledge through computer conferencing

In the preceding section we contrasted the traditional approach to team knowledge management with a computer-mediated approach, illustrated by a case example. We have also indicated the importance of computer conferencing in team computer-mediated knowledge management. In contrast to teams using the telephone, audio conferencing, video conferencing or even email, teams using computer conferencing create a permanent shared record of all their communications. We can predict that soon these records will not just be text and word-processor or graphic files, but also video and audio clips.

In this section we look more closely at two aspects of computer conferencing as a knowledge management tool. We look first at how computer conferencing conveys context and structure. We then look at the issue of one team using a computer conference structured according to a previous team's view of its knowledge.

5.12.1. Context

Context binds messages and pieces of information together to form meaning and thus provides infill to a map or body of knowledge. It includes situations, relationships, assumptions, expectations and prior events. Context is important to knowledge management because knowledge is highly contextual. We might say that adding context to information is one of the transformations from information to knowledge.

One of the great advantages of computer conferencing as a knowledge management process is that it superbly retains context. Within its major structuring by subject, a computer conference lays out in chronological sequence the history of a project or program - providing excellent clues as to what is going on or what went on, in the words that people used as part of their work. No other communication tool conveys the context of communication as well as computer conferencing.

5.13.Structure

5.13.1. Structuring of knowledge by the team that created it

As a team creates and populates its own computer conferences, emergent knowledge is placed within a structure of its own making. That structure - the mapping of subject-matters to conferences and groups - is designed at the outset to reflect the team's intended work, and is continually iterated. Assuming that the team is alive to the need to design and re-design its electronic workspace, the structure of the team's computer conferences is by definition always a good approximation to the structure of the team's knowledge.

5.13.2. Structuring of knowledge for later teams

While computer conferencing creates the requisite knowledge structure of and for a team, which is using its own conferences (as "prosumers"), that structure need not necessarily be suitable for any later team or individual ("consumers") who want to learn from those conferences. Hence a knowledge management strategy based on computer conferencing needs to address the issue of the later re-use of conference records by people with a different viewpoint.

For example, in the aerospace proposal described earlier, the team proposed that the client use the computer company's established phase review process. The way in which the phase review process would be applied was discussed in a number of the conferences, since it was applicable to a number of different aspects of the proposal. There was no one conference called "phase review process". Hence someone interested in learning how the phase review process was presented in this proposal would not have found that laid out in one conference, and would have to browse all the conferences to find mention of it.

5.13.3. Hyper linked structures

We believe that the answer to the re-structuring of knowledge in computer conference records is hyper linking. In order to make the knowledge base that a computer conference record represents accessible to an unknown variety of future viewpoints, the content of the computer conference should be hyper linked: that is, turned into a web of knowledge.

Hypermedia protocols are now widely available in HTML tools, and these allow the creation of new links across the content of computer conference records. The fact that these tools may also permit the publishing of those records on internal networks serves to increase their utility in sharing knowledge within an enterprise. It may also be that those computer conferences are in fact web conferences (conferences run on intranets), increasing the ease of sharing the conference record.

Specifically, therefore, we believe that in order to make computer conferences reusable as knowledge bases for later study, an important task is to identify the substantive items of content in computer conference records, and link them together. That knowledge base should then allow the following views to be taken of it:

The original view, reflecting the original team's structure - which includes a chronological view of communication within conferences, plus

A hyper linked, web view, allowing navigation to conference items, which address the same subject-matter.

Through this hyper linked structure, the later reader wishing to learn how the previous team dealt with a particular subject may serendipitously find

that it is already the subject of a conference, but may alternatively have access to a set of hyper linked messages within separate conferences. Once the user has alighted on an item linked as relevant to a particular subject matter, the conference record has preserved the context of that note. That is, rather than being presented with a bewildering array of mentions of a particular subject, the user has the opportunity to understand the context in which each item was written.

We recognize that it may not be necessary to go to the lengths of hyper linking in every case. There may be sufficient commonality of knowledge structure throughout an enterprise that computer conferences generated by one team can be used by others without re- structuring into a web. However, if that is not the case, then hyper linking conference records are a relatively simple and cost-effective process for knowledge management.

5.13.4. Hyper linking policies and skills

Enterprises will need to create appropriate policies if what people write to their team colleagues is made available enterprise-wide. Further, best practices will need to be developed to hyperlink and edit conference records (giving rise to such questions as who does the hyper linking, and what material can safely be edited out). Policies and practices for hyper linking are under development by the authors for the WORKING BY WIRE program.

5.14. Team knowledge management and Working by Wire

From our experience with projects such as those recounted in this paper, we have developed the WORKING BY WIRE program. Within this program, we interact with users online, helping them to migrate to online work. We help them design their online work processes and the online

workspace. And we further help users understand and overcome the psychological and cultural barriers they may be facing in working online, working online in teams, utilizing knowledge and sharing knowledge with others.

WORKING BY WIRE creates the environment and competencies for effective distributed teamwork. WORKING BY WIRE is at the same time a powerful intervention for enterprises that are concerned with knowledge management. If a team's knowledge is to be managed and shared within a computer network or intranet, then the bottom line is that their needs to be some process to get a team's knowledge into the computer in the first place. WORKING BY WIRE greatly assists that process. It helps to ensure that

Everyone on the team uses computer-mediated communications,
All their team dialogue takes place in the team electronic workspace, and not through private email, even when that dialogue is informal,
A culture is formed online which reinforces knowledge sharing and continuous communication,
Team members are encouraged to learn from each other and from outside the team,
The structure of that electronic workspace remains tuned to the emerging structure of the knowledge that the team is handling.

Hence WORKING BY WIRE addresses the issues of knowledge management head-on, providing sound design and operational bases for both concurrent and later use of knowledge.

When its own members are using a team's knowledge concurrently, wherever they are located, WORKING BY WIRE helps teams:

Capture their knowledge

Organize their knowledge

Distribute / share their knowledge

Apply their knowledge to their work.

When a later team or set of individuals is using a team's knowledge, WORKING BY WIRE helps:

Capture knowledge from previous teams

Reorganize the knowledge for their own viewpoint

Distribute / access the knowledge in archival conferences

Apply the knowledge to their own work.

WORKING BY WIRE is an essential part of an enterprise's knowledge management strategy. Through equipping people with the competencies and skills for online work, it allows distributed teams to accelerate their online work and achieve their goals. A significant part of this is enabling the team to manage its knowledge for its own concurrent use. A team adhering to WORKING BY WIRE principles will also create, in the stored record of its communications, the knowledge, which can be made available to later teams and individuals.

5.15. Roadblocks to adoption of knowledge management solutions

There have been many roadblocks to adoption of formal knowledge management activities. In general, managing knowledge has been perceived as an unmanageable kind of problem — an implicitly human, individual activity — that was intractable with traditional management methods and technology.

We tend to treat the activities of knowledge work as necessary, but ill-defined, costs of human resources, and we treat the explicit manifestations of knowledge work as forms of publishing — as byproducts of "real" work.

As a result, the metrics associated with knowledge resources — and our ability to manage those resources in meaningful ways — have not become part of business infrastructure.

But it isn't necessary to throw up one's hands in despair. We do know a lot about how people learn. We know more and more about how organizations develop and use knowledge. The body of literature about managing intellectual capital is growing. We have new insights and solutions from a variety of domains and disciplines that can be applied to making knowledge work manageable and measurable. And computer technology — itself a cause of the problem — can provide new tools to make it all work.

We don't need another "paradigm shift" (Please!), but we do have to accept that the nature of business itself has changed, in at least two important ways:

Knowledge work is fundamentally different in character from physical labor.

The knowledge worker is almost completely immersed in a computing environment. This new reality dramatically alters the methods by which we must manage, learn, represent knowledge, interact, solve problems, and act.

You can't solve the problems of Information Age business or gain a competitive advantage simply by throwing more information and people at the problems. And you can't solve knowledge-based problems with approaches borrowed from the product-oriented, print-based economy. Those solutions are reactive and inappropriate.

Applying technology blindly to knowledge-related business problems is a mistake, too, but the computerized business environment provides opportunities and new methods for representing "knowledge" and leveraging its value. It's not an issue of finding the right computer interface — although that would help, too. We simply have not defined in a rigorous, clear, widely accepted way the fundamental characteristics of "knowledge" in the computing environment. (See "Cooperative development of a classification of knowledge management functions.")

5.16 Categorization of knowledge management approaches

The term "knowledge management" is now in widespread use, having appeared in the titles of many new books about knowledge management as a business strategy, as well as in articles in many business publications, including The Wall Street Journal. There are, of course, many ways to

slice up the multi-faceted world of knowledge management. However, it's often useful to categorize them.

In a posting to the Knowledge Management Forum, Karl-Erik Sveiby identified two "tracks" of knowledge management:

Management of Information. To researchers in this track, according to Sveiby, "... knowledge = Objects that can be identified and handled in information systems."

Management of People. For researchers and practitioners in this field, knowledge consists of "... processes, a complex set of dynamic skills, know-how, etc., that is constantly changing."

(From Sveiby, Karl-Erik, "What is knowledge management")

Sveiby's characterization is on target, but it may not capture the full flavor of the important distinctions in approaches to organizational knowledge management. At Knowledge Praxis, we have adopted a three-part categorization: (1) mechanistic approaches, (2) cultural/behaviorist approaches, and (3) systematic approaches to knowledge management.

5.16.1 Mechanistic approaches to knowledge management

Mechanistic approaches to knowledge management are characterized by the application of technology and resources to do more of the same better. The main assumptions of the mechanistic approach include:

Better accessibility to information is a key, including enhanced methods of access and reuse of documents (hypertext linking, databases, full-text search, etc.)

Networking technology in general (especially intranets), and groupware in particular, will be key solutions.

In general, technology and sheer volume of information will make it work.

Assessment:

Such approaches are relatively easy to implement for corporate "political" reasons, because the technologies and techniques — although sometimes advanced in particular areas — are familiar and easily understood. There is a modicum of good sense here, because enhanced access to corporate intellectual assets is vital. But it's simply not clear whether access itself will have a substantial impact on business performance, especially as mountains of new information are placed on line. Unless the knowledge management approach incorporates methods of leveraging cumulative experience, the net result may not be positive, and the impact of implementation may be no more measurable than in traditional paper models.

5.16.2 Cultural/behaviorist approaches to knowledge management

Cultural/behaviorist approaches, with substantial roots in process re-engineering and change management, tend to view the "knowledge problem" as a management issue. Technology — though ultimately essential for managing explicit knowledge resources — is not the solution. These approaches tend to focus more on innovation and creativity (the "learning organization") than on leveraging existing explicit resources or making working knowledge explicit.

Assumptions of cultural/behavioristic approaches often include:

Organizational behaviors and culture need to be changed ... dramatically. In our information-intensive environments, organizations become dysfunctional relative to business objectives.

Organizational behaviors and culture can be changed, but traditional technology and methods of attempting to solve the "knowledge problem" have reached their limits of effectiveness. A "holistic" view is required. Theories of behavior of large-scale systems are often invoked.

It's the processes that matter, not the technology.

Nothing happens or changes unless a manager makes it happen.

Assessment:

The cultural factors affecting organizational change have almost certainly been undervalued, and cultural/behavioristic implementations have shown some benefits. But the cause-effect relationship between cultural strategy and business benefits is not clear, because the "Hawthorne Effect" may come into play, and because we still can't make dependable predictions about systems as complex as knowledge-based business organizations. Positive results achieved by cultural/behavioristic strategies may not be sustainable, measurable, cumulative, or replicable ... and employees thoroughly "Dilbertized" by yet another management strategy may roll their eyes. Time will tell.

5.16.3 Systematic approaches to knowledge management

Systematic approaches to knowledge management retain the traditional faith in rational analysis of the knowledge problem: the problem can be solved, but new thinking of many kinds is required. Some basic assumptions:

It's sustainable results that matter, not the processes or technology ... or your definition of "knowledge."

A resource cannot be managed unless it is modeled, and many aspects of the organization's knowledge can be modeled as an explicit resource.

Solutions can be found in a variety of disciplines and technologies, and traditional methods of analysis can be used to re-examine the nature of knowledge work and to solve the knowledge problem.

Cultural issues are important, but they too must be evaluated systematically. Employees may or may not have to be "changed," but policies and work practices must certainly be changed, and technology can be applied successfully to business knowledge problems themselves.

Knowledge management has an important management component, but it is not an activity or discipline that belongs exclusively to managers.

Assessment:

Unrepentant rationalists in the business world are taking a systematic approach to solving the "knowledge problem." You'll also find evidence of such approaches — as well as a less formal use of the term systematic knowledge management —Karl Wiig's Knowledge Research Institute Web site and Gene Bellinger's Systems Thinking Web pages. Systematic approaches show the most promise for positive cumulative impact, measurability, and sustainability.

5.17. Check your progress

1. Who contributed to the evolution of knowledge management?

Ans:- Peter Drucker, Paul Strassmann, and Peter Senge

2.Context is important to knowledge management because knowledge is highly contextual. (True/False)

Ans:- True

3.Knowledge management is a.....

“Process that emphasizes generating, capturing and sharing information know how and integrating these into business practices and decision making for greater organizational benefit.”

4. If you are asked to arrange the concepts “information”, “knowledge” and “data” in ascending order of complexity which of the following sequence is correct?

(i) **data – information – knowledge** (ii) knowledge – information – data (iii) information – data –knowledge (iv) information –knowledge – data.

5. Sometimes the terms ‘data’ and ‘knowledge’ are synonymously used for

(i) wisdom (ii) intelligence (iii) news (iv) **information**

5.18 Summary

Where do we stand at the moment, and where do we go from here? We conclude with a thought from Bo Newman, via email:

As attested to in numerous articles in the popular press, knowledge management has already been embraced as a source of solutions to the problems of today's business. Still it has not been easy for this "science" to construct for itself that royal road of self validation. On the contrary, I believe that it is still, at least for the majority of the practitioners and their customers, in the stage of blind groping after its true aims and destination.

5.19. Glossary

Knowledge Management: knowledge management often encompasses identifying and mapping intellectual assets within the organization, generating new knowledge for competitive advantage within the organization, making vast amounts of corporate information accessible, sharing of best practices, and technology that enables all of the above — including groupware and intranets.

Knowledge : Knowledge has two basic definitions of interest. The first pertains to a defined body of information. Depending on the definition, the body of information might consist of facts, opinions, ideas, theories, principles, and models (or other frameworks). Clearly, other categories are

possible, too. Subject matter (e.g., chemistry, mathematics, etc.) is just one possibility.

Knowledge also refers to a person's state of being with respect to some body of information. These states include ignorance, awareness, familiarity, understanding, facility, and so on.

Working By Wire: It is a principle in which the knowledge workers Capture knowledge from previous teams ,reorganize the knowledge for their own viewpoint' distribute / access the knowledge in archival conferences,apply the knowledge to their own work.

Organizational Knowledge Management : Organization al Knowledge is created with in a corporate or institution .It is concerned with , how to deal with exponential increases in the amount of available knowledge and increasingly complex products and processes of a institution .

5.20.Questions for self study

1. Define Knowledge Management.

5.21 References: -

1. Agile Networking: Competing Through the Internet and Intranets by George Metes, John Gundry and Paul Bradish. Prentice Hall PTR, Upper Saddle River, NJ., 1997.

2..Barclay, Rebecca O. and Murray, Philip C. “What is knowledge management.” 16th Mar. 2006. <http://www.media-access.com/whatis.html>

3. Gundry, John and Metes, George ”Team Knowledge Management: A Computer-Mediated Approach A Knowledge Ability White Paper” 16th Mar. 2006. <http://www.knowab.co.uk/wbwteam.html>

4.. http://www.nelh.nhs.uk/knowledge_management/km1/what_is_km.asp

5. “Special Library Knowledge Management.” 16th Mar. 2006

6. The Wisdom of Teams by J. R. Katzenbach and D. K. Smith. Harvard Business School Press, MA., 1993.

Unit - 6

Knowledge Management Models

6.0 Objectives

6.1 Introduction

6.2. Mix & Match KM Models

6.2.1 Network Models

6.2.2 Cognitive Models

6.2.3 Community Model

6.2.4 Philosophical Model

6.2.5 Quantum Model

6.3 Other Knowledge Models; State of the Art

6.3.1 SECI (Nonaka)

6.3.2 The N-Form Organization (Helund)

6.3.3 Knowing the Knowledge (Earl)

6.3.4 The Ok Net and OCS (Carayannis)

6.3.5 Three Pillars of Knowledge Management (Wiig)

6.3.6 A Model of Intellectual Capital (Edvinsson)

6.3.7 The ecology of Knowledge Management

6.3.8 Knowledge Management Processes (Inkpen and Dinur)

6.3.10 Taxonomy of Knowledge Management (Deper and chauvel)

6.4 Check your progress

6.5 Summary

6.6. Glossary

6.7 Questions for self study

6.8 References

6.0 Objectives

- ❖ The main objectives of this unit are to:
- ❖ Presents various models of KM
- ❖ Their components of various models of KM
- ❖ Various typical cases of Km in different companies are presented

6.1. Introduction

In this unit you will be learning about the basics of KM models, their features and components. Different kinds of models are also discussed. For example we have a quantum model along with cognitive models, community models, philosophical models which are discussed here. Some typical models are illustrated. A state of the art report on KM is presented for further reading

6.2. Mix & Match KM Models

KM models cover basic knowledge and information related activities such as *gathering, structuring, storing and publishing* to highly abstract life cycle conceptualizations .The review of KM model taxonomies presented by Kakabadse, *etal* in their article " Reviewing the knowledge management literature: towards a taxonomy", Journal of Knowledge Management 7 (4) 2003 pp75-91 make s an interesting reading .

6.2.1. Network Models

The focus is on connections, acquisition, sharing, transfers via horizontal exchanges. Important knowledge resides in a network of actors connected by 'boundary spanners'. Awareness of insights and information outside formal teams and groups is a key driver. Knowledge work is seen as building social relationships, social capital and attending to reciprocity. Competencies include empathy, facilitation networking via telephony and Internet tools.

6.2.2. Cognitive Models

Knowledge is seen as a corporate asset that requires careful capture, representation, storage, measurement, preservation and dissemination. Value comes from repetitive application of captured best practices and avoiding pitfalls documented as lessons learned. Key focus is on reuse,

replication, standardization and 'weeding' of outdated routines. Finding the correct balance between *exploration and exploitation* has eluded many organizations that follow this model

6.2.3. Community Models

Recognizes the close relationship between self-organization, continuous learning and informal exchanges for knowledge stewardship. Knowledge is founded in the thinking that circulates in a community, where language is shared, trust allows exploration of heuristics, patterns may be crafted and subtle symptoms and repetitive working solutions are spread via story telling.

6.2.4. Philosophical Models

Based on interactive Socratic dialog within a strategic context this model values deep questioning of assumptions and continual inquiry into behavior of competitors, markets and internal processes. This approach values personalization over codification and uses very little technology. The key cultural drivers are maintaining open communication, encouraging deep reflection & learning, creative abrasion and belief justification.

6.2.5. Quantum Model

These authors maintain, "*builds on quantum physics, emergent quantum technology and consequential economy*". It is possible to follow a mix of the above models. Organizations that have made good KM progress subscribe to parts of the Network, Philosophical and Community models with a little cognitive modeling thrown into the mix. The key drivers seem to be connections & relationships, trust, empathy, community, deep dialog and technology to capture *persistent conversations*.

6.3 Other Knowledge Management models: a state of the art

The following is selection of models and classification systems that appeared in the literature of KM. These are representative but certainly not an exhaustive collection of such devices in what may be termed the domain of Knowledge Management. The following sections present a brief description of each model or classification system and constrain the discussion to its dimensional structure.

6.3.1. SECI (Nonaka)

Ikujiro Nonaka, a professor at Hitotsubashi University and the University of California at Berkeley, articulated a model of “knowledge creation” in a series of articles and books dating from the early 1990s. The SECI (Socialization, Externalization, Combination, Internalization) model first appeared in 1991 and attained recognition as a useful and rigorous approach to describing the ways knowledge is generated, transferred and re-created in organizations. In brief, the model incorporates the following:

Two forms of knowledge (tacit and explicit)

An interaction dynamic (transfer)

Three levels of social aggregation (individual, group, context) and four “knowledge-creating” processes (socialization, externalization, combination and internalization).

The model proposes that a "knowledge-creating company" consciously facilitates the interplay of tacit and explicit forms of knowledge. This is accomplished through systems and structures, and a corporate culture, which facilitate the interaction of four knowledge-creating processes. They are as follows:

Socialization: the sharing of tacit knowledge between individuals through joint activities, physical proximity.

Externalization: the expression of tacit knowledge in publicly comprehensible forms.

Combination: the conversion of explicit knowledge into more complex sets of explicit knowledge: communication, dissemination, systematization of explicit knowledge.

Internalization: the conversion of externalized knowledge into tacit knowledge on an individual or organizational scale. The embodiment of explicit knowledge into actions, practices, processes and strategic initiatives. Critical for Nonaka is the interaction dynamic between forms of knowledge and levels of organization.

He proposes that the spiral resulting from the exchange of tacit and explicit knowledge across different organizational levels is the key to knowledge creation and re-creation. The prescription is that companies should recognize the importance of this interaction dynamic and imbed the mechanisms

In 1998 Nonaka & Konno introduced the concept of Ba, which relates to the English concept of place. A Ba in Knowledge Management is a space for dynamic knowledge conversion and emerging relationships. Nonaka defines four Bas:

- **Originating Ba:** a space where individuals share feelings, emotions, experiences and mental models.
- **Interacting Ba:** a space where tacit knowledge is made explicit. Two key factors are dialogue and metaphors.
- **Cyber Ba:** a space of interaction in a virtual world. Implicates the combination of new and existing explicit knowledge to generate new explicit knowledge through out the organization.
- **Exercising Ba:** a space that facilitates the conversion of explicit knowledge into tacit. Ba calls attention to the fact that knowledge is context-dependent: it cannot be separated from its "place" in any meaningful way. Each knowledge-creating process therefore requires a Ba, a phenomenal space whose importance should be recognized by the organization. The organization, in fact, should focus significant attention on the development of its Bas since more is to be gained by developing the environment around knowledge processes than efforts directed at the processes
- Themselves.

6.3.2. The N-Form Organization (Hedlund)

Gunnar Hedlund of the Stockholm School of Economics introduced the notion of the N-Form corporation in 1994. He proposed that the N-Form corporation goes beyond the M-Form in that it better accommodates the emerging imperatives of knowledge-based organizational design, drawing its synthetic wisdom from the, "*...gray zone between economics, organization theory and strategic management*" (1994: 74). Hedlund suggests that a principal attribute of the model is its conjoint

analysis of two sets of concepts: tacit/explicit knowledge, and four levels of social aggregation. He injects into these a set of dynamics related to knowledge creation, development, transfer and use, yielding a structure that is built around 3 basic dimensions:

Two types of knowledge (tacit and articulated), and within each type three forms of knowledge (cognitive, skill, embodied)

Four levels of carrier (individuals, small groups, organizations, the inter-organizational domain)

The dynamics of knowledge transfer and transformation, which are articulated by the following processes:

- Articulation and internalization, the interaction of which is reflection,
- Extension and appropriation, the interaction of which is dialogue,
- Assimilation and dissemination which refer to "... knowledge imports from and exports to the environment" (1994: 76).

Hedlund lays the foundation for his dynamic model by distinguishing between types, forms and levels of knowledge. In brief, he juxtaposes tacit and articulated knowledge (attending closely to definitional issues) with different levels of social aggregation. This results in a classification scheme that assumes cognitive, skill-based and embodied forms of knowledge exist in both tacit and articulated forms across the range of organizational levels. On this foundation Hedlund then situates the dynamics of knowledge transfer and transformation. He writes that most existing works speak, *"...primarily in terms of storage of information, and only secondarily about its transfer, whereas its transformation is left outside most analyses"* (1994: 76). Knowledge transfer, storage and transformation are presented as a set of processes whose interactions, across the different types and levels of knowledge, privilege knowledge creation and, in turn, argue for the N-Form organizational design. The articulation of tacit knowledge, and the internalization of articulated knowledge, may occur at any level of carrier and the interaction, termed reflection, is held to be a primary source of knowledge creation. The acquisition of tacit or articulated knowledge by lower agency levels, termed appropriation, and the dissemination of tacit or articulated knowledge to higher agency levels, termed extension, signal the movement of knowledge through different levels of carrier. Their

interaction is termed dialogue whose, "*...quantity and quality are hypothesized to be important determinants of the type and effectiveness of knowledge management in an organization*" (1994: 77).

6.3.3. Knowing and Knowledge (Earl)

Michael Earl of the London Business School is known for the work he has conducted on the Information systems function in organizations, the role of the CIO and more recently, the role of the CKO. His more recent works propose a set of heuristics that situate the CKO / knowledge function within organizations and prescribe its activities.

One distinction he makes, often discussed by others, is that of data, information and knowledge. Earl proposes a classification and writes, "*Trite and imperfect as this classification is, it suggests that knowledge comprises expertise, experience, know-how, skills and competence...*" (1998: 7). Going further, he recognizes two organizational states that are relevant to Knowledge Management: knowledge and knowing. Earl proposes that an organization may usefully concern itself with the creation, protection and leveraging of its knowledge assets by attending to four functions:

Inventorising: mapping individual and organizational knowledge,

Auditing: assessing the nature and extent of planned ignorance and then developing knowledge through learning activities,

Socializing: creating events which enable people to share tacit knowledge,

Experiencing: addressing the problem of unknown ignorance by learning from experience, action and handling unusual situations.

6.3.4. The OK Net and the OCS (Carayannis)

Elias Carayannis (George Washington University) has recently proposed a "*...synergistic symbiosis between information technology and managerial and organizational cognition*" (1999: 219) whose conjunction is Knowledge Management. IT is approached as a value-adding technological infrastructure, managerial / organizational cognition as the "*...capability for individual*

and collective reasoning, learning, emoting and envisioning," and Knowledge Management as "...a socio-technical system of tacit and explicit business policies and practices"(1999: 219). In general terms Carayannis attempts to define the systems and structures, both real and virtual, which would allow an organization to maximize the efficiency and effectiveness of its cognitive processes. The crystallized form of this effort is termed the Organizational Knowledge Network or OK Net. Carayannis specifies a number of concepts to lay its foundation and among them, the key elements of meta-cognition, meta-learning and meta-knowledge. A familiar theme in the organizational learning Community, Carayannis states that the relationship between knowledge (K) and meta-knowledge (MK) is critical in Knowledge Management. He defines a 2 X 2 matrix, which, "...consists of successive knowledge cycles where an individual or an organization can transition or traverse 4 stages of awareness and ignorance" (1999:224).

Four possible states of organizational Knowledge Management obtain:

Ignorance of ignorance (K, MK)

Ignorance of awareness (K, MK)

Awareness of ignorance (K, MK)

Awareness of awareness (K, MK)

Organizations may thereby plot their situation(s) in one of these cells and a development effort is aimed at managing the transitions from one state to another. The ideal is awareness—of knowledge, of ignorance—and the willingness to move from the latter to the former. Transitions may be accomplished via two paths: connectivity or interactivity. Connectivity is enabled by information technology and held to be the efficiency-driven path. Interactivity denotes sociotechnical phenomena and emphasizes the tacit / explicit interplay in human interaction. Managed correctly, it engenders not only a spiral of increasing wisdom (meta-knowledge), but also learning how to learn.

6.3.5. Three Pillars of Knowledge Management (Wiig)

Karl Wiig is one of the pioneers in the field of Knowledge Management and was among the first to publish a series of texts that assembled management-relevant concepts focusing squarely on the topic. His overarching framework is based on three pillars and a foundation. Wiig proposes that the foundation of Knowledge Management is comprised of the way knowledge is created, used in problem solving and decision-making, and manifested cognitively as well as in culture, technology and procedures. On this foundation he situates three pillars, which categorize the exploration of knowledge, its value assessment and its active management. This framework summarizes the main areas on which a KM initiative should focus.

6.3.6. A Model of Intellectual Capital (Edvinsson)

Leif Edvinsson of Skandia achieved notoriety in the field of Knowledge Management after being named the first CKO in 1991. He publicized his work within Skandia and later developed his thinking in a series of publications. The focus of Edvinsson's interest is intellectual capital management and the valuation of knowledge assets. His core model is a scheme for organizing a firm's assets, which defines four major components of intellectual capital and their interactions for value creation: Human capital relates to a firm's human resources, including the knowledge and know-how that can be converted to value. This is said to reside in people, organizational routines and procedures. Intellectual assets include codified, tangible or physical descriptions of specific knowledge to which the company can assert ownership rights and readily trade in disembodied form.

- Structural capital relates to the firm's supporting infrastructure. This is defined as both physical infrastructure (building, computers, etc.) and intangible infrastructure (history, culture, management)
- Business assets are defined as the structural capital which a firm uses to create value in its commercialization process (processing facilities, distribution networks) Intellectual property relates to the intellectual assets of the firm for which legal protection has been obtained. The dynamic aspect of this model relates to the creation of value, for which Edvinsson proposes there are two fundamental sources. The first are those innovations which are generated by the firm's human resources into legally-protected intellectual assets, and the second the products and services which result from the commercialization of innovations.

6.3.7. The Ecology of Knowledge Management (Snowden)

David Snowden, who directs the Cynefin, IBM's Center for Organizational Complexity, has developed an approach to implementing Knowledge Management programs in a series of articles that rest, in general terms, on a foundation of cognitive science, semiotics and epistemological pragmatics. In these works, Snowden elaborates an action-oriented knowledge system that embraces four major elements:

Explicit / Tacit knowledge

Knowledge assets

Trust

The certainty / uncertainty of decisions relative to (a) objectives and (b) causal relations

These are developed, together with their interactions, in a system of thought that is focused on action: the value of knowledge, he writes, "*...comes from its exercise, not from its existence per se*" (1999: 4). This is woven together with a fabric that recognizes trust as a fundamental arbiter of knowledge dynamics, humans as the vessels of tacit knowledge, and external systems and structures as the holders of explicated knowledge. The approach to knowledge in organizational contexts is from a decision-making perspective, particularly with regard to the level of certainty pertaining to means, ends and causal relations. Snowden argues that the first step is to map the stock of tacit and explicit knowledge in an organizational unit. Explicit knowledge thus identified and considered valuable is channeled into artifact-creating systems and structures (e.g., a knowledgebase).

6.3.8. Knowledge Management Processes (Inkpen & Dinur)

Andrew Inkpen and **Adva Dinur**, of Thunderbird and Temple University respectively, introduced an empirical model of Knowledge Management designed to explicate learning and knowledge transfer between partners in strategic alliances. They begin with the idea that, "*...the firm is a dynamic system of processes involving different types of knowledge*" (1998: 454) and go on to explore how firms acquire

and manage new knowledge, particularly with respect to alliance arrangements. The model they propose distinguishes between tacit and explicit knowledge and holds that a key challenge is the conversion of tacit individual knowledge to explicit organizational competence. They state that, "*...organizational knowledge creation should be viewed as a process whereby the knowledge held by individuals is amplified and internalized as part of an organization's knowledge base*" (1998: 456).

Knowledge conversion, creation and learning occur in a multi-level context that invokes different processes depending on the level in play. At the individual level, interpretation and sense making are key; at the group level, integration; and at the organizational level, integration and institutionalization. Organizations therefore have, "...a range of types of knowledge and carriers of knowledge" (1998: 457) and the issue becomes understanding the importance of different types of knowledge specific to an organizational situation, and how organizations transform and manage this knowledge. The vertical dimension of this model – tacitness – is a continuum that carries the assumption that the more tacit the knowledge, the more difficult it is to codify and transfer. The horizontal dimension straightforwardly distinguishes the different organizational levels at which knowledge may reside. This base model is joined by the notion of mechanisms and processes, either formal or informal, which are invoked to encourage or accomplish knowledge transfer. Forty-two-partner joint ventures in the automotive industry formed the empirical context in which Inkpen and Dinur applied this model to investigate knowledge creation and transfer. Their results, which are significantly abridged for present purposes, outline the various ways in which different types of knowledge may be transferred and integrated across the organizational levels of a partner participating in an alliance.

6.3.9. Intellectual Capital Management (Van Buren)

Van Buren, a senior associate with the Research & Enterprise Solutions unit of the American Society for Training and Development (ASTD), has reported a model developed by the ASTD Effective Knowledge Management Working Group, a virtual organization composed of Knowledge Management practitioners in various industries. This group has created an intellectual capital management model whose goal — much akin to a benchmarking exercise — is a standard set of measures that can be used to assess Knowledge Management activities across different companies. The model includes two sets of measures:

Those pertaining to intellectual capital stocks, including (a) human capital, (b) innovation capital, (c) process capital and (d) customer capital;

Those pertaining to financial performance and business effectiveness.

The starting point resides in the firm's stock of intellectual capital, the identification of which serves as input for knowledge management processes and enablers (Figure 16). Despite their lack of

visibility, these are held to constitute, "... the critical leverage points for enhancing the firm's Knowledge Management capability" (1999: 76). The critical Knowledge Management processes, which are imbedded in the firm's activities and initiatives, are held to be the (a) definition, (b) creation, (c) capture, (d) sharing and (e) use of knowledge. The enablers are, in brief, those corporate functions / systems / structures, which define, leverage and structure the firm's activity: leadership, corporate culture, communication, technology processes, human resources policy and so on. This therefore highlights the interaction of processes and enablers, all of which is placed in the context of a firm's business strategy: Knowledge Management efforts should be driven by strategic intent rather than the reverse. Outputs are made as concrete as possible through measures associated with financial performance and changes in the stock of intellectual capital. Van Buren suggests a range of financial performance measures including market-to-book value, return on equity, revenue per employee and value added per employee. He suggests a total of 50 intellectual capital measures distributed across four categories human capital, innovation capital, process capital and customer capital — and including such items as educational levels, time in training, the number of copyrights and trademarks, average age of patents, IT accesses per employee and annual sales per customer.

6.3.10. Taxonomy of Knowledge Management (Despres & Chauvel)

The authors of this chapter launched its precursor as a research program, which aimed to systematically review the various literatures, associated with applied Knowledge Management and construct from these a classification that accounted for activities in the field. This review led us to conclude that "islands of discourse" which are in various states of agreement dominate the field. Based on this, we

Suggested that four dimensions cut across many of the discussions:

Time: referring to a linear and simplified representation of cognitive process, including the (a) mapping, (b) acquisition, (c) codification, (d) storage, (e) application and (f) transformation of knowledge or its elements,

Type: referring to tacit and explicit knowledge Level:

Referring to different levels of social aggregation,

Context: referring sense making, in that no knowledge element has any meaning outside of a given context. We assembled these in a classification system which purports to situate actions in the field. This approach allows one to situate both the Knowledge Management practices commonly employed by companies, and the products and services offered by vendors. After reviewing anecdotal and case evidence from this ensemble, we concluded that seven major clusters of activity are currently active in Knowledge Management:

Business intelligence,

Benchmarking,

Data warehousing,

Group ware/virtual teaming,

Communities of Practice,

Innovation/synergies, Creativity,

Learning/Competencies/Employee Development Our claim is that the majority of behaviors and practices associated with Knowledge Management may be located in this classification, which we liken to a "map" that permits the plotting and tracking of KM initiatives. We draw the practical implication that managers working in the field should realize that Knowledge Management is more than groupware or an intranet (Group level / Package-Store & Share-Apply in the KM Map), more than business intelligence (Organization level / Scan-Map) and more than a yellow pages database of employee CVs (Individual level / Package-Store). This research indicates that most companies implement such projects on a small, experimental scale and then expand into other areas of the "map" which is itself a chart of the feasible options. We have also made the point that while Knowledge Management has always been rooted in the individual and his or her behavior, the formalization of the field has shifted attention upwards in the Map towards systems and structures that encourage the generation, transfer, application and re-invention of knowledge in a company. Much of this shift has been occasioned by the information technologies that facilitate one-to-one, one-to-many, and many-to-many communication. conundrum of being more valuable but also more problematic, leading to the explication of tacit assets that can be readily articulated, and the creation of competence management systems for those that cannot. A decision matrix provides a starting

point for the judgment as to whether tacit knowledge assets should be explicated. This contrasts the, *"...uncertainty of objective ... with uncertainty of cause and effect. It provides four environments, each of which requires a different balance of tacit and explicit knowledge"* (1999,p4) This decision matrix and the model suggest that organizations will manage four types of transitional activities:

Sharing explicit knowledge through systems and structures;

Sharing tacit knowledge through psychosocial mechanisms;

Transforming tacit to explicit knowledge through BPR, documentation and related;

Releasing tacit knowledge through trust and its dynamics. The balanced and adapted management of explicit and tacit knowledge is said to lead to Knowledge Management ecology within a firm.

6.4. Check your progress

1. **Ikujiro Nonaka** articulated a model of “knowledge creation” this model incorporates two models those are.....

Ans:- (a)Two forms of knowledge (tacit and explicit)

(b)An interaction dynamic (transfer)

2.What is information Auditing?

Ans:- Assessing the nature and extent of planned ignorance and then developing knowledge through learning activities.

3.Who proposed a *"...synergistic symbiosis between information technology and managerial and organizational cognition"*?

Ans:- **Elias Carayannis**

4.What is Cognitive Model of Knowledge?

Knowledge is seen as a corporate asset that requires careful capture, representation, storage, measurement, preservation and dissemination.

5. Community Model of knowledge is.....

Ans:- Recognizes the close relationship between self-organization, continuous learning and informal exchanges for knowledge stewardship.

6.6 Questions for self study

Explain the Mix and Match Model Of KM.

6.7 Summary

This unit has dealt with various models of KM .Some of them are very useful and quite popular .The unit has also presented the state of the art of KM Models and a detailed bibliography for further reading along with some important references.

6.8 Glossary

Network Models

The focus is on connections, acquisition, sharing, transfers via horizontal exchanges. Important knowledge resides in a network of actors connected by 'boundary spanners'. Awareness of insights and information outside formal teams and groups is a key driver. Knowledge work is seen as building social relationships, social capital and attending to reciprocity. Competencies include empathy, facilitation networking via telephony and Internet tools.

Cognitive Models

Knowledge is seen as a corporate asset that requires careful capture, representation, storage, measurement, preservation and dissemination. Value comes from repetitive application of captured best practices and avoiding pitfalls documented as lessons learned. Key focus is on reuse, replication, standardization and 'weeding' of outdated routines. Finding the correct balance between *exploration and exploitation* has eluded many organizations that follow this model

Community Models

Recognizes the close relationship between self-organization, continuous learning and informal exchanges for knowledge stewardship. Knowledge is founded in the thinking that circulates in a community, where language is shared, trust allows exploration of heuristics, patterns may be crafted and subtle symptoms and repetitive working solutions are spread via story telling.

Philosophical Models

Based on interactive Socratic dialog within a strategic context this model values deep questioning of assumptions and continual inquiry into behavior of competitors, markets and internal processes. This approach values personalization over codification and uses very little technology. The key cultural drivers are maintaining open communication, encouraging deep reflection & learning, creative abrasion and belief justification.

Quantum Model

These authors maintain, "*builds on quantum physics, emergent quantum technology and consequential economy*" I do not understand how this fits their schema yet! Clearly it is possible to follow a mix of these models. Organizations that have made good KM progress in my experience subscribe to parts of the Network, Philosophical and Community models with a little cognitive modeling thrown into the mix. The key drivers seem to be connections & relationships, trust, empathy, community, deep dialog and technology to capture *persistent conversations*.

6.9 References

- 1.Carayanis, E. 1999, *Fostering Synergies between Information Technology and Managerial and Organizational Cognition: the Role of Knowledge Management*, Technovation, 19 pp 219-231
- 2.Despres, C. & Chauvel, D. 2000. *A Thematic Analysis of the Thinking in Knowledge Management*: In Charles Despres & Daniele Chauvel (Eds.), *Knowledge Horizons: The Present and the Promise of Knowledge Management*. Butterworth-Heinemann
- 3.Earl, M. & Scott, I. 1998 *What on earth is a CKO?* Survey IBM. London Business School
- 4.Edvinsson, L.. 1996, *Developing a model for managing intellectual capital*, European Management Journal, Vol 14, N 4, August, pp 356-364
- 5.Hedlund, G. 1994, *A model of Knowledge Management and the N-Form Corporation*, Strategic Management Journal, Spring - pp 73-90
- 6.Inkpen, A. & Dinur, A., 1999, *Knowledge Management Processes and International Joint Ventures* .Organization Science, 9(4): 454-468.

7. Nonaka, I. 1991, *The Knowledge Creating Company*. Harvard Business Review, November-December, 96-104.
8. Snowden, D., 1998, *The ecology of a sustainable Knowledge Management Program*. Knowledge Management, 1(6)
9. Van Buren, M. 1999, *A Yardstick for Knowledge Management*, Training & Development, v 53(5), pp 1-78, May
10. Wiig, K., 1993, *Knowledge Management Foundations* – Schema press - Knowledge Board 20-Nov-2002
11. Kakabadse, *teal* in their article " Reviewing the knowledge management literature: towards a taxonomy", Journal of Knowledge Management 7 (4) 2003 pp75-91
12. http://72.14.203.104/search?q=cache:CmIBbNSNcIOJ:www.providersedge.com/docs/km_articles/KM_Models__State_of_the_Art.pdf+%22Knowledge+management+models%22&hl=en&gl=in&ct=clnk&cd=2
13. http://denham.typepad.com/km/2003/11/km_models.html

Unit 7

HUMAN RESOURCE PLANNING

- 7.0 Objectives of the Unit
- 7.1 Introduction
- 7.2 The Concept of Human Resource Planning
- 7.3 Need and importance of Human Resource Planning
- 7.4 Factors Affecting Human Resource Planning
- 7.5 Steps in Human Resource Planning
- 7.6 Job Analysis
- 7.7 The Recruitment
- 7.8 Selection
- 7.9 Induction/ Orientation
- 7.10 Performance Appraisal
- 7.11 Check your progress
- 7.12. Summary
- 7.13 Glossary
- 7.14 Questions for self study
- 7.15 References

HUMAN RESOURCE PLANNING

7.0. Objectives of the Unit

- to make students understand the importance of human resource planning;
- to identify and describe the factors affecting personnel planning; and
- to know the process of planning human resources;
- to understand the concept of job analysis, job description and job specification;
- to know the recruitment, selection and induction processes; and
- to know the methods of performance evaluation.

7.1. Introduction

Human Resource Planning (HRP) is one of the basic functions of management in any organisation. In libraries and information centres particularly, planning has been focused on buildings, collection development, information resource organisation and utilisation etc. Libraries and information centres have recently recognised the need for human resource planning as an important part of the overall planning of their system and greater attention is being given on optimum utilisation of human resource through proper planning.

7.2. The Concept of Human Resource Planning (HRP)

The terms human resource planning, man power planning, personnel planning are generally used interchangeably. However, the term human resource planning is more prevalent during recent days.

E. Geislet defines human resource planning as “the process including forecasting, developing and controlling by which a firm ensures that it has the right number of people and the right kind

of people at the right places, at the right time doing work for which they are economically most useful”.

According to Eric W. Vetter human resource planning is “the process by which a management determines how an organisation should move from its current manpower position to its desired manpower position. Through planning a management strives to have the right number and the right kinds of people at the right places, at the right time, to do things which result in both the organisation and the individual receiving the maximum long-range benefit”.

In the words of Coleman, “human resource planning is “the process of determining manpower requirements and the means for meeting those requirements in order to carry out the integrated plan of the organization”.

According to Leap and Crino human resource planning includes the estimation of how many qualified people are necessary to carry out the assigned activities, how many people will be available, and what, if anything, must be done to ensure that personnel supply equals personnel demand at the appropriate point in the future.

Decenzo and Robbins have stated that human resource planning is “the process by which an organisation ensures that it has the right number and kind of people, at the right time, capable of effectively and efficiently completing those tasks that will help the organisation achieve its overall objectives. Human resource planning translates the organisation’s objectives and plans into the number of workers needed to meet those objectives. Without a clear-cut planning, estimation of an organisation’s human resource need is reduced to mere guesswork”.

To put these definitions in a nutshell, human resource planning may be expressed as a process by which the organisation ensures the right number of people and right kind of people at the right time doing the right things for which they are suited for the achievement of goals of the organisation. It is a two phased process by which management can project the future manpower requirements and develop manpower action plans to accommodate the implications of projections. Thus, human resource planning involves the process of developing and determining objectives, policies and programmes that will develop, utilise and distribute manpower so as to

achieve the goals of the organisation. It consists of projecting future manpower requirements and developing manpower plans for the implementation of the projections. Human resource planning need to be flexible; it is amenable to modification, review and adjustments in accordance with the needs of the organisation or the changing circumstances.

7.3. Need for and importance of Human Resource Planning

The following reasons have made human resource planning has become an indispensable activity in modern organizations.

a) Future personnel needs

HRP is significant as it helps determine future personnel needs. Surplus or deficiency in staff strength is the result of the absence of planning or defective planning. The determination of future personnel needs well in advance ensure that adequate persons are selected and are prepared for anticipated openings. Avoidance of surplus staff results in optimum expenditure on human resources. Thus HRP ensures a smooth growth of the organisation.

b) Coping with change

Jobs created and people employed become redundant when old technologies and tools being used become extinct and obsolete with the adoption of new technologies and tools. It is not easy to retrench employees once recruited and neither they can be retained and redeployed for new jobs. Hence they become burden to the organisation. Systematic HRP prevents this kind of situations to occur. HRP enables an enterprise to cope with changes in competitive forces, markets, technology, products and government regulations. Such changes generate changes in job content, skill demands, and number and type of personnel. Shortage of people may be noticed in some areas while surplus in other areas may occur.

c) Creating highly talented personnel

Today jobs are becoming highly intellectual and incumbents are getting vastly professionalised. Organisations must use their ingenuity to attract and retain qualified and skilled personnel who

would be more productive as these persons are known for job hopping, thereby creating frequent shortages in the organisation.

d) Foundation for personnel functions

HRP planning provides essential information for designing and implementing personnel functions, such as recruitment, selection, personnel movement (transfers, promotions, layoffs) and training and development.

e) Huge investments in human resources

Another compelling reason for HRP is the investment an organisation makes in its human resources. Human assets, as opposed to physical assets, can increase in value. An employee who gradually develops his / her skills and abilities becomes a more valuable resource. Because an organisation makes investments in its personnel either through direct training or through job assignments it is important that employees are used effectively throughout their careers.

f) Resistance to change and move

Resistance among employees to change and move is a common phenomena. There is a growing emphasis on self-evaluation and on evaluation of loyalty and dedication to the organisation. All these changes are making it more difficult for the organisation to assume that it can move its employees around anywhere and anytime it wants, thus increasing the importance and necessity of planning ahead.

7.4. Factors Affecting Human Resource Planning

HRP is influenced by several considerations. The more important of them are:

- 7.14 Type and strategy of organization;
- 7.15 Organisational growth cycles and planning;

- 7.16 Environmental uncertainties;
- 7.17 Time horizons;
- 7.18 Type and quality of forecasting information;
- 7.19 Nature of jobs being filled; and
- 7.20 Off-loading the work.

a) Type and strategy of organisation:

Libraries and information centers are normally the part a parent organization. They exist primarily to facilitate the parent organization to accomplish its objectives. The objectives of the libraries and information centers are drawn from the primary objectives of its parent organization. The collection being developed, services being provided are influenced by the requirements of the parent organization. Hence HRP in library and & information centers is dependent on the type and strategy of the parent organization.

b) Organisational growth cycles and planning:

Need for planning is felt when the library and information centres enter the growth stage. With the growth of the organization, human resource forecasting becomes essential. Internal development of personnel also begins to receive attention in order to keep phase with the growth. Well established library and information center experiences less flexibility and variability. Its growth slows down. The workforce becomes old and few youngsters are hired. Planning becomes more formalized and less flexible and innovative. In declining stage HRP takes different focus. Planning at this stage is done for layoff, retrenchment and retirement.

c) Environmental uncertainties

Political, social and economic changes affect all organisations. So also library and information centres. HRP needs to consider carefully formulating recruitment, selection and training and development policies and programs to meet these environmental uncertainties.

d) Recruitment of Candidates against Job Vacancies:

Job vacancies arise because of separations, promotions and expansion strategies. Different jobs need different skills, attitudes, knowledge and ability to perform it successfully and efficiently. It therefore becomes necessary to anticipate the vacancies and the type of the jobs well in advance and ensure that suitable candidates are recruited.

time horizon and vice - verse.

e) Type and quality of forecasting information

The information used to forecast personnel needs originates from a multitude of sources. A major issue in HRP is the type of information being used in forecasting. Closely related to the type of information is the quality of data used. The quality and accuracy of data depend upon the clarity with which decision makers have defined their strategy, organizational structure, budgets, and so on. Maintenance of well-developed job analysis information and HR information system that provide accurate and timely data.

f) Time horizons

There are shorter plans ranging from six months to one year. On the other hand, there are long term plans spreading over three to twenty years. The exact time span depends on degree of uncertainty in the organization as a whole. In general, the greater the uncertainty, the shorter the plan's

g) Subcontracting or Ancillarisation

Many organisations today offload part of their work to outside parties either in some form of subcontracting or ancillarisation. This is more so when the workload is more while it is a regular feature of industrial organisations. Libraries and information centres today are offloading their work of retrospective conversion of data to automate the bibliographical details of their collection.

6.Steps in Human Resource Planning

The process of human resource planning can be broken down into various stages.

a) Determination of manpower objectives

Determination of manpower objectives based upon environmental analysis and corporate goals relating to productivity, growth, development of the organisation, together with budgeting constraints is the first step in human resource planning.

b) Projection for the planning period

Stage two consists of analysis of jobs involved in carrying various functions and the personnel of different level, skill and experience required to carry out these jobs / tasks. In other words it is projection of manpower required based on the size of labour force, skill inventory etc.

c) Inventory of manpower availability

In the third stage detailed inventory of current manpower status including their skill, educational experience, background, their earning higher productivity levels etc., is prepared.

d) Identification of gaps between manpower needs and manpower availability

The fourth stage of human resource planning includes identification of gaps between projected manpower needs and present status of manpower. This would result either as a match, excess or deficit of personnel. In doing so, it becomes necessary to relate the specific skills, occupations and the levels of staff.

e) Alternative actions

The gaps identified in the fourth stage emphasize to search for alternative actions to overcome these gaps. Such alternatives may include recruitment and for layoffs of personnel, redesign of jobs, reorganisation of work processes, changes in the requirement of the abilities sought by recruits, skill training programmes, revision of wage structure and / or system of compensation, and changes in work rules.

f) Feed back, monitoring and evaluation

The final stage involves continuous monitoring and obtaining feedback regarding the performance of the information centre and evaluation of performance of information centres programmes and revision and alteration of the programmes and / or objectives as necessary.

This stage of monitoring, feedback and revision ensures that the human resource planning process is continual and dynamic rather than periodic and formal.

7.5. Job Analysis

S R Ranganathan considers job as an ultimate piece of work, which is best done at a single stretch and whose duration is ordinarily short. Number of related jobs constitute an item of work. Jobs/works can be grouped according to the periodicity like daily, weekly, monthly, quarterly etc.

David A Decenzo and Stephen P Robbins define job analysis as *“a systematic exploration of the activities within a job. It is a basic technical procedure, one that is used to define the duties, responsibilities and accountabilities of a job”*.

According to Herbert G. Herman III *“a job is a collection of tasks that can contribute to the production of some product or service provided by the organisation. Each job has certain ability requirements (as well as certain remarks) associated with it. Job analysis is the process used to identify these requirements”*.

Thus job analysis is the process of studying and collecting information relating to the operations and responsibilities of a specific job. It is a basic technical procedure, that is used to define the duties, responsibilities and accountabilities of a job. Job analysis is a systematic exploration of activities within a job.

a) Collection of data for job analysis.

There are three approaches in collecting data for job analysis. These are :

- i) Task oriented approach
- ii) Work oriented job element
- iii) Analysis of underlying abilities and aptitudes.

i) *Task oriented approach:*

The job analysis provides details on a quantitative as well as a qualitative basis. Quantitative statements refer to such factors as the size of the work group, and the number of times a task is performed per hour, day or week. Qualitative statements refer to working conditions and personnel requirements. Often the job is broken down into elementary units or tasks, the focus being on the work activity itself. This is called the task-oriented approach.

ii) *Worker-oriented job element:*

A second approach in analysing jobs is the worker-oriented job element. In this approach the units of analysis are the generalized human behaviours required to do the work. Similarities and differences are described in terms of processes that are common to all jobs, not distinctive to one particular job.

iii) *Analysis of underlying abilities and aptitudes:*

In this approach, jobs are studied in terms of the profiles of abilities required to perform the work.

The process of collecting data usually consists of interviews (individual or group), observation, questionnaire, filming activities, daily dairies or timesheets, and written descriptions.

Observation is a particularly useful method of data collection if the job is simple and repetitive. If this is coupled with an interview, it will result in obtaining information which is not readily observable. The interview will also allow verbal verification of information already obtained from observing job practices. A sincere, attentive and assuring attitude on behalf of the interviewer is required to ensure accurate and complete information, since job analysis are often viewed with suspicion.

Questionnaires and written descriptions rely upon the ability of the jobholder to provide an organized and complete report of the job. These skills are not always forthcoming at lower levels in the organization hierarchy where report writing and analytical skills are not required. In such cases, daily dairies or timesheets provide a more structured approach to analysing tasks. They can therefore be used more widely throughout the organization.

b) Type of information collected :

A variety of information is collected for job analysis. This includes:

i) **Description of the work activities performed:** The description of the work activities performed such as report writing, or applying a bibliographic description to an item or recording details of accounts which have been paid – and the purpose of the work, the procedures used and the frequency of the procedures.

ii) **Work-oriented behaviours:** These include details of machinery, technology or equipment used – for example, a personal computer, fax machine or work processing facilities – as well as proportions of time spent sitting, standing, moving about and the amount of time devoted to, or the importance of, communication or decision-making skills. Individual demands such as aptitude, personality or physical characteristics are also included in work-oriented behaviours.

iii) **Other type of information collected include:** accountability - the superiors and subordinates and levels of responsibility, the nature of the supervision – i.e. clerical, administrative, technical or professional – and its extent, as in continuous or close supervision and so on.

The systematic job analysis results in two byproducts, viz. - Job description and job specification.

7.5.1 Job Description

The first and immediate product of the job analysis is the job description. This is a descriptive, factual statement of the duties and responsibilities of a specific job. The following information is usually provided in the job description:

- a. **Job identification :** This includes such information as job title, alternative title, department, division and code number for the job.
- b. **Job summary :** It provides a short definition of the job itself, which is useful as additional identification when the job title is not sufficient. It also serves as a summary to orient the reader towards an understanding of the detailed information that follows.

- c. ***Duties performed*** : This is the heart of the job description. It tells what is to be done, how it is to be done and the purpose behind each duty. If possible, duties should be arranged in chronological or some other systematic order. An estimation of the approximate percentage of time devoted to each major duty is helpful as is the degree of supervision received.
- d. ***Achievable results*** : It provides some measure of performance or standards which describe the minimal acceptable employee performance of each job's duties.
- e. ***Reporting-supervising functions*** : This identifies the immediate superior and subordinate positions and the degree of supervision received and given.
- f. ***Combination tasks/ relationship to other jobs*** : Here the vertical and horizontal relationships of work flow and procedures, and the positions within the organization with which coordination is required are identified.
- g. ***Machines, tools and materials*** : Lists and defines here each major type of technology, knowledge and equipment used are listed and defined. Possible trade names are also identified here.
- h. ***Working conditions*** : Working conditions, using such alternatives as hot, cold, dry, dusty, noisy, etc. are provided here. Hazardous conditions also are noted. Checklists are often used to indicate these conditions.

Definitions of technical terms and other comments which clarify the above are also included

Job description form the basis for human resource planning, recruitment and position management. They can be used to provide intending applicants and new appointees with details of idio-industrial disputes. Results-oriented job descriptions provide for some measure of performance and the beginning of a description of inputs and outputs for the position. They also serve as a useful basis for staff appraisal.

Job descriptions need to be updated continuously if they are to be effective; otherwise they become irrelevant and ignored. Unfortunately, it is often the case that job descriptions are only updated when positions become vacant and new staff are to be appointed. An ideal opportunity to update the job description is at the time of the annual performance appraisal interview.

Because library and information centre positions usually centre around technology, environmental changes in such technologies make the updating of job descriptions an important task in libraries. For this reason it is also helpful to write job descriptions in dynamic terms

Job descriptions need to leave some scope for initiative and innovation on the part of the jobholder. If they are too specific and detailed, they can allow the jobholder merely to continue the practices of their predecessor, thereby stifling initiative and creativity and failing to lead to an improvement in efficiency.

The value of job description depends very much on how they are used and updated in the library or information centre. At best their value extends beyond the recruitment stage. They should be referred to at times of staff appraisal and when considering staff development and manpower planning. To be of true value, they should be results-oriented and written in dynamic terms to allow for challenging work environments. Given below is the sample of job description of the post of Assistant librarian of a public library (Figure 2).

Division Community Services	Department Libraries	Position Number 25
Title ASSISTANT LIBRARIAN	Special Allowances Nil	Classification C5
1. Job Summary		
The Assistant Librarian assists at a semi-professional level with the day-to-day operations of the library service.		
2. Organizational Relationship :		
Reports to :	Branch Librarian	
Supervises :	Library Assistants	
Coordinates with :	Childrens Librarian	
3. Duties performed :		
<i>Principal Duties :</i>	Frequency	Supervision received
Rostered enquiry desk duty	% 30	Min
Supervise issue, discharge and shelving of books and other materials	30	Min
Accession, catalogue and classify books, pamphlets and cassettes	30	Min
Bibliographic checking/verification of requests	10	Min
<i>Subsidiary Activities :</i>		
Attend to telephone enquiries	5	Min
Supervises shelf tidying and general library tidying	5	Nil
Any other duties as directed by Branch Librarian	5	
<i>Combination Tasks :</i>		
Assist Children's Librarian in organizing and conducting children's activities	15	Min
4. Achievable Results :		
All tasks will have to be completed when library users' enquiries are efficiently and effectively answered, when all materials have been correctly issued, discharged or shelved; when an accurate bibliographic description has been assigned to all newly accessioned material; when all outstanding requests have been correctly verified; and when all materials are placed in their proper location and the library is neat and tidy.		
5. Equipment to be handled :		
<ul style="list-style-type: none"> • VT 100 Visual display terminal • Calculator • Xerox photocopying machine 		
6. Working conditions :		
Well designed, clean building, equipped with necessary facilities.		

Figure 2.
Job Description of Assistant Librarians of Public Library

7.5.2 Job Specification

The job description describes the job whereas the job specification describes the desired attributes of the person doing the job. It is a statement of the minimum acceptable human qualities required to perform a job properly. Such requirements are usually established for individual jobs on the basis of judgments (such as those of the job analyst), but in some instances they are based upon statistical validation procedures.

The job specification can include the following aspects :

- a. Job summary
- b. Minimum educational requirements and work experience
- c. Abilities required to perform the work
 - d.1 **Information inputs to the position** : Interpretations of perceptions, verbal or auditory interpretation, environmental awareness, visual input from materials – for example, visual appraisal of condition of stock.
 - d.2 **Mental processes** : Decision-making, information processing, use or job-related knowledge.
 - d.3 **Work output** : Manual or control activities, physical coordination required, skills and technical abilities, use of equipment, technology.
 - d.4 **Relationships with other persons** : Supervising of staff activities, public contact, communication of instructions, directions or other related job information, interpersonal communication skills.
 - d.5 **Job context** : Potentially stressful/unpleasant environment, potentially hazardous job situations, personally demanding situations.
 - d.6 **Other job characteristics** : Attention-demanding activities, vigilant/ discriminating activities, structured/unstructured activities, continuity of workload.

The job specification should be used as a guideline to the knowledge, skills and aptitude required to perform a specific job. It should not be allowed to dictate the recruitment process to the extent that, all other things being equal, an applicant who is qualified and capable but deficient in some aspect fails to be appointed.

Given below (Figure 3) is a sample of the job specification of the post of Assistant Librarian in Public Library

Division Community Services	Department Libraries	Position Number 25
Job Title Assistant Librarian		
1. Job Summary The Assistant Librarian assists at a semi-professional level with the day-to-day operations of the library service.		
2. Educational Requirements Completion of an accredited course leading to a degree in library and information science.		
3. Experience Previous work experience in a public library-related environment would be an advantage.		
4. Abilities required to perform work		
4.1 Good general knowledge and ability to interpret written and verbal requests for information		
4.2 Possession of effective written and verbal communication skills.		
4.3 Ability to translate theoretical knowledge of librarianship gained in learning environment into the work situation.		
4.4 Basic working knowledge of an online, integrated library automated system		
4.5 Ability to efficiently and effectively organize own work after initial instruction.		
4.6 Ability to relate effectively with people of all ages, and to recognize and provide for their information needs.		
4.7 Ability to display empathy with children.		
4.8 Enthusiastic and energetic personality.		
4.9 Reliable and cooperative		

Figure 3.
Job Specification of Assistant Librarians in a Public Library

It is easy to analyse the main qualifications or qualities required for a job, as there are fairly acceptable standards of education recognized by all; however, the degree of training is usually defined in specific terms – the completion of a specific programme, for example – or it may be

defined quantitatively such as the typing or data input at so many words per minute. The ability to read, write or count and , in the case of non-English-speaking persons, the ability to understand a minimum of English may be a job qualification. The degree of experience required is best defined in actual job experience, either in the job itself or in a related job. A time measure of experience is sometimes specified. For instance, a minimum of three years experience in managing a public library.

The degrees of requirement of personnel and the job specification can be condensed and form part of the original advertisement. It should be given to prospective candidates along with the job description so that they are fully informed of the position for which they are applying.

The job specification should form the base upon which applications are initially screened. It should be used as a comparison between the qualifications of the candidates and the basic qualifications of the job. At the time of the interview, the interviewer should get questions to evaluate the interviewee in terms of the qualities and qualifications outlined in the job specification.

7.8. The Recruitment

8.1 Meaning and Definition

Recruitment is understood as the process of searching for and obtaining applicants for jobs, from among whom the right people can be selected. Werther and Davis defined the term recruitment as *“the process of finding and attracting capable applicants for employment. The process begins when new recruits are sought and ends when their applications are submitted. The result is a pool of applicants from which new employees are selected.”* The purpose of recruitment is to provide a pool of potentially qualified job candidates.

8.2 Sources of Recruitment

In general, there are two potential sources for prospective candidates for a position – internal and external.

a) Internal sources

Filling a position internally has the advantage of increasing the general level of morale by providing an example of career path development within the library or information centre. It is a reward mechanism for good work, and may stimulate others to greater achievement. However, the management personnel should have access to information relating to the candidates history of work performance within the organization. This may be more reliable than the curriculum vitae or external references furnished by external candidates.

Internal promotion is not always in the organization's best interest. External sources may provide ore highly skilled candidates than those of existing staff, or the organization may need some new blood injected into it.

b) External sources

A number of external sources for recruiting library personnel are available. These include recruitment advertising, employment agencies, recommendations by present employees, educational institutions, unsolicited or casual applicants or networking etc.

i) Advertisements

Advertisements may be placed in the local or national press, trade journals or professional media. The choice of media depends upon the level of the position to be advertised. Information relating to the organization, job specifications and the job itself should be included in the advertisement to assist in self-screening. The advertisement should include details of the name of the library or information centre, the name of a contact person or place to whom applications should be sent and application details required.

The advertisement layout, design and copy should reflect an accurate image of the library or information centre. It should reflect the organization's size, whether the organization is conservative or progressive, centralized or decentralized, dynamic or static. High quality design can boost the immediate response as well as the organization's image. Advertisements are governed by media deadlines. In general, the more frequent the publication, the shorter will be

the deadline. Thus, a local newspaper will have a shorter deadline than a professional or trade journal.

ii) Employment agencies

In India the Government has established Employment Exchanges in all district places. Employment and Guidance Bureau also exist in universities. During recent past, private agencies have also entered this area and their number is growing. These employment agencies maintain record of candidates looking for employment. Employment agencies can be used to screen potential applicants. Employment agencies want to keep their clients happy by effectively working toward the client's goal, and they do this by effective advertisement design and placement of staff.

iii) Recommendations

Current employees may suggest prospective candidates for job vacancies. It can be presumed that the employee know both the organization and the acquaintance, and would therefore want to please both. The hiring of relatives is an inevitable component of which allow or disallow this practice. Such a policy does not necessarily consider selection on the basis of merit, but believe in interest and loyalty to the enterprise.

iv) Library schools

Many libraries make special efforts to establish and maintain constructive relationships with school of library and information science. The faculties in these departments helping finding suitable newly qualified professionals for the tasks to be performed. Some of these schools maintain a job register or have bulletin boards where advertisements are displayed. Some institutions also have placement cells.

v) Unsolicited applications

Unsolicited application received both in person or by mail, provide a source of recruitment. Policies differ between libraries or information centres as to how such applications are handled. Some keep all applications for future reference, whilst others not only outstanding ones. Some

libraries reuse to take such applications, advising applicants to apply again when formal advertisements appear in the media.

vi) Consultants

There are numerous recruiting agencies such as Consultants, Ferguson Associates, Human Resource Consultants, Head Hunters, Batliboi and Co., Analytic Consultancy Bureau, AIMS and Management Consultants, The Search House etc. These agencies act as consultants in recruiting personnel to given institutional organisations.

vii) Radio and Television

Radio and television are used but sparingly, and that too, mainly by the government departments. Companies in the private sector are hesitant to use the media because of high costs and also because they fear that such advertising will make the companies look desperate and damage their conservative image. Radio and television can be used to reach certain types of job applicants such as skilled workers. Besides, there is nothing inherently desperate about using radio or television.

c) Screening of Applications

Screening of applications as an integral part of the recruiting process, where as many view it as the first step in the selection process. Whatever may be the view, screening of applications is important. The purpose of screening is to remove from the recruitment process, at an early stage, those applicants who are visibly unqualified for the job. Effective screening can save a great deal of time and money. Care must be exercised, however, to assure that potentially good employees are not lost and that women, deprived and minorities receive full and fair consideration and are not rejected without justification.

In screening, clear job specifications are invaluable. It is both a good practice and a legal necessity that applicants' qualifications be judged on the basis of their knowledge, skills, abilities and interests required to do the job. The techniques used to screen applicants vary depending on the candidate sources and recruiting methods used. Reference checks are also useful in screening.

7.9. Selection

Selection is the process of picking individuals (out of the pool of job applicants) with requisite qualifications and competence to fill jobs in the organisation. The term selection is defined as the process of differentiating between applicants in order to identify (and hire) those with a greater likelihood of success in a job.

Although, some selection methods can be used within an organisation for promotion or transfer, it is focussed here on selecting applicants from outside the organisation.

a) Role of selection

The role of selection in an organisation's effectiveness is crucial primarily due to two reasons. Firstly, work performance depends on individuals. The best way to improve performance is to hire people who have the competence and the willingness to work. Arguing from the employee's viewpoint, poor or inappropriate choice can be demoralising to the individual concerned (who finds himself or herself in the wrong job) and de-motivating to the rest of the workforce. Effective selection, therefore, assumes greater relevance.

Secondly, cost incurred in recruiting and hiring personnel speaks volumes about the role of selection. Cost of wrong selection are much greater. An organisation with a false positive error incurs three types of costs. The first type is incurred while the person is employed. This can be the result of losses, damaged company reputation, accidents due to negligence, absenteeism, and the like. The second type of costs is associated with the training, transfer or terminating the services of the employee. Costs of replacing an employee with a fresh one—costs of hiring, training and replacement – constitute the third type of costs. Generally, the more important the job, the greater the cost of the selection error.

b) Selection process

Selection is a long process, commencing from the preliminary interview of the applicants and ending with the contract of employment. Figure 4 shows a generalised selection process. In practice, the process differs among organisations and between two different jobs within the same organisation. Selection procedure for senior positions will be long-drawn and rigorous, but it is simple and short while hiring personnel for lower positions.

c) Environmental factors affecting selection

Selection is influenced by several factors. More prominent among them are supply and demand of specific skills in the labour market, unemployment rate, labour-market conditions, legal and political considerations, company's image, company's policy, HRP and cost of hiring. The last three constitute the internal environment and the remaining form the external environment of the selection process.

d) Preliminary interview

In the previous section, it was stated that the applications received from job seekers would be subject to scrutiny so as to eliminate unqualified applicants. This is usually followed by a preliminary interview the purpose of which is more or less the same as scrutiny of applications, i.e., elimination of unqualified applications. Scrutiny enables the HR specialists to eliminate unqualified job seekers based on the information supplied in their application forms. Preliminary interview, on the other hand, helps reject misfits for reasons, which did not appear in the application forms. Besides, preliminary interview, often called 'courtesy interview', is a good public relations exercise.

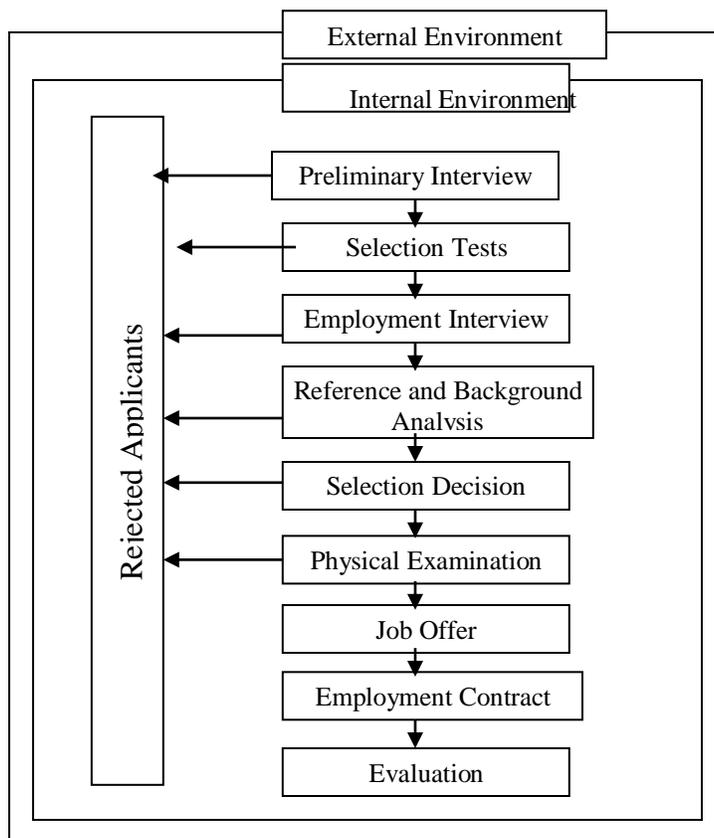


Fig. 4. Selection process

(Source: The management of human resources by R Wayne Mondy and Robert M Noe III, p.156)

e) Selection tests

Job seekers who pass the screening and the preliminary interview are called for tests. Different types of tests may be administered, depending on the job and the company. Generally, tests are used to determine the applicant's ability, aptitude and personality. Ability tests (also called achievement tests) assist in determining how well an individual can perform tasks related to the job. An excellent illustration of this is the typing test given to a prospective employee for a secretarial job. An **aptitude test** helps to determine a person's potential to learn in a given area. **Personality tests** are given to measure a prospective employee's motivation to function in a particular working environment. There are various tests designed to assess a candidate's personality. The Bernsenter Personality Inventory, for example, measures one's self-sufficiency, neurotic tendency, sociability, introversion and extroversion, locus of control, and self-

confidence. The Thematic Apperception Test (TAT) assesses an individual's achievement and motivational levels. Other personality tests, such as the California Psychological Inventory (CPI), the Thurstone Temperament survey (TTS), Minnesota Multiphasic Personality (MMPI), and Guilford-Zimmerman Temperament Survey, have been designed to assess specific personality traits.

Interest tests are used to measure an individual's activity preferences. These tests are particularly useful for candidates considering many careers or employees deciding upon career changes.

Medical tests reveal physical fitness of a candidate. With the development of technology, medical tests have become diversified. Drug tests help measure the presence of illegal or performance-affecting drugs. Genetic screening identifies genetic predispositions to specific medical problems. Medical servicing helps measure and monitor a candidate's physical resilience upon exposure to hazardous chemicals.

f) Employment Interview

The next step in the selection process is employment interview. Interview is a formal, in-depth conversation conducted to evaluate the applicant's acceptability. It is considered to be an excellent selection device. Its popularity stems from its flexibility. Interview can be adapted to unskilled, skilled, managerial and professional employees. It allows a two-way exchange of information, the interviewers learn about the applicant, and the applicant learns about the employer.

However, interviews do have shortcomings. Absence of reliability is one limitation. No two interviewers offer similar scoring after interviewing an applicant. Lack of validity is another limitation. This is because, few departments use standardised questions upon which validation studies can be conducted. Further, biases of interviewers may cloud the objectivity of interviews.

The employment interview can be : (i) one-to-one (ii) sequential (iii) panel

In the **one-to-one interview** there are only two participants, i.e. the interviewer and the interviewee. The **sequential interview** takes the one-to-one a step further and involves a series of interviews, usually utilising the strength and knowledge-base of each interviewer, so that each interviewer can ask questions in relation to his or her subject area of each candidate, as the candidate moves from room to room. The panel interview consists of two or more interviewers and the figure may go up to as many as 15. Any panel interview is less intimate and more formal than the one-to-one, but if handled and organized well, it can provide a wealth of information. If not handled carefully the panel interview can make the candidate feel ill at ease and confused about whose question to answer and whom to address. Interviewers themselves are likely to experience nightmare, not knowing who will ask which question and in what order.

i) Objectives of Interviews

Interview has primarily four objectives - (i) It helps obtain additional information from the applicant; (ii) It facilitates giving general information to the applicant such as organisation's policies, job, services offered and the like; and (iii) helps build the institution's image among the applicants and (iv) To begin the induction process for the successful candidate.

ii) Types of Interviews

Interviews can be of different types. The usual types are structured, unstructured, mixed, behavioural and stress-producing. Table 2 compares these different types.

In a structured interview, the interviewer uses a pre-set standardised questions which are put to all the interviewees. This interview is also called 'guided' or 'patterned' interview. In an unstructured interview, also known as 'unguided' or 'unpatterned' interview, the interview is largely unplanned and the interviewee does most of the talking. Unguided interview is advantageous as it would lead to a friendly conversation between the interviewer and the interviewee and in the process, the latter reveals more of his or her

Table 2.
Comparison of Various Types of Interviews

Type of Interview	Type of Questions	Usual Applications
Structured	A predetermined checklist of questions, usually asked of all applicants.	Useful for valid results, especially when dealing with large number of applicants
Unstructured	Few, if any, planned questions. Questions are made up during the interview.	Useful when the interviewer tries to probe personal details of the candidate to analyse why they are not right for the job.
Mixed	A combination of structured and unstructured questions, which resembles what is usually done in practice	A realistic approach that yields comparable answers plus in-depth insights.
Behavioural	Questions limited to hypothetical situations. Evaluation is based on the solution and approach of the applicant	Useful to understand applicant's reasoning and analytical abilities under modest stress.
Stress – producing	A series of harsh, rapid fire questions intended to upset the applicant	Useful for stressful jobs, such as handling complaints.

desires and problems. But the un-structured interview lacks uniformity and, sometimes this approach may overlook key areas of the applicant's skills or background.

In practice, a blend of structured and unstructured questions is used by the interviewer while interviewing the job seekers. This approach is called the mixed interview. The structured questions provide a base of information that allows comparison between candidates. But the unstructured questions make the interview more conventional and permit greater insights into the unique differences between applicants. Behavioural interviewing focuses on a problem or a hypothetical situation that the applicant is expected to solve. Often, these are hypothetical situations, and the applicant is asked what he/she would do in a given circumstance. This interview technique has a limited scope. It primarily reveals the applicant's ability to solve the types of problem presented. Validity is more likely if the hypothetical situations match those found on the jobs. When the job involves much stress, stress interview attempt to learn how the applicant will respond to the pressure. This technique is more relevant in jobs involving stress,

for example, circulation section in the libraries. Since stressful situations are usually only a part of the job, this technique should be used along with other approaches.

iii) Interviewing

Interviewers are essentially fortune-tellers, for they are the one who select the candidates on whom the future of the organisation depends. To do this, the interviewer has various roles: as an initiator or leader in conducting the interview in a right way; as a participant in communicating with the others present; to act as an observer noting behaviour, speech and other non-verbal communications; as an analyst, listening, watching and analyzing actions; as an evaluator by interpreting correctly and drawing conclusions to what has been seen and heard; as a mind-reader in putting aside what has been said in exchange for what has not been said but is in the mind; as a judge to make objective judgments at the end of the interview; as a patient listener to listen to the candidate in order to determine the context correctly; as a counselor to counsel and to identify emotions, relating these to their cause.

iv) Qualities of Interviewer

Interviewers must be able to perform two basic functions: to acquire only relevant information and to interpret data correctly, once acquired. To carry out these functions the interviewer needs to have the following qualities:

- a warm and engaging manner and an ability to quickly establish rapport;
- a sensitivity to social situations;
- a quickness in perceiving implications in the remarks of others;
- a sensitivity to vocal intonation and hesitation;
- a mental level as high as or higher than that of applicants, enabling him to take control of the situation;
- an analytical mind with the ability to make critical judgments, enabling correct evaluation of all factors; vii) open mind and adaptability; and
- viii) possessing a mature personality, showing evidence of sound practical judgment.

If it is used as the sole selection process for a position, it is most important that the interview is not only based upon the need to appoint the most appropriate person to the position, but that

there is also an awareness of the ethical and legal reasons for the interview to be completely objective. Library and information center managers should be aware that a substantial degree of subjectivity can creep into the interview if it is not structured correctly. This can arise by a lack of knowledge in the person (s) conducting the interview; a concern that the library is viewed in too favorable a light; a lack of interpretation or communication by those taking part in the interview; and the 'halo effect' which causes the interviewer (s) to lead into discussions an intent which is not intended.

A considerable amount of planning is required for employment interviews. To overcome the likelihood of any subjectivity a structured interview is required. This necessitates basing the interview exclusively upon those job duties and requirements which are critical to job performance. There should be an interview committee so that answers are rated by more than one person. It is preferable that both males and females are employed on the interviewing committee, and that there is a balance of management and personal skills between them and all procedures should be consistently followed to ensure that each applicant has exactly the same chance.

Interviews are a two-way process. The interviewer should deliver appropriate and accurate information about the organization to the interviewee. The prospective candidate also evaluates the organization and makes decisions as to its suitability as an employing body. The interview is often the first contact with the organization and provides the first impression of its dynamics.

The interviewers should show concern for the applicant's feelings while maintaining control over the interview. They should convey a feeling of interest in the applicant by reacting appropriately to the applicant's comments, questions and non-verbal behaviours. An atmosphere of warmth and trust should be created. Interviewers should make use of encouragement and praise in order to put the applicant at ease.

Other selection tests should preferably be administered in conjunction with the interview, since such tests provide a more objective approach to personnel selection. Reference checks, psychological testing and job simulations offer additional dimensions to the selection process, either serving to support the interviewer's decision or, alternatively, justify a possible reappraisal of the decision-making process and the final decision.

If an incorrect decision is taken on the strength of one interview the results can be expensive, not only in financial terms for the organization, but also in mental anguish and the lowering of morale for both the employee and his or her co-workers who will be unsettled by the inevitable resignation or dismissal.

Correct interviewing procedures set realistic job expectations. As a result, the position may fail to meet the needs of some successful applicants, who will therefore reject the job offer. For those who accept, their work experience will confirm their expectations. Their needs will match the job. There will be high job survival. Job satisfaction and less likelihood of resignation. The outcome result is a motivated, satisfied staff.

If initial job expectations are set too high or too low it may attract a high rate of job offer acceptance. However, work experience will subsequently fail to match the new employee's expectations, resulting in dissatisfaction and a realization that the job does not suit. Frequent thoughts of resignation affect other members of staff leading to low morale and an unsettled staff.

g) Reference and background Checks

Many employers request names, addresses, and telephone numbers of references for the purpose of verifying information and, perhaps, gaining additional background information on an applicant. Although listed on the application form, references are not usually checked until an applicant has successfully reached the fourth stage of a sequential selection process. When the labour market is very tight, organisations sometimes hire applicants before checking references.

Previous employers, known public figures, university professors, neighbours or friends can act as references. Previous employers are preferable because they are already aware of the applicant's performance. But, the problem with this reference is the tendency on the part of the previous employers to over-rate the applicant's performance just to get rid of the person.

Organisations normally seek letters of reference or telephone references. The latter is advantageous because of its accuracy and low cost. The telephone reference also has the

advantage of soliciting immediate, relatively candid comments, and attitudes can sometimes be inferred from hesitations and inflections in speech. While many organisations carry on this process before interview, few conduct this after the interview and final selection decision.

h) Selection Decision

After obtaining information through the preceding steps, selection decision – The most critical of all the steps – must be made. The other stages in the selection process are used to narrow the number of candidates. The final decision has to be made from the pool of individuals who pass the tests, interviews and reference checks.

i) Physical Examination

After the selection decision and before the job offer is made, the candidate is required to undergo a physical fitness test. A job offer is, often, contingent upon the candidate being declared fit after the physical examination. The results of the medical fitness test are recorded in a statement and preserved in the personnel records. There are several objectives behind a physical test. One of the reasons for a physical test is to detect if the individual carries any infectious diseases. Secondly, the test assists in determining whether an applicant is physically fit to perform the work. Thirdly, the physical examination information may be used to determine if there are certain physical capabilities which differentiate successful and less successful employees. Fourth, medical check-up protects applicants with health defects from undertaking work that could be detrimental to themselves or might otherwise endanger the employer's property. Finally, such an examination will protect the employer from workers' compensation claims that are not valid because the injuries or illnesses were present when the employee was hired.

j) Job Offer

The next step in the selection process is job offer to those applicants who have crossed all the previous hurdles. Job offer is made through a letter of appointment. Such a letter generally contains a date by which the appointee must report on duty. The appointee must be given reasonable time for reporting. This is particularly necessary when he or she is already in employment, in which case the appointee is required to obtain a relieving certificate from the

previous employer. Again, a new job may require movement to another city, which means considerable preparation, and movement of property/ personal belongings.

Decency demands that the rejected applicants be informed about their non-selection. Their applications may be preserved for future use, if any. It needs no emphasis that the applications of selected candidates must also be preserved for future references.

k) Contracts of Employment

After the job offer has been made and the candidates accept the offer, certain documents need to be executed by the employer and the candidate. One such document is the **attestation form**. This form contains certain vital details about the candidate which are authenticated and attested by him/her. Attestation form will be a valid record for future reference.

There is also a need for preparing a contract of employment. The basic information that is normally included in a written contract of employment is as under:

- Job title;
- Duties, including a phrase such as “The employee will perform such duties and will be responsible to such a person, as the company may from time to time direct”;
- Date when continuous employment starts and the basis for calculating service;
- Rate of pay, allowances, shift rates if any, method of payment etc.;
- Hours of work including lunch break and overtime and shift arrangements;
- Holiday arrangements;
- Sickness;
- Length of the notice and due to and from employee;
- Grievance procedure (or reference to it);
- Disciplinary procedure (or any reference to it);
- Work rules (or any reference to them);
- Arrangements for terminating employment;
- Arrangements for union membership (if applicable);
- Special terms relating to rights to patents and designs, confidential information

- and restraints on trade after termination of employment; and
- Employer's right to vary terms of the contract subject to proper notification being given.

Alternatively called employment agreements or simply bonds, contracts of employment serve many useful purposes. Such contracts seek to restrain job-hoppers, to protect knowledge and information that might be vital to institutions healthy bottom line, and to prevent competitors from poaching highly valued employees. Most employers insist on agreements being signed by newly hired employees.

7.10. Induction/Orientation

One very important facet of personnel management which is often overlooked is the induction process. Too often it is felt that the appointment of an individual to a position ends the selection process, but the induction process is, in fact, one of the most vital processes of library or information center management. It is the process which establishes what is required of the new appointee, and which produces a well-informed staff.

Induction orientates and introduces the new employee to the organization and may be done on either a formal or informal basis. The first phase is often conducted by the staff of the personnel unit (if one exists) and is one of information provision: employee benefits; salary schedules; safety; probationary period; time recording and absences; holidays; grievance procedures; hours of work; lunch and coffee breaks; use of telephone facilities, and so on.

The second phase is performed by the immediate supervisor. It provides information relating to the library environment and includes visits to branch libraries or orientation of other departments within the organization, introduction to all senior staff and a complete overview of special programmes or facilities within the organization. It is at this stage that the new employee will begin to be aware of the norms and values of the parent organization's and library 's corporate culture and subcultures. They may need some explanation as to why certain things

occur and what values are most prevalent within the organization. A typical induction programme is summarised below.

Typical Induction Programme

Greet personally. When the new employee arrives don't keep them standing or waiting unattended. Make them feel welcome. Greet them by name/s, and address them by it often. Show friendliness.

Put them at ease. They are likely to feel nervous or uneasy at first. Avoid any impression that they arrived at an awkward time. If you can't see to them immediately, apologize and arrange for someone else to look after them. Discuss their background and interests.

Show interest. Make them feel that the job genuinely needs them. Ask questions in a friendly tone; don't interrogate. Invite questions from them and act in accordance with the genuineness of the invitation. Enquire if they have any problems.

Explain the work to be done. Do not make it sound too difficult. Tell them their wages again, and when, where and how they will be paid. Provide them their job description for discussion.

Introductions. Introduce the new employee to their co-workers and their immediate subordinates (if any). Tell them who they report to, and who reports to him or her.

Point out amenities. Prevent them from feeling awkward; show them the work layout, particularly things which immediately concern them – for example, restroom facilities, canteen, locker room, car park. Have their desk or office and supplies ready.

Show them the work. Show them where they will be working. Introduce them to nearby workers. Avoid nicknames that could offend. Stay with them for a short time. Explain the work of the section, its relationship to the total organization and other sections/ departments. Clarify their position in the section, and its relationship to others in the section.

Instruct. Before instructing them in their jobs, find out what they already know. Explain the task carefully step-by-step and be patient if they are slow to grasp what you tell them. Repeat key points till you are sure they understand. Indicate safety hazards. Alert them to job standards. Don't give detailed instructions until they are at ease and have lost their nervousness. Even though you have assigned instruction of the new employee to an assistant, take time yourself to make the new person feel that you are concerned about their training.

Let them know in more detail how their work fits into overall activities. Don't overburden them with information or rules. Give information on things that affect them personally. Make a point of seeing them, even if it is for a short period during subsequent days till about a month. Encourage them to talk about problems they have met. Answer their questions readily. Look interested in their welfare.

Arrange guidance. Tell them whom to approach with work problems. Provide them with a policy and procedures manual. Make sure they are not left alone to fend for themselves – this includes lunch time and coffee breaks.

Maintain contact. Make sure you see them again on the job later in the day. Also make sure that they know where they are to report next day.

Additional Information. Give further additional information if any. Help them to develop a sense of belonging. Ask them if they are interested in such things as social activities, and tell them how they can participate.

Review. Show interest in their progress. Help them problems they have met, but avoid criticism. Be alert for personal problems that arise which could affect the newcomer's work performance. Clear up any misunderstanding.

Explain rules, norms and values. Explain why rules are necessary and point out their application to other employees. Discuss the norms and values of the library and of the parent organization and how these affect library staff.

Discuss informally. Informal contact should be made about every second day.

Check progress. By the end of one month, they should have settled down. Check their work. Correct errors by arranging further instruction, not by pointing up the failures.

Praise them. If they have done a job well, tell them so. Let them know that their efforts are appreciated.

7.11. Performance Appraisal

An organisation's goals can be achieved only when people put in their best efforts. Ascertaining whether an employee has shown his or her best performance on a given job then becomes necessary. And, this asserting of one's performance is done through performance appraisal. Employee's performance assessment is one of the fundamental jobs of HRM.

11.1 Meaning and Definition

In simple terms, performance appraisal may be understood as the assessment of an individual's performance in a systematic way, the performance being measured against such factors as job knowledge, quality and quantity of output, initiative, leadership abilities, supervision, dependability, co-operation, judgement, versatility, health, and the like. The other terms used for performance appraisal are : performance rating, employee assessment, employee performance review, personnel appraisal, performance evaluation, employee evaluation and merit rating.

Performance appraisal is defined as *“the systematic evaluation of the individual with respect to his or her performance on the job and his or her potential for development”*.

Performance appraisal is also defined as *“a formal, structured system of measuring and evaluating an employee's job related behaviours and outcomes to discover how and why the employee is presently performing on the job and how the employee can perform more effectively in the future so that the employee, organisation, and society all benefit”*.

The second definition includes employees' behaviour as part of the assessment. Behaviour can be active or passive – do something or do nothing. Either way, behaviour affects job results. Assessment should not be confined to past performance alone. Potentials of the employee for future performance must also be assessed.

11.2 Objectives of performance appraisal

Data relating to performance assessment of employees are recorded, stored and used for several purposes. The main purposes of employee assessment are:

- a) To effect promotions based on competence and performance.
- b) To confirm the services of probationary employees upon their completing the probationary
- c) To assess the training and development needs of employees.

- d) To decide upon a pay raise where (as in the unorganised sector) regular pay scales have not been fixed.
- e) To let the employees know where they stand in so far as their performance is concerned and to assist them with constructive criticism and guidance for the purpose of their development.
- f) To improve communication. Performance appraisal provides a format for dialogue between the superior and the subordinate, and improves understanding of personal goals and concerns. This can also have the effect of increasing the trust between the rater and the ratee.
- g) Finally, performance appraisal can be used to determine whether HR programmes such as selection, training, and transfers have been effective or not.

Broadly, performance appraisal serves four objectives. –

- a. developmental uses,
- b. administrative uses / decisions,
- c. organisational maintenance/ objectives, and
- d. documentation purposes.

Table 3 outlines these objectives and specific uses more clearly.

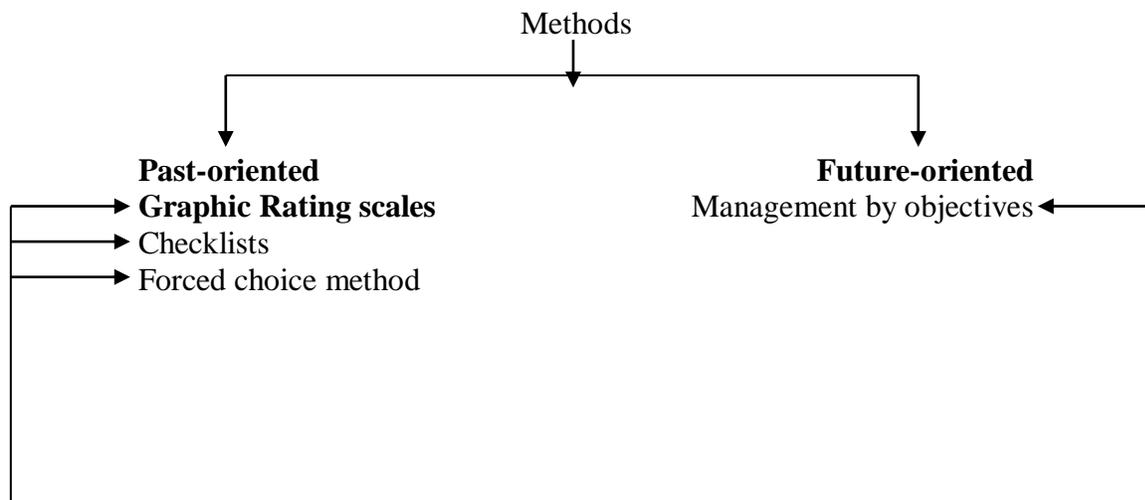
Table 3.
Objectives of Performance Assessment and Their Specific Uses

Objectives	Specific Use
Developmental uses	Identification of individual needs Performance feedback Determining transfers and job assignments Identification of individual strengths and developmental needs

Administrative uses/Decisions	Salary Promotion Retention or termination Recognition of individual performance Lay-offs Identification of poor performance
Organisational maintenance/Objectives	HR planning Determining organisation training needs Evaluation of organisational goal achievement Information for goal identification Evaluation of HR systems Reinforcement of organisational development needs
Documentation	Criteria for validation research Documentation for HR decisions Helping to meet legal requirements

11.3 Methods of appraisal:

Different methods have been devised to measure the quantity and quality of employee's job performance. Each of these methods could be effective for some purposes, for some organisations. None can be dismissed or accepted as appropriate, as they relate to the particular needs of the organisation or of a particular type of employees. Broadly, all the approaches to appraisal can be classified into (i) past-oriented methods, and (ii) future-oriented methods. Each group has several techniques as shown in the Figure 5 given below.



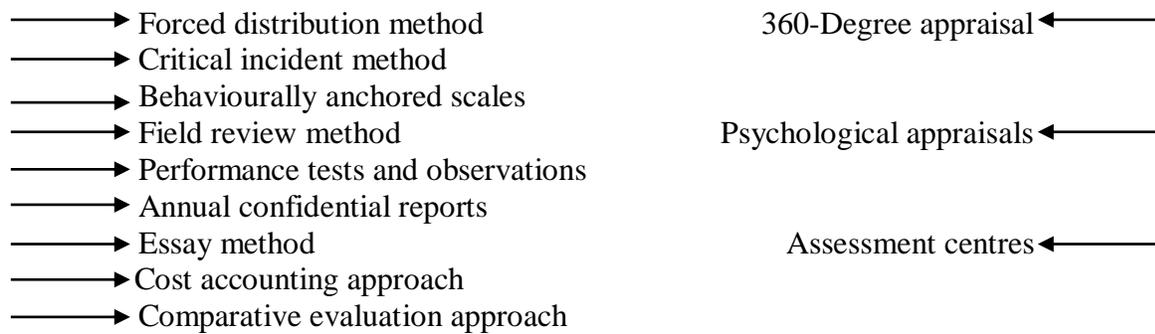


Figure 5: Methods of Performance Appraisal

a) Past-oriented methods

i) Rating scales

This is the simplest and most popular method, used for appraising employee performance. The typical rating scale system consists of several numerical scales, each representing a job-related performance criterion such as dependability, initiative, output, attendance, attitude, co-operation, and the like. Each scale ranges from excellent to poor. The rater checks the appropriate performance level on each criterion, then computes the employee's total numerical score. The number of points scored may be linked to salary increases, whereby so many point equal a rise of some percentage. Figure 6 presents a sample rating scale form for performance assessment.

Rating scales offer the advantages of adaptability, relatively easy to use and lost cost. Nearly every type of job can be evaluated with the rating scale, the only requirement being that the job-performance criteria should be changed. This way, a large number of employees can be evaluated in a short time, and the rater does not need any training to use the scale.

The disadvantages of this method are: i) The rater's biases are likely to influence evaluation, and the biases are particularly pronounced on subjective criteria such as co-operation, attitude and initiative. ii) Numerical scoring gives an illusion of precision that is really unfounded.

Sample Rating Scale Form

Instructions: For the following performances factors, please indicate on the rating scale your evaluation of the employee named below :

Employee's Name _____		Dept. _____		
Rater's Name _____		Date _____		
Excellent 5	Good 4	Acceptable 3	Fair 2	Poor 1
1. Dependability	-	-	-	-
2. Initiative	-	-	-	-
3. Overall output	-	-	-	-
4. Attendance	-	-	-	-
5. Attitude	-	-	-	-
6. Co-operation	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
20. Quality of work	-	-	-	-
Total	+	+	+	+

Figure 6: Sample of Rating Scale Form

ii) Graphic rating scales

This is one form of rating scales. Like rating scales, certain factors to be rated, such as neatness, personality, leadership, initiative, loyalty, dependability appearance and quantity and quality of work output are identified. Employees are assessed as to their performance in each factor with either four or five degrees of rating. The graphic rating scale is one of the most popular in use. However, it is time consuming to fill the scale when a large number of people have to be assessed. A typical example of Graphic rating scale is given in Figure 7.

Staff Assessment Form
(Confidential)

Division Community Services	Department Libraries		Position Number			
Surname	First Name					
Employees should be rated according to an objective assessment of the person's actual performance. Consider only one factor at a time. Carefully read each description and mark the one most closely associated with actual performance.						
These headings are not necessarily in order of importance nor do they carry equal weight	A	B	C	D	E	Comments
Attendance and punctuality. Is the officer regular or irregular in attendance?	Frequently away/and or late	Very seldom away or late	Rarely away but sometimes late	Regular and punctual	Rarely late but sometimes away	
Appearance and dress What is the officer's personal appearance?	Excellent	Near and tidy	Passable	Untidy	Unsuitable and extreme tastes	
Interest, What degree of interest does the officer display?	Lacks interest generally	Shows lack of interest to a marked degree	Exceptionally keen and enthusiastic	Displays above-average interest	Displays a reasonable amount of interest	
Alertness and comprehension. How readily does the officer grasp what is required?	Readily comprehends	Slow to comprehend and adapt	Exceptionally quick even in a new area	Very slow and dull	Very quickly understands	
Application. What is the officer's application to the task in hand?	Keen and industrious	Steady worker	Usually industrious with occasional lapses	Poor worker and can distract others	Exceptionally energetic and enthusiastic	
Knowledge of the job. To what extent does the officer possess the knowledge an ability necessary for the job?	Has barely sufficient to cope with general requirements	Needs to refer too frequently even on routing matters	Very well informed with unusually sound knowledge	Well informed with good knowledge of work area	Fairly well able to cope with most aspects	
Neatness and presentation. Is the officer's work tidy or untidy?	Very neat and tidy	Neat	Adequate	Somewhat untidy	Careless and untidy	
Work output. What is the	Consistently slow,	Very fast worker,	Quick worker with greater	Normal output and	Rather a slow worker	

officer's effective output?	tending to hold up the office	consistently producing considerable volume of work	output than normal	keeps up with work flow		
Accuracy and reliability. How accurate and reliable is the officer's work?	Exceedingly accurate and reliable	Rarely makes errors	Normally accurate and reliable	More errors and omissions than normal	Many errors and omissions	
Leadership. To what extent can the officer organize and inspire others	Leads and organizes efficiently	Shows indications of leadership	Job does not normally require leadership	A bad influence on others	Outstanding organizer and leader	
Temperament. How well does the officer stand up to varying situations and pressures?	Steady and balanced	Normally steady but unusual situations can upset officer	Becomes ruffled and acts imperiously under pressure	Unusually well balanced and reliable under pressure	Very effective and reliable	
Signature Assessor	Position			Date		
Signature Interviewee	Position			Date		

Figure 7: An example of performance assessment form using Graphic Rating Scale

iii) Checklist

Under this method, a checklist of statements on the traits of the employee and his or her job is prepared in two columns – viz., a ‘Yes’ column and a ‘No’ column. All that the rater (immediate superior) should do is tick the ‘Yes’ column if the answer to the statement is positive and in column ‘No’ if the answer is negative. A typical checklist is given in Table 4. After ticking off against each item, the rater forwards the list to the HR department where the actual assessment of employee takes place. The HR department assigns certain points to each ‘Yes’ item ticked. Depending on the number of ‘Yes’ the total score is arrived at. When points are allotted to the checklist, the technique becomes a weighed checklist. The advantages of a checklist are economy, ease of administration, limited training of rater, and standardisation. The disadvantages include susceptibility to rater’s biases, use of personality criteria instead of performance criteria, misinterpretation of checklist items, and the use of improper weights by the HR department.

Table 4
Typical Checklist for Measuring Employee Performance

Description	Yes	No
1. Is the employee really interested in the job?	--	--
2. Does he or she possess adequate knowledge about the job?	--	--
3. Is his or her attendance satisfactory?	--	--
4. Does he or she maintain his or her equipment in good condition?	--	--
5. Does he or she co-operate with co-workers?	--	--
6. Does he or she keep his/her temper?	--	--
7. Does he or she obey orders?	--	--
8. Does he or she observe safety precautions?	--	--
9. Does he or she complete what he or she commences?	--	--
10. Does he or she evade responsibility?	--	--

iv) Forced Choice Method

In this, the rater is given a series of statements about an employee. These statements are arranged in blocks of two or more, and the rater indicates which statement is most or least descriptive of the employee. Typical statements are:

- 1. Learns fast - Works hard
- 2. Work is reliable - Performance is a good example for
- 3. Absents often - others usually tardy.

As in the checklist method, the rater is simply expected to select the statements that describe the rate. Actual assessment is done by the HR department.

This approach is known as the forced choice method because the rater is forced to select statements which are readymade. The advantage of this method is the absence of personal bias in rating. The disadvantage is that the statements may not be properly framed – they may be precisely descriptive of the ratee's traits.

v) Forced Distribution Method

One of the limitations in rating is leniency – clustering a large number of employees around a high point on a rating scale. The forced distribution method overcomes the problem by compelling the rater to distribute the ratees on all points on the rating scale. The method operates under an assumption that the employee performance level conforms to a normal statistical distribution.

One merit of this approach is that it seeks to eliminate the error of leniency. The major weakness of the forced distribution method lies in the assumption that employee performance levels always conform to a normal (or some other) distribution. In organisations that have done a good job of selecting and retaining only the good performers, the use of forced distribution approach would be unrealistic, as well as possibly destructive to the employee morale.

The error of central tendency may also occur, as the rater resists from placing an employee in the lowest or in the highest group. Difficulties also arise for the rater to explain to the ratee why he or she has been placed in a particular group. The forced choice method is not acceptable to raters and ratees, especially, in small groups or when group members are all of high ability.

vi) Critical Incidents Method

This approach focuses on certain critical behaviours of an employee that make all the differences between effective and non-effective performance of a job. Such incidents are recorded by the superiors as and when they occur.

One of the advantages of the critical incidents method is that the evaluation is based on actual job behaviour. Further, the approach has descriptions in support of particular ratings of an employee. Giving job-related feedback to the ratee is also easy. It also reduces the bias, if raters record incidents throughout the rating period. Finally, this approach can increase the chances that the subordinates will improve because they learn more precisely what is expected of them. The method has the following limitations:

- i. Negative incidents are generally more noticeable than positive ones.
- ii. The recording of incidents is a chore to the supervisor and may be put off and easily forgotten.
- iii. Overly close supervision may result in detracting the work performance of the ratee.
- iv. In case of a series of complaints about incidents during an annual performance review session. The feedback may be too much at one time and thus appear as a punishment to the ratee.

In view of its advantages, the critical incidents method of employee assessment has generated a lot of interest during recent past particularly in industrial sectors.

vii) Behaviourally Anchored Rating Scales (BARS)

Behaviourally anchored scales, sometimes called behavioural expectation scales, are rating scales whose scale points are determined by statements of effective and ineffective behaviours. They are said to be behaviourally anchored in that the scales represent a range of descriptive statements of behaviour varying from the least to the most effective. A rater must indicate which behaviour on each scale best describes an employee's performance. Behaviourally anchored rating scales have the following features.

- i. Areas of performance to be evaluated are identified and defined by the people who will use the scales.
- ii. The scales are anchored by descriptions of actual job behaviour that, supervisors agree, represent specific levels of performance. The result is a set of rating scales in which both dimensions and anchors are precisely defined.

- iii. All dimensions of performance to be evaluated are based on observable behaviours and are relevant to the job being evaluated since BARS are tailor – made for the job.
- iv. Since the raters who will actually use the scales are actively involved in the development process, they are more likely to be committed to the final product.

BARS were developed to provide results which subordinates could use to improve performance. Supervisors would feel comfortable to give feedback to the ratees. Further, BARS help overcome rating errors. Unfortunately, this method too suffers from distortions inherent in most rating techniques.

viii) Field Review Method

This is an appraisal by someone outside the assessee's own department, usually some one from the corporate office or the HR department. The outsider reviews employee records and holds interviews with the ratee and his or her superior. The method is primarily used for making promotional decision at the higher level. Field reviews are also useful when comparable information is needed from employees in different units or locations. Two disadvantages of this method are:

- i. An “outsider” is usually not familiar with conditions in an employee's work environment which may affect the employee's ability or motivation to perform.
- ii. An ‘outsider’ review does not have the opportunity to observe employee behaviour of performance over a period of time and in a variety of situations, but only in an artificially structured interview situation which extends over a very short period of time.

Raters making field reviews normally receive training on how to conduct the interview and develop their writing skills. Being independent of the work sense, they normally have less bias for or against the ratee than does the immediate supervisor. Even when a supervisor or others concerned supply biased information, the rater may be able to pinpoint areas requiring training and development assistance.

ix) Performance Tests and Observations

With a limited number of jobs, employee assessment may be based upon a test of knowledge or skills. The test may be of the paper-and-pencil variety or an actual demonstration of skills. The test must be reliable and validated to be useful. Performance tests are apt to measure potential more than actual performance. In order for the test to be job related, observations should be made under circumstances likely to be encountered.

x) Confidential Records

Confidential records are maintained mostly in government departments, though its application in the industry is not ruled out. Called the Annual Confidential Report (ACR), the approach consists of varied number of items, such as (i) attendance, (ii) self-expression (written or oral), (iii) ability to work with others, (iv) leadership, (v) initiative, (vi) technical ability (job knowledge), (vii) ability to understand new material, (viii) ability to reason, (ix) integrity, (ix) originality and resourcefulness, (x) areas of work that suits the person best, (xi) judgement, (xii) integrity, (xiii) responsibility and, (xiv) and defect – indebtedness, memo served, etc. Each of these carry on a four/five point grade scale (Excellent, good, fair and poor/ outstanding, very good, good, average, poor). For integrity, there will be special instructions from the management, Justification is required for outstanding or poor rating. Sometimes recommendations for promotion are also given. Feedback to the assessee is given only in case of an adverse entry. Ratings are easily manipulated because the evaluation was linked to promotion.

xi) Essay Method

In the essay method, the rater has to describe the employee within a number of broad categories, such as:

- i. the rater's overall impression of the employee's performance,
- ii. the promotability of the employee,
- iii. the jobs that the employee is now able or qualified to perform,
- iv. the strengths and weaknesses of the employee, and
- v. the training and the development assistance required by the employee.

Although this method may be used independently, it is most frequently found in combination with others. It is extremely useful in filling information gaps about the employees that often occur in the better structured checklist method.

The strength of the essay method depends on the writing skills and analytical ability of the rater. However, many raters do not have good writing skills. They become confused about what to say, how much they should state and the depth of the narrative. The essay method can consume much time because the rater must collect the information necessary to develop the essay and then he or she must write it. The essay method also depends on the memory power of the rater.

A problem with this method is that the ratees may be rated on the quality of the appraisals that they give. The quality standard for the appraisal may be unduly influenced by appearance rather than content. Thus, a 'high quality' appraisal may provide little useful information about the performance of the ratee.

xii) Cost Accounting Method

This method evaluates performance from the monetary returns the employee yields to his or her organisation. A relationship is established between the cost included in keeping the employee and the benefit the organisation derives from him or her. Performance of the employee is then evaluated based on the established relationship between the cost and the benefit.

xiii) Comparative Evaluation Approaches

These are a collection of different methods that compare one worker's performance with that of his/her co-workers. Comparative appraisals are usually conducted by supervisors. As these appraisals can result in a ranking from best to worst, they are useful in deciding merit-pay increases, promotions and organisational rewards. The usual comparative forms used in this kind of evaluation are the ranking method and the paret comparison method.

xiv) Ranking Method

In this, superior ranks his or her subordinates in the order of their merit, starting from the best to the worst. All that the HR department knows is that A is better than B. The 'how' and 'why'

are not questioned, nor answered. No attempt is made to fractionalise what is being appraised into component elements. This method is subject to the halo and recency effects, although rankings by two or more raters can be averaged to help reduce biases. Its advantages include: ease of administration and explanation.

xv) Paired-comparison Method

Under this method, the appraiser compares each employee with every other employee, one at a time. For example, there are five employees named A, B, C, D and E. The performance is better. Then A is compared with C, D and E in that order. The same procedure is repeated for other employees. The number of comparisons may be calculated with the help of a formula which reads thus :

$(N*(N-1))/2$: where N stands for the number of employees to be compared. If there are 10 employees, the number of comparisons will be $(10*(10-1))/2 = 45$.

After the completion of comparison, the results can be tabulated, and a rank is created from the number of times each person is considered to be superior.

b) Future-Oriented Appraisals

While assessment of the past performance is important, how an employee can perform in the days to come is equally important. This can be assessed by focussing on employee potential or setting future performance goals. The commonly used future-oriented techniques are MBO, psychological appraisals, and assessment centres.

i) Management by Objectives

It was Peter F. Drucker who first gave the concept of MBO to the world way back in 1954 when his '**The Practice of Management**' was first published. The MBO concept, as was conceived by Drucker, reflects a management philosophy which values and utilises employee contributions. Application of MBO in the field of performance appraisal is a recent thinking.

MBO works can be described in four steps :

- a. Establish the goals each subordinate is to attain.
- b. Setting the performance standard for the subordinates in a previously arranged time period.
- c. The actual level of goal attainment is compared with the goals agreed upon.
- d. Establishing new goals and, possibly, new strategies for goals not previously attained.

As with other approaches, MBO too has been criticised. One comment made against the approach is that it is not applicable to all jobs in all organisations. The MBO process seems to be most useful with managerial personnel and employees who have a fairly wide range of flexibility and self-control in their jobs.

ii) Psychological Appraisals

Large organisations employ full-time industrial psychologists. When psychologists are used for evaluations, they assess an individual's future potential and not past performance. The appraisal normally consists of in-depth interviews, psychological tests, discussions with supervisors and a review of other evaluations.

iii) Assessment Centres

Assessment centres are being used for evaluating executive or supervisory potential. An assessment centre is a central location where managers may come together to have their participation in job-related exercises evaluated by trained observers. The principal idea is to evaluate managers over a period of time, say one to three days, by observing (and later evaluating) their behaviour across a series of select exercises or work samples. Assesseees are requested to participate in in-basket exercises, work groups (without leaders), computer simulations, role playing, and other similar activities which require the same attributes for successful performance, as in the actual job. After recording their observations of the ratee behaviours, the raters meet to discuss these observations. The decision regarding the performance of each assessee is based upon this discussion of observations. Self-appraisal and peer evaluation are also thrown in for final rating.

The characteristics assessed in a typical assessment centre include assertiveness, persuasive ability, communicating ability, planning and organisational ability, self-confidence, resistance to stress, energy level, decision-making, sensitivity to the feelings of others, administrative ability, creativity, and mental alertness.

iv) 360-Degree Feedback

Where multiple raters are involved in evaluating performance, the technique is called 360-degree appraisal as stated earlier. The 360-degree technique is understood as systematic collection of performance data on an individual or group, derived from a number of stakeholders – the stakeholders being the immediate supervisors, team members, customers, peers, and self.

The 360-degree appraisal provides a broader perspective about an employee's performance. In addition, the technique facilitates greater self-development of the employees. It enables an employee to compare his or her perceptions about self with perceptions of others. Besides, the 360-degree appraisal provides formalised communication links between an employee and his or her customers. It makes the employee feel much more accountable to his or her internal or external customers. The technique is particularly helpful in assessing soft skills possessed by employees. By design the 360-degree appraisal is effective in identifying and measuring interpersonal skills, customer satisfaction and team-building skills.

However, there are drawbacks associated with the 360-degree feedback. Receiving feedback on performance from multiple sources can be intimidating.

11.4 Performance Interview

Performance interview is another step in the appraisal process. Once appraisal has been made of employees, the raters should discuss and review the performance with the ratees, so that they will receive feedback about where they stand in the eyes of superiors. Feedback is necessary to effect improvement in performance, specially when it is inadequate. Specifically, performance interview has three goals:

- i. to change behaviour of employees whose performance does not meet organisational requirements or their own personal goals,
- ii. to maintain The behaviour of employees who perform in an acceptable manner, and
- iii. to recognise superior performance behaviours so that they will be continued.

Raters offer feedback to the ratees through several methods – tell and sell, tell and listen, problem solving and mixed. In tell and sell, also called directive interview, the interviewer lets assesses know how well they are doing and tells them on the merits of setting specific goals for improvement, if needed. The tell and listen interview provides the subordinates with chances to participate and establish a dialogue with their superiors. Its purpose is to communicate the rater’s perceptions about the ratee’s strength and weaknesses and let the subordinates respond to those perceptions. In the problem-solving or participative interview, an active and open dialogue is established between the superior and the subordinate. Not only are perceptions shared, but also solutions to problems are presented, discussed, and sought. Mixed interview is a combination of tell and sell and problem-solving interviews.

Whatever be the approach followed, the emphasis in the interview needs to on counselling and development and not on criticism witch-hunting and buck passing. Because of the significance of appraisal interview, every effort has to be made to make it effective. Following guidelines in Table 5 will help to make the appraisal interview successful.

Table – 5
Guidelines for Effective Appraisal Interview.

- | |
|---|
| <ul style="list-style-type: none">• Select a good time• Minimise interruptions• Welcome, set at ease• Start with something positive• Ask open-ended questions to encourage discussion• Listen• Manage eye contact and body language |
|---|

- Be specific
- Rate behaviour, not personality
- Layout development plan
- Encourage subordinate participation
- Complete form
- Set mutually agreeable goals for improvement
- End in a positive, encouraging note
- Set time for any follow-up meetings

11.5 Use of Appraisal Data

The data and information generated through performance evaluation has to be used by the HR department.

The data and information outputs of a performance-appraisal programme will be useful in the following areas of human resource management:

- i. Remuneration administration;
- ii. Validation of selection programmes;
- iii. Employee training and development programmes;
- iv. Promotion, transfer and lay-off decisions;
- v. Grievance and discipline programmes and
- vi. HR planning.

7.12. Check your progress

1. What is Human Resource Planning (HRP)?

According to E. Geislet defines human resource planning as “the process including forecasting, developing and controlling by which a firm ensures that it has the right number of people and the right kind of people at the right places, at the right time doing work for which they are economically most useful”.

2. What is Job Analysis?

Ans:- S R Ranganathan considers job as an ultimate piece of work, which is best done at a single stretch and whose duration is ordinarily short. Number of related jobs constitute an item of work. Jobs/works can be grouped according to the periodicity like daily, weekly, monthly, quarterly etc.

3. Posting the right person at the right place is called

(a) **Recruitment** (b) Coaching (c) Deployment (d) Induction

4. Performance Appraisal is an important tool for merit rating. (True/ False)

Ans:- **True**

5. Methods and techniques of human resource planning includes

(i) Selection and recruitment (ii) Induction and placement (iii)

Quality management (iv) Performance evaluation

Codes:

(a) (i), (iv) and (ii) are correct (b) (iv), (iii) and (i) are correct

(c) **(i), (ii) and (iv) are correct** (d) (iii) and (i) are correct

7.14. Summary

HRP refers to the estimating the number and type persons needed to accomplish the objectives of a given institution/ organisation. It helps in determining future personnel needs, ensures optimum utilization of human resources & thereby delimiting waste of manpower, acts as a basis for other personnel functions, also helps in overcoming resistance to change and so on. HRP is influenced by several factors such as type & strategy of organisation, environmental uncertainties, time horizons, type and quality of information and the type of jobs being performed. The process of HRP includes forecasting of personnel needs & supplies based on organisational objectives and policies, HR programming, implementing HRP and performance evaluation.

7.13. Questions for self study

1. What do you understand by HRP? Explain its importance.
2. What do you understand by HRP? Explain its importance.
3. Discuss factors affecting HRP.
4. Briefly explain various steps in HRP process.
5. What is meant by job analysis? Briefly explain job description and job specification
6. Explain various sources of recruitment.
7. Explain the process involved in selection.
8. Describe the roles and qualities of interviewer.
9. What is performance appraisal? Explain briefly various methods of performance appraisal.
10. Write short notes on the following:
 - a. Collection of data for job analysis.
 - b. Employment interview
 - c. Induction interview
 - d. Induction programme
 - e. Objectives & functions of performance appraisal
 - f. Performance interview

7.15. References

1. Aswathappa, K
Human resource and personnel management: Texts and cases ed 3.
New Delhi: Tata Mc-Graw Hill, 2002. Chapter 1.
2. Bryson, J O.
Effective library and information center management.
Aldershot: Gower, 1990. p 71-93.
3. Evans, G Edward

- Management techniques for librarians.
New York: Academic Press, 1983.
4. Milkovich, George T and Boudreau, Johri W.
Human resource management.
Chacago: Irwin, 1997. Chapter 1
 5. Werther Jr, William B and Davis, Keith.
Human resources and personnel management. ed 4.
New York: Mc-Graw Hill, 1993. p 11.

Unit - 8

HUMAN RESOURCE MANAGEMENT, LEADERSHIP, MOTIVATION, TRAINING AND DEVELOPMENT

- 8.1 Objectives of the Unit
- 8.2 Introduction
- 8.3 Meaning and Definition of Human Resource Management (HRM)
- 8.4 Scope of HRM
- 8.5 HRM and Personnel Management
- 8.6 Objectives of HRM
- 8.7 Functions of HRM
- 8.8 Human Resource Development (HRD)
- 8.9 Attributes of HRD
- 8.10 Objectives of Human Resource Development
- 8.11 Need for Human Resource Development in Library and Information Science
- 8.12 Assumptions about leadership
- 8.13 Functions of Leadership
- 8.14 Leadership Styles
- 8.15 Likerts Four Systems of Management
- 8.16 Leadership Theories
- 8.17 Emerging Approaches to Leadership
- 8.18 Motivation: Its meaning and concepts
- 8.19 Importance of Motivation
- 8.20 Early Theories of Motivation
- 8.21 Contemporary Theories of Motivation:
- 8.22 Integrating Contemporary Theories Of Motivation
- 8.23 From Theory to Practice
- 8.24 Training and Education
- 8.25 Objectives of Training
- 8.26 Benefits of Training
- 8.27 Kinds of Training Programmes

- 8.28 Methods of Training
- 8.29 HRD and Training
- 8.30 Skills Required for LIS Personnel
- 8.31 Training for LIS personnel
- 8.32 Modules for Training LIS Professionals
- 8.33 Short Term Training Programmes
- 8.34 Summary
- 8.35 Model Questions

HUMAN RESOURCE MANAGEMENT

8.1. Objectives of the Unit

The objectives of this unit are:

- ❖ to enable the students to understand the concept of Human Resource Management and its nature, scope and objectives;
- ❖ to know the functions of Human Resource Management;
- ❖ to understand the value and pertinence of HRD;
- ❖ to know various concepts and attributes of HRD; and
- ❖ to realize the need for HRD in library and information science.
- ❖ Understand the nature of motivation and know the motivational process;
- ❖ Describe the importance of motivation;
- ❖ Describe the various theories of motivation – both early theories and contemporary theories

8.2. Introduction

Human resources constitute most expensive and the most valuable resource compared to all other resources in any organization. Managed appropriately, the organisation's workforce becomes its life-breath. Managed inappropriately, it turns out to be expensive commitment leading to even closure of organization. Attention to human resource development thus becomes important and vital. Proper human resource planning and development programmes yield greater improvement

in quality of products and services of a given organization. The importance of the human factor also stems from the fact that by use with the passage of time, the human resources increase in value through the acquisition of greater knowledge through experience and thus reflect an inherent dynamism and development potential, where as, all other resources such as. material, equipment, building etc, depreciate in value.

8.3. Meaning and Definition of Human Resource Management (HRM)

According to Leon C Megginson, the term human resources can be thought of as “the total knowledge, skills, creative knowledge, abilities, talents, and aptitudes of an organization’s workforce as well as the value, attitudes and beliefs of the individuals involved.” Human Resources comprise the aggregate of employee attributes including knowledge, skills, experiences and health which are presently and potentially available to an organization for the achievement of its goals. In other words, human resources consist of the value of the productive capacity of the firm’s human organization.

Human Resource Management is a management function that helps managers recruit, select, train and develop members for an organisation. Hence, HRM is concerned with the people’s dimension in organisations. Milkovich and Boudreau define Human Resource Management (HRM) as “a series of integrated decisions that form the employment relationship; their quality contributes to the ability of the organisations and the employees to achieve their objective.”

According to Decenzo and Robbins HRM “is concerned with the peoples’ dimension in management. Since every organisation is made up of people, acquiring their services, developing their skills, motivating them to higher levels of performance and ensuring that they continue to maintain their commitment to the organisation are essential to achieving organisational objectives. This is true, regardless of the type of organisation – government, business, education, health, recreation or social action.”

Edwin B Flippo states “management is the planning, organizing, directing and controlling of the procurement, development, compensation, integration, maintenance and separation of human resources to the end that individual, organisational, and social objectives are accomplished.”

Thus, HRM refers to a set of programmes, functions and activities designed and carried out in order to maximize both employee as well as organisational effectiveness.

8.4. Scope of HRM

The scope of HRM is vast. All major activities in the *working* life of a worker – from the time of his or her entry into an organisation until he or she leaves – come under the purview of HRM. Specifically, the activities included are – HR planning, job analysis and design, recruitment and selection, orientation and placement, training and development, performance appraisal and job evaluation, employee and executive remuneration, motivation and communication, welfare, safety and health, industrial relations (IR) and the like.

8.5. HRM and Personnel Management

HRM differs from Personnel Management (PM) both in scope and orientation. HRM views people as an important source or asset to be used for the benefit of organisations, employees and the society. It is emerging as a distinct philosophy of management aiming at policies that promote mutuality – mutual goals, mutual respect, mutual rewards and mutual responsibilities. The belief is that policies of mutuality will elicit commitment which, in turn, will yield both better economic performance and greater human resource development (HRD). Though a distinct philosophy, HRM cannot be treated in isolation. It is being integrated into the overall strategic management of business. Further, HRM represents the latest term in the evolution of the subject. The American Society of Personnel Administration (ASPA), the largest professional association in this field of management, changed its name to the Society for Human Resource Management (SHRM). Since then, the expression is gradually replacing the hackneyed term ‘personnel management’.

PM has limited scope and an inverted orientation. It viewed labour as a tool, the behaviour of which could be manipulated for the benefit of the organisation and replaced when it was worn-out. The personnel department itself was not treated with respect. It was filled with not-very-productive employees whose services could be spared with minimal damage to the organisation’s ongoing operations. Personnel function was treated as a routine activity meant to hire new employees and to maintain personnel records. It was never considered a part of the strategic management of businesses. Historically, PM preceded HRM. The table 1 draws the line of separation between HRM and PM clearly. Table 1

Differences between HRM and PM.

	<i>Dimension</i>	<i>Personnel Management</i>	<i>Human Resource Management</i>
1	Employment contract	Careful delineation of written contracts	Aim to go beyond contract
2	Rules	Importance of devising clear rules	Can do outlook, impatience with rule
3	Guide to management action	Procedures	Business need
4	Behavior referent	Norms/customs and practices	Values/ mission
5	Managerial task vis-à-vis labour	Monitoring	Nurturing
6	Key relations	Labour management	Customer
7	Initiatives	Piecemeal	Integrated
8	Speed of decision	Slow	Fast
9	Management role	Transactional	Transformational leadership
10	Communication	Indirect	Direct
11	Prized management skills	Negotiation	Facilitation
12	Selection	Separate, marginal task	Integrated, key task
13	Pay	Job evaluation (fixed grades)	Performance related
14	Conditions	Separately negotiated	Harmonization
15	Labour management	Collective-bargaining contracts	Individual contracts
16	Job categories and grades	Many	Few
17	Job design	Division of labour	Team work
18	Conflict handling	Reach temporary truce	Manage climate and culture
19	Training and development	Controlled access to courses	Learning companies
20	Focus of attention for interventions	Personnel procedures	Wide-ranging cultural, structural and personnel strategies
21	Respect for employees	Labour is treated as a tool which is expendable and replaceable	People are treated as assets to be used for the benefit of an organisation, its employees and the society as a whole
22	Shared interests	Interests of the organisation are uppermost	Mutuality of interests
23	Evolution	Preceded HRM	Latest in the evolution of the subject

8.6. Objectives of HRM

The primary objective of HRM is to ensure the availability of a competent and willing workforce to an organisation. In addition there are other objectives, too. Specifically, HRM objectives are four fold – societal, organisational, functional and personal (Figure 1.)

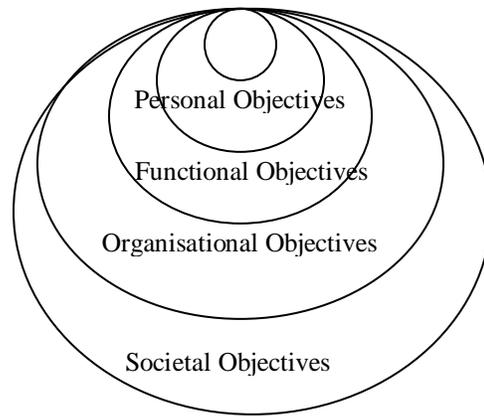


Fig. 1: Objectives of HRM

- a) **Societal objectives:** *One of the important objectives of HRM is to be ethically and socially responsible to the needs and challenges of the society while minimising the negative impact of such demands upon the organisation. The failure of organisations to use their resources for the society's benefit in ethical ways may lead to restrictions. For example, the society may limit HR decisions through laws that enforce reservation in hiring and laws that address discrimination, safety or other such areas of societal concern.*
- b) **Organisational Objectives:** *The second objective of HRM is to recognize the role of HRM in bringing about organisational effectiveness. HRM is not an end in itself. It is only a means to assist the organisation with its primary objectives. HR department exists to serve the rest of the organisation.*
- c) **Functional Objectives.** *Maintenance of the department's contribution at a level appropriate to the organisation's needs is the third objective of the HRM. Resources are wasted when HRM is either more or less sophisticated to suit the organisation's demands. The department's level of service must be tailored to fit the organisation it serves.*
- d) **Personal Objectives:** *The fourth objective of the HRM is to assist employees in achieving their personal goals, at least insofar as these goals enhance the individual's contribution to the organisation. Personal objectives of employees must be met if workers are to be*

maintained, retained and motivated. Otherwise, employee performance and satisfaction may decline and employees may leave the organisation.

8.7. Functions of HRM

In order to realize the objectives stated above, HRM must perform certain functions. Various functions of HRM may be grouped under the following five headings. There is a correlation between the objectives of the HRM and its functions. These functions help realize specific objectives of HRM. For example,

- a) Employee hiring;
- b) Employee/Executive remuneration;
- c) Employee motivation;
- d) Employee maintenance; and
- e) Interpersonnel/ Institutional relations.

8.8. Human Resource Development (HRD)

Harbinson and Myers have aptly defined Human Resource Development as “the process of increasing the knowledge, skills & capabilities of all the people in the country”.

According to T. V. Rao “HRD is a continuous planned process by which the employees are helped to:

- a) acquire or sharpen capabilities required to perform various functions associated with their present or expected future roles;
- b) develop their general capabilities as individuals and discover and exploit their own inner potentials for their own and/or organization development purposes; and
- c) develop an organization culture in which supervisor – subordinate relationships, teamwork and collaboration among sub-units are strong and contribute to the professional well being, motivation and pride of employees”.

Three Emphases involved in the concept of HRD

Human resources development involves three important concepts. These are:

- Valuable Resource

- Special Characteristics
- Human Units and Processes

- a) **Valuable Resource:** Persons working in organisations are regarded as valuable resource. It implies that there is a need to invest time and effort in their development.
- b) **Special Characteristics:** Human have their own special characteristics and therefore cannot be treated as material resources. This focuses on the need to humanize organizational life, and introduce human values in the organization.
- c) **Human Units and Processes:** Human resource does not merely focus on employees as individuals, but also on other human units and processes in the organization. These include:
 - the role or the job a person has in the organization,
 - the dyadic unit (consisting of the person and his boss),
 - the various teams in which people work,
 - inter teams, and
 - the total organization.

Thus, there are six units which are included in human resources: i.e., individual employees or persons, roles or jobs, dyads, teams, inter teams, and organisation. The concepts of the development of these units is briefly discussed below.

i. The Individual Employees:

The individual employee is the key unit in the organization. HRD is primarily concerned with the development of persons working in the organization, so that they may be able to have their own fulfillment and contribute to achieve the goals of the organization. Development of individuals include three aspects viz., self management, competence building and advancement.

- **Self Management:** The person working in the organization should develop competencies to carry on his / her work effectively and efficiently. This involves learning to set realistic goals that are challenging, but not too high to the individual to achieve. It also involves learning how to analyze the performance results in terms of factors responsible for the success or failure in

achieving performance results. Some of the factors are related to the employee while others may be concerned with external conditions. Finally, self management would involve using such information and competency to improve one's performance in future.

- **Competence Building :** The main contributions of HRD to the individual's development is in terms of building competencies required for better performance on the job. The individual employee comes with his/her educational background, and personal strengths and weaknesses. While working in the organization he / she learns new skills which help him / her to work effectively on organizational goals.
- **Advancement:** Every employee wants to advance his/her career in the organization. HRD should help in the process of such advancement. We shall later see that advancement of employees involves identifying their potential for use in carrying higher responsibilities in the organization, and helping them to develop further potential to take up new challenges.

ii. The Role

Although the individual employees perform various roles in the organization, it is necessary to pay attention to roles independently. Role is not synonymous with job, although both are very similar. Nor is role synonymous with status or position in the organization. Role is the position a person occupies as defined by expectations of different significant persons (who have face-to-face relationship with the role occupant) have from him/her.

There are three main aspects of the development of role with which HRD needs to be concerned with. These are:

- **Optimum Stress:** Each role must have enough challenges which may help the role occupant to stretch himself/herself to meet the challenge. The role in which the scope is limited to routine work and in which role occupants do not see any challenges, is not likely to inspire the role occupants to do their best. They will

feel underworked. While every role has routine elements, challenge must also be developed in every role. However, the challenge should not exceed a limit, otherwise it may produce dysfunctional stress, resulting in poorer performance and damage to the health of the employee. Building optimum stress in the role is like setting the strings of a musical instrument at a level where the strings are stretched enough to produce music, but not too much stretched to break.

- **Linkages:** While roles in organizations are occupied by individual employees, it is necessary to build linkages amongst the roles, as well as linkages of different organizational roles with challenging goals. If the roles get isolated and produce a feeling in the role occupants that their work is very narrow (and not much use for wider groups) it will have damaging effects on the individuals as well as the organization.
- **Autonomy:** If individuals who occupy the various roles feel that they have enough scope of taking initiative of solving problems or doing creative work, the role occupants as well as the organization benefit a great deal, HRD must attempt to develop the autonomy of this kind in every role, even at the lowest level in the organization.

iii. The Dyad

The dyadic groups (an employee and his supervisor) are the basic building blocks in an organizational structure. The stronger the dyads are, the stronger the organization will be. The focus of developments of dyads in an organization would involve developing the following three aspects.

- **Trust:** Effective work cannot be done in an organization unless trusting relationship is established between an employee and his supervisor. Trust does not develop easily: efforts should be made to develop such relationship.
- **Mutuality:** Effective dyads will require free exchanges of help between the employee and the supervisor. Helping relationship is not a one-way relationship. The supervisor should take help from his employees, as much as he would give

them the needed help. Mutuality in relationships will also involve support to each other.

- **Communication:** Developing effective dyads will also involve improving communication between the members (the employee and the supervisor). Both should be able to give feedback to each other. The employee should improve his feedback, as the supervisor should improve his competence to coach the employee.

iv. The Team

Effective teams are quite important for the strength of the organization. Primarily two aspects should be the focus of HRD, as far as team development is concerned.

- **Cohesion:** The teams should be cohesive. Well knit teams produce synergy, and are able to utilize individual competencies.
- **Resource Utilization:** Effective teams maximize the use of resource available amongst members of the team. This would both satisfy the members, because each will contribute whatever resources one has, and help the team to produce effective results. Poor teams rely on and use resources only of a few members, resulting in limited opportunities for other members.

v. The Inter- team:

The main emphasis of inter- teams is to develop cooperation amongst various groups working different divisions, departments, sections in the organization so as to pool their ability towards accomplishing organizational objectives. The key focus of such cooperation is to develop corporate identity. In the absence inter-team cooperation, it becomes difficult to achieve organizational goals if only the teams are strong and work for their own goals.

vi. The Organization

As far as the organization is concerned the following three aspects should deserve the attention of the HRD effort.

- **Growth:** Obviously the development of the organization would involve increase in its size, activities and operations. Every organization looks forward to its

growth. Even if growth is not in terms of its size the organization may be concerned with providing qualitative services or maintaining leadership position in its field of operations.

- **Impact:** Each organization would like to have some impact on the outside organizations or customers etc. Impact may be in terms of developing new markets, developing services or products, introducing new technology which others can follow etc.
- **Self-renewal:** The organization must examine its working from time to time and take steps to update its technology. It should also analyze the present and potential problems imminent on its growth, and take steps to prepare itself to meet these challenges. Self-renewal competency is necessary for organizational effectiveness.

Thus, HRD is concerned with development of the following six human units of an organization on the aspects shown against them.

The individual employee: Self management, competence building, advancement.

The role: optimum stress, linkage, autonomy.

The dyad: trust, mutuality, communication.

The team: cohesion, resource utilization.

The inter-team: identity, collaboration.

The organization: growth, impact, self-renewal.

8.9. Attributes of HRD

a) HRD is based on system perspective:

HRD is viewed as a system consisting of several interdependent and interrelated subsystems. These include performance appraisal, potential appraisal, role analysis, training, job enrichment, communication etc. In designing human resources development system enough attention should be paid to build linkages between various subsystems. These linkages can be established in a number of ways depending upon the components of the system.

b) The discipline of HRD is built around behavioural sciences:

The discipline of HRD makes use of principles and concepts of behavioural sciences for the development of people. It uses knowledge drawn from psychology, sociology and anthropology for planning and implementing various programmes for the development of individuals groups and organization.

c) **HRD is an ongoing process:**

HRD emphasizes the need the continuous development of personnel to face the present and future challenges in the functioning of an organization. Change is a natural phenomena. This change deeply influences the social, cultural, economic and political factors. In turn, these factors influence HRD subsystems calling for continuous development and updating. Hence, HRD is an ongoing process which is dynamic and pro-active in nature.

8.10. Objectives of Human Resource Development

Some of the objectives of HRD may be summarised as under:

- a) To develop constructive overall personality of each employee;
- b) To enhance capabilities of employees to enable them to do their present and future jobs effectively;
- c) To re-orient the knowledge, skills and attitudes of employees to cope with the ever-changing technology;
- d) To facilitate the utilization of human resources effectively through training and development;
- e) To evolve and evaluate effective systems of manpower planning so as to prevent over staffing and wastage of human resources ;
- f) To formulate career advancement path for all employees to make them committed to and interested in work ;
- g) To increase the motivation levels of employees ;
- h) To develop innovative strategies to nurture better human relations aiming at integration of people into productive work situation ;

To create a climate that enable every employee to develop his capabilities to a fuller extent in order to further both individual and organizational goals.

8.11. Need for Human Resource Development in Library and Information Science

The need for HRD arises out of the development objectives of the organization. No organization can grow and strive without the growth and development of its personnel. In view of speedy changes, the Human Resource Development be viewed as the total system interrelated and interacting with the other systems at work – for e g. in library & information centers collection development, information retrieval, information services...Though the personnel policies can keep the morale and motivation of employee high, these efforts are not enough to make the organization dynamic and take it to new directions. Employees capabilities must continuously be acquired, sharpened and used. When the organization expects the employees to direct their actions to organizational goals, every employee expects the organization to fulfill his/her personal needs. Unless and otherwise, the organization takes care to fulfill the personal needs of the employees one cannot expect the employee fully to convert his/her capabilities to work for the organization and contribute higher output. Hence, there arises the need of HRD that helps in creating an organizational culture and improves the work life by overcoming monotony, ensuring better communication and creation of congenial working conditions where creativity of all employees comes into full play.

8.12. Assumptions about leadership

There are several assumptions about leadership. Few of them are summarised below :

- 1) A leader attains or assumes leadership position in a library through an appointment process in which the staff does not have the final say. Therefore, in the minds of staff, the librarian or leader is, and all that can be varied is the degree of informal influence that can be exerted on higher positions or outside bodies.
- 2) A person starts off in every position with only the rank and authority that is derived from the office. Initially, there is no leadership. People in the unit do the work because the supervisor is 'boss', and because that work is their job. A "good" leader will quickly move beyond this approach and use leadership rather than authority to accomplish things through people.
- 3) No one is a born leader; leadership is a skill that can be learnt. To some degree, everyone has leadership potential in some situations. Leadership is a complex process that depends on a combination of people and environmental factors.

8.13. Functions of Leadership

Following are the functions of leadership:

1. *Executive or top coordinator of group activities:* To coordinate activities, the leader needs to devote considerable time and energy to reconciling personal (own and staffs) and organizational goals.
2. *Planner for the group:* As the person in charge, the leader must develop new ideas, anticipate changes and propose adjustments in the group's activities. A leader who has no plans is not a leader.
3. *Policy maker within limits:* A manager who operates only on authority receives policy guidelines from above. A true leader derives policy-making power from a third source – the subordinates. The subordinates' trust and desire helps the leader to formulate result oriented policy for them.
4. *Expert in the field:* The leader shares knowledge and skills willingly and in a manner suggesting an equal relationship, not a superior-subordinate relationship.
5. *Example setter:* Both in attitude and performance, the leader sets the tone and pace for the group. It may be found that the staff of a leader emulate the leader's methods of working, attitudes, and occasionally, even style of dress.
6. *Controller of internal relations:* In a unit supervised by a leader, the formal and informal structures usually are very similar. More often, the leader is the hub around which all activities revolve.
7. *Arbitrator and mediator:* Although the leader and manager have this role thrust upon them, the leader actually takes more of it on voluntarily. Because of the staffs respect for and trust in the leader, they bring most of their problems to that person for resolution.
8. *Purveyor of rewards and punishment:* Again, this role is held both by the leader and by the manager. Although neither one may personally administer rewards and punishment, both approve or recommend such actions. The difference is that the manager will find that even rewards are questioned; this is something that never occurs in the case of a leader.
9. *Substitute for individual responsibility:* A leader will often tell a subordinate, "Go ahead and do X, and if there's anything wrong in it, I'll take the blame." The subordinate knows

that this will be the case with a leader. Non-leaders neither force the subordinate to take the blame or they avoid after acceptance of the responsibility.

10. *Symbol of the group:* Because they set its tone, leaders tend to be regarded both by members of the group and by people outside it as the symbol of group.
11. *Representative to non-group persons:* The group expects that its leader will be its spokes person to outsiders. Other persons may be capable of assuming this role, but the majority of people are secure in the belief that the leader is best qualified to present the group's position and protect its interests.
12. *Scapegoat:* True leaders know that they will at times receive the blame for things they have no way of controlling. They accept this as readily as they accept the accountability that accompanies their position. Nonleader managers often have difficulty in accepting the accountability of their position.

In addition to the above, the other functions of a leader are to motivate subordinates, to instill values concerned to quality, honesty etc., among them and to create a good and congenial atmosphere to enable them to have smooth flow of work.

Stoner and Freeman had suggested two major functions of leaders:

- (a) task related or problem solving; and
- (b) group maintenance or social functions, such as mediating in case of disputes and ensuring that individuals feel values by the group.

Both roles have to be performed by the leader. Leaders also inspire their followers and create major impact on the library as organization. Such leaders are known as charismatic or transformation leader. Leadership is challenging and they need to change their style to fit into changing situations.

Weinrich and Koontz have stated the ingredients of leadership as follows :

- (a) The ability to use power/authority effectively and in a responsible manner;
- (b) The ability to comprehend that human beings have different motivating forces at different times and in different situations;
- (c) The ability to inspire; and

- (d) The ability to act in a manner that will develop a climate conducive to responding to evolving motivations.

Librarians must develop the leadership qualities and lead all the staff to achieve the objectives of the library/ information centre successfully.

8.14. Leadership Styles

Leaders have been observed applying three basic styles – autocratic, democratic and free-rein.

The *Autocratic leader* was defined as one who commands and expects compliance, who is dogmatic and positive and who leads by the ability to withhold or give rewards and punishment.

The *Democratic leader or Participative leader* consults with subordinates on proposed actions and decisions and encourages participation from them. He does not take action without sub-ordinates concurrence.

The third type of leader, namely *Free-rein leader or Laissez-faire*, uses his or her power very little. He gives subordinates a high degree of independence or free hand in their operations. Such leaders depends highly on subordinates to set their own goals and means of achieving them and they see their role as one of aiding the operations of followers by furnishing them information and acting primarily as contact with the groups external environment.

Stoner and Freeman have categorized leadership styles as follows:

- a) Task oriented style; and
- b) Employee-oriented style.

The managers in the first category closely supervise employees to be sure that the task is performed satisfactorily. Getting the job is more important than the employees' growth and personal satisfaction. The managers of the second category motivate subordinates rather than control. They seek friendly, trusting and respectful relationship with employees. The manager leads his subordinates, influenced by his background, knowledge, values and experience.

8.15. Likerts Four Systems of Management

Rensis Likert and his associates at Michigan have supplied the patterns and styles of leaders that are found to be important in understanding leadership behaviour. Since it appeals to

human motivations, Likert views are considered to be the most effective way to lead a group. According to this approach, all members of the group, including the manager or leader, adopt a supportive attitude in which they share in one another's common needs, values, aspirations, goals, and expectations. The Table 10.1 presents a sample of Likert's Four Systems of Management.

Table 15.1 Likert's Four Systems of Management

System 1 Exploitive- authoritative	System 2 Benevolent- authoritative	System 3 Consultative	System 4 Participative
1. Managers are highly autocratic	Managers have patronizing confidence in subordinates	These managers have substantial but not complete confidence and trust in subordinates	These managers have complete confidence and trust in subordinates
2. Little trust in subordinates	Trust subordinates	Make use of ideas and opinions of subordinates	Make constructive use of subordinates idea and opinions
3. Motivate people through fear & punishment	Motivate with rewards, some fear & punishment	Use rewards for motivation with occasional punishment and some participation	Reward for motivation with occasional punishment and some participation
4. Occasional rewards	Rewards are common	Rewards are given	Economic rewards are given on the basis of participation and involvement
5. Engage downward communication	Permit some upward communication & opinions	Engage in communication flow both downward and upward	Engage in communication flow both downward and upward
6. Limit decision making to the top	Solicit some ideas and opinions from subordinates but with close policy control. Allow some delegation of decision making	Make broad policy and general decisions at the top, allowing specific decisions to be made at lower levels	Encourage decision making throughout the organisation and operate among themselves and with their subordinates as a group.

Likert saw System 4 management as most participative of all the referred to it as “participative group” In general, Likert found that those managers who applied the system 4 approach to their operations had great success as leaders. More over he noted that departments and companies managed by system 4 were most effective in setting goals and achieving them and were generally productive. The success is mainly based on the degree of participation and the extent of involvement from the subordinates.

8.16. Leadership Theories

Leadership, just like motivation, is another organizational behaviour topic that’s been heavily researched. And practically, all the research has been aimed at answering the question “What is an effective leader?” There are various theories proposed to understand and explain the evolution of leadership. The major theories that provide us with basic understanding of leadership are summarized here.

8.17. Trait Theories

Trait means distinct quality or feature. Earlier attempts were made to identify the traits that a leader possesses. The “Great Man” theory states that leaders are born and not made. Researchers made an attempt to identify the physical, mental and personality traits.

Ralph Stogdill found that various researchers have identified specific traits related to leadership ability, They are:

- 1) Five physical traits (such as energy, appearance, height);
- 2) Four intelligence and ability traits
- 3) Sixteen personality traits (such as adaptability, aggressiveness, enthusiasm and self-confidence)
- 4) Six task related characteristics (such as achievement, drive, persistence and initiative)
- 5) Nine social characteristics (such as cooperativeness, inter-personal skills and administrative ability).

Recently, some management studies have identified the key traits of leadership. They are – drive (including achievement, motivation, energy, ambition, initiative and tenacity); honesty;

integrity; self -confidence (including emotional stability); cognitive ability and understanding the activities.

This approach has been not very fruitful as every leader do not have all the traits. But this approach may give some idea and these traits are associated with the patterns of behaviour.

17.1 Behavioural theories

The inability to identify behaviours that differentiate between effective and non- effective leader in trait theories led researchers to look at the behaviours that specific leaders exhibited.

It was hoped that not only would the behavioural theories approach provide more definitive answers about the nature of leadership, but if successful, would have practical implications quite different from those of the trait approach.

A number of studies looked at behavioural styles. There are three most popular studies done at the University of Iowa, Ohio State, and the University of Michigan. These are summarised below.

17.2 Autocratic – Democratic Continuum

One of the first studies of leadership behaviour was done by Kurt Lewin and his associates at the University of Iowa. In their studies, the researchers explored three leadership behaviours or styles: autocratic, democratic, and laissez-faire. *Autocratic style* describes a leader who typically tends to centralize authority, dictate work methods, make unilateral decisions, and limit subordinate participation. The *democratic style* of leadership describes a leader who tends to involve subordinates in decision making, delegate authority, encourage participation in deciding work methods and goals, and use feedback as an opportunity for coaching subordinates. Finally, the *laissez-faire style* leader generally gives the group complete freedom to make decisions and complete the work in whatever way it sees fit. The behaviours a laissez-faire leader might exhibit include providing necessary materials or answering questions. Lewin and his associates wanted to find out which of these three leadership styles was the most effective.

For this purpose, the researchers trained different adults to use each of these styles in leading groups of young boys from local boys' clubs. They quickly discovered that the laissez-faire style was ineffective on every performance criterion when compared to both the democratic and autocratic styles. Quantity of work done, however, was equal in groups with autocratic and democratic leaders. But work quality and group satisfaction were higher in the democratic groups. The results seemed to indicate that democratic leadership style could contribute to both good quantity and quality of work.

17.3 The Ohio State Studies

The most comprehensive and replicated of the behavioural theories resulted from research that began at Ohio State University in the 1940s. These studies sought to identify independent dimensions of leader behaviour. Beginning with over 1,000 dimensions, they eventually narrowed the list down to just two categories that accounted for most of the leadership behaviour described by subordinates. They called these two dimensions as '*initiating structure*' and '*consideration*'.

The term '*initiating structure*' refers to the extent to which a leader is likely to define and structure his or her role and those of subordinates in the search for goal attainment. It includes behaviour that attempts to organize work, work relationships, and goals. For example, the leader who believes high in initiating structure assigns group members to particular tasks, expects workers to maintain definite standards of performance and emphasizes meeting deadlines.

The term '*consideration*' is defined as the extent to which a person has job relationships characterized by mutual trust and respect for subordinates' ideas and feelings. A leader who is high in consideration helps subordinates with personal problems, is friendly and approachable, and treats all subordinates as equals. He or she shows concern for his or her followers' comfort, well-being, status, and satisfaction.

Extensive research based on these definitions found that a leader who is high in initiating structure and consideration achieved high subordinate performance and satisfaction more frequently than one who rated low on either consideration, initiating structure, or both.

17.4 The University of Michigan Studies

Leadership studies carried on at the University of Michigan's Survey Research Center, at about the same time as those being done at Ohio State, had similar research objectives of identifying behavioural characteristics of leaders that were related to performance effectiveness.

The Michigan group also came up with two dimensions of leadership behaviour. The group labeled them as '*employee oriented*' and '*production oriented*'. Leaders who were 'employee oriented' were described as emphasizing interpersonal relations. They took personal interest in the needs of their subordinates and accepted individual differences among members. The 'production-oriented' leaders in contrast, tended to emphasize the technical or task aspects of the job, were concerned mainly with accomplishing their group's tasks and regarded group members as a means to that end.

The conclusions of the Michigan researchers strongly favoured leaders who were employee oriented. Employee-oriented leaders were associated with high group productivity and higher job satisfaction. Production-oriented leaders were associated with low group productivity and lower worker satisfaction.

The concepts that each of these three studies developed provided the basis for the development of a 'managerial grid' for appraising leadership styles.

17.5 The Managerial Grid

Blake and Mouton proposed a managerial grid based on the styles of "concern for people" and "concern for production", which essentially reflect the Ohio State dimensions of 'consideration' and 'initiating structure' and the Michigan dimensions of 'employee orientation' and 'production orientation'.

The grid, shown in Figure 2 has nine possible positions along each axis, creating 81 different categories into which a leader's style may fall. The grid doesn't show the results produced, but rather the dominating factors in a leader's approach in getting results.

Although there are 81 positions on the grid, the five key positions identified by Blake and Mouton are as follows :

- 1, 1 *Impoverished*: The leader exerts a minimum of effort to accomplish the work.
- 9,1 *Task*: The leader concentrates on task efficiency but shows little concern for the development and morale of subordinates.
- 1,9 *Country Club*: The leader focuses on being supportive and considerate of subordinates to the exclusion of concern for task efficiency.
- 5, 5 *Middle of the road* : The leader maintains adequate task efficiency and satisfactory morale.
- 9,9 *Team* : The leader facilitates task efficiency and high morale by coordinating and integrating work-related activities.

From these findings, Blake and Mouton concluded that managers/leaders perform best using a 9,9 style. Unfortunately, the grid offers no answer to the question of what makes a manager an effective leader, but only a framework for conceptualizing leadership style.

17.6 Contingency Theories

It became increasingly clear to those studying leadership that predicting leadership success involved something more complex than isolating a few leader traits or preferable behaviours. The failure to attain consistent results led to a new focus on situational influences. The relationship between leadership style and effectiveness suggested that under condition ‘A’ leadership style ‘X’ would be appropriate, whereas style ‘Y’ would be more suitable for condition ‘B’, and style ‘Z’ for condition ‘C’.

Several approaches to isolate key situational variables have proven more successful than others and, as a result, have gained wider recognition. Among others, the Fiedler model, Hersey and Blanchard’s situational theory, Path-goal theory, and the Leader participation model are considered important.

17.7 Fiedler’s Contingency Model

In the 1950s Fred Fiedler began working with some associates on a situational theory of leadership effectiveness. Fiedler concluded that a group’s performance is contingent upon the appropriate matching of the leadership style and the degree of favourableness of the group situation for the leader.

Leadership style, according to Fiedler, was measured by a Least-Preferred Co-worker (LPC) score, obtained by the leader's critical rating of the person with whom he or she least prefers to work. A low-LPC-scoring leader who rates most critically is task-motivated, while a high-scoring LPC leader shows sensitivity for their relationships with others in their ratings and is people-oriented.

Task-oriented individuals need to get things done. They gain self-esteem from tangible, measurable evidence of performance and achievement. They are strongly motivated successfully to accomplish any task to which they have committed themselves, even if there are few or no external rewards.

Task-oriented leaders are out of their element in moderate control situations, especially those with interpersonal conflicts. They are likely to concentrate heavily on the task and they ignore group members' needs and as well as any conflict that may exist. Hence, the performance of the group may suffer.

People-oriented leaders are concerned with doing a good job, but their primary orientation is towards good interpersonal relationships with others. Their self-esteem is affected by how other people relate to them. They tolerate different view points and are good at dealing with complex problems requiring creative and resourceful thinking. In stressful and challenging low-control situations, these relationship-oriented behaviours may become exaggerated.

Fiedler's theory suggests that task-motivated leaders will be most successful in situations of high leadership control and in situations of low leadership control. They are likely to be less successful in situations of moderate control. The relationship-oriented leader is at his/her best in moderate-control situations where the leader's concern for interpersonal relations is appropriate. Relationship-oriented leaders are not successful in either high or low control situations.

17.8 House's Path-Goal theory

Robert House developed his Path-Goal theory of leadership (1971) to explain how the 'consideration' or 'initiating structure' behaviours of leaders influence the motivation and satisfaction of subordinates – in particular, their perceptions of work goals and personal goals.

The essence of the theory is that it's the leader's job to assist his or her followers in attaining their goals and to provide the necessary direction and / or support to ensure that their goals are compatible with the overall objectives of the group or organization. The term 'path-goal' is derived from the belief that effective leaders clarify the path to help their followers to achieve their work goals and make the journey along the path easier by reducing roadblocks and pitfalls.

According to path-goal theory, a leader's behaviour is acceptable to subordinates to the degree that they view it as an immediate source of satisfaction or as a means of future satisfaction. A leader's behaviour is motivational to the extent that it: (1) makes subordinate need-satisfaction contingent on effective performance; and (2) provides the coaching, guidance, support and rewards that are necessary for effective performance. To test these statements, House identified following four leadership behaviours :

- *Directive leader* : who lets subordinates know what's expected of them, schedules work to be done, and gives specific guidance as to how to accomplish tasks – similar to 'initiating structure from the Ohio State studies.
- *Supportive leader* : who is friendly and shows concern for the needs of subordinates – essentially synonymous with the Ohio State dimension 'consideration'
- *Participative leader* : who consults with subordinates and uses their suggestions before making a decision.
- *Achievement-oriented leader* : who sets challenging goals and expects subordinates to perform at their highest level.

In contrast to Fiedler's view of a leader's behaviour, House assumes that leaders are flexible. Path-goal theory implies that the same leader can display any or all of the above leadership styles depending on the situation.

17.9 The Hersey-Blanchard Situational Theory

Situational leadership theory of Paul Hersey and Kenneth Blanchard is a contingency theory that focuses on followers. Hersey and Blanchard argue that successful leadership is achieved by selecting the right leadership style, which is contingent on the level of the followers' maturity.

The emphasis on followers in determining leadership effectiveness reflects the reality that it's they who accept or reject the leader. Regardless of what the leader does, effectiveness depends on the actions of his or her followers. This important dimension has been overworked or underemphasized in most leadership theories. The term readiness, as defined by Hersey and Blanchard, is the ability and willingness of people to take responsibility for directing their own behaviour.

Situational leadership uses the same two leadership dimensions that Fiedler identified : task and relationship behaviours. However, Hersey and Blanchard go a step further by considering each as either high or low and then combining them into four specific leadership styles, described as follows :

- *Telling* (high task-low relationship) : The leader defines roles and tells people what, how, when, and where to do various tasks.
- *Selling* (high task-high relationship) : The leader provides both directive behaviour and supportive behaviour.
- *Participating* (low task-high relationship) : The leader and follower share in decision making. The main role of the leader is facilitating and communicating.
- *Delegating* (low task-low relationship) : The leader provides little direction or support.

The final component in Hersey and Blanchard's theory is defining four stages of follower readiness :

- R1 : People are both unable and unwilling to take responsibility for doing something. They are neither competent nor confident;
- R2 : People are unable but willing to do the necessary job tasks. They are motivated but currently lack the appropriate skills;
- R3 : People are able but unwilling to do what the leader wants;
- R4 : People are both able and willing to do what is asked of them.

17.10 Leader Participation Model

Victor Vroom and Phillip Yetton developed a leader participation model in 1973 that related leadership behaviour and participation to decision making. Vroom and Yetton argued that leader behaviour must adjust to reflect the task structure – whether it was routine, non-routine, or anywhere in between. This model was set up as a decision tree incorporating seven contingencies about task structure (whose relevance could be identified by making yes-or-no choices) and five alternative leadership styles. These leadership styles are described in Table 10.4.

More recent work by Vroom and Arthur Iago has resulted in a revision of this model. The new model retains the same five alternative leadership styles but expands the contingency variables to twelve, including factors such as the importance of technical quality of the decision, importance of subordinate commitment to the decision, level of leader, information about the decision, and likelihood of subordinate conflict over preferred solutions. Vroom and Iago have developed a computer program that cuts through all the complexity of the new model.

Table 17.4

Possible Leadership Styles in Vroom – Yetton Leader Participation Model

Autocratic I (AI)	You solve the problem or make a decision yourself using information available to you at that time.
-------------------	--

Autocratic II (AII)	You obtain the necessary information from subordinates and then decide on the solution to the problem yourself. You may or may not tell subordinates what the problem is in getting information from them. The role of your subordinates in making the decision is clearly one of providing the necessary information to you rather than generating or evaluating alternative solutions.
Consultative I (CI)	You share the problem with relevant subordinates individually, getting their ideas and suggestions without bringing them together as a group. Then you make the decision that may or may not reflect your subordinates' influence.
Consultative II (CII)	You share the problem with your subordinates as a group, collectively obtaining their ideas and suggestions. Then, you make the decision that may or may not reflect your subordinates' influence.
Group II (GII)	You share the problem with your subordinates as a group. Together you generate and evaluate alternatives and attempt to reach an agreement (consensus) on a solution

17.11 Summary of Contingency Theories

In deciding the “best leadership style”, the contingency theories recognize the three key elements of any leadership situation : the leader and his or her style (traits), the subordinates and how the leader interacts with them (leader behaviour), and the leadership situation (situational contingencies). Each of the theories help us better grasp how leadership works in organizations.

18. Emerging Approaches to Leadership

There are three emerging approaches to the leadership : an Attribution theory of leadership, Charismatic leadership, and Transactional versus Transformational leadership.

Attribution theory deals with trying to make sense out of cause-effect relationships. It says that leadership is merely an attribution that people make about other individuals.

Charismatic leadership theory is an extension of attribution theory. It says that followers make attributions of heroic or extraordinary leadership abilities when they observe certain behaviours.

Transactional versus Transformational leadership differentiate transformational leaders from transactional leaders. Transactional leaders guide or motivate their followers in the direction of established goals by clarifying role and task requirements, whereas transformational leaders inspire followers to transcend their own self-interests for the good of the organization and are capable of having a profound and extraordinary effect on their followers.

8.19. Motivation: Its meaning and concepts

“Motivation is the willingness to exert high levels of effort toward organizational goals, conditioned by the effort’s ability to satisfy some individual need”. While general motivation is concerned with effort toward any goal, we’ll narrow the focus to organizational goals in order to reflect our interest in work-related behaviour.

The three key elements in this definition are effort, organizational goals, and needs. The **effort** element is a measure of intensity. When someone is motivated, he or she tries hard. But high levels of effort are unlikely to lead to favorable job performance outcomes unless the effort is channeled in a direction that benefits the organization.

Therefore, we must consider the quality of the effort, as well as its intensity. Effort that is directed toward, and consistent with, the organization’s goal is the kind of effort that we should be seeking.

A **need** means some internal state that makes certain outcomes appear attractive. An unsatisfied need creates tension that stimulates drives within the individual. These drives generate a search behaviour to find particular goals that, if attained, will satisfy the need and lead to the reduction of tension.

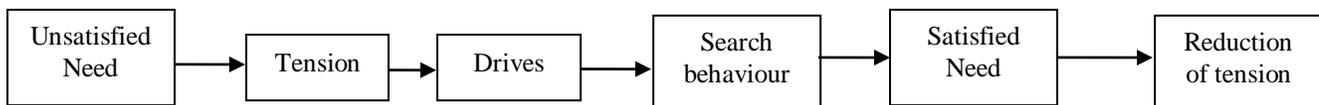


Fig. 7: The Motivation Process

Fig. 7: The Motivation Process

20. Importance of Motivation

Every organisation today recognises motivation is important. This increased attention towards motivation is justified by several reasons. Some of them are:

- i. Motivated employees always look forward for better ways to do a job. When people actively seek new ways of doing things they usually find them.
- ii. A motivated employee, generally, is more quality oriented. This quality consciousness benefits organisation because individuals in and outside the organisation see the enterprise/institution as quality conscious.
- iii. Highly motivated workers are more productive than others. The high productivity of workers is attributable to many reasons but motivation occupies an important place in it. Productivity or efficiency of workers becomes a question of the management's ability to motivate it's employees.
- iv. Motivation as a concept represents a highly complex phenomenon that affects, and is affected by a multitude of factors in the organisational milieu. The comprehensive understanding of the way in which an organisation functions, requires that increasing attention be directed towards the question of why people behave as they do on their jobs. An understanding of motivation is thus essential in order to comprehend more fully the effects of leadership type, job realization salary systems etc as they relate to performance, satisfaction and so forth.
- v. The changing technology also calls for attention towards motivation of employees. The increasing complexity of technological gadgets demands higher skills efficient operation and so on thus wanting motivated employees to handle this complex IT tools.

21. Early Theories of Motivation

Three specific theories formulated during 1960s are probably the best known explanations for employee motivation. These are: the **hierarchy of needs theory, theories X and Y**, and the **motivation-hygiene theory**.

21.1 Hierarchy of Needs Theory

The most well known theory of motivation is Abraham Maslow's hierarchy of needs. He hypothesized that within every human being there exists a hierarchy of five needs. These needs are:

- a) **Physiological:** includes hunger, thirst, shelter, sex and other bodily needs.
- b) **Safety:** Includes security and protection from physical and emotional harm.
- c) **Social:** Includes affection, belongingness, acceptance, and friendship.
- d) **Esteem:** Includes internal esteem factors such as self-respect, autonomy and achievement; and external esteem such as status, recognition and attention.
- e) **Self-actualization:** The drive to become what one is capable of becoming; includes growth, achieving one's potential, and self-fulfillment.

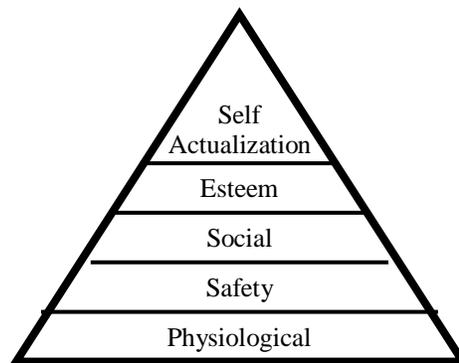


Fig. 8. Maslow's Hierarchy of Needs

Figure 8 represents the hierarchy of needs. The individual moves up the steps of hierarchy as his needs at a particular level is fulfilled. As each of these needs becomes substantially satisfied, the next need becomes dominant. A substantially satisfied need no longer motivates. So if you want to motivate someone, according to Maslow, you need to understand what level of hierarchy that person is currently on and focus on satisfying those needs at or above that level.

Maslow separated the five needs into higher and lower order. *Physiological* and *safety needs* were described as **lower-order** and *social*, *esteem*, and *self-actualization* as **higher-order needs**. The differentiation between the two orders was made on the premise that higher-order needs predominantly satisfied externally (by such things as money, wages, union contracts, and

tenure). The conclusion to be drawn from Maslow's classification is that in times of economic plenty, almost all permanently employed workers have their lower-order needs substantially met.

21.2 Theory 'X' and Theory 'Y'

Douglas McGregor proposed two distinct views of human beings: one basically negative, labeled Theory 'X', and the other basically positive, labeled Theory 'Y'. After viewing the way in which managers dealt with employees, McGregor concluded that a manager's view of the nature of human beings is based on a certain grouping of assumptions and that he or she tends to mould his or her behaviour toward subordinates according to these assumptions.

Under Theory X, the four assumptions held by managers are:

- b) Employees inherently dislike work and, whenever possible, will attempt to avoid it.
- c) Since employees dislike work, they must be coerced, controlled, or threatened with punishment to achieve goals.
- d) Employees will avoid responsibilities and seek formal direction whenever possible.
- e) Most workers place security above all other factors associated with work and will display little ambition.

In contrast to these negative views about the nature of human beings, ***McGregor listed the four positive assumptions that he called Theory Y:***

- a) Employees can view work as being as natural as rest or play.
- b) People will exercise self-direction and self-control if they are committed to the objectives.
- c) The average person can learn to accept, even seek, responsibility.
- d) The ability to make innovative decisions is widely dispersed throughout the population and is not necessarily the sole province of those in management positions.

McGregor held the belief that Theory Y assumptions were more valid than Theory X. Therefore, he proposed such ideas as participation in decision making, responsible and challenging jobs, and good group relations as approaches that would maximize an employee's job motivation.

21.3 Motivation-Hygiene Theory

The motivation-hygiene theory was proposed by Frederick Herzberg. Herzberg investigated the question, “What do people want from their jobs?” He asked people to describe, in detail, situations when they felt exceptionally good and bad about their jobs. These responses were tabulated and categorized. Factors affecting job attitudes as reported in twelve investigations conducted by Herzberg are illustrated in Fig-9.

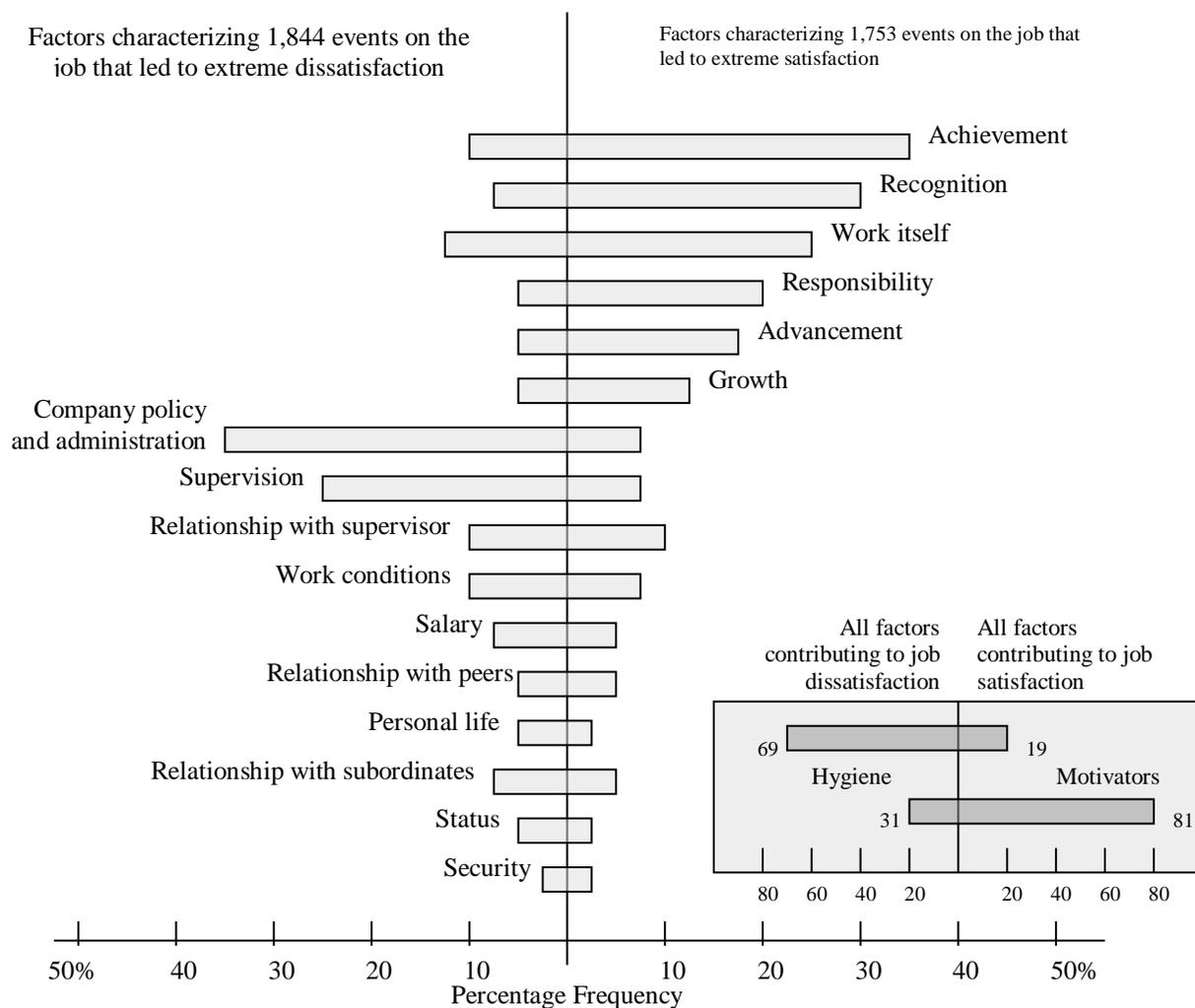


Fig. 9 Comparison of Satisfiers and Dissatisfiers

From the categorized responses, Herzberg concluded that the replies people gave when they felt good about their jobs were significantly different from the replies given when they felt bad. Characteristics tend to be consistently related to job satisfaction, and others to job dissatisfaction. Intrinsic factors, such as achievement, recognition, the work itself, responsibility, advancement, and growth, seem to be related to job satisfaction. On the other hand, extrinsic factors, such as company policy and administration, supervision, interpersonal relations, and working conditions related to job dissatisfaction.

The data suggest, says Herzberg, that the opposite of satisfaction is not dissatisfaction, as was traditionally believed. Removing dissatisfying characteristics from a job does not necessarily make a job satisfying. Herzberg proposes that his findings indicate the existence of dual continuum: the opposite of “Satisfaction” is “No Satisfaction,” and the opposite of “Dissatisfaction” is “No Dissatisfaction”.

According to Herzberg, the factors leading to job satisfaction are separate and distinct from those that lead to job dissatisfaction. Therefore, managers who seek to eliminate factors that create job dissatisfaction can bring about peace, but not necessarily motivation. They will be placating their work force rather than motivating them. As a result, such characteristics as company policy and administration, supervision, interpersonal relations, working conditions, and salary have been characterized by Herzberg as hygiene factors. When they are adequate, people will not be dissatisfied; however, neither will they be satisfied. If we want to motivate people on their jobs, Herzberg suggests emphasizing achievement, recognition, the work itself, responsibility, and growth. These are the characteristics that people find intrinsically rewarding.

22. Contemporary Theories of Motivation

22.1 ERG Theory

Clayton Alderfer of Yale University has reworked Maslow’s need hierarchy to align it more closely with the empirical research. His revised need hierarchy is labeled ERG theory.

Alderfer argues that there are **three groups of core needs-existence, relatedness, and growth**, hence the label: ERG theory. The existence group is concerned with providing our basic material existence requirement. They include the items that Maslow considered physiological and safety needs.

The second group of needs are those related the desire we have for maintaining important interpersonal relationships. These social and status desires require interaction with others if they are to be satisfied, and they align with Maslow's social need and external component of Maslow's esteem classification. Finally, Alderfer isolates growth needs – an intrinsic desire for personal development. These include the intrinsic component from Maslow's esteem category and the characteristics included under self-actualization.

Besides substituting three needs for five in contrast to the hierarchy of needs theory, the ERG theory demonstrates that (1) more than one need may be operative at the same time, and (2) if the gratification of the higher-level need is satisfied, the desire to satisfy a lower-level need increases.

22.2 McClelland's Theory of Needs

McClelland's theory of needs focuses on three needs: achievement, power and affiliation. They are defined as follows:

- **Need for achievement (nAch):** the drive to excel, to achieve in relation to a set of standards, to strive to succeed.
- **Need for power (nPow):** The need to make others behave in a way that they would not have behaved otherwise.
- **Need for Affiliation (nAff):** The desire for friendly and close interpersonal relationships.

Some people who have a compelling drive to succeed are striving for personal achievement rather than the rewards of success per se. They have a desire to do something better or more efficiently than it has been done before. This drive is the achievement need (nAch). From research into the achievement need, McClelland found that high achievers differentiate

themselves from others by their desire to do things better. They seek situations where they can attain personal responsibility for finding solutions to problems, where they can receive rapid feedback on their performance so they can tell easily whether they are improving or not, and where they can set moderately challenging goals. High achievers prefer the challenge of working at a problem and accepting the personal responsibility of success or failure rather than leaving the outcome to chance or the actions of others.

The **need for power** (*nPow*) is the desire to have impact, to be influential, and to control others. Individuals high in *nPow* enjoy being “in charge”, strive for influence over others, prefer to be placed into competitive and status-oriented situations, and tend to be more concerned with prestige and gaining influence over others than with effective performance.

The third need isolated by McClelland is **affiliation** (*nAff*). Affiliation can be viewed as the desire to be liked and accepted by others. Individuals with a high affiliation motive strive for friendship, and desire relationships involving a high degree of mutual understanding.

22.3 Cognitive Evaluation Theory

Historically, motivation theorists have generally assumed that intrinsic motivations such as achievement, responsibility, and competence are independent of extrinsic motivators like high pay, promotions, good supervisor relations, and pleasant working conditions. That is, the stimulation of one would not affect the other . but the cognitive evaluation theory argues that when intrinsic rewards, which are derived from individuals doing what they like, are reduced. In other words, when extrinsic rewards are given to someone for performing an interesting task, it causes intrinsic interest in the task itself to decline.

Therefore, the theory may have limited applicability to work organization because most low-level jobs are not inherently satisfying enough to foster high intrinsic rewards. Cognitive evaluation theory may be relevant to that set of organizational jobs that falls in between-those that are neither extremely dull nor extremely interesting.

22.4 Task Characteristics Theories

Frank Greer is acknowledging two facts we all know : (1) jobs are different and (2) some are more interesting and challenging than others. These facts have not gone unnoticed by OB researchers. They have responded by developing a number of task characteristics theories that seek to identify task characteristics are combined to form different jobs, and the relationship of these task characteristics to employee motivation, satisfaction, and performance.

There are three most important task characteristics theories – Requisite task attributes theory, the Job characteristics model and the Social information – processing model.

22.5 Requisite Task Attributes Theory

The task characteristics approach began with the pioneering work of Turnover and Lawrence in the mid-1960s. They developed a research study to assess the effect of different kinds of jobs on employee satisfaction and absenteeism. They predicted that employees would prefer jobs that were complex and challenging; that is, such jobs would increase satisfaction and result in lower absence rates. They defined job complexity in terms of six task characteristics: (1) variety; (2) autonomy; (3) responsibility; (4) knowledge and skill; (5) required social interaction; and (6) optional social interaction. The higher a job scored on these characteristics, according to Turner and Lawrence, and more complex it was.

Their findings confirmed their absenteeism prediction. Employees in high-complexity tasks had better attendance records. But they found no general correlation between task complexity and satisfaction – until they broke their data down by the background of employees. When individual differences in the form of urban-versus-rural background were taken into account, employees from urban settings were shown to be more satisfied with low complexity jobs. Employees with rural backgrounds reported higher satisfaction in high-complexity jobs. Turner and Lawrence concluded that worker in larger communities had a variety of nonwork interests and thus were

less involved and motivated by their work. In contrast, workers from smaller towns had fewer nonwork interests and were more receptive to the complex tasks of their jobs.

Turner and Lawrence's requisite task attributes theory was important for three reasons. First, they demonstrated that employees did respond differently to different types of jobs. Second, they provided a preliminary set of task attributes by which jobs could be assessed. And third, they focused attention on the need to consider the influence of individual differences on employees' reaction to jobs.

Table 8
Example of High and Low Job Characteristics

Skill Variety	High Variety	The owner-operator of a garage who does electrical repair, rebuild engines, does body work, and interacts with customers
	Low Variety	A body shop worker who sprays paint eight hours a day
Task Identity	High Identity	A cabinet maker who designs a piece of furniture, selects the wood, builds the object, and finishes it to the perfection
	Low Identity	A worker in a furniture factory who operates a lathe solely to make table legs
Task Significance	High Significance	Nursing the sick in a hospital intensive care unit
	Low Significance	Sweeping hospital floors
Autonomy	High Autonomy	A telephone installer who schedules his or her own work for the day, makes visits without supervision, and decides on the most effective techniques for a particular installation.
	Low Autonomy	A telephone operator who must handle calls as they come according to a routine, highly specified procedure
Feedback	High Feedback	An electronics factory worker who assembles a radio and then tests it to determine if it operates properly

	Low Feedback	An electronics factory worker who assembles a radio and then routes it to a quality control inspector who tests it for proper operation and makes needed adjustments
--	--------------	--

22.6 The Job Characteristics Model

According to the JCM, any job can be described in terms of five core job dimensions, defined as follows:

1. **Skill variety:** the degree to which the job requires a variety of different activities so the worker can use a number of different skills and talent.
2. **Task identity:** the degree to which the job requires completion of the whole and identifiable piece of work.
3. **Task significance:** the degree to which the job has a substantial impact on the lives or work of other people.
4. **Autonomy:** the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out.
5. **Feedback:** the degree to which carrying out the work activities required by the job results in the individual obtaining direct and clear information about the effectiveness of his or her performance.

Table 8 offers examples of job activities that rate high and low for each characteristics. Figure 10 presents that model. Notice how the first three dimension-skill variety, task identity, and task significance – combine to create meaningful work. That is, if these three characteristics exist in a job, we can predict that the incumbent will view the job as being important, valuable, and worthwhile. Notice, too, that jobs that possess autonomy give the job incumbent a feeling of personal responsibility for the results and that, if a job provides feedback, the employee will know how effectively he or she is performing. From a motivational standpoint, the model says that internal rewards are obtained by an individual when he learns (knowledge of results) that he personally (experienced responsibility) has performed well on a task that he cares about.(experienced meaningfulness). The more that these three psychological states are present, the greater will be the employee’s motivation performance, and satisfaction, and the lower his or

her absenteeism and likelihood of leaving the organization. As Figure 10 shows, the links between the job dimensions and the outcomes are moderated or adjusted by the strength of the individuals' growth need; that is, by the employee's desire for self-esteem and self-actualization. This means that individuals with a high growth need are more likely to experience the psychological states.

When their jobs are enriched than are their counterparts with a low growth need. Moreover, they will respond more positively to the psychological states when they are present than will low-growth-need individuals.

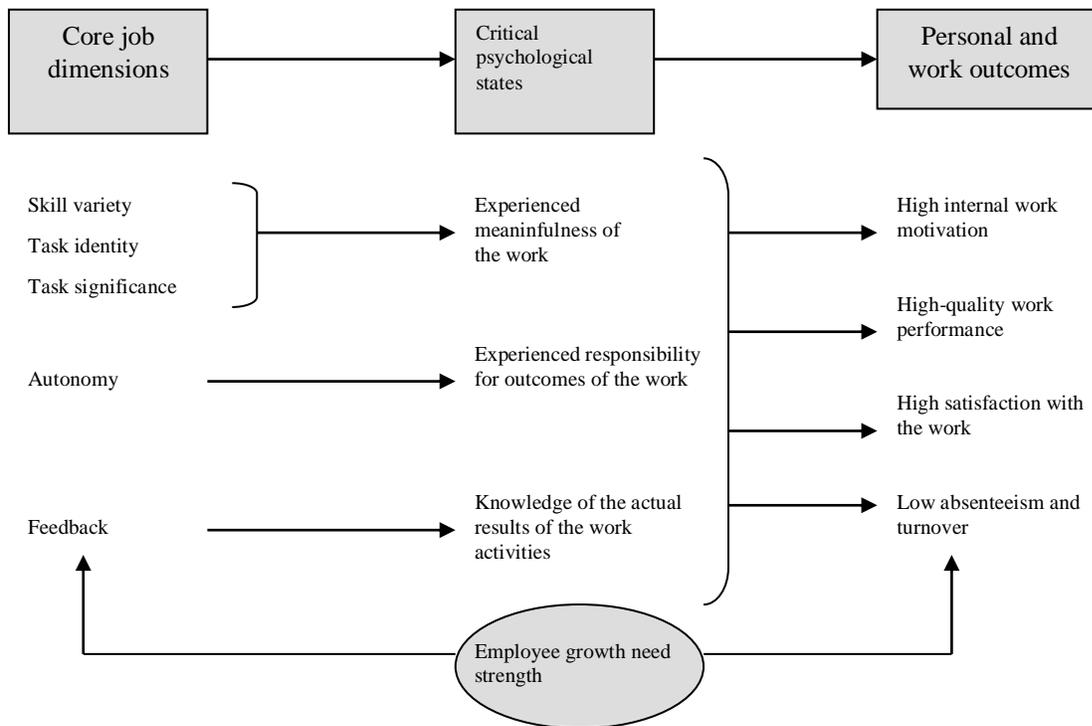


Fig 10. The Job Characteristics Model

22.7 Social Information Processing Model

The SIP model argues that employees adopt attitudes and behaviours in response to the social cues provided by others with whom they have contact. These others can be co-workers, supervisors, friends, family members, or customers.

A number of studies confirm the validity of the SIP model.

Newly hired employees and people transferred or promoted to a new position are more likely to be receptive to social information than are those with greater seniority.

22.8 Goal-Setting Theory

In the late 1960s, Edwin Locke proposed that intentions to work toward a goal are the major source of work motivation. That is, goals tell an employee what needs strongly support the value of goals. More to the point, we can say that specific goals increase performance; that difficult goals, when accepted, result in higher performance than do easy goals; and that feedback leads to higher performance than does nonfeedback.

Specific hard goals produce a higher level of output than does a generalized goal of “do your best”. The specificity of the goal itself as an internal stimulus.

If factors like ability and acceptance of the goals are held constant, we can also state that the more difficult the goal, the higher the level of performance. However, it's logical to assume that easier goals are more likely to be accepted. But once an employee accepts a hard task, he or she will exert a high level of effort until it is achieved, lowered, or abandoned.

People will do better when they get feedback on how well they are progressing toward their goals, because feedback helps to identify discrepancies between what they have done and what they want to do; that is, feedback acts to guide behaviour. But all feedback is not equally potent. Self-generated feedback-where the employee is able to monitor his or her own progress-has been shown to be a more powerful motivator than externally generated feedback.

In addition to feedback, two other factors have been found to influence the goals-performance relationship. These are goal commitment and adequate self-efficacy. Goal – setting theory presupposes that an individual is committed to the goal; that is determined not to lower or abandon the goal this is most likely to occur when goals are made public, when the individual has an internal locus of control, and when the goals are self-set rather than assigned.

Self-efficacy refers to an individual's belief that he or she is capable of performing a task. The higher your self-efficacy, the more confidence you have in your ability to succeed in a task. So, in difficult situations, we find that people with low self-efficacy are more likely to lessen their effort or give up altogether, while those with high self-efficacy will try harder to master the challenge. In addition, individuals high in self-efficacy seem to respond to negative feedback with increased effort and motivation, whereas those low on self-efficacy are likely to lessen their effort when given negative feedback.

Thus, conclusion is that intentions – as articulated in terms of hard and specific goals – are a potent motivating force. They can lead to higher performance.

22.9 Reinforcement theory

Reinforcement theory argues that reinforcement conditions behaviour and behaviour is a function of its consequences. Reinforcement theorists see behaviour as being environmentally caused. They argue that one need not be concerned with internal cognitive events; what controls behaviour are reinforcing consequence that, when immediately following a response, increases the portability that the behaviour will be repeated.

22.10 Equity Theory

According to equity theorists individual compare their job inputs and outcomes with those of others and then respond so as to eliminate any inequities.

Based on equity theory, when individuals perceive an inequity they can be predicted to make one of six choices.

- a. Change their inputs
- b. Changer their outcomes.
- c. Distort perceptions of self.
- d. Distort perceptions of others.
- e. Choose a different referent.
- f. Leave the field.

22.11 Expectancy Theory

It argues that the strength of a tendency to act in a certain way depends on the strength of an expectation that an act will be followed by a given outcome and on the attractiveness of that outcome to the individual.

23. Integrating Contemporary Theories Of Motivation

The number of theories of motivation developed by different thinkers are not all in competition with one another! Because one is valid doesn't automatically make the others invalid. In fact, many of the theories discussed are complementary. So the challenge is now to tie these theories together to help us understand their interrelationships. Figure 11 presents a model that integrates much of what we know about motivation.

We begin by explicitly recognizing that opportunities can aid or hinder individual effort. The individual effort box also has another arrow leading into it. This arrow flows out of the individual's goals. Consistent with goal-setting theory, this goals-effort loop is meant to remind us that goals direct behaviour.

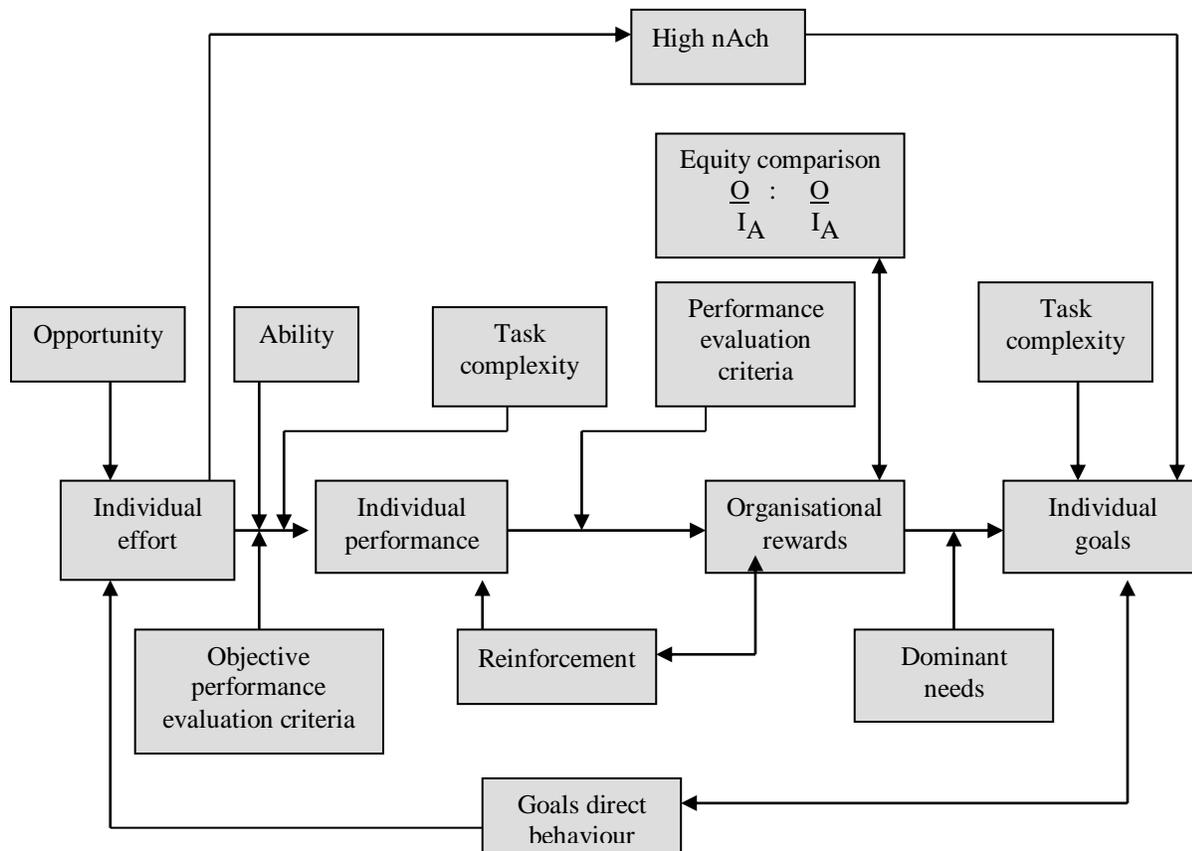


Fig 11. Integrating Contemporary theories of motivation

Expectancy theory predicts that an employee will exert a high level of effort if he or she perceives that there is a strong relationship between effort and performance, performance and rewards, and rewards and satisfaction of personal goals. Each of these relationships, in turn, is influenced by certain factors. For effort to lead to good performance, the individual must have the requisite ability to perform, and the performance evaluation system that measures the individual's performance must be perceived as being fair and objective. The performance-reward relationship will be strong if the individual perceives that it is performance (rather than seniority, personal favorites, or other criteria) that is rewarded. If cognitive evaluation theory were fully valid in the actual workplace, we would predict here that basing rewards on performance should decrease the individual's intrinsic motivation. The final link in expectancy theory is the rewards-goals relationship. ERG theory would come into play at this point. Motivation would be high to the degree that the rewards an individual received for his or her high performance satisfied the dominant needs consistent with his or her individual goals.

A closer look at Fig. 11 will also reveal that the model considers the achievement need and reinforcement and equity theories. The high achiever is not motivated by the organization's assessment of his or her performance or organizational rewards; hence, the jump from effort to individual goals for those with a high nAch. High achievers are internally driven as long as the jobs they are doing provide them with personal responsibility, feedback, and moderate risks. So they are not concerned with the effort-performance, performance-rewards, or rewards-goal linkages.

Reinforcement theory enters our model by recognizing that the organization's rewards reinforce the individual's performance. If management has designed a reward system that is seen by employees as "paying off" for good performance, the rewards will reinforce and encourage continued good performance. Rewards also play the key part in equity theory. Individuals will compare the rewards (outcomes) they receive from the inputs they make with the outcome-input ratio of relevant others ($O/I_A:O/I_B$), and inequities may influence the effort expended.

Finally, task characteristics influence motivation at two places in Fig. 11. First, jobs that score high in motivating potential are likely to lead to higher actual job performance. Second, jobs that score high in motivating potential increase an employee's control over key elements in his or her work. Therefore, jobs that offer autonomy, feedback, and similar complex task characteristics help to satisfy the individual goals of those employees who desire greater control over their work. Of course, consistent with the social information-processing model, the perception that task characteristics are complex is probably more important in influencing an employee's motivation than the objective task characteristics themselves. The key, then, is to provide employees with cues that suggest that their jobs score high on factors such as skill variety, task identity, autonomy, and feedback.

Different Strokes and Different Folks

What motivates me doesn't necessarily motivate you. Expectancy theory recognizes this by proposing that rewards be tailored to the individual. But can we generalize about what different

subgroups of employees might place greater importance upon? A study of one thousand employees asked them to rank-order ten work related factors. Their answers were then tabulated by subgroups on the basis of sex, age, income level, job type, and organization level. The results are shown in Table – 9.

While the results suggest that there is a great deal of similarity in preferences, especially between men and women, there are a few important differences. For instance, younger workers, those with low incomes and those in lower, non-supervisory positions are most concerned with money. Job security also is significantly less important to older workers and to those higher in the organization.

Table 9

	Sex		Age				Income Level				Job Type				Organisation Level		
	Men	Women	Under 30	31-40	41-50	Over 50	Under \$12000	\$12000-\$18000	\$18000-\$25000	Over \$25000	Blue-Collar Unskilled	Blue-Collar Skilled	White Collar unskilled	White Collar skilled	Lower Nonsupervisory	Middle Nonsupervisory	Higher Nonsupervisory
Interesting work	2	2	4	2	3	1	5	2	1	1	2	1	1	2	3	1	1
Full appreciation of work done	1	1	5	3	2	2	4	3	3	2	1	6	3	1	4	2	2
Feeling of being in on things	3	6	6	4	1	3	6	1	2	4	5	2	5	4	5	3	3
Job security	5	4	2	1	4	7	2	4	4	3	4	3	7	5	2	4	6
Good wages	4	5	1	5	5	8	1	5	6	8	3	4	6	6	1	6	8
Promotion and growth in organization	6	6	3	6	8	9	3	6	5	7	6		4	3	6	5	5
Good working conditions	7	7	7	7	7	4	8	7	7	6	9	7	2	7	7	7	4
Personal loyalty to employees	8	8	9	9	6	5	7	8	8	5	8	9	9	8	8	8	7
Tactful discipline	9	9	8	10	9	10	10	9	9	10	7	10	10	9	9	9	10
Sympathetic help with personal problems	10	10	10	8	10	6	9	10	10	9	10	8	8	10	10	10	9

*** Ranked from 1 (highest) to 10 (lowest)8. From Theory to Practice**

While there's no simple, all-encompassing set of guidelines, the suggestions outlined below draw on the essence of motivating employees and motivating ourselves.

Suggestions for Motivating Employees & Ourselves:

- Recognize individual differences
- Match people to jobs
- Use goals
- Ensure that goals are perceived as attainables
- Individualize rewards
- Link rewards to performance
- Check the system for equity
- Don't ignore money

a) Recognize individual differences:

Almost every contemporary motivation theory recognizes that employees aren't homogeneous. They have different needs. They also differ in terms of attitudes, personality, and other important individual variables. For instance, expectancy predictions are more accurate with individuals who have an internal rather than external locus of control. Why? The former believe that events in their lives are largely under their own control, which is consistent with the expectancy theory's self-interest assumptions.

b) Match people to jobs:

There's a great deal of evidence showing the motivational benefits of carefully matching people to jobs. For example, high achievers should be sought for a job of running an autonomous unit within a larger business. However, if the job to be filled is a managerial slot in a large bureaucratic organization, a candidate high in nPow and low in nAff should be selected. Along these same lines, don't put a high achiever into a job that's inconsistent with his or her needs. Achievers will do best in jobs that provide opportunities to participate in setting moderately challenging goals and in which there's autonomy and feedback: one should keep in mind that not everybody is motivated by jobs that are high in autonomy, variety, and responsibility. Such jobs are most attractive and motivating to employees with a high growth need.

c) Use Goals:

The literature on goal-setting theory suggests that managers should ensure that employees have hard, specific goal and feedback on how well they're doing in pursuit of those goals. For those

with high achievement needs, typically a minority in any organization, the existence of external goals is less important because high achievers are already internally motivated.

Should the goals be assigned by a manager, or should employees participate in setting goals? The answer depends on one's perception of goal acceptance and the organization's culture. If you expect resistance to goals, the use of participation should increase acceptance. If participation is inconsistent with the culture, use assigned goals. When participation and the culture are incongruous, employees are likely to perceive the participative process as manipulative and be turned off by it.

d) Ensure that goals are perceived as attainable:

Regardless of whether goals are actually attainable, employees who see these goals as unattainable will reduce their effort – their feeling being “why bother”. Managers, Librarians must be sure, therefore, that employees feel confident that increased efforts can lead to performance goals. This means that employees must be capable of doing the job and must perceive the performance process as both reliable and valid.

e) Individualize Rewards:

Because employees have different needs, what acts as a reinforce for one may not for another. Librarians should use their knowledge of employee differences to individualize the rewards over which they have control. Some of the more obvious rewards that Librarians allocate include pay, promotions, autonomy, and the opportunity to participate in goal setting and decision making.

f) Link rewards to performance:

Librarians need to make rewards contingent on performance. Rewarding factors other than performance will only reinforce those other factors. Key rewards such as pay increases and promotions should be given for the attainment of the employee's specific goals. Librarians should also look for ways to increase the visibility of rewards.

g) Check the system for Equity:

Employees should perceive that rewards or outcomes are equal to the inputs given. On a simplistic level, experience, ability, effort, and other obvious inputs should explain differences in pay, responsibility and other obvious outcomes. The problem, however, is complicated by the existence of dozens of both inputs and outcomes and by the fact that employee groups place degrees of importance on them.

h) Don't ignore money:

It's easy to get so caught up in setting goals, creating interesting jobs, and providing opportunities for participation that one forgets that money is a major reason why most people work. Thus, the allocation of performance – based wage increases, piecework bonuses, and other pay incentives is important in determining employee motivation.

Some scholars consider HRD as co-terminus with training. However, training is merely a subsystem of HRD. Training alone is not enough for accomplishment of development of human resources. Training is specific in purpose and looks at the short term objective of bridging the gap between and expected performance. The HRD concept is wider, and the commitment is for the long-term. HRD embraces almost all areas of an organization and places emphasis on the development individuals as integral part within an organization, along with the development of methods and systems.

HRD is a process concerned with an organized series of learning activities designed to produce behavioural changes in the human resources in such a way that they acquire desired level of competence for present and future roles. It attempts to enable people to overcome their deficiencies and develop their productive potential so that they are able to contribute to the ethical and harmonious growth of the society, fulfill their individual needs and wants and with pleasure. In other words, HRD brings about “all-round development” of the people so that they can contribute their best to the organization, society and the nation.

The concept of HRD is comparatively of recent origin and it is now used at both macro and micro levels. At the macro level HRD is described as the core of all developmental efforts in the sense of improvement of quality of life of people of a nation. At the micro of organizational level, HRD connotes the improvement in the quality of managers and workers so as to achieve greater quality and higher levels of productivity.

However, we are concerned at present with the micro view of HRD here as we are discussing the concept of HRD relating to Library and Information Centres.

23 The Concept of Training

The term '*training*' denotes a systematic procedure for transferring technical know-how to the employees so as to increase their knowledge and skills for doing particular jobs. It involves the development of skills that are usually necessary to perform a specific job. Its purpose is to achieve a change in the behaviour of those trained and to enable them to do their jobs better.

Training makes newly appointed employees fully productive in a minimum of time. It is equally necessary for the employees who are already on their jobs, for, they have to be possessed with the knowledge of new developments in their field of operation and equipped with the skills required for handling new machines, equipments, systems, tools and techniques to improve their job performance and maintain competency in their field. Training attempts to bring about positive changes in the knowledge, skills and attitudes of the employees. It is a continuous on-going process.

4. Definition

Edwin B. Flippo defines training as the act of increasing the knowledge and skills of an employee for doing a particular job". The Oxford English Dictionary (1989) defined training "as a systematic instruction and exercise in some art, profession or occupation, with a view to achieve proficiency in it". According to Gates training is "the process whereby individuals acquire knowledge, skills and attitudes, through experience, reflection, study or instruction". To conclude, training is a means for maintenance and improvement of the level of performance by employees in organisations by updating their knowledge and skills continuously.

24. Training and Education

Though, both education and training are concerned with human change and learning, education is broader in its scope. According to R.G. Haster "training attempts to help those who are or will be performing a certain job to achieve successful role behaviour, whereas 'education' is tied to the goals of the individual, more than to those of the organisation, though some overlapping between the two may be anticipated. The table 6 given below draws a distinction between training and education more clearly.

Table – 6: **Distinction between Training and Education**

Sl. No	Training	<i>Education</i>
1.	Application oriented	Theoretical orientation
2.	Demands job experience	Class room learning
3.	Explanation on specific tasks	General concepts predominate
4.	Has narrow perspective	Has broad perspective

25. Objectives of Training

The following are the objectives of the training:

a. To know and accept the overall goals and objectives of the organisation :

Each employee regardless of level or place of employment in the organisation needs to know its overall goals, objectives and its mission. These have to be set in the minds of each employee and are accepted. The training that would create awareness and make each employee accept the organisation’s mission, goals and objectives helps the institution to overcome indiscipline, indifferent attitude and so on. It creates entirely a new organisational culture that promotes organisational growth and prosperity.

b. To improve job related skills

Some employees do not perform their jobs well due to inadequate skills and knowledge of their assignments. With the result, they produce poor quality and volume of output, waste resources, damage equipment and tools, respond insufficiently to the instructions of higher officials and so on. They need training to overcome these limitations and for fitting themselves to their jobs.

c. To update knowledge and skills

Organisations need to help their employees to keep up their knowledge and skills in tune with the contemporary trends. This is particularly true in these days of explosive improvement and innovations in science and technology, wherein knowledge and skills once possessed go obsolete within a very short time. To combat such speedy obsolescence and to meet the global competition in a given area, it becomes necessary

responsibility to organisation and individuals working in such organisations to update their skills and knowledge from time to time.

d. To prepare for higher responsibilities

The personnel need to have opportunities for advancement in their careers. Concurrently, they should also be striving for assuming higher responsibilities and performing more complex tasks with competence. For this purpose, an organisation may design a system whereby opportunities are made available to personnel for their career advancement and simultaneously preparing them through training for higher positions. This does help them to seek individual prosperity and increases their morale and responsibility.

e. To develop proper job-related attitudes

The employees both new incumbents and those already in the organization have to be trained to develop positive and helpful attitudes towards their jobs, superiors, colleagues and juniors, the goals, policies and procedures of the organisation and to the environment of the work place. Employees sometimes tend to be ignorant, indifferent and even hostile towards their jobs in their inter-personnel relations and to the work culture. Attitude development and socialisation of the personnel is essential for generating teamwork, ensuring discipline and maintaining consistent behaviour.

f. To mould personnel to adapt to organisational changes

Organisations need to be dynamic to cope with, adjust and adapt to the changes in technology, and other environmental changes. New methods, techniques, processes and equipments have to be adopted. New and innovative approaches to planning, structuring, motivation, leadership control and conflict management have to be evolved to overcome resistance from any corner caused by fear, anxiety and unfamiliarity. The personnel have to be conditioned to learn new skills and capabilities to enable them to be receptive to required changes and to assimilate them. Great many changes in information in information storage media, information organizing and accessing systems and services so on have laid greater stress on training LIS staff to adapt themselves to ongoing changes.

26. Benefits of Training

Employee training yields benefits to both the organisation and the employees.

Benefits of Training to Organisation

The benefits of the training to the organisation include :

- a. **Systematic Learning** : A well structured training programme enables employees to learn systematically within shortest possible time to reach the acceptable level of performance in their job. Soon after the training the employee starts performing the job without waste of time.
- b. **Reduce the learning time** : In the absence of training the employee has to learn job by trail and error or by observing others, and many a time fail to learn job at all. Such a learning phase takes lot of time and until then, the job performance could be much below the expected level.
- c. **Better performance** : Training increases the employees skill in the performance of a particular job. An increase in skill helps in increasing both quantity and quality output. Thus trained employee shows better productivity and higher quality than an untrained employee.
- d. **Helps in spotting out promising employees for promotion** : When totally new skills are required by an organisation, it has to go through selection process of outsiders which is tedious, time consuming and expensive job. Training can be used in spotting out promising men/women and assign through promotions such jobs requiring new skills. This helps the organisation to overcome the difficulty of new recruiting process.
- e. **Better utilisation of machines and materials** : Machines and materials are handled economically resulting in elimination of wastage. It leads to reduction in cost of production.
- f. **Economical supervision** : If the employees are given proper training, the responsibility of supervision is lessened. Training does not eliminate the need for supervision, but it reduces the need for detailed and constant supervision.
- g. **Uniform procedures** : With the help of training the best available methods of performing the work can be standardized and made available to all employees. Standardisation will make high levels of performance rule rather than the exception.
- h. **Reduction in accidents**: Since the workers are trained in handling equipment/instrument and are taught various safety measures, rate of accidents falls considerably.

- i. **High morale:** Training helps in reducing absenteeism, labour turnover and grievances among the employees. This increases the morale of the workers.
- j. **Better climate:** An endless chain of positive reactions results from training such as higher productivity, better quality, efficient use of resources, more financial incentives, stress on promotion, less conflicts and so on.

Benefits of Training to Employees

Training is useful not only to the organisation, but to its employees also. The following are some of the benefits of training to the employees:

- a. **Increased skills and knowledge:** The employees acquire new skills and knowledge which will help them improve their career.
- b. **Increased output:** The work output of the staff is increased as a result of training. Because of this, they earn higher wages and bonus.
- c. **Opportunity for promotion:** It is a great opportunity for the efficient workers to sharpen their skills and enhance their knowledge during training. This helps them to try for promotion to higher jobs.
- d. **Increased mobility:** There exist lot of opportunities in various sectors for trained LIS professionals and hence they shift from one organisation to another in order to advance in their career.
- e. **High morale :** Trained employees know their jobs fully and have greater job satisfaction. This increases their morale.
- f. **Less accidents/damages :** Trained workers are less prone to accidents/damages as they know how to handle risky equipments using safety devices. They also reduce wastages as they will know how to use resources optimally.

27. Kinds of Training Programmes

There are various kinds of training programmes. They vary in their purpose, content, approach, duration, etc. These may be grouped as under :

- a. **Induction or orientation training :** It is concerned with orienting new employees to the organisation and familiarising him/her to rules, regulations, procedures, etc. When newly appointed employee reports for work, it is necessary that he or she is helped to get acquainted with the work environment and the fellow employees.

An induction programme tends to achieve the following objectives :

- ii. To build up the new employee's confidence in the organisation and in himself/herself so that he may become an efficient employee.
- iii. To give the new entrant the information that he needs such as locations of locker rooms, cafeteria and other facilities, time to break off, leave rules, etc.
- iv. To promote a feeling of belongingness and loyalty to the organisation among new-corners.
- v. To ensure that new employees do not form false impression regarding the new place of work because first impression is the best impression.

- b. **Job training** : Job training is given in different ways to make the worker proficient in handling machines, equipments and materials so that operations are smooth and faultless and accidents are avoided.

Various on-the-job training and off-the-job training techniques are adopted to acquaint the employees in handling the equipment and raw materials correctly and perform their jobs efficiently. The purpose of job training is to enable them to learn new techniques, skills and knowledge.

- c. **Craft Training** : Training for craftsmanship involves preparation, not for a single job but for the many types of related jobs which can be assigned to a competent craftsman. The extent and intensity of training vary from craft to craft. Apprenticeship training is the major method adopted for this type of training.

Under apprenticeship training, the trainee is placed under the supervision of an experienced employee who teaches the trainee necessary skills and observes his/her performance. The advantages of apprenticeship training to the trainees are that they receive stipend while learning and acquire valuable skills. In India apart from apprenticeship training there are many earn when you learn schemes both in the private as well as public sector undertakings, which also attribute to craft training.

- d. **Learner Training** : Learner training programme is meant for those people who do not have sufficient vocational background and knowledge about the jobs for which they have been selected. Such employees are sent to vocational schools for some time where they

get some education and learn equipment operations. Such trainees are placed on regular work assignments after they complete the training programme.

- e. **Internship Training** : Under this method, the vocational or professional institute enters into arrangement with a big business enterprise for providing practical skills to its students by gaining actual work experience. Internship training is usually meant for such vocations where theoretical knowledge has to be supported by practical experience on the job. The period of such training varies from six months to two years. The trainees do not belong to the business enterprises, but they come from the vocational or professional institutions. Usually the enterprises giving training to trainees absorb them later on by offering suitable jobs.
- f. **Refresher Training or Retraining** : Refresher training is meant for the old employees of the enterprises. The basic purpose of refresher training is to acquaint the existing workforce with the latest methods of performing their jobs and improve their efficiency further. The trainee will have an opportunity to update his / her knowledge, skill during refresher training.

8.28. Methods of Training

A wide range of training methods and programmes have been devised over the years by organisations and training experts. Different training methods and programmes are suitable for different categories of personnel involved in different types of jobs in the organisation : managerial and non-managerial, technical, administrative, skilled, unskilled, senior, junior and so on. Each organisation has to make choice of techniques and programmes relevant for its training needs and organisational conditions.

These methods of training may be grouped into the following categories.

- (1) Vestibule training
- (2) On-the-job training
- (3) Off-the-job training

28.1 Vestibule training

In this method employees are taken through a short course under working conditions that are similar to actual shop, sales or office conditions. The name vestibule is used because of the

resemblance of the school to a vestibule through which one passes before entering the main hall of a house. Vestibule schools are adapted to the same general type of training problem that is faced at the actual place of work. In this method, an attempt is made to create working conditions which are similar to the actual work environment.

Vestibule training is suitable where it is not desired to put the burden of training on line supervisors and where a special coaching is required. The staff of the vestibule school consists of expert and specialist instructors.

The merits of vestibule training are :

- a) It gives more emphasis on teaching skills than on getting production.
- b) Trainees get an opportunity to get accustomed to work-routines and recover from their initial nervousness before going on the actual jobs.
- c) It avoids the inconvenience of on-the-job training method. Therefore, the employee is able to learn the whole process within a short time.
- d) It does not interfere with the regular production in the course of the training being imparted.

The demerits of vestibule training are :

- a) The artificial training atmosphere may create adjustment problems for the trainees when they return to the place of job
- b) The vestibule training is relatively expensive because there is duplication of equipment and conditions found in a real work-place.

28.2 On-the-job Training

This is considered to be the most effective method of training the operative personnel. Under this method, the worker is trained on the job and at his work place. This enables him to get training under the same working conditions and with the same processes, materials and equipment that he will be using ultimately. The responsibility of the training is given to his immediate supervisor who knows exactly what the trainee should learn to do.

On-the-job training has the main advantage of strongly motivating the trainee to learn. It permits the trainee to learn at the actual equipment and in the environment of the job. On-the-job

training methods are relatively cheaper and less time consuming. Moreover, line supervisors take an important part in training their subordinates. This increases the effectiveness of training.

The limitations of the on-the-job training are :

- It takes longer time for the employee to learn the required skills.
- Expert guidance may not be available to the employee. The weaknesses of the supervisor or worker from whom the new employee learns are passed on to him.
- There is disturbance in the production schedules. The supervisor is more interested in getting work than teaching the skills.

There are three forms of on-the-job training which are discussed below :

- a) **Coaching** : On-the-job coaching is a procedure by which a superior teaches job knowledge and skills to a subordinate. The emphasis in on-the-job coaching is on learning by doing.
- b) **Understudy** : Here, a superior gives training to a subordinate as his under-study. The subordinate chosen for under-study is designated as the heir-apparent and his future depends upon what happens to his boss. The purpose of under-study is to prepare someone to fill the vacancy caused by death, retirement, promotion or transfer of the superior.
- c) **Position rotation** : The purpose of position rotation is to broaden the background of the trainee in various positions. The trainee is periodically rotated from job to job instead of sticking to one job so that he acquires a general background of different jobs.

28.3 Off-the job Training

As the name implies, off-the-job training is provided to the employee away from his job. It is generally theoretical in nature and is imparted in a class-room type atmosphere. It is associated more with knowledge than with skills. Thus, classroom training is used when concepts, theories, problem solving skills and new attitudes are to be taught. There are certain aspects of nearly all jobs that can be learnt better in the classroom than on the job. Orientation about organisation and safety training can be accomplished most effectively in the classroom. Various forms of off-the-job training are:

- a) **Lecture method** : The standard instruction method suitable for operative employees is a 'formal lecture' by an instructor to the trainees. The instructor possesses a considerable depth of

knowledge of the subject at hand. He seeks to communicate his thoughts in such a manner as to interest the class and cause them to retain what he has said. The trainees generally take notes as aid to learning.

The lecture method can be easily used for training large groups. Thus, the cost per trainee is low. However, it has certain limitations also. The learners may be passive. It violates the principle of learning-by-doing and constitutes one-way communication. But trainees may be permitted to ask questions. This will provide feedback from the trainees. Lectures can easily be combined with other techniques. Thus, a trainer may conduct a class by the combined lecture-discussion method. He may lecture only to add new information that the group does not possess. Formal reading assignments may be given, demonstrations may be presented and films may be shown along with the lecture.

The other classroom methods are conference, case study and role playing. But these methods are not of much value for the operative employees. These can be employed to train and educate the employees preparing for various executive positions.

b) Programmed Instruction

Programmed instruction (sometimes packaged in a device called a teaching machine) was developed in the late 1950's for both school and industrial applications. Cook and Mechner have defined programmed instruction as the application of the science of learning to the task of education and training.

The key features of programmed learning are :

- students learn at their own pace;
- instructors are not a key part of the learning;
- the material to be learnt is broken down into very small units or stages;
- each step logically builds upon those that have preceded it;
- the student is given immediate knowledge of results for each answer he gives; and
- there is active participation by the learner at each step in the programme.

The core feature of programme instruction is participation by the trainee and immediate feedback to him. The programmed instructions include elaborate teaching machines, films, sound tapes, programmed books, illustrations, printed material, diagrams. Whatever may be the method of programmed instructions, it basically provides feed-back to the learner whether his response is correct or not. These days, programmes have been devised which take into account individual differences in background. If a student is unable to give the right answer to a question

to a series of questions, he will be directed along a different branch of the programme to provide him with the fundamentals he has missed.

c) Computer-Assisted Instruction

Computer-assisted instruction is based on some of the learning principles employed in programmed instruction. It is often used to provide practice to help trainees learn material that is well structured such as grammar and basic mathematics. It can also be used as an adjunct to other educational methods to develop problem-solving skills. Computer-assisted instruction is costly. It is used mostly to teach basic skills in schools. Its adaptation to teaching job skills in industry has been slow.

Programmed instruction is used primarily for teaching factual knowledge such as mathematics, foreign language, and job routines. It is not used to develop philosophical concepts, attitudes, or clinical problem-solving skills. The cost of creating a single programme is very high.

29. HRD and Training

Some scholars consider HRD as co-terminus with training. However, training is merely a subsystem of HRD. Training alone is not enough for accomplishment of development of human resources. Training is specific in purpose and looks at the short term objective of bridging the gap between actual and expected performance. The HRD concept is wider, and the commitment is for the long-term. HRD embraces almost all areas of an organization and places emphasis on the development of individuals as an integral part within an organization, along with the development of methods and systems.

HRD is a process concerned with an organized series of learning activities designed to produce behavioural changes in the human resources in such a way that they acquire desired level of competence for present and future roles. It attempts to enable people to overcome their deficiencies and develop their productive potential so that they are able to contribute to the ethical and harmonious growth of the society, fulfill their individual needs and wants and with pleasure. In other words, HRD brings about “all-round development” of the people so that they can contribute their best to the organization, society and the nation.

30. Skills Required for LIS Personnel

To organise Library and Information Centers properly so as to provide efficient and effective services, the personnel working there need to update their knowledge, skill and ability. The Table 6 lists the professional and managerial skills and personal attitudes required to be developed among LIS professionals.

Table 6
Professional and Managerial Skills and Personal Attitudes required by LIS Professionals

<p>Profession Information Skills</p> <ul style="list-style-type: none">➤ Identifying, anticipation and analysing users and organisational information needs;➤ Technological skills;➤ Subject expertise;➤ Knowledge of disparate information resources and how to access/ integrate them;➤ Familiarity with research methods;➤ Ability to evaluate information;➤ Ability to organise and store information for effective retrieval;➤ Ability to add value to information (presentation, editorial and publication skills);➤ Knowledge of delivery mechanisms and means of disseminating information;➤ Training, education and consultancy skills;➤ Knowledge management;➤ Knowledge of legal, economic and consultancy skills;➤ Sourcing and acquiring internal information;➤ Organisation/ structuring of information;➤ Database design;➤ Information analysis and consolidation;➤ Information technology skills;➤ Familiarity with external electronic sources and their access;➤ Management of internal database and intranet applications; <p>Management Skills</p> <ul style="list-style-type: none">➤ Strategic planning;➤ Financial management;➤ Human resource management;➤ Project management;➤ Change management;➤ Communication skills;➤ Marketing skills; creativity;➤ Liaison and negotiating skills;➤ Leadership skill;➤ Futuristic vision;➤ Negotiation skills;➤ Team play and team building skills;➤ Interpersonal skills;➤ Training and development;➤ Human psychology and motivation; <p>Personal Attributes</p> <ul style="list-style-type: none">➤ Strategic thinking;➤ Professional image;➤ Competence in problem solving, tactical, sensitivity and vigilance;➤ Creativity – imaginative, initiative, flexibility, lateral thinking;

- Interpersonal – influential, diplomatic, persuasive, engendering trust approachable confident;
- Involvement – interest, curiosity, motivation, high level of responsibility and willingness to accept accountability

31. Training for LIS personnel

To inculcate skills above mentioned among LIS personnel, there exist various kinds of training programs both under ‘on-the-job’ and ‘off-the-job’ streams in India.

Some of the important training programs are various degree, diploma and certificate courses offered by universities, institutions, agencies and associations through formal and distance mode, apart from other short period training programs. The table 8 provides details of LIS programmes offered at different levels and the certificate/ diploma/ degree courses. There are more than 125 institutions/ agencies including over 70 post-graduate departments in universities offering these programmes/ courses. During recent past many institutions have started distance education programmes at different levels in Library and Information Science.

32. Modules for Training LIS Professionals

The field of Library and Information Studies is a dynamic interdisciplinary area of study, drawing as it does upon such disparate disciplines as management studies, computer science, communication studies and librarianship as well as more peripheral subjects such as psychology, linguistics and statistics. To be successful, any curriculum in Library and Information Studies must be concerned as a logical, integrated and coherent whole whilst retaining a flexibility and responsiveness to change. Furthermore, LIS studies and training must include a strong practical component which must be fully catered for within the curriculum.

Table 8
Six Levels of Library & Information Science Courses / Programmes offered in India

Sl. No	Level	Course/Degree	Nomenclature	Min Qualification required	Duration
1	Certificate	Certificate in Library & Information Science	CLISc	SSLC-PUC	3-9 months.
2	Diploma	Diploma in Library & Information Science	DLISc	SSLC-PUC	6 months - 2 yrs.
		JOC Diploma in Library Science	DLISc (JOC)	SSLC	2 yrs.

3	Bachelor Degree	Bachelor of Library & Information Science	BLISc	Degree	1 yr.
		Bachelor of Arts (Hons)(Pass) (Optional)	BA	10+2	2-3 yrs.
4	P-G Diploma	P-G Diploma in Information Technology	PGDIT	BLISc	1 yr.
		P-G Diploma in Archives and Documentation Management	PGDADM	Degree	1 yr.
		Post-MLISc Diploma in Library Automation	PGDLA	MLISc	1 yr.
5	Master's Degree	Master of Library & Information Science	MLISc	BLISc	1 yr.
		Master of Library & Information Science (Integrated)	MLISc	Degree	2 yrs.
		Master of Information Science	MISc	Degree	2 yrs.
		Master of Science (Library & Information Science)	MSc(LIS)	Degree	2 yrs.
		*Master of Information management	MIM	BBM, BCom, BSc, BA with Maths at PU (10 + 2) level	2 yrs.
		Associateship in Information Science	AISc	Degree & BLISc, MBBS	2 yrs.
6	Research	Master of Philosophy	MPhil	MLISc	1-2 yrs.
		Doctor of Philosophy	PhD	MLISc	3-5 yrs.

The designing of curricula for this increasingly important subject which needs in different contexts inclusion or exclusion of certain topics and at times giving emphasis to certain individual topics such as Information Technology is a complicated and complex area., Hence a modular curriculum with different modules simplifies the task, allowing the trainees to choose the modules they desire to study and specialize. A few such training modules are given below to ponder over them.

As early as in 1982 J A Lang in the UNESCO report proposed a Modular Approach to the curriculum for Information Studies. The curricula for the general information programmes of

UNISIST in 1987 was published by UNESCO. The core modules and elective modules of this curricula are presented here under.

Core modules

1. Information in its social and communication contexts
2. Information users
3. Quantitative methods
4. Research methods
5. Information sources
6. Information storage and retrieval systems
7. Information services
8. Electronic data processing
9. Application of information technology
10. Telecommunication and networking of information systems
11. Management of information systems and services
12. Economics and marketing of information.

Elective Modules

1. Design of computer-assisted information system
2. Sectoral/subject oriented information sources and systems
3. Planning and design of building and facilities for information centres and libraries
4. Online searching
5. Health and welfare library and information services
6. Agriculture library and information services
7. Audio-visual studies
8. Printing, book binding and conservation
9. Linguistics and information studies
10. Community information studies
11. Psychology and information studies

12. Industrial library and information services
13. Government library and information services.

Modules for Training in LIS suggested by the UGC

University Grants Commission appointed a Curriculum Development Committee for Library and Information Science in 1990. The modules recommended by the Committee for MLISc programme are given below :

Core Papers :

1. Information and Communication : Evolution and Development
2. Library and Information Management : Sources and Services
3. Computer Technology, Library Automation and Information System
4. Information Processing and Retrieval
5. Research Methodology and Informatics

Elective Papers :

1. Comparative and International Librarianship
2. Higher Education and Academic Library System
3. Communication, Mass Media and Public Library
4. Bibliographic Control
5. Users Education and user studies
6. Education for Library and Information Science

UGC Curriculum Development Committee (1998)

A similar approach was also advocated in the Asia-Pacific report on “A curriculum for an Information Society” (1998). Dr. Vasanth Gowariker, in his article on Higher Education in India in the 21st century contributed to ‘Higher Education Challenges and Visions’, published by the University of Pune (1999), expressed a view to changes in the approach in the higher education and suggested a “Cafeteria” mode for the courses offered by the universities. Considering the scholarly guidelines offered in this article the Curricular Development Committee (CDC) constituted by the U G C during 1998 also followed the modular approach to the curriculum and prepared 6 core modules and 1 module on electives. These modules are listed below:

MODULE – I: Foundations of Library and Information Science

MODULE – II: Knowledge Organization, Information Processing and Retrieval,

MODULE – III: Information Sources, Products and Services

MODULE – IV: Management of Library and Information Centres/Institutions

MODULE – V: Information Technology: Basics and Applications

MODULE – VI: Research Methods and Statistical Techniques

MODULE – VII: Electives: Information Systems

Under **Module VII** – Electives, following are suggested:

1. Business Information System
2. Environmental Information System
3. Biotechnology Information System
4. Health Science Information System
5. Archival, Museum and Archeological Information Systems
6. Legal Information Systems
7. Agricultural Information Systems
8. Social Sciences Information Systems
9. Industrial Information Systems
10. Rural and Community Information Systems

14. Short Term Training Programmes

Orientation Programme organized by UGC - Academic Staff College.

As many as 48 UGC – Academic Staff Colleges throughout the country organize four week long orientation programme for teachers and Library and Information Science professional working in degree colleges and universities. These programmes have been designed to new teachers and LIS professionals who have less than eight years of experience. The curriculum for these programmes have been organized in five components. These are:

Component A: Awareness of linkages between society, environment, development and education, including environmental awareness, Indian constitution & women empowerment.

Component B: Philosophy of education, Indian educational system and Pedagogy.

Component C: Subject upgradation.

Component D: Management and personality development.

Component E: Distance education.

Library schools in different universities have their own syllabi with variations. Some schools have changed their syllabi during the last few years whereas some remained without any changes.

While Component 'A' aims at helping the teachers and librarians to realize the larger context of education and the role of the teacher/ librarians in a society, Component 'B' is to impart basic skills that a teacher needs for effective class-room teaching and for librarians for understanding supportive role of libraries in higher education system. The Component 'C' has two major thrusts: (i) to enable the teacher to translate the relevant syllabus into a detailed plan of classroom presentation, and to effectively present the basic concepts at the appropriate level; and (ii) to make the teacher/ librarians self sufficient in keeping himself/herself continuously abreast of the new knowledge in the discipline.

The Component 'D' facilitates the teacher/librarian to familiarize with the organisation and the management of the college/ university. It aims to make the teacher to understand the interlocking of the various subsystems within the college/ university and appreciate the role and functions of a teacher/librarian within the system.

Component 'E' aims to discuss theoretical and philosophical foundation of Distance Education including working of Open University and Institutes of Distance Education/ Correspondence Courses. Computer Awareness is added part to make every teacher/ librarian to understand & learn basic skill of computer handling. The training consists of a series of lectures, demonstrations, group discussions, panel discussion on emerging issues & problems, exercises, assignments and a test at the end of the programme. A written feedback after each session of 90 minutes participant trainee is a special feature of this programme.

Refresher Courses

As envisaged in the National Policy of Education, UGC Academic Staff Colleges organize Refresher courses in different subjects with the joint cooperation of the respective post-graduate departments in universities and so also Refresher courses in Library and Information Science. The refresher courses are meant for teachers/ librarians of colleges and universities with more than 5 years of experience. These courses provide opportunities for serving teachers/ librarians to keep abreast of the latest advances in the various subjects. They also provide a forum for them to exchange their experiences with the peer group and to mutually learn from each other. Each refresher course is designed on a specific theme of current importance and emerging issues.

In the orientation programmes nearly 80% sessions are meant for General Components viz., A, B, D & E and about 20 % sessions are devoted for subject upgradation. In the case of Refresher courses it is vice-versa.

INFLIBNET Programmes

INFLIBNET – an unit of UGC has organizes throughout the country a week long training programme for librarians and teachers to train them in handling SOUL package. The programme apart from giving details of various modules of the package, gives hands on training to participants.

Apprentice Training Programmes

During recent past a large number of institutions are appointing fresh graduates and post graduates in Library and Information Science as Library Apprentice. The period of appointment is normally for 1 year. During the course of time the trainees are assigned to perform library operations in almost all sections and hence gain practical experience. They are paid a remuneration of different ranges depending upon the type of institution.

Thus there are variety of training programmes initiated by different agencies and institution to upgrade the knowledge & skills of working LIS personnel. However, large many of these programmes are of the job training programmes.

Training Programmes conducted by other Agencies/ Institutions

Various agencies, universities and institutions such as DESIDOC, NASSDOC, various PG Departments in universities are often organizing training programmes on specific issues, the present thrust being digitization of resources and digital library development. The District Training Institutes in Karnataka often organize training programmes to library professionals at different levels working in the Department of Public Libraries.

8.32. Check your progress

1. What is Human Resource Management?

Ans:- “the total knowledge, skills, creative knowledge, abilities, talents, and aptitudes of an organization’s workforce as well as the value, attitudes and beliefs of the individuals involved.”

2. What is Human Resource Development (HRD)?

Harbinson and Myers have aptly defined Human Resource Development as “the process of increasing the knowledge, skills & capabilities of all the people in the country”.

3. What are Likerts Four Systems of Management?

Ans:- Exploitive-authoritative, Benevolent- authoritative, Consultative, Participative

4. Who developed Path-Goal theory of leadership (1971)?

Ans:- Robert House

6. The most well known theory of motivation is Abraham Maslow’s hierarchy of needs (Yes/ No)

Ans:- Yes

8.33. Summary

34. Questions for self study

1. Define HRM and discuss its scope and objectives.
2. What do you mean by HRD ? Explain its attributes.
3. State and explain the objectives of HRD.
4. Write short notes on the following:
 - a) Difference between HRM and Personnel Management
 - b) Functions of HRM.
 - c) Need for HRD in library and information science.
5. Define the term leadership and explain its functions.
6. Briefly discuss the leadership styles.
7. Enumerate important behavioral theories of leadership and briefly explain any one of them.
8. Write a brief essay on contingency theories.
9. Write short notes on the following:
 - Likert's Four Systems of management.
 - Trait theories.
 - The managerial grid.
 - Fielder's contingency model.
 - Vroom-Yetton leader participation model.

- i. Define motivation and describe its importance..
- ii. What are the implications of Theory X and Theory Y for motivational practices?
- iii. Explain Maslow's theory of hierarchy of needs.
- iv. Compare and contrast ERG Theory and Motivation-Hygiene Theory.
- v. Explain briefly the integration of contemporary theories of motivation.

- vi. Write short notes on the following:
- a. Reinforcement Theory
 - b. Equity Theory
 - c. Goal Setting Theory
 - d. Task characteristic theories
 - e. Cognitive Evaluation Theory.

37. References

1. Aswathappa, K Human resource and personnel management: Texts and cases ed 3. New Delhi: Tata Mc-Graw Hill,2002. Chapter 1.
2. Bryson, J O. Effective library and information center management. Aldershot: Gower, 1990. p 71-93.
3. Flippo, Edwin B, Personnel management. ed 4. New York: Mc-Graw Hill ,1984.Chapter 1.
4. Milkovich, George T and Boudrean, Johri W. Human resource management. Chacago: Irwin, 1997. Chapter 1.
5. Werther Jr, William and Davis, Keith. Human resources and personnel management. ed 4. New York: Mc-Graw Hill, 1993. p 11.
6. Bryson, J O. Effective library and information center management. Aldershot: Gower, 1990.
7. Evans, G Edward, Management techniques for librarians.New York: Academic Press, 1983.
8. Milkovich, George T and Boudrean, Johri W. Human resource management. Chacago: Irwin, 1997.
9. Robbins,Stephen P and Coulter, Mary. Management. 5th ed. NewDelhi: Prentice-Hall of India, 1998.
10. Stueart, Robert D and Moran, Barbara B. Library and information centre management. 6th ed. Colorado: Libraries Unlimited, 2004..
11. Werther Jr, William B and Davis, Keith. Human resources and personnel management. Ed New York: Mc-Graw Hill, 1993.



KARNATAKA STATE OPEN UNIVERSITY
MUKTHAGANGOTRI, MYSORE –570 006

MASTER OF LIBRARY AND INFORMATION SCIENCE
M.Lib.I.Sc - 4

Management of Information Resources

BLOCK - 3

Block

3

SYSTEMS ANALYSIS

Unit-9
Systems analysis and design

Unit-10
Work flow and organizational routines

Unit-11
Monitoring techniques

Unit-12
Evaluation techniques

INSTRUCTIONAL DESIGN AND EDITORIAL COMMITTEE

COURSE DESIGN

Prof. D. Shivalingaiah Chairman
Vice Chancellor
Karnataka State Open University
Mukthagangotri, Mysuru-570006

Prof. M. Mahadevi Convener
Dean (Academic)
Karnataka State Open University
Mukthagangotri, Mysuru-570006

COURSE COORDINATOR

Shilpa Rani N R
Chairperson
Department of Studies in Library and Information Science
Karnataka State Open University, Mukthagangotri, Mysuru-570006

COURSE EDITORS

Prof. M A Gopinath
Professor (Retd.) in LISc
DRTC, ISI Building, Mysore Road,
Bangalore

Dr. N. S Harinarayana
Senior Lecturer
Dept. of Library & Information Science
University of Mysore, Mysore -06

Prof. A Y Asuudi
Professor (Retd.) in LISc
Bangalore University
Bangalore

Prof. V. G. Talwar
Professor in LISc
Dept. of Library & Information Science
University of Mysore, Mysore -06

COURSE WRITER

Dr. Khaiser Nikham
Reader
Dept. of Library & Information Science
University of Mysore, Mysore -06

BLOCK EDITOR

Prof. N B Pangannaya
Retd. Professor of LISc,
University of Mysore
Mysore -06

PUBLISHER

Registrar
Karnataka State Open University
Mukthagangotri, Mysuru-570006

Developed by Academic Section KSOU, Mysore

Copy Right: KARNATAKA STATE OPEN UNIVERSITY,2017

© All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from Karnataka State Open University.

This courseware is printed and published by The Registrar, Karnataka State Open University, Mysuru for limited use only. No individual or collaborative institution can use / print / distribute in any form without the written permission from KSOU. For user rights of this content and for other queries contact The Planning and Development Officer, KSOU, Mysuru 570 006.

Digital delivery of this courseware is also available for those who opt. For more details visit

www.ksoustudymaterial.com or www.ksoumysore.edu.in/digitalcontent

M.Lib.I.Sc – 4 : Management of Information Resources
Block – 3: Systems Analysis.

Introduction

In recent years, the problems of managing libraries have been multiplying at a frantic rate. The operations of libraries have become increasingly complex, involving in many cases mechanisation, centralisation, and computerisation of library services. There has been a rapid growth in the size and scope of collections, in the variety of services offered and in the expectations of users. A concomitant expansion has taken place in the development of cooperation arrangements among libraries. Therefore, the use of traditional and intuitive approaches in day to day work situations is even more difficult.

In this context, management techniques especially work analysis technique help in studying any work situation in libraries and to take necessary steps to ensure smoothness in work flow. In general, these techniques are useful in analysing the present procedures as a prelude to design of a new systems. This unit discusses some of the techniques, such as method study techniques, work measurement techniques and cost analysis techniques. Many of the techniques described require no particular mathematical background, and are essential extensions of commonsense.

Prof. N B Pangannaya



**KARNATAKA STATE OPEN UNIVERSITY
MUKTHAGANGOTRI, MYSORE –570 006**

Master of Library and Information Science

M.Lib.I.Sc - 4

Management of Information resources

BLOCK - 4

BLOCK

4

Intellectual Property Rights and Cyber Laws

Unit – 13

Overview of IPR, IPR Laws in India

Unit – 14

Patent Information, Importance and Use

Unit – 15

Cyber Laws and IT Act of India

Unit – 16

IPR Laws in India

INSTRUCTIONAL DESIGN AND EDITORIAL COMMITTEE

COURSE DESIGN

Prof. D. Shivalingaiiah

Chairman

Vice Chancellor

Karnataka State Open University

Mukthagangotri, Mysuru-570006

Prof. M. Mahadevi

Convener

Dean (Academic)

Karnataka State Open University

Mukthagangotri, Mysuru-570006

COURSE COORDINATOR

Shilpa Rani N R

Chairperson

Department of Studies in Library and Information Science

Karnataka State Open University, Mukthagangotri, Mysuru-570006

COURSE EDITORS

Prof. M A Gopinath

Professor (Retd.) in LISc

DRTC, ISI Building, Mysore Road,

Bangalore

Prof. A Y Asudi

Professor (Retd.) in LISc

Bangalore University

Bangalore

Dr. N. S Harinarayana

Senior Lecturer

Dept. of Library & Information Science

University of Mysore, Mysore -06

Prof. V. G. Talwar

Professor in LISc

Dept. of Library & Information Science

University of Mysore, Mysore -06

COURSE WRITER

Dr. K N Prasad

SRELS, Bangalore

Prof. N B Pangannaya

Rtd. Professor of LISc

V K Gupta

Senior Scientist

NISTADS, New Delhi

BLOCK EDITOR

Prof. V. G. Talwar

Professor in LISc, Dept. of Library & Information Science

University of Mysore, Mysore -06

PUBLISHER

Registrar

Karnataka State Open University

Mukthagangotri, Mysuru-570006

Developed by Academic Section KSOU, Mysore

Copy Right: KARNATAKA STATE OPEN UNIVERSITY, 2017

© All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from Karnataka State Open University.

This courseware is printed and published by The Registrar, Karnataka State Open University,

Mysuru for limited use only. No individual or collaborative institution can use / print / distribute in any form without the written permission from KSOU. For user rights of this content and for other queries contact The Planning and Development Officer, KSOU, Mysuru 570 006. Digital delivery of this courseware is also available for those who opt. For more details visit www.ksoustudymaterial.com or www.ksoumysore.edu.in/digitalcontent

Block Introduction

Intellectual property refers to creations of the mind: inventions in field of technology, literary and artistic works, and symbols, names, images, and designs used in commerce. The Government grants protection to such inventions for a limited period by developing legal framework in order to encourage the inventors and authors to disclose their creations for the benefits of the society. The laws have to keep pace with the developments in technology enabling protection to inventions in several new areas like information technology, biotechnology, software, and databases. Most of these developments are having tremendous impact on the role and functions of the library and information scientists. The library and information personnel are required to understand these developments. This Block provides a basic understanding about the intellectual property rights, patent information, cyber laws and IT Act in India.

The intellectual property rights which includes an understanding of the meaning of intellectual property and the basic concepts of its elements like patent, copyright, trademark, design, geographical indication, layout design of integrated circuits, and trade secret or confidential Information. The Unit also focuses upon the IPR laws in India and the international treaties and conventions on IPR, protection of software, protection of databases, protection of traditional knowledge and the issues of interest to library and information science professionals in the context of IPR.

The patent information provides an easy source of prior art in a field of technology. Its importance lies in planning and management of R & D, particularly, in identifying directions for research and development and technological opportunities, choosing research subjects, and understanding business trends. The library and information professionals play a key role in providing latest information in R&D organizations, and with the emerging importance of patent information, they will need to equip themselves with the tools and techniques to effectively manage patent information.

With international competition becoming ever more intense since establishment of World Trade Organization (WTO) in 1995, there is no doubt that the successful use of patent information in R&D is going to be the key. The characteristics of patent information, particularly, the bibliographic information, technical information, references in patent documents, address and jurisdiction of the Patents Office in India, the primary and secondary sources of patent information in India, and the international patent databases. The Unit also provides the basic information about the international patent classification, patent search, patent statistics, and the use of patent information for R&D scientists. The Internet, or simply the Net, is fast emerging a popular medium of the exchange of information worldwide. It consists of millions of smaller business, academic, domestic, and government networks, which together carry various information and services, such as electronic mail, online chat, and the interlinked Web pages and other documents of the World Wide Web. The growing use of the Internet has given rise the need to regulate the domain of Internet, which in turn has necessitated the Cyber Laws. In today's highly digitalized world, almost everyone is affected by cyber laws.

The development of the cyber laws and in particular shares information about the IT Act of India. The term “Cyberlaw.” refers to all the legal and regulatory aspects of Internet and the World Wide Web. The cyber laws are needed to prepare a legal ground in order to prevent countermanding or reversal of instructions given on digital medium and deal with the operational security for the systems including frauds, technical failures and errors, data protection and record preservation. The salient features of the IT Act of India enacted in 2000 have been indicated in this Unit, for example, provisions relating to digital signature, electronic records, electronic gazette, security, and penalties. The Unit describes the salient points of emerging issues relating to domain names, intellectual property in cyberspace, cyber crimes, data protection, and the relevance of cyber laws for library and information professionals.

Prof. V G Talwar

Unit - 13

Patent Information: Importance and Uses

Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Importance of Patent Information
- 1.3 Characteristics of Patent Information
 - 1.3.1 Patent
 - 1.3.2 Obtaining a Patent
 - 1.3.3 Patent Information
 - 1.3.4 Bibliographic Information
 - 1.3.5 Technical Information
 - 1.3.6 References in Patent Documents
- 1.4 Address and Jurisdiction of the Patents Office in India
- 1.5 Sources of Patent Information in India
 - 1.5.1 Primary Sources of Patent Information
 - 1.5.1.1 Technical Library of Patent Offices
 - 1.5.1.2 Patent Inspection Centres
 - 1.5.2 Secondary Sources of Patent Information
 - 1.5.2.1 Patent Information System, Nagpur
 - 1.5.2.2 National Informatics Centre (NIC)
 - 1.5.2.3 National Research and Development Corporation (NRDC)
 - 1.5.2.4 Patent Facilitating Centre
 - 1.5.2.5 Indian Patent Database
 - 1.5.2.6 National Information System for Science and Technology (NISSAT) S&T information centers
- 1.6 International Patent Databases
 - 1.6.1 USPTO Patent Full-Text and Full-Page Image Databases
 - 1.6.2 INPADOC/EPIDOS
 - 1.6.3 European Patent Office (EPO) worldwide database

- 1.6.4 Japanese Patent Information Database
- 1.6.5 WIPO Patent Database
- 1.7 Private vendors
- 1.8 International Patent classification
- 1.9 Patent search
- 1.10 Patent Statistics
- 1.11 Use of Patent Information for R&D Scientists
- 1.12 Scientometric analysis based on patent data
- 1.13 Summary
- 1.14 Answer to self-check exercises
- 1.15 References and further reading

1.0 Objectives

After reading this Unit, you will be able to:

- Comprehend the importance of patent information;
- Define and explain the characteristics of patent information, bibliographic and technical information and references in patent documents;
- Indicate the addresses and jurisdiction of patent offices in India;
- Identify the sources of patent information in India and elaborate their roles;
- Indicate the role of international patent databases, and private vendors in providing patent information;
- Understand the concepts of international patent classification;
- Delve on the methodology for making patent search; and review the global patent statistics including data from India,
- Describe the use of patent information for R&D scientists, and
- Explain the use of scientometric analysis of patent data.

1.1 Introduction

The patent information is an important competitive and strategic tool to take right steps at a right time for technology development. It refers to information contained in patent documents and is an integral component of the IPR information. With international competition becoming ever more intense since establishment of World Trade Organization (WTO) in 1995, there is no doubt that the successful use of patent information in R&D is going to be the key. The publication of a patent

application is often the first time that the information has ever been published, because the details of an invention have to be kept secret before a patent application is submitted. Significant inventions such as the jet engine, television and ductile cast iron were all first disclosed in the patent literature 5-10 years ever before they appeared in any other literature sources. If you don't look at patents, you can miss out on a vast amount of information because 70-90% of patent information is never published anywhere else. Over 35 million patents have been published worldwide to date, and another 1 million new patent specifications appear each year. This makes patents the largest single body of technological information available anywhere, and one that is ideally suited for use as a business information source.

1.2 Importance of Patent Information

The importance of the patent information lies in planning and management of R & D, particularly, in identifying directions for research and development and technological opportunities, choosing research subjects, and understanding business trends. In planning an R&D project, the patent information is important in concretizing the contents of the research subject and establishing targets of R & D, check competitors' patents, draw patent map relevant to technology and establish strategy to circumvent existing patents. The patent information provides an easy source of prior art in a field of technology. It also provides significant insights into technology collaboration, and technology transfer. The analysis of patent information also helps in avoiding infringement of patents by other inventors and in stopping re-inventing the wheel.

One can make practical use of several components of patent information. For example, the information about the names of inventors may help in identifying specialist in specific technology area as well as activities of specific research groups and organizations. The information about inventor country can facilitate a review of a country's technology position and its strong and weak areas. The patent documents contain references to non-patent and patent literature, which may be given by applicants and the patent examiners. The processing of information about these references can help in identifying the pattern of the use of scientific and technical information in patenting. For example, one can identify the journals references from which have been used in the patent document. For an R&D organization, such analysis can indicate the journals from which most of the references have been cited, which can in turn help in planning and organizing scientific and technical information by library and information specialists with a view to effectively meet the needs of

scientists. Thus, patents are a valuable source of technical information, which is available to inventors for finding technological solutions to technical problems. In addition, till the expiry of a patent, the information contained in the claims portion of a patent document is valuable in ensuring the legal rights of the inventors over their invention.

1.3 Characteristics of Patent Information

Patent information is mainly characterised by the technical and bibliographic information contained in patent documents. The significant features of such information are described below.

1.3.1 Patent

What is a patent? A patent is a government granted and secured legal right to prevent others from 'practicing' i.e. making, using, selling or importing the inventions covered by the patent. An invention is patentable if it is new, involves an inventive step, i.e. it is not obvious in the sense that it will not occur to any specialist, if such a specialist was asked to find a solution to the particular problem, and is industrially applicable in the sense that it can be industrially manufactured and used.

1.3.2 Obtaining a Patent

In order to properly understand the meaning of patent information, it may be worthwhile to know about the process of generating a patent document. The process is started by the inventor by filing an application in a patent office for obtaining a patent. In India, there are four patent offices, located at Kolkata, Mumbai, Delhi and Chennai, where the application is accepted according to the territorial limits defined for each office. For example, invention developed in R&D laboratory in Delhi can only be filed for patent in Delhi office. The territory is determined on the basis of the normal place of residence of the applicant or the first mentioned applicant in case of joint applicants or his place of business or the place from where the invention actually originated.

There are two types of patent applications that can be filed in India viz., the provisional specification and the complete specification. The provisional specification for patent may contain the description of invention but not necessarily the Claims. The complete specification fully describes the invention. Once granted patent, the complete specification is the latest available information about an invention and is also termed as the patent document. Therefore, the initial patent information comes from patent offices of every country. The patent offices of other countries also grant patents for inventions according to their respective laws resulting in patent documents.

1.3.3 Patent Information

The term "patent information" covers all types of technical information, market information, legal information, and any information on companies that can be obtained in documents published by patent offices. In brief, the information contained in patent documents may be termed as the patent information. The characteristic features of the bibliographic information, technical information as well as the references to scientific and technical information in patent documents are described in the following sections.

1.3.4 Bibliographic Information

The bibliographic information is given on the first page of the patent document and contains information on the key parameters like application number and date, publication number and date, registration number and date, priority information, name of the inventors, inventor country, international patent classification code, national patent classification code, and name of the country granting the patent, and names of the applicant, patent agent or attorney, and examiners. It also includes information on the title of patent, patent number, assignee, and the country of the assignee. The application number is the number given by the receiving patent office to the applicant on filing the application for grant of patent and date of application being the date on which patent application is filed. The final number and the date given to the patent application, if it is granted, is termed as the patent number and the date of publication or the grant of patent. The date of grant of patent will be taken into account for determining the life of the patent. A sample of the front page of a patent document in US Patent Office is given at Figure 1.

1.3.5 Technical Information

The technical information includes scientific and technical concepts as well as practical details about the invention. Normally, the patent document contains the title of invention, field of invention, abstract about the invention, background of invention with regard to the drawbacks associated with known art i.e., the "prior art", object of invention, statement of invention, and a summary of invention. The main body of the patent document also gives the detailed description about the invention including the experiments conducted and the results obtained, the examples and illustrations and drawings, and the claims. The claims essentially determine the legal boundaries of the rights of inventors over the patented invention.

1.3.6 References in Patent Documents

The issued patent contains references to non-patent and patent literature, primarily, to establish novelty of the invention. The non-patent literature includes references to publications in journals, books or other published documents. It gives data on the name of the author, title of journal or book or any other document, and its year of publication. The references to patent literature give data on cited patent number, its year of publication, and the publishing country. The references are cited both by applicants and examiners. The applicants may cite references because they are required to indicate the prior art in order to establish the novelty of the invention. The reasons of citation by examiners may vary. They may not cite all available references but only the best. The references by examiners in patent documents have also been examined as indicators of science linkages in a field of technology. The inventor-given references are also important in the context of examination of scientific and technical information needs of R&D scientists in patenting. The library and information specialists can make use of these references in planning and organizing scientific and technical information for patenting in an R&D organization¹.

Exercise

- 1. Describe the meaning of patent information.**
- 2. What kind of information is contained in patent documents? Describe the characteristic features of such information.**



US006858141B2

(12) **United States Patent**
Kulkarni et al.

(10) **Patent No.:** **US 6,858,141 B2**
(45) **Date of Patent:** **Feb. 22, 2005**

(54) **PROCESS FOR THE PREPARATION OF
ULTRAFILTRATION MEMBRANES OF
POLYACRYLONITRILE, USING MALIC
ACID AS AN ADDITIVE**

(75) **Inventors:** **Sudhir Sharadchandra Kulkarni,**
Pune (IN); **Madhuri Himmatrao**
Shinde, Pune (IN); **Deepak Anandrao**
Musale, Pune (IN)

(73) **Assignee:** **Council of Scientific & Industrial
Research (CSIR),** New Delhi (IN)

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **10/232,098**

(22) **Filed:** **Aug. 30, 2002**

(65) **Prior Publication Data**

US 2003/0102259 A1 Jun. 5, 2003

Related U.S. Application Data

(60) Provisional application No. 60/316,943, filed on Aug. 30,
2001.

(51) **Int. Cl.⁷** **B01D 39/14**

(52) **U.S. Cl.** **210/500.43; 210/493.4;**
210/500.27; 210/500.42; 264/41

(58) **Field of Search** 210/500.43, 500.27,
210/490, 654, 321.43, 493.4, 32.74, 500.42;
264/41

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,615,024 A * 10/1971 Michaels 210/490
3,616,024 A * 10/1971 Windle 156/257
4,177,150 A * 12/1979 Inoue et al. 210/500.43
4,251,605 A * 2/1981 Inoue et al. 429/145
4,252,652 A * 2/1981 Elfert et al. 210/654
4,323,627 A * 4/1982 Joh 428/398
4,366,062 A * 12/1982 Kurihara et al. 210/651
4,584,103 A * 4/1986 Linder et al. 210/650
5,039,421 A * 8/1991 Linder et al. 210/651
5,265,734 A * 11/1993 Linder et al. 210/654
5,281,337 A * 1/1994 Chou et al. 210/654

* cited by examiner

Primary Examiner—Ana Fortuna

(74) *Attorney, Agent, or Firm*—Schiff Hardin LLP

(57) **ABSTRACT**

The present Application relates to a process for the prepa-
ration of ultrafiltration membranes from polyacrylonitrile
using malic acid as additives, with said membrane of
molecular weight ranging between 80 to 180K, showing
high purification and water permeating ability.

20 Claims, No Drawings

(Figure 1: Sample of the front page of a patent document in US Patent Office)

1.4 Address and Jurisdiction of the offices of the Patents Office in India

The Patent Office has its Head Office at Kolkata and Branch Offices at Mumbai, Delhi and Chennai having territorial jurisdiction on a Zonal basis as shown below²: -

1. Patent Office Branch, Todi Estates, IIIrd Floor, Sun Mill Compound, Lower Parel (West), Mumbai-400 013.

Territorial Jurisdiction: The States of Gujrat, Maharashtra, Madhya Pradesh and Goa and the Union Territories of Daman and Diu & Dadra and Nagar Haveii.

Phone: 91-22-2492 5092
91-22-2492 4058
Fax : 91-22-2495 0622
E-mail: patmum @vsnl.net

2. Patent Office Branch, Boudhik Sampada Bhavan, Plot No. 32, Sector-14, Dwarka, New Delhi 110 075

Territorial Jurisdiction: The States of Haryana, Himachal Pradesh , Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh and Delhi and the Union Territory of Chandigarh.

Phone: 91-11-28081920 - 25
Website : ipindia.nic.in
Email: delhipatent@vsnl.com

3. Patent Office Branch, Wing 'C' (C-4, A), III Floor, Rajaji Bhavan, Besant Nagar, Chennai 600 090

Territorial Jurisdiction: The States of Andhra Pradesh, Karnataka, Kerala, Tamilnadu and Pondicherry and the Union Territories of Laccadive, Minicoy and Aminidivi Islands.

Phone: 91-44-2490 1495/ 91-44-2490 1496

Fax : 91-44-2490 1492

E-mail: patentchennai @ vsnl.net

4. Patent Office (Head Office), Nizam Palace, 2nd M.S.O. Building, 5th, 6th & 7th Floor, 234/4, Acharya Jagadish Bose Road, Kolkata-700 020

Territorial Jurisdiction: Rest of India

Phone: 91-33-2247 4401-03; 91-33-2247 3851

91-22-2240 1353

Fax : 91-33-2247 3851

E-mail: patentin @ vsnl.com / patindia @ giascl01.vsnl.net.in

Exercise

3. Indicate the location and jurisdiction of the patent offices in India.

1.5 Sources of patent information in India

1.5.1 Primary Sources of Patent Information

1.5.1.1 Technical Library of Patent Offices

The national patent office is the primary source of information on patent documents. In India, the primary information on patent documents is first published in the *Gazette of India, part II, section 3*. The Patent Office and its branches have Technical Library services, which are available to the public. The collections of Technical Library include scientific & technical books, Indian & foreign scientific and technical journals, Indian & foreign journals on intellectual property rights, CD ROMs containing full texts of Indian patents, CD ROMs containing the patent abstracts of European Patent Office (EPO), and Japan, CD ROMs containing the full text of U.K., Australia and patent under Patent Cooperation Treaty (PCT), Gazette of India (Part III, Section 2) containing patent proceedings under the Indian Patent Act, 1970 (as amended in 2002 and 2005), official Gazettes of foreign countries, other publications of the patent office, and published Indian patent specifications arranged according to fields of inventions as per Indian and International Patent classification. (*Note: Xerox copies of the Patents and other documents can be obtained on payment of prescribed charge; further information may be available from the website www.ipindia.nic.in / www.ipindia.gov.in*)

1.5.1.2 Patent Inspection Centres

The Indian Patent Office has authorized certain organizations in India and abroad which receive its publications on the condition that they may be seen by the public free of charge³. A complete list and

addresses of these intuitions can be obtained from the Patent Office. For example, in India, such locations include State Central Library and Indian Institute of Chemical Technology (earlier Regional Research Laboratory) in Hyderabad; Regional Engineering College in Warrangal; Regional Research Laboratory, Jorhat; Librarian, North Eastern Hill University, Shillong; in New Delhi National Productivity Council, National Physical Laboratory, Intellectual Property Management Division, CSIR and NRDC; Central Salt and Marine Chemical Research Institute, Bhavnagar; Regional Research Laboratory, Jammu; Librarian, Indian Institute of Science, Bangalore; Librarian, University of Kerala, Thiruvananthapuram; University Librarian, Cochin University, Cochin; and Maharashtra Chamber of Commerce and National Chemical Laboratory in Pune. The inspection centers are also located in Bhubneshwar, Cuttack, Ludhiana, Jaipur, Chennai, Allahabad, Dehra Dun, Hardwar, Lucknow, Kanpur and Varanasi. In West Bengal, the centers are located in Kolkata, Durgapur, Howrah, and Kharagpur.

The Indian patent documents are also received by organizations in Washington, London, Moscow, Munich, Poland, and Sweden.

1.5.2 Secondary Sources of Patent Information

The secondary sources of patent information are Patent Information System, Nagpur, Intellectual Property and Know-how Division of the National Informatics Centre (NIC), National Research and Development Corporation (NRDC), Patent Facilitating Centre of the Technology Information Forecasting and Assessment Council (TIFAC), Indian National Scientific Documentation Centre (INSDOC), renamed as National Institute of Science Communication and Information Resources (NISCAIR) and S&T information centers set up by the National Information System for Science and Technology (NISSAT). A brief introduction of their activities is given below.

1.5.2.1 Patent Information System

The Patent Information System (PIS) was established by the Ministry of Industry, Department of Industrial Development, Government of India, in the year 1980 with the objectives (i) to obtain and maintain a comprehensive collection of patent specification and patent related literature on a world wide basis to meet the needs for technological information, of various users in R&D establishments, Government organisations, private industries, business, investors and other users; (ii) to provide technological information contained in patents or patent related literature through publication services, search services and patent copy supply service; and (iii) to meet statutory obligation regarding novelty search under the Indian Patent Act, 1970. The PIS caters to user needs on the basis of patent documentation and computerised system for retrieval and dissemination of

patent information. It has patent information from United States of America, United Kingdom, European Patent Office, Patent Cooperation Treaty, Australia, India, and Japan on CD-ROM. The PIS offers patent information services on payment of appropriate charges. In order to provide Patent Information Service to any interested person/organization, PIS operates subscriber advance payment scheme. Its other services include patent search services, current awareness search, state of art search, bibliographic search, English equivalent patent search, equivalent family patent search, and patent copy supply service. (*Patent Information system (PIS) and Intellectual Property Training Institute (IPTI). CGO Complex, Block C, 3rd Floor, Seminary Hills, Nagpur-400 006. The Centre provides full-text search of patent documents. Phone : 91-712-511241/91-712-510670; Fax : 91-712-510186. E-mail: pishnagp@nag.mah.nic.in*)

1.5.2.2 National Informatics Centre

Intellectual Property and Know-how Division of the National Informatics Centre (NIC) maintains data with respect to Indian and foreign patents and provides patent information services on charge. The services include bibliographic and abstract search, on-line access to EPIDOS database, off-line search to EPIDOS database and CD-Rom /DVD-ROM based search to patent data from USPTO, EPO and TIFAC. It also provides equivalent patent search on EPIDOS database and full-text documents for all US patents published since 1.1.1790, all European patent applications published by EPO, and all PCT applications published by WIPO. (For further details please refer to <http://pk2id.delhi.nic.in/>)

1.5.2.3 National Research Development Corporation (NRDC)

NRDC is India's premier technology service enterprise whose business is to be the identifier, the carrier and the pilot of technology transfer. By providing business critical information to companies and research institutes across the country, NRDC has maintained its position among the top information providers on IPR. For over 45 years, NRDC's IPR solutions have met the needs of corporations and, equally important, fulfilled the technological demands of more specialised organizations. Its patent information and assistance services include the National Patent Protection Scheme, Foreign Patent Protection Scheme, Online Search Facility, Commercialising Patented Inventions, Consultancy on IPR, Organising IPR Awareness Programmes, and IPR Helpline for SMEs.

NRDC's 'Online' search facility enables scientists, inventors or business managers to identify and source international patents and trademarks which can be used to provide a state-of-the-art

technology survey; for world-wide tracking of technological advances or to monitor a competitor's R&D and marketing strategy. This service, now being offered to industries, also provides bibliographic references and abstracts from published literature, business information and financial data, text of articles, trade statistics and other relevant business information. This diverse range of information services helps Indian industries to track technologies, get a global overview of the technological competition in their business and to obtain background information on foreign corporate sources of technology, on competitors and potential suppliers of parts, components and bought outs. (for details one can see the website www.nrdcindia.com)

1.5.2.4 Patent Facilitating Centre

The Patent Facilitating Centre (PFC) was set up by the Department of Science and Technology, Government of India under Technology Information Forecasting and Assessment Council (TIFAC) in 1995 with the objectives of introducing patent information as a vital input in the process of promotion of R&D programmes and creating awareness relating to patents by arranging workshops and seminars. The Centre brought out the Indian patent information on CD-ROM's, namely Ekaswa A – database of patent applications filed in India as published in the Gazette of India (Part III, Section 2) from January 1995 onwards, and Ekaswa B, the database of patent applications notified for opposition in the Gazette of India (Part III, Section 2) from January 1995 onwards. The access to the database is through subscription of CD-ROM and can also be accessed online through Internet. The database are quite user friendly and equipped with latest search tools and logical operations. Value addition has been done in the databases to make the information easily accessible.

The Patent Facilitating Centre has set up Patent Information Centers in 20 states, namely, Andhra Pradesh, Assam, Chattishgarh, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Manipur, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttaranchal, Uttar Pradesh, Haryana, Goa and West Bengal.

1.5.2.5 Indian patent database

INPAT on CD-ROM is a bibliographic database that provides information on more than 52,600 patents granted in India from the year 1975 to 2002. The National Institute of Science Communication and Information Resources of the Council of Scientific and Industrial Research maintains the database. The information on a patent in the database comprises patent title, applicant(s) and inventor(s) names, patent and application numbers, application and publication dates, International Classification Code and country. The database can be searched by variety of

parameters including keywords from title, applicant(s) and inventor(s) names, patent number, application number, application date, publication date, international classification code and subject. The database will be useful to scientists, researchers, patents attorneys and patent offices, libraries of R& D units and business houses throughout the world. The database is regularly updated. The patent search facility from this database is also available on-line. The database on CD-ROM is priced Rs. 10,000/-.

1.5.2.6 NISSAT Information Centres

The National Information System for Science and Technology (NISSAT) has established information centers in specialized fields of science and technology. In addition to scientific and technical information, these centers also provide patent information services. The information centers are functioning in the fields of food at Central Food Technology Research Institute, Mysore; drugs and pharmaceuticals at Central Drugs Research Institute, Lucknow; leather at Central Leather Research Institute, Chennai; machine tools at Central Machine Tools Institute, Bangalore; textiles at ATIRA, Ahmedabad; chemicals at National Chemical Laboratory, Pune; National Aerospace laboratories, Bangalore; and ceramics at Central Glass and Ceramics Research Institute, Kolkata. NISSAT has also established two value added patent information systems at NCL, PUNE and CMTI, Bangalore. These centers add value to patent information by analyzing the contents given the users requirements. The value addition includes preparation of trend reports, making forecasts, identifying technological alternatives, research areas and business opportunities. These services are charged from the customers.

Exercise

- 4. What are the primary sources of patent information in India?**
- 5. Name the secondary sources of patent information in India**

1.6 International Patent Databases

Until the advent of the Internet, CD-ROMs were, for many people, the only economic way to cope with the large amounts of patent documents being published. In principle, there are four types of patent CD-ROM viz., CD-ROMs containing complete patent documents; CD-ROMs containing searchable databases of patent information; CD-ROMs containing patent documents or patent information issued from different patent granting authorities; and specially customised CD-ROMs produced on a one-off basis according to a client's needs. Now that the Internet has made the

transmission of information much more cost-effective, databases are being used by a much wider public. A number of patent offices have put their patent collections on the Internet. Often, access to these databases is free of charge. The databases are mainly of three types viz., bibliographic, full-text, and bibliographic and full-text. There are auxiliary databases that relate to International Patent Classification, US Patent Classification and European Classification. There is also a database of citations of patent documents.

A number of commercial companies compile patent information from a number of sources and re-assemble it into large databases. It is even possible to consult several such databases simultaneously and to gain a complete picture from one single search. Many patent offices and information brokers have special expertise in searching patent databases and offer this service to the public. Online access to commercial databases enables one to perform complex queries oneself provided one has some expertise.

This section provides salient features of some of the significant international patent databases.

1.6.1 USPTO Patent Full-Text and Full-Page Image Databases (<http://www.uspto.gov>)

The United States Patent and Trademark Office⁴ (PTO or USPTO) is an agency in the United States Department of Commerce that provides patent protection to inventors and businesses for their inventions. Each year, the USPTO issues thousands of patents to companies and individuals all around the world. As of March 2006, it has issued over seven million patents. It provides full-text patent database of issued patent since 1976 and full page images since 1790. It also provides database for published patent applications since 15 March 2001. These databases are intended for use by the general public. Due to limitations of equipment and bandwidth, they are not intended to be a source for bulk downloads of USPTO data. Bulk data may be purchased from USPTO at cost. Patents issued from 1790 through 1975 are searchable only by patent number and current US classifications. Attempts to search those patents by any other fields will result in an error message. The issued patents Full-Text Database is a database of patent full-text as it was printed on the patent on the day of issue. Changes to patent documents contained in Certificates of Correction and Re-examinations Certificates are not included in the searchable full-text of the patent databases, but are available as additional full-page images at the end of each patent's linked full-page images. The database includes information about all US patents (including utility, design, reissue, and plant patents) from the first patent issued in 1790 to the most recent issue week. Patents from January 1976 to the present offer the full searchable text, including all bibliographic

data, such as the inventor's name, the patent's title, and the assignee's name; the abstract; the full description of the invention; and the claims.

The database can be searched in Quick search mode as well as Advanced search mode. The Quick search allows searching the US Patent Full Text Database using two-term Quick search queries. There are seven steps to using the Quick Search Page viz. (i) Select a year or range of years to search from the 'Select years to search' drop-down menu; (ii) Enter a term in the text entry box labeled 'Term 1'; (iii) Select which field to apply to Term 1 by using the 'Field 1' drop-down menu located to the right of the Term 1 box; (iv) Select a 'Quick Operator' (AND, OR, or ANDNOT) from the menu located between the two Term boxes; (v) Enter a term in the text entry box labeled 'Term 2'; (vi) Select which field to apply to Term 2 by using the 'Field 2' drop-down menu located to the right of the Term 2 box; and (vii) Hit the 'Search' button.

The Advanced Search allows making a query of the US Patent Full Text Database using command line search syntax. There are 3 steps to submit a query using the Advanced Search viz. (i) Select a year or range of years to search from the 'Select years to search' drop-down menu; (ii) Type search statement into the Text Entry box marked 'Query'; and (iii) Hit the 'Search' button. To search for a patent number using the Advanced Search Page, the syntax 'PN/number' can be used where *number* is the number of the patent. Non-utility patents should include a prefix: 'D' for design patents, 'PP' for plant patents, 'RE' for reissue patents, and 'T' for defensive publications. There is also a possibility to use the Patent Number search, in which, one can enter the number of a patent one is searching for in the box provided, and thereafter hit the 'Search' button.

1.6.2 INPADOC-EPIDOS

INPADOC (International Patent Documentation Center) contains the bibliographic and family data of patent documents and utility models of 76 patent-issuing organizations including the European Patent Office (EPO) and the World Intellectual Property Organization (WIPO). In addition, the legal status data of 46 patent-issuing organizations are included. INPADOC-EPIDOS (European Patent Information and Document Service) is one of the most comprehensive databases on the patent bibliography. European Patent Office (EPO) publishes this database. EPO has been receiving the bibliography of all the patents filed and granted in approximately 71 countries since 1968. It contains over 33 millions references from 1968 onwards. Almost 3 millions references are added each year. The several fields in the database include Applicant's Country (ac), Application Date (ad), Application Number**(an), Applicant's Name**(ap), Chemical Abstract (ca), Country of

Priority**(cp), Designated Country (dc), Elected Country (ec), Edition Symbol(ed), Extended Kind of Document (ek), Inventors' Country (ic), Inventor's Name**(in), International Classification** (ip), Kind of Application (ka), Kind of Document (kd), Kind of Priority (kp), National Classification (nc), Application No. Priority**(pr), Publishing Date (pb), Publishing Country** (pc), Priority Date (pd), Language of Publication (pl), Patent Number**(pn), Status of Application (st), Title of Invention**(ti), Family/Equivalent Patent (FP). The fields marked ** are indexed and searchable. There were 42,862,927 records in the Database as updated on Mar 21, 2006.

1.6.3 European Patent Office (EPO) worldwide database (www.espacenet.com)

The European Patent Office⁵ (EPO) holds one of the largest digital repositories of public knowledge in the world and endeavours to offer the general public optimal access to its data resources. *esp@cenet*® is a registered trade mark of the European Patent Organisation. *esp@cenet* enables one to access the same patent database as that available to the EPO examiners. The worldwide database enables search for information about published patent applications from over 72 different countries and regions. The database is based on the Patent Cooperation Treaty (PCT) minimum documentation, which is defined by WIPO as the minimum requirement for patent collections used to search for prior-art documents for the purpose of assessing novelty and inventiveness. The EPO has expanded the coverage of its internal database far beyond the PCT minimum documentation to include data from other countries and other time periods. Abstracts of non-examined Japanese patent applications filed by Japanese applicants since October 1976 and all patent applications filed since 1998 which do not have a Japanese priority are available in the worldwide database since January 2005. Due to the translation process from Japanese into English, these abstracts are not available until six months after publication. In September 2005, *esp@cenet* held data on 59 million patents from 72 countries. Since February 2005, European and British applications are immediately made available on the day of publication. The database provides search facility for bibliography, abstract and the facsimile coverage and European Classification (ECLA) classification. The European patent office (EPO) site provides links to several sites of national patent offices across the world and also provides access to EPIDOS database for patent search.

1.6.4 Japanese Patent Information Database

One of the main functions of the Japan Patent Office⁶ (JPO) is the dissemination of information on Intellectual Property (IP). The Industrial Property Digital Library (IPDL) of the JPO offers the public access to IP Gazettes of the JPO free of charge through the Internet. JPO has also

started publishing DVD-ROM version official gazettes. The JPO inaugurated the IPDL service on its website in March 1999 to facilitate the use of industrial property information. Amongst others, the Patent & Utility Model Gazette Database stores the Patent & Utility Model Gazette. In this service, one can retrieve a variety of patent and utility model gazettes by their number. On the search screen, if one gives an input 'kind code and document number', and clicks "Search", the list of document numbers are displayed. On clicking each document number of the hit list it displays the document one would like to see.

In addition, the JAPIO patent database, provided by the Japan Patent Information Organization (JAPIO), represents the most comprehensive English-language access to Japanese unexamined patent applications published since October 1976. All technologies are covered. Application records include both Japanese and non-Japanese priorities. Abstracts are provided only for applications originating in Japan, but are available for most records. Images of front-page drawings, when available for a given patent, are also included. JAPIO covers patents in four major fields: Mechanical (tools, vehicles, machines, engines, components), Chemical (organic, inorganic, medical, biochemical, food chemistry, metallurgy, chemical apparatus and processes), Electrical (semiconductors, circuitry, electric machines, communications, radiation technology), and Physical (computing, information storage, measuring and testing, photography, optics). JAPIO is based on the print *Patent Abstracts of Japan*, produced by the Japan Patent Information Organization. *Patent Abstracts of Japan* is issued approximately four months after the original publication of the documents in the Japanese patent gazette.

1.6.5 WIPO Patent Database (<http://www.wipo.int/ipdl/en/>)

The Patent Cooperation Treaty⁷ (PCT) offers inventors and industry an advantageous route for obtaining patent protection internationally. By filing one "international" patent application under the PCT, protection of an invention can be sought simultaneously in each of a large number of countries. Both applicants and patent offices of PCT member states benefit from the uniform formality requirements, the international search and preliminary examination reports, and the centralized international publication provided by the PCT system.

The Intellectual Property Digital Library Web site, by the World Intellectual Property Organization, provides access to intellectual property data collections. These collections include PCT (Patents), Madrid (Trademarks), Hague (Industrial Designs), Article 6ter (State Emblems, Official Hallmarks, and Emblems of Intergovernmental Organizations) and others.

Of these, the PCT Electronic Gazette provides data with respect to the patent applications. It contains data relating to PCT international applications published as PCT pamphlets from January 1997, and where applicable, republished from April 1998. Bibliographic data, abstracts, drawings and images of PCT pamphlets are provided for all published and republished international applications in the collection. For international applications published and/or republished since April 1998, the searchable text of claims and descriptions is also provided. Frequent users who would like to maintain a search query history across connections should set up a free user account.

One of the principal mandates of the World Intellectual Property Organization (WIPO) is to offer technical assistance to developing countries. This also includes the access to and use of technological information contained in patent documents in order to accelerate the economic, social and cultural development in developing countries. In line with this part of its mandate, WIPO has set-up and operates the unique WIPO Patent Information Services (WPIS) for handling individual requests for patent information. The WIPO Patent Information Services for Developing Countries (WPIS) are offered free of charge. WIPO accepts such requests only if they are made by institutions or individuals from developing countries. Requests made by private institutions or individuals require the endorsement of a government authority. The service includes providing of State-of-the-art search reports. Such reports identify the "state of the art", as reflected in patent documents and non-patent literature, in respect of a technical problem described in the request. It also provides the Search and examination of patent applications under the International Cooperation for the Search and Examination of Inventions Program. WIPO also provides search of Equivalent patent documents (patent "family"). The identification of "equivalent" patent documents or the location of a member of a patent family can be useful in order to find the countries in which a patent application for a given invention has been filed (if published); find a "patent family member" that is written in a desired language; estimate the importance of the invention (by number of patent documents relating to the same invention and being published in different countries or by Regional or International industrial property organizations). Free copies of the full text of any published patent or patent application, as may be specifically requested by the users from developing countries, are also available.

WIPO also maintains the Journal of Patent Associated Literature (JOPAL) Database in electronic form. The database contains bibliographic details of articles published in leading scientific and technical periodicals. The database contains data relating to the period 1981 to date, i.e., all data as previously published on the last issue of the JOPAL CD-ROM (Disc: 1997/3) and all subsequently

published data. Each month, the latest set of data as provided by the offices is added to the JOPAL database which supports fully searchable information retrieval and display of the latest month added to the database or all of the database as required.

Improved Technology Searches Online

The wealth of technological information contained in international patent applications is more easily accessible as a result of improvements made by the World Intellectual Property Organization (WIPO) to its online database, PatentScope since April 6, 2006. Over 1.2 million international applications under WIPO's Patent Cooperation Treaty (PCT) are available in fully searchable form for free consultation by all through the PatentScope service (<http://www.wipo.int/patentscope/>). In addition, WIPO has discontinued paper publications and now makes all information about international patent applications filed under the PCT available in electronic form on the Internet.

PatentScope is a valuable technical resource as new technologies are often disclosed for the first time as international patent applications. The patent applications filed under the PCT system and, therefore, accessible through the PatentScope service, are typically those that inventors consider to be the most valuable and therefore worth patenting internationally. The upgraded Patentscope service will now provide access to international applications in full text format on the day they are published. The information may be searched by entering keywords, names of applicants, categories used in the international patent classification and many other search criteria, thereby making the system significantly more accessible. Complete documents may be printed or downloaded, free of charge.

The growth rate in the filing of PCT applications has been especially significant during the last decade. It took 18 years from the beginning of PCT operations in 1978 to reach 250,000 total applications, but only four years to double that figure (500,000), and another four to double it again (1,000,000). In 2005, over 134,000 PCT applications were filed.

Exercise

- 6. Which are the significant international patent databases. Describe in brief the characteristics of WIPO patent database.**

1.7 Private vendors

There are a number of commercial companies and organisations that can help with patent information needs. The website of Patent Information User Group (PIUG) maintains a list of patent information vendors (<http://www.piug.org/vendor.html>). The site provides links to several vendors

providing patent news services, patent document delivery, database producers and suppliers, translation services and online services and database vendors. Derwent, Dialog, STN, Questel, Orbit, CHI Research, MicroPatent are some of the leading patent information providers. Derwent World Patents Index is one of the most comprehensive database of value-added patent documents published in the world. *Delphion* is the premier web site for searching, viewing, and analysing worldwide patent documents. *Derwent World Patents Index* contains more than 13.7 million unique inventions and more than 28.5 million patent documents in total, including full coverage of pharmaceuticals from 1963, agricultural and veterinary medicine from 1965, polymers from 1966, all chemistry from 1970, and electrical/ electronic engineering from 1974.

1.8 International Patent classification (IPC)

The Strasbourg Agreement concerning the International Patent Classification (of 1971), which entered into force on October 7, 1975 provides for a common classification for patents for invention including published patent applications, inventors' certificates, utility models and utility certificates (hereinafter referred to as "patent documents"). The International Patent Classification is hereinafter referred to as "the Classification". The Classification, being a means for obtaining an internationally uniform classification of patent documents, has as its primary purpose the establishment of an effective search tool for the retrieval of patent documents by patent offices and other users, in order to establish the novelty and evaluate the inventive step (including the assessment of technical advance and useful results or utility) of patent applications.

The text of the first edition of the Classification was established pursuant to the provisions of the European Convention on the International Classification of Patents for Invention of 1954. The first edition of the Classification was in force from September 1, 1968 to June 30, 1974, the second from July 1, 1974 to December 31, 1979, the third from January 1, 1980 to December 31, 1984, the fourth from January 1, 1985 to December 31, 1989, the fifth from January 1, 1990 to December 31, 1994, and the sixth from January 1, 1995 to December 31, 1999, and the seventh from January 1, 2000 to 31 December 2005. The current eighth edition entered into force on 1 January 2006. The Classification is established in the English and French languages, both texts being equally authentic. Pursuant to Article 3(2) of the above-mentioned Strasbourg Agreement, official texts of the Classification may be established in other languages. Complete texts of the sixth edition of the Classification were established in the Chinese, Czech, German, Hungarian, Japanese, Korean, Polish, Russian and Spanish languages.

International Patent Classification⁸ (IPC) is a comprehensive subject classification system applied to all patents by patent-issuing authorities and is denoted by a set of symbols. A complete IPC symbol comprises the combined symbols representing section, class, subclass and main group or subgroup. Each patent indicates the international patent class to which the invention belonged. The technical subjects of inventions dealt within patent documents indicated either the intrinsic nature or function of a thing or the way a thing was used or applied. The thing may mean any technical matter, e.g., process, product or apparatus. The Guide to IPC by WIPO attempts to describe in simple terms and by means of examples how the Classification should be used for the purpose of classifying or retrieving patent documents. An Introductory Manual to the Classification has been elaborated in order to assist classifiers and searchers in the use of the Classification, and can be obtained from WIPO. Assistance in the use of the Classification, and information on the transfer of subject matter as a result of the revision work, is also available through the IPC: CLASS CD-ROM, which has been produced by the International Bureau of WIPO.

The Classification represents the whole body of knowledge which may be regarded as proper to the field of patents for invention, divided into eight sections. These are described below.

Section Symbol - Each section is designated by one of the capital letters A through H.

Section Title - The section title is to be considered as a very broad indication of the contents of the section. The eight sections are entitled as follows:

- A. HUMAN NECESSITIES
- B. PERFORMING OPERATIONS; TRANSPORTING
- C. CHEMISTRY; METALLURGY
- D. TEXTILES; PAPER
- E. FIXED CONSTRUCTIONS
- F. MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
- G. PHYSICS
- H. ELECTRICITY

Contents of Section - Each section title is followed by a summary of the titles of its main subdivisions.

Subsection - Within sections, informative headings form subsections, which are titles without classification symbols. Example: AGRICULTURE.

CLASS: Each section is subdivided into classes.

Class Symbol - Each class symbol consists of the section symbol followed by a two-digit number.

Example: A 01.

Class Title - The class title gives an indication of the content of the class. Example: A 01 AGRICULTURE; FORESTRY; ANIMAL HUSBANDRY; HUNTING; TRAPPING; FISHING.

Class Index - Some classes have an index which is merely an informative summary giving a broad survey of the content of the class.

SUBCLASS: Each class comprises one or more subclasses.

Subclass Symbol - Each subclass symbol consists of the class symbol followed by a capital letter.

Example: A 01 B

Subclass Title - The subclass title indicates as precisely as possible the content of the subclass.

Example: A 01 B - SOIL WORKING IN AGRICULTURE OR FORESTRY; PARTS, DETAILS, OR ACCESSORIES OF AGRICULTURAL MACHINES OR IMPLEMENTS, IN GENERAL.

Subclass Index - Some subclasses have an index which is merely an informative summary giving a broad survey of the content of the subclass.

GROUP: Each subclass is broken down into subdivisions referred to as "groups", which are either main groups or subgroups.

Group Symbol - Each group symbol consists of the subclass symbol followed by two numbers separated by an oblique stroke.

Main Group Symbol - Each main group symbol consists of the subclass symbol followed by a one- to three-digit number, the oblique stroke and the number 00.

Example: A 01 B1 /00

Main Group Title - The main group title defines a field of subject matter considered to be useful for search purposes. Main group symbols and titles are printed in bold in the Classification.

Example: A 01 B1 /00 Hand tools.

Subgroup Symbol - Subgroups form subdivisions under the main groups. Each subgroup symbol consists of the subclass symbol followed by the one- to three-digit number of its main group, the oblique stroke and a number of at least two digits other than 00. Example: A 01 B1 /02

Any third or subsequent digit after the oblique stroke is to be understood as a decimal subdivision of the digit preceding it, e.g., 3/426 is to be found after 3/42 and before 3/43, and 5/1185 is to be found after 5/118 and before 5/119.

Subgroup Title - The subgroup title defines a field of subject matter within the scope of its main group considered to be useful for search purposes. In all cases, the subgroup title must be read as being dependent upon, and restricted by, the title of the group under which it is indented. Examples: A 01 B1 /00 Hand tools. 1 /24 for treating meadows or lawns. The title of 1/24 is to be read as: Hand tools for treating meadows or lawns. A 01 B1 /00 Hand tools. 1 /16 Tools for uprooting weeds. The title of 1/16 is a complete expression, but owing to its hierarchical position, the tools for uprooting weeds are restricted to hand tools.

COMPLETE CLASSIFICATION SYMBOL

A complete classification symbol comprises the combined symbols representing the section, class, subclass and main group or subgroup.

A sample of IPC Code

G 06 E 1/00

G: Physics

06: Computing, Calculating, Counting

E: Optical Computing Devices

1/00: Devices for processing exclusively digital data

The Classification, furthermore, has the important purposes of serving as: an instrument for the orderly arrangement of patent documents in order to facilitate access to the technological and legal information contained therein; a basis for selective dissemination of information to all users of patent information; a basis for investigating the state of the art in given fields of technology; a basis for the preparation of industrial property statistics which in turn permit the assessment of technological development in various areas.

Exercise

- 7. Explain the International Classification Symbol. Indicate the symbols that constitute a complete classification symbol.**

1.9 Patent search

In practice, there are several reasons for performing searches in collections of patent documents, each of them requiring a slightly different approach in the search method used. Some of the search types are basically concerned with technological information as such, while others are directed towards the processing of patent applications, or relevant to the legal state of a new technology. It is a well-known fact that many items of bibliographic information may be combined in

searching. The patent information can be accessed by making in-house search, on-line search, and free access on the Internet. The in-house search may be done on CD-ROM workstations with efficient staff. The on-line search facilities are available from national and international patent databases and patent information vendors.

One of the aims of patent search is to obtain a list of relevant patents in order to identify technological trends and opportunities for R&D. For this purpose, the patents can be searched in a database by way of: (i) keywords, or (ii) international patent classification code. The suitable key words can be identified on the basis of the description of planned or on-going research. The preliminary search on the basis of these keywords in title, abstract and claims of patents will result in a list of patents. Many times search in one database may not give complete information. It may, therefore, be necessary that data be obtained from more than one database.

The list of patents obtained by making preliminary search is examined to select patents relevant to the topic of research. In the next step, by going through the title of patents, relevant list of patents is identified. For these patents, information on patent abstracts is obtained. On examination of the patent abstracts, and taking a closer look at the inventive features of the patent, the list is further narrowed down to patents for which a copy of full text of patent document is obtained. The standard search methodologies depending upon the key parameters, which are inherent to the respective databases, may also be used; for example, Quick search mode in USPTO.

1.10 Patent Statistics

WIPO compiles patent statistics based on information provided to WIPO by national and regional patent offices via annual statistical questionnaires. The information can be seen at the WIPO website (<http://www.wipo.int/ipstats/en/statistics/patents/index.html>). It gives patent statistics on patent applications filed and patents granted by country as well as patent applications filed and patents granted by year for 100 years from 1883 to 1982. In addition, the site also gives statistics about the patent applications filed and granted by national patent offices during 1985 to 2004 according to the applications filed residents, non-residents and the data about the patent applications entered into national phase during a year.

PCT statistics

The growth rate in the filing of PCT⁹ applications has been significant during the last nine years since 2005. It took 18 years from the beginning of PCT operations in 1978 to reach 250,000 total applications, but only four years to double that figure (500,000), and another four to double it

again (1,000,000). In 2005, over 134,000 PCT applications were filed, representing a 9.4% increase over the previous year. The five top users of the international patent system remained unchanged, namely: United States of America, Japan, Germany, France and the United Kingdom. Japan, the Republic of Korea and China, between them accounted for 24.1% of all international applications, compared to 34.6% from the countries party to the European Patent Convention and 33.6% from the United States of America.

Inventors and industry from the United States of America represented 33.6% (a 3.8% increase over 2004) of all applications in 2005. Applicants from Japan maintained their second place position with 18.8% of the total number of applications, representing a 24.3% increase. Germany held third position with 11.8% of all applications in 2005, representing a 4% increase, followed by France (4.1% of all applications and a 6.6% increase) and the United Kingdom (3.8% of all applications and a 1.5% increase).

The 134,073 applications filed in 2005 (provisional estimate), represents a 9.4% increase on the number filed in 2004. The Dutch multinational Philips Electronics N.V. was again the largest filer (an estimated 2,492 applications), followed by Matsushita (Japan) (2,021), Siemens (Germany) (1,402), Nokia (Finland) (898), Bosch (Germany) (843), Intel (USA) (691), BASF (Germany) (656), 3M (USA) (603), Motorola (United States) (580), and DaimlerChrysler (Germany) (567). Among the 20 top filing companies, seven were from the United States of America, four from Germany and four from Japan.

International patent applications received from developing countries in 2005 saw a 20% increase as compared to 2004, representing 6.7% of all international patent applications filed. The list was topped by applications from the Republic of Korea with 4,747 applications, followed by China (2,452), India (648), South Africa (336), Singapore (438), Brazil (283) and Mexico (136). Developing countries make up 79% of the membership of the PCT, representing 101 of the 128 countries that have signed up to the treaty to date. The top ten users of the PCT from developing countries include: Samsung Electronics, (Republic of Korea), LG Electronics (Republic of Korea), Huawei Technologies (China), Council of Scientific and Industrial Research (India), Ranbaxy Laboratories (India), LG Chem (Republic of Korea), Electronics and Telecommunications Research Institute (Republic of Korea), Agency for Science, Technology and Research (Singapore), ZTE Corporation (China) and NHN Corporation (Republic of Korea).

The number of applications filed electronically increased by 106.9% and filing on electronic media now exceeded paper filings. Information technology had also been successfully deployed in the movement of applications and associated data between WIPO and the various national and regional offices within the system. The deployment of full electronic processing within WIPO for PCT applications not only resulted in major productivity gains at WIPO, but also assisted in making the world's technology available online for free-of-charge consultation. The WIPO website "PatentScope" now made available over 1.2 million international applications, representing the most important technological advances of the past twenty years, in fully searchable form for free.

Patent statistics in India

The number of applications for patents filed in 2001-2002 in India¹⁰ were 10,952 compared to 8,502 applications in 2000-2001. The number of applications that originated in India were 2,371 contributing approximately 22.38% of the total number of applications filed during the year. Of the total 10,952 applications, 1870 applications were filed directly by foreigners resident abroad while 6351 applications filed by them through the PCT route were in the national phase in India. Out of the 2,371 applications that originated in India, Delhi (678) accounted for the maximum applications, followed by Maharashtra (650), Tamilnadu (220), Karnataka (147), Gujarat (120) and Andhra Pradesh (120). Of the 6,351 national phase applications for patents filed at the designated offices/elected offices in India during the year, the United States (2,351) led with the maximum number of applications followed by Germany (877), Great Britain (460), and Japan (418).

The following table indicates the trend in patent applications from 1997-98 to 2002-2003.

	1997-98	1998-99	1999-2000	2000-2001	2001-02	2002-03
Filed	10155	8954	4624	8503	10592	11466
Examined	2688	2931	2824	4264	5104	9538
Granted	1844	1800	1881	1318	1591	1379

The following table gives the number of patent applications granted during 1998-99 to 2002-2003 under various fields of inventions.

Year	Chemical	Drug	Food	Electrical	Mechanical	General	Total
1998-99	609	150	35	138	462	406	1800
1999-2000	516	307	250	147	569	92	1881
2000-2001	353	276	72	142	254	221	1318
2001-2002	483	320	36	139	311	302	1591
2002-2003	399	312	67	118	228	255	1379

As on 31st march, 2002, there were 8320 patents in force. Of these, 1578 patents stood in the names of Indians while the remaining patents were owned by the foreigners.

Exercise

8. Give in brief the current status of patent statistics in India.

1.11 Uses of Patent Information for R&D Scientists

The R&D scientists can make use of patent information by identifying specific purposes related to: (i) R&D and technology development, (ii) R&D policy and management, and (iii) information support in patenting¹¹. These are described below:

For R&D and technology development

The patent literature provides information about latest developments in a field of technology or area of research. This information may enable R&D scientists to keep abreast of the latest knowledge, identify new technological opportunities, assess trends in research, and monitor competitors' R&D activities. R&D scientists can make use of this information while defining new research projects so as to avoid overlap with research results that are already available in patent literature.

For R&D policy and management

The analysis of patent information provides significant insights for R&D policy and management. For example, it may identify pattern of growth in patenting, evaluate performance of research groups belonging to industry, academia or government, indicate active players in patenting or assignees of patents, evaluate productivity of individual inventors, nature of collaboration among inventors, and indicate core competency of R&D organizations. The results can be useful for R&D

management in taking decisions with respect to resource allocation to research groups, keeping track of most productive scientists and taking measures to retain them, developing linkages between research groups working in industry, university or government R&D institutions, and setting standards for the evaluation of the performance of R&D organizations.

For Information support to R&D

Processing of information contained in patent documents and converting them into useful information for R&D scientists is likely to significantly change the role and function of the information services. Each patent document includes references to patent and non-patent literature that are cited by patent examiners or by patent applicants. An analysis of these references may help in identifying the pattern of use of S&T information, their sources and their significance in patenting by R&D scientists. For example, analysis may indicate highly cited journals, immediacy of the literature used, and scientific and technological disciplines of the information used by R&D scientists in patenting. The results of analysis can facilitate quick retrieval of information for use by R&D scientists. The information services can be planned and organized by library and information specialists to effectively meet the S&T information needs of R&D scientists.

Exercise

- 9. Identify the specific purposes for which patent information can be used by R&D scientists.**

1.12 Scientometric analysis based on patent data

Ranganathan was the first scholar, who in the year 1948 suggested the term librmetry at the Aslib Conference in Leamington-spa¹² for the application of quantitative methods in the management of library and its services. Since then, the terms, namely bibliometrics, informetrics and scientometrics, have also been coined. The word "bibliometrics" first appeared in print in 1969 in Alan Pritchard's article "Statistical Bibliography or "Bibliometrics" in the December issue of the Journal of Documentation¹³. Morales¹⁴ coined the term "informetrics" in 1985. He defined it "as the metric discipline concerned with the study of mathematical and statistical methods and model and their application to the quantitative analysis of the structure and properties of scientific information and the patterns and laws of scientific communication process including identification of laws proper.

The term "scientometrics" originated as a Russian term for the application of quantitative methods to the history of science¹⁵, but its scope and objectives have widened considerably.

"Scientometrics" is concerned directly or indirectly, with quantitative aspects of scientific enterprise, like publications, patents, journals, scattering of scientific information, and citation processes, etc.. The bibliographic information contained in patent documents can be used for several purposes. The studies in the literature have reported use of bibliographic information contained in patent documents to examine the status of technology¹⁶⁻¹⁹. The scientometrics techniques have used patent data for investigations of pattern of innovation, technological and economic performances at the aggregate or sectoral level for firms and the countries, trends in technology development, research evaluation, and developing technological indicators²⁰⁻²². Karki reviewed several studies on the use of patent data in R&D and industry²³. Several studies looked into the analysis of data on Indian patents²⁴⁻²⁵. The main orientation of studies in India is to simplify the concept and methodology of analysis of patent data in identifying R&D opportunities and trends in technology.

From the perspectives of library and information sciences, data on references cited in patent documents has been used to examine information dependence of the inventive activities of R&D scientists in a R&D organization. Noyons et al investigate several aspects of non-patent literature references in patents²⁶. Collins and Wyatt point out that applicants are more likely than examiners to cite basic journal literature²⁷. Vinkler defines indicator of total information needs, scientific information needs, and patent information needs. According to him, one can draw conclusions regarding information needs of research and development from the type and quality of the literature referenced in the patent documents²⁸. Gupta²⁹ examined the use of references by applicants and examiners in US patent documents by R&D scientists and observed that there is scope in improvement in making relevant prior art search by R&D scientists and in planning and organizing scientific and technical information support for conducting patentable R&D. Information professionals have an important role to play in providing such information.

Exercise

- 10. Describe the meaning of Scientometrics and explain use of these techniques in the analysis of patent data.**
- 11. How library and information scientists can support the R&D scientists in patenting?**

1.13 Summary

This Unit gives in brief the importance of patent information. In particular, it explains the meaning of patent and the process of obtaining of patent. As a result, it indicates the process of creation of patent documents as an important source of patent information. It provides the meaning of patent information and describes the characteristic features of patent information including bibliographic information, technical information and references in patent documents. The address and jurisdiction of respective patent offices in India have been pointed out.

The Unit delves upon both primary and secondary sources of patent information in India. The primary sources included the technical library of the patent office and the patent inspection centers. The activities of the secondary sources of information in the country have been described. The details of the international patent databases viz. USPTO patent database, INPADOC-EPIDOS, European Patent Office world patent database, Japanese patent database, and the WIPO patent database have been dealt with by highlighting their functions and the kind of services provided by them. It points out the role of private vendors in providing the patent information services.

The concepts of International Patent Classification and patent search have been described. The current status of patent statistics in India and through PCT filings have been reviewed. The use of patent information for R&D scientists have also been provided. Finally, the Unit gives the use of scientometric techniques in the analysis of patent data and how library and information scientists can play a useful role in providing such information in R&D organisations.

1.14 Answer to self-check exercises

1. Describe the meaning of patent information.

The patent information is an important competitive and strategic tool to take right steps at a right time for technology development. It refers to information contained in patent documents and is an integral component of the IPR information. Once a patent is granted patent, the complete patent application is the latest available information about an invention and is also termed as the patent document. The initial patent information comes from patent offices of every country. The term "patent information" covers all types of technical information, market information, legal information, and any information on companies that can be obtained in documents published by patent offices. In brief, the information contained in patent documents may be termed as the patent information.

2. What kind of information is contained in patent documents? Describe the characteristic features of such information.

The characteristic features of patent information include the bibliographic information, technical information and the references to scientific and technical information in patent documents. The bibliographic information is given on the first page of the patent document and contains information on the key parameters like publication number and date, priority information, name of the inventors, inventor country, international patent classification code, national patent classification code, and name of the country granting the patent, and names of the applicant, patent agent or attorney, and examiners. It also includes information on the title of patent, patent number, assignee, and the

country of the assignee. The technical information includes scientific and technical concepts as well as practical details about the invention. The main body of the patent document gives the prior art, the detailed description about the invention including the experiments conducted and the results obtained, the examples and illustrations and drawings, and the claims. The patent document also contains references to non-patent and patent literature, primarily, to establish novelty of the invention. The non-patent literature includes references to publications in journals, books or other published documents. It gives data on the name of the author, title of journal or book or any other document, and its year of publication. The references to patent literature give data on cited patent number, its year of publication, and the publishing country.

3. Indicate the location and jurisdiction of the patent offices in India.

The Patent Office has its Head Office at Kolkata and Branch Offices at Mumbai, Delhi and Chennai. The territorial jurisdiction of the office at Mumbai includes the States of Gujrat, Maharashtra, Madhya Pradesh and Goa and the Union Territories of Daman and Diu & Dadra and Nagar Haveii; at New Delhi includes the States of Haryana, Himachal Pradesh , Jammu and Kashmir, Punjab, Rajasthan, Uttar Pradesh and Delhi and the Union Territory of Chandigarh; at Chennai includes the States of Andhra Pradesh, Karnataka, Kerala, Tamilnadu and Pondicherry and the Union Territories of Laccadive, Minicoy and Aminidivi Islands; and at Kolkata includes the Rest of India.

4. What are the primary sources of patent information in India?

The national patent office is the primary source of information on patent documents. In India, the primary information on patent documents is first published in the *Gazette of India, part II, section 3*. The Patent Office and its branches have Technical Library services, which are available to the public. These libraries possess the collections of scientific & technical books, Indian & foreign scientific and technical journals, Indian & foreign journals on intellectual property rights, CD ROMs containing full texts of Indian patents and that of other countries.

The Indian Patent Office has also authorized certain organizations in India and abroad which receive its publications on the condition that they may be seen by the public free of charge. A complete list and addresses of these intuitions can be obtained from the Patent Office.

5. Name the secondary sources of patent information in India.

The secondary sources of patent information are Patent Information System, Nagpur, Intellectual Property and Know-how Division of the National Informatics Centre (NIC), National Research and

Development Corporation (NRDC), Patent Facilitating Centre of the Technology Information Forecasting and Assessment Council (TIFAC), Indian National Scientific Documentation Centre (INSDOC), renamed as National Institute of Science Communication and Information Resources (NISCAIR) and S&T information centers set up by the National Information System for Science and Technology (NISSAT).

6. Which are the significant international patent databases. Describe in brief the characteristics of WIPO patent database.

The significant international patent databases include i) USPTO Patent Full-Text and Full-Page Image Databases (<http://www.uspto.gov>), ii) INPADOC-EPIDOS database of bibliographic and family data of patent documents and utility models, iii) European Patent Office (EPO) worldwide database (www.espacenet.com), iv) Japanese Patent Information Database, and v) WIPO Patent Database (<http://www.wipo.int/ipdl/en/>).

A brief description of WIPO patent database is given below.

World Intellectual Property Organization (WIPO) has set up the Intellectual Property Digital Library Web site which provides access to intellectual property data collections. These collections include PCT (Patents), Madrid (Trademarks), Hague (Industrial Designs), Article 6ter (State Emblems, Official Hallmarks, and Emblems of Intergovernmental Organizations) and others. Of these, the PCT Electronic Gazette provides data with respect to the patent applications. WIPO has set-up and operates the unique WIPO Patent Information Services (WPIS) for handling individual requests for patent information. The WIPO Patent Information Services for Developing Countries (WPIS) are offered free of charge. It has recently established Improved Technology Searches Online, **PatentScope**. Over 1.2 million international applications under WIPO's Patent Cooperation Treaty (PCT) are available in fully searchable form for free consultation through this service (<http://www.wipo.int/patentscope/>). The upgraded Patentscope service provide access to international applications in full text format on the day they are published. The information may be searched by entering keywords, names of applicants, categories used in the international patent classification and many other search criteria, thereby making the system significantly more accessible. Complete documents may be printed or downloaded, free of charge.

7. Explain the International Classification Symbol. Indicate the symbols that constitute a complete classification symbol.

The International Patent Classification is a means for obtaining an internationally uniform classification of patent documents. Its primary purpose is the establishment of an effective search tool for the retrieval of patent documents by patent offices and other users, in order to establish the novelty and evaluate the inventive step (including the assessment of technical advance and useful results or utility) of patent applications.

A complete IPC symbol comprises the combined symbols representing section, class, subclass and main group or subgroup. Each patent indicates the international patent class to which the invention belonged. The technical subjects of inventions dealt within patent documents indicated either the intrinsic nature or function of a thing or the way a thing was used or applied. The thing may mean any technical matter, e.g., process, product or apparatus.

The Classification is divided into eight sections. Each section is designated by one of the capital letters A through H. The section title is to be considered as a very broad indication of the contents of the section. Each section title is followed by a summary of the titles of its main subdivisions. Each section is subdivided into classes. Each class symbol consists of the section symbol followed by a two-digit number. Example: A 01. The class title gives an indication of the content of the class. Each class comprises one or more subclasses. Each subclass symbol consists of the class symbol followed by a capital letter. Example: A 01 B The subclass title indicates as precisely as possible the content of the subclass. Each subclass is broken down into subdivisions referred to as "groups", which are either main groups or subgroups. Each group symbol consists of the subclass symbol followed by two numbers separated by an oblique stroke. Each main group symbol consists of the subclass symbol followed by a one- to three-digit number, the oblique stroke and the number 00. Example: A 01 B 1 /00. The main group title defines a field of subject matter considered to be useful for search purposes. Main group symbols and titles are printed in bold in the Classification. Example: A 01 B 1 /00 Hand tools. Subgroups form subdivisions under the main groups. Each subgroup symbol consists of the subclass symbol followed by the one- to three-digit number of its main group, the oblique stroke and a number of at least two digits other than 00. Example: A 01 B 1 /02. The subgroup title defines a field of subject matter within the scope of its main group considered to be useful for search purposes. In all cases, the subgroup title must be read as being dependent upon, and restricted by, the

title of the group under which it is indented. A complete classification symbol comprises the combined symbols representing the section, class, subclass and main group or subgroup.

A sample of IPC Code

G 06 E 1/00

G: Physics

06: Computing, Calculating, Counting

E: Optical Computing Devices

1/00: Devices for processing exclusively digital data

8. In brief, give the current status of patent statistics in India.

In India, the number of applications for patents filed in 2001-2002 were 10,952 compared to 8,502 applications in 2000-2001. Of these, the applications that originated in India were 2,371. Of the total 10,952 applications, 1870 applications were filed directly by foreigners resident abroad while 6351 applications filed by them through the PCT route were in the national phase in India. Out of the 2,371 applications that originated in India, Delhi (678) accounted for the maximum applications. Of the 6,351 national phase applications for patents filed at the designated offices/elected offices in India during the year, the United States (2,351) led with the maximum number of applications.

Of the 1379 total number of patent applications granted during 2002-2003 under various fields of inventions, the patent applications in the chemical field were 399, drug – 312, food – 67, electrical – 118, mechanical – 228, and general 255.

As on 31st march, 2002, there were 8320 patents in force. Of these, 1578 patents stood in the names of Indians while the remaining patents were owned by the foreigners.

9. Identify the specific purposes for which patent information can be used by R&D scientists.

The R&D scientists can make use of patent information by identifying specific purposes related to: (i) R&D and technology development, (ii) R&D policy and management, and (iii) information support in patenting. For R&D and technology development, it provides information about latest developments in a field of technology or area of research, enable R&D scientists identify new technological opportunities, assess trends in research, and monitor competitors' R&D activities. The use for R&D policy and management can provide significant insights about the performance of research groups belonging to industry, academia or government, indicate active players in patenting

or assignees of patents, evaluate productivity of individual inventors, nature of collaboration among inventors, and indicate core competency of R&D organizations.

The information about references in patent documents can be converted into useful information for R&D scientists by effectively planning and organizing S&T information services for patenting. It is likely to significantly change the role and function of the information services in R&D organisations.

10. Describe the meaning of Scientometrics and explain use of these techniques in the analysis of patent data.

"Scientometrics" is concerned directly or indirectly, with quantitative aspects of scientific enterprise, like publications, patents, journals, scattering of scientific information, and citation processes, etc. The bibliographic information contained in patent documents can be used for several purposes. The studies in the literature have reported use of bibliographic information contained in patent documents to examine the status of technology, for investigations of pattern of innovation, technological and economic performances at the aggregate or sectoral level for firms and the countries, trends in technology development, research evaluation, and developing technological indicators. Several studies looked into the analysis of data on Indian patents. The main orientation of studies in India is to analyse the patent data in identifying R&D opportunities and trends in technology.

11. How library and information scientists can support the R&D scientists in patenting?

From the perspectives of library and information sciences, data on references cited in patent documents can be used to examine information dependence of the inventive activities of R&D scientists in a R&D organization. Vinkler defines indicator of total information needs, scientific information needs, and patent information needs. According to him, one can draw conclusions regarding information needs of research and development from the type and quality of the literature referenced in the patent documents. The references by applicants and examiners in patent documents can be used in identifying the nature of information used by R&D scientists in taking patents. The library and information scientists can use such information in planning and organizing scientific and technical information support for conducting patentable R&D. Information professionals have an important role to play in providing such information.

1.15 References and further reading

1. Gupta V.K., References to literature in patent documents: a case study of CSIR in India' accepted for publication in the journal. *Scientometrics* 68 (1) (2006).
2. Annual Report of the Controller General of Patents, Designs and Trade Marks, GOI, 2002-03.

3. *Appendix 'M': List of authorities receiving patent office publications.* Annual Report of the Controller General of Patents, Designs and Trade Marks, GOI, 2002-03.
4. USPTO Patent Full-Text and Full-Page Image Databases (<http://www.uspto.gov>)
5. European Patent Office (EPO) worldwide database (www.espacenet.com)
6. Japan Patent Office (JPO) (<http://www.jpo.go.jp/>)
7. WIPO Patent Database (<http://www.wipo.int/ipdl/en/>)
8. Basic Information on WIPO International Classification (<http://www.wipo.int/classifications/en/>)
9. WIPO patent statistics : Patents and PCT (<http://www.wipo.int/ipstats/en/statistics/patents/>)
10. Annual Report of the Controller General of Patents, Designs and Trade Marks, GOI, 2002-03.
11. Gupta V.K., Thesis on Intellectual Property Rights (IPR) Information for R&D Scientists in CSIR awarded by the Department of Studies in Library and Information Science, University of Mysore, Mysore, March 2006.
12. *Aslib Proceedings*, 1 (1948) 102.
13. Pritchard, A., Statistical bibliography or bibliometrics, *Journal of Documentation*, 25(1969), 348-49.
14. Morales, M. Informetrics and its importance, *International Forum of Information and Documentation*, 10(1985) 15-21.
15. Dobrov, G.M., Korennoi, A.A., The informational basis of scientometrics. (In) Mikhailov, A.I. *et al* (Eds), *on the theoretical problems of informetrics*, Moscow, VINITI for FID, 1969, 165-191.
16. Schmoch, U., Indicators and the relations between science and technology. *Scientometrics* 38 (1997) 103-116.
17. Carpenter, Mark P., Linkage between basic research literature and patents. *Research Management* 23 (1980) 30-35.
18. Narin, F., Noma, E., Is technology becoming science? *Scientometrics* 7 (1985) 369-381.
19. Meyer, M., Does science push technology? Patents citing scientific literature. *Research Policy* 29 (2000) 409-434.
20. Griliches Z (ed.), *R&D, Patents and Productivity* (University of Chicago Press) Chicago, 1984
21. Mansfield E, Academic research and industrial innovation, *Research Policy*, 20 (1991) 1-12

22. Dosi G, Pavitt L, Soete L, *The Economics of Technical Change and International Trade* (Harvester Wheatsheaf) London, 1990
23. Karki M M S, *Bibliometric analysis of patents: Implications for R&D and industry*, In Nagpaul P S, Garg K C, Gupta B M et al (eds.), *Emerging Trends in Scientometrics* (Allied Publishers) New Delhi, 1999, 111-125
24. Rajeswari A R, *Indian patent statistics – An analysis*, *Scientometrics*, 36 (1996) 109-130
25. Kardam K S, *Patenting activity in India: An overview*, *Journal of Intellectual Property Rights*, 2 (1997) 113-122
26. Noyons E C M, Raan A F J van, Schmoch U, *Exploring the science and technology interface: Inventor-author relations in laser medicine research*, *Research Policy*, 23 (1994) 443-457
27. Collins P, Wyatt S, *Citations in patents to the basic research literature*, *Research Policy*, 17 (1988) 64-74
28. Vinkler P, *The origin and features of information referenced in pharmaceutical patents*, *Scientometrics*, 30 (1994) 283-302
29. Gupta V.K., 'References to literature in patent documents: a case study of CSIR in India' accepted for publication in the journal *Scientometrics* Vol. 68, No. 1. 2006.

MLISc – 4
Management of Information resources

Block – 4
Intellectual Property Rights and Cyber Laws

Unit - 14
Overview of Intellectual Property Rights

Structure

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Importance of Intellectual Property rights
- 14.3 Basic Concepts of IPR
 - 14.3.1 Intellectual property
 - 14.3.2 Patent
 - 14.3.3 Copyright
 - 14.3.3 Trademark
 - 14.3.4 Design
 - 14.3.5 Geographical Indication
 - 14.3.6 Layout design of Integrated Circuits
 - 14.3.7 Trade secret or confidential Information
 - 14.3.8 Unfair competition
- 14.4 International Treaties and Conventions on IPR
- 14.5 Summary
- 14.6 Answer to self-check exercises
- 14.7 References and further reading

14.0 Objectives

After reading this Unit, you will be able to:

- Comprehend the importance of intellectual property rights;
- Define and explain the basic concepts of intellectual property rights;
- Indicate the international treaties and conventions on IPR;

14.1 Introduction

Intellectual property (IP) represents the fruit of an individual's intellectual creativity. The right to IP encourage the creativity in man thereby contribute to the development of society culturally and technologically. It is also logical that the creative person should enjoy the economic or other benefits of his labours. The counter argument is that IP creates monopolies, which are unfair and may distort trade and progress may not be possible unless one knows everything that has been done before. There is little evidence to show that the absence of IPRs damages creativity or an industry. Nonetheless, it is widely accepted that individuals and organizations deserve their IP to be protected and rewarded.

There are two distinct schools of thought on intellectual property rights (IPR). Most scholars argue that stronger intellectual property system is one of the cornerstones of modern economic policy. In contrast, other scholars argue that intellectual property rights are constraints on development [1]. They feel that the developed countries are using IPR for establishing their political and economic superiority over the developing countries [2]. The differences in perceptions about the importance of intellectual property are largely due to differences in the developmental needs of developed and developing countries. However, in a global economy, a global system of IPR is needed that reflects the needs of both the developed and the developing countries.

14.2 Importance Of Intellectual Property

The subject of intellectual property (IP) has assumed international importance especially in view of the globalization of national economies, emergence of new technologies such as biotechnology, nanotechnologies, microelectronics, and information and communication technologies, and the increasing global competition in the world trade. There is a growing appreciation of the importance of IPR protection for promoting innovation, social development and economic growth. An effective system for protecting IPRs is critical to ensuring that the R&D institutions, business enterprises, and industry continue to contribute to nation's development [3].

The advances made through organized research and development (R&D) leading to inventions, innovations, and new knowledge are major instruments of human survival and progress. In present day competitive environment, facilitation of quick sharing and commercialization of new knowledge requires protection of such knowledge through appropriate IP laws so as to prevent illegal use or copying. Intellectual property rights play a significant role in the international transfer of technology. IPRs increasingly facilitate the operation of markets. Strong and effective intellectual property rights are an essential tool for technology transfer. They encourage private and public enterprises to transfer technology, not only through voluntary licensing and other contractual arrangements, but also through the development of innovative approaches for promoting technological development, direct investment, technology sales and dissemination, and cooperative ventures. IPRs also play a crucial role in our growing awareness of the role that diffusion of knowledge plays in the process of technological change and economic development.

In the context of growing importance of knowledge based-economy, particularly, developing countries, which depend heavily on technology and knowledge developed abroad, are most in need of effective IPR policies to facilitate the inward flow of that knowledge and to foster a more competitive business climate over the long term. By providing exclusive rights to an invention, a properly functioning patent system frequently spurs others to innovate by developing alternative solutions to technical problems and spurring new and improved inventions. Innovators are stimulated to “invent around” or “design around” the original invention in order to avoid infringing the applicable patent(s).

Several studies discuss intellectual property issues of direct concerns to library and information activities [4,5,6]. These issues mainly relate to copyright, databases, digital contents, rights and responsibilities of content creators, providers and users, balancing fair use and commercial interests, freedom of information, financial implications of intellectual property as they relate to the electronic access, scholarly publications, law and ethics for the information professionals, and other legal dimensions of the works of librarians. The legal frameworks are often not well understood, either by information users or information providers. Most important of these issues, is the issue of fair use exception under the IPR laws, which provide freedom of operation to library and information professionals to provide service of photocopying and access to information on digital media for being used for personal purposes for the users in the library.

Exercise

- 1) **Describe the importance of intellectual property rights in the economic development.**
- 2) **State the IPR issues of concern to library and information science.**

14.3 Basic Concepts of IPR: Definitions And Explanations

14.3.1 Intellectual property

Intellectual property refers to creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce. Intellectual property is divided into two categories: Industrial property, which includes inventions (patents), trademarks, industrial designs, and geographic indications of source; and copyright, which includes literary and artistic works such as novels, poems and plays, films, musical works, artistic works such as drawings, paintings, photographs and sculptures, and architectural designs. Rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and those of broadcasters in their radio and television programs. There are several issues of recognizing newer forms of intellectual property such as intellectual property in the lay-out designs of integrated circuits, protection of plant varieties, software, databases, internet domain names, electronic publishing, electronic commerce, and traditional knowledge and folklore. The issues also include protection of publications, archives, databases or other such material on the Internet, individual items in a database, computer software, and inventive pieces of hardware that are subject to patent coverage.

The legal profession views IP as real (physical) property, which can be mortgaged, sold, rented and passed on to heirs and successors. The owner of an IP has certain rights that prevent third parties from using it without his permission. In essence, the IPR connotes the rights to literary, artistic and scientific work; performances of performing artists; phonograms and broadcasts; inventions in all fields of human endeavour; scientific discoveries; industrial designs; trademarks; service marks and commercial names and designations; and all other products resulting from intellectual activity in the industrial, scientific, literary and artistic fields. It is a generic term covering patent, registered design, trademark, copyright, layout designs of integrated circuits, trade secrets, geographical indications and anticompetitive practices in contractual licenses [7,8]. The various forms of IP are protected and governed by appropriate national legislation.

14.3.2 Patent

A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. It gives the legal right to the patentee to prevent others from 'practicing' i.e. making, using, selling or importing the inventions covered by the patent. In order to be patentable, the invention must fulfill certain conditions. It must be of practical use; it must show an element of novelty, that is, some new characteristic which is not known in the body of existing knowledge in its technical field. This body of existing knowledge is called "prior art". The invention must show an inventive step, which could not be deduced by a person with average knowledge of the technical field. Finally, its subject matter must be accepted as "patentable" under law [9]. In many countries, scientific theories, mathematical methods, plant or animal varieties, discoveries of natural substances, commercial methods, or methods for medical treatment (as opposed to medical products) are generally not patentable.

A patent provides protection for the invention to the owner of the patent. A patent is a legal monopoly granted for a limited period to the owner of an invention. Patent rights are granted by the State. The protection is granted for a limited period, generally, 20 years. Merely to have a patent does not give the owner the right to use or exploit a patented invention; that right may still be affected by other laws such as health and safety regulation, or the food and drugs regulation or by other patents. The patent law is a property right and it can be given away, inherited, sold, licensed and even abandoned. As it is conferred by the State, it can be revoked by the State even after grant, whether or not it has, in the meantime, been sold or licensed. There is no such thing as world patent.

An invention is protected through claims in a patent that precisely define what the invention is [10]. The claims and the claims alone construct a fence around the patented invention to avoid its unlawful use. It may be noted that legal protection is awarded only to what is included in the claims and the matter not included in claims is in open to public for creating new inventions. As a great deal in decision-making would depend on how does one construct claims, the language assumes a very important place]. Also, a patent is a contract between the state and an inventor; and care must be exercised to see that both are treated fairly. If this policy is interpreted to limit the scope of the inventor's claims, he would not receive adequate legal protection for the contribution he is making to the promotion of science and technology. On the contrary, further experimentation by others is discouraged if the patent claims are made very broad and there is no method of checking liberal interpretation of claims leading to monopolization of the art unfairly. This in turn would violate the

general purpose of the patent laws, which are primarily designed to promote the progress of science in addition to rewarding of the inventor.

Exercise

3) What is meant by Patent?

4) How claims are important in a patent?

14.3.3 Copyright

The copyright and its related rights are essential to human creativity, by giving creators incentives in the form of recognition and fair economic rewards. Under this system of rights, creators are assured that their works can be disseminated without fear of unauthorized copying or piracy. This in turn helps increase access to and enhances the enjoyment of culture, knowledge, and entertainment all over the world. Copyright, an important type of IP, protects the labour, skill and judgment of author, artist or other creator in the creation of an original piece of work [11]. Copyright protection extends only to expressions of ideas, and not to ideas, procedures, and methods of operation or mathematical concepts as such. A field of rights related to copyright has rapidly developed over the last 50 years. These related rights grew up around copyrighted works, and provide similar, although often more limited and of shorter duration, rights to performing artists (such as actors and musicians) in their performances; producers of sound recordings (for example, cassette recordings and compact discs) in their recordings; and broadcasting organizations in their radio and television programs.

The owner of copyright has the right to prevent others from copying, selling, hiring out, performing, broadcasting or amending the work. The skill, labour and judgement of the author are protected irrespective of the form in which the product appears. The definition of “published” applicable to print media is modified to cover present day electronic media. Fair Dealing or Fair Use, permits copying for certain specific purposes and under certain conditions. It is intended as a defence against an infringement action, and relies on the argument that the individual made the copy (or under certain circumstances, even multiple copies) of not too substantial a part of the literary work and the copying would not damage the legitimate interests of the copyright owner. What is Fair Dealing should be specified in the legislation. Typically, national legislations will permit Fair Dealing/Use for such purposes as private research, private study, criticism and book reviewing, reporting current events, and educational purposes. For a fair use exemption, a person wanting a copy should make the copy himself or herself, or someone else may be authorized to make the copy. In many countries, librarians and information officers are also entitled to make copies on behalf of a

patron. Fair dealing applies to books, journal articles, and databases for academic and personal use only and cannot be used for commercial purposes.

Different countries apply different tests in order for copyright to be enjoyed. In a majority of the countries, copyright is an automatic right. One need not even register with any authority. More than one individual can enjoy the copyright on the same item if they independently created the same item without prior knowledge of each other's efforts. In some countries the owner can only be an individual, but in most it can be an individual or an organization. An employee of an organization who creates something in the course of his normal duties passes ownership of the copyright to the employer. In many countries, Reproduction Rights Organizations (RROs) are a well-established part of the copyright scene. RROs are typically owned wholly or in part by publishers' representatives, and have authority to issue blanket licenses to organisations so that they may photocopy copyright materials beyond the legally permitted limits for a fee [12].

The different types of work covered under copyright include the (i) original literary, dramatic, musical and artistic works; (ii) computer programmes/software, (iii) cinematographic film, and (iv) sound recording. The rights of a copyright holder are [13]:

- I. In the case of literary, dramatic or musical work, not being a computer programme/software:
 - a) to reproduce the work in any material form including the storing of it in any medium by electronic means;
 - b) to issue copies of the work to the public not being copies already in circulation;
 - c) to perform the work in public or communicate it to the public;
 - d) to make any translation of the work;
 - e) to make any adaptation of the work; and
 - f) to do, in relation to a translation or an adaptation of the work, any of the acts specified in relation to the work in sub-clauses (a) to (e).
- II. In the case of computer programme/software :
 - a) to do any acts specified in I; and
 - b) to sell or give on hire, or offer for sale or hire any copy of the computer programme, regardless of whether such copy has been sold or given on hire on earlier occasions;
- III. In the case of an artistic work :
 - a) to reproduce the work in a material form including depiction in three dimensions of a

two dimensional work or in two dimensions of a three dimensional work;

- b) to communicate the work to the public;
- c) to issue copies of the work to the public not being copies already in circulation;
- d) to include the work in any cinematograph film;
- e) to make any adaptation of the work; and
- f) to do in relation to an adaptation of the work, any of the acts specified in relation to the work in sub-clauses (a) to (e).

IV. In the case of cinematograph film :

- a) to make a copy of the film including a photograph of any image forming part thereof;
- b) to sell or give on hire, any copy of the film, regardless of whether such copy has been sold or given on hire on earlier occasions; and
- c) to communicate the film to the public.

V. In the case of sound recording :

- a) to make any other sound recording embodying it;
- b) to sell or give on hire, or offer for sale or hire, any copy of the sound recording, regardless of whether such copy has been sold or given on hire on earlier occasions; and
- c) to communicate the sound recording to the public.

The term of a Copyright is a) if published during the life time of the author of a literary work, the term is for the lifetime of the author plus 60 years; b) for cinematographic films, records, photographs, posthumous publications, anonymous publication, works of government and international agencies the term is 60 years from the beginning of the calendar year following the year in which the work was published; and c) for broadcasting the term is 25 years from the beginning of the calendar year following the year in which the broadcast was made.

Exercise

5) What is meant by Copyright?

6) Describe the salient features of the 'fair use' in the copyright law.

14.3.4 Trademark

A trademark is a distinctive sign that identifies certain goods or services as those produced or provided by a specific person or enterprise. It helps consumers identify and purchase a product or service because its nature and quality, indicated by its unique trademark, meets their needs [14]. The trademark provides protection to the owner of the mark by ensuring the exclusive right to use it to identify goods or services, or to authorize another to use it in return for payment. The period of protection varies, but a trademark can be renewed indefinitely beyond the time limit on payment of additional fees. In order to be eligible for protection, a mark is to be distinctive of the proprietor so as to identify the proprietor's good, for example, KODAK for photographic films or COMPAQ for personal computers. Where a trademark is used in connection with services, it may be called 'service mark'. For example, service marks are used by hotels, airlines or travel agencies. The registration for a mark is for ten years and is renewable from time to time.

Exercise

7) What is meant by trademark?

14.3.5 Design

An industrial design is the ornamental or aesthetic aspect of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color [15]. Industrial designs are applied to a wide variety of products of industry and handicraft: from technical and medical instruments to watches, jewelry, and other luxury items; from housewares and electrical appliances to vehicles and architectural structures; from textile designs to leisure goods. To be protected under most national laws, an industrial design must be original and should appeal to the eye. This means that an industrial design is primarily of an aesthetic nature, and does not protect any technical features of the article to which it is applied.

Exercise

8) What is meant by protection of design?

14.3.6 Geographical Indication

A geographical indication is an indication that identifies a good as originating in a territory where a given quality, reputation or other characteristics of the good is essentially attributable to its geographical origin [16]. The geographical indication may be simple and need not be associated with any obligation other than of production in a specified geographical area. It prevents unauthorised

persons from using the protected geographical indication for products not from that region or from misleading the public as to the true origin of the product.

Exercise

9) **What is meant by protection of a geographical indication?**

14.3.7 Lay-out design of Integrated Circuits

Integrated circuits are creations of human mind. There is a need for the creation of new layout designs, which reduce the dimensions of existing integrated circuits as also increase their functions. The protection is given for designs that are original and is inherently distinctive [17]. The law prohibits reproducing, importing, selling or otherwise distribution for commercial purposes of a protected layout design or an integrated circuit.

Exercise

10) **What is meant by protection of layout design of integrated circuits?**

14.3.8 Trade secret or confidential Information

A trade secret is a formula, practice, process, design, instrument, or compilation of information used by a business firm or an to obtain an advantage over competitors who do not know or use the trade secret or such confidential information. It is also referred to in some jurisdictions as know-how or confidential information, and in others is a subset or example of confidential information. The protection of confidential information is significant for R&D organisation [18].

Exercise

11) **What is trade secret?**

14.3.9 Unfair competition

By unfair competition, one means wrongful, fraudulent and/or business methods to gain an unfair advantage over competitors, including: a) untrue or misleading advertising or promotion which misrepresent the nature, characteristics, qualities or geographic origin (such as where wine comes from), b) misleading customers by imitative trademark, name, or package, including trademark infringement, c) falsely disparaging another's product. In the context of industrial property protection, acts of unfair competition are prohibited by the law [19].

Exercise

12) **What is meant by unfair competition?**

14.3.9.1 Protection of Plant Variety and Farmer's Rights

The development of new plant variety is protected under Plant breeders' rights (PBRs) as a *sui generis* system. The plant breeders' rights are granted to breeders of new, distinct, uniform and stable plant varieties. The farmers are entitled to save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under the act in the same manner as he was entitled before except that he cannot sell branded seed of such registered variety [20].

14.4 International Treaties and Conventions on IPR

The need for international protection of intellectual property became evident when foreign exhibitors refused to attend the International Exhibition of Inventions in Vienna in 1873 because they were afraid their ideas would be stolen and exploited commercially in other countries. Later, 1883 marked the birth of the Paris Convention for the Protection of Industrial Property, the first major international treaty designed to help the people of one country obtain protection in other countries for their intellectual creations in the form of industrial property rights. Since then several treaties and international agreements have been signed between nations. Generally, the IPR laws operate territorially, and normally provide protection only for a country's nationals. The international treaties, and bilateral agreements enable protection for foreign authors/inventors under reciprocity conditions. The World Intellectual Property Organization (WIPO), one of the specialized agencies of the United Nations, provides the secretariat to most of these treaties and conventions [21,22]. A list of these treaties and conventions is given in the Annexure. Some of the important international conventions applicable across national boundaries are mentioned below.

Berne Convention

The Berne Convention was established in 1886 relating to Copyright Protection. Since then five revisions have taken place in 1908, 1928, 1948, 1967 and 1971. It is administered by WIPO and presently has 160 states as its members. The Convention deals with definitions, literary and artistic work, scope of rights and protection, term of copyright and freedom of Member States [23].

The Convention rests on three basic principles and contains a series of provisions determining the minimum protection to be granted, as well as special provisions available to developing countries, which want to make use of them. The three basic principles are the following: (a) works originating in one of the contracting States (that is, works the author of which is a national of such a State or works which were first published in such a State) must be given the same protection in each

of the other contracting States as the latter grants to the works of its own nationals (principle of “national treatment”), (b) such protection must not be conditional upon compliance with any formality (principle of “automatic” protection), and (c) such protection is independent of the existence of protection in the country of origin of the work (principle of the “independence” of protection). If, however, a contracting State provides for a longer term than the minimum prescribed by the Convention and the work ceases to be protected in the country of origin, protection may be denied once protection in the country of origin ceases.

Universal Copyright Convention

The Universal Copyright Convention (UCC), adopted in 1952 and administered by UNESCO, has 99 countries as signatories by the end of December 2005. India is a member of UCC. Under this treaty, each Member State grants the same protection to works (whether published or not) of nationals of, and to works first published in any other Member State as it grants to its nationals for work, first published in its territory or unpublished works created within its territory. Thus, software created by an Indian or first published in India is protected in a Convention Member State to the extent that the member’s current copyright statute protects software. This provision applies only to works that were first published outside the country requiring the observance of the formalities, and were not authored by one of that country’s nationals. Also, formalities such as, registration are permitted under UCC in order to bring an infringement suit. The universal copyright symbol © was also introduced during the 1952 General Convention [24].

Paris Convention

The first system for protection of IP came in the form of the Venetian Ordinance in 1485. This was followed by the Statute of Monopolies in England in 1623 which extended patent rights for technological inventions. In the USA patent laws were introduced in 1760. Most European Countries developed their patent laws between 1880 and 1889. In order to help patenting in those countries which had developed their own patent laws and systems, an international convention known as the Paris Convention was signed by most of the above countries in 1883. The Paris Convention, concluded in 1883, was revised at Brussels in 1900, at Washington in 1911, at The Hague in 1925, at London in 1934, at Lisbon in 1958 and at Stockholm in 1967, and it was amended in 1979.

The Paris Convention applies to industrial property which includes inventions (patents) marks, industrial design, utility models (a kind of small patent provided by the laws of some countries), trade names, geographical indicators and the repression of unfair competition. Industrial

property applies to industry and commerce, agricultural and extractive industries and all manufactured and natural products like wine, grain, tobacco leaf, fruit, cattle, minerals, mineral water, beer, flowers and flour.

By December 2005, there were 169 total contracting parties to the Paris Convention including many developing countries. India is now a member of the Paris convention. The countries ratifying the Convention form a Union for the protection of industrial property. The substantive provisions of the Convention fall into three main categories: national treatment, right of priority and common rules. The Convention lays down a few common rules which all the contracting States must follow. The Convention does not lay down anything relating to the term of various types of freedom given to each country but has left it to each country to formulate its own patent laws [25].

The member countries of the TRIPS Agreement are required to comply with Articles 1 to 12 and Article 19 of the Paris Convention.

Patent Cooperation Treaty

The Patent Cooperation Treaty makes it possible to seek patent protection for an invention simultaneously in each of a large number of countries by filing an “international” patent application. Such an application may be filed by anyone who is a national or resident of a contracting State. It may generally be filed with the national patent office of the contracting State of which the applicant is a national or resident or, at the applicant’s option, with the International Bureau of WIPO in Geneva. The Treaty regulates in detail the formal requirements with which any international application must comply. The procedure of filing a patent under the PCT has great advantages for the applicant, the patent offices and the general public.

The PCT was concluded in 1970, amended in 1979 and modified in 1984. It is open to States party to the Paris Convention. Instruments of ratification or accession must be deposited with the Director General of WIPO. By December 2005, there were 128 total contracting parties to the PCT. India became a member of PCT on December 7, 1998 [26].

Madrid Agreement concerning the International Registration of Marks

The Madrid Agreement was adopted on 14 April 1891 to facilitate obtaining the protection of a trademark or service mark in several countries through a single international registration. By December 2005, there were 56 countries party to this Agreement. India is not a signatory to this agreement. This agreement covers both trademarks and service marks. The protocol relating to the

Madrid Agreement was adopted on 27 June 1989 and came into force on 1 December 1995. It retains the basic features of the Madrid Agreement [27].

World Copyrights Treaty (WCT)

The World Copyright Treaty was concluded in 1996. The Treaty entered into force on March 6, 2002, after 30 instruments of ratification or accession by States had been deposited. The Director General of WIPO is the depositary of the Treaty. By December 2005, 58 countries were signatories to the Treaty. India is not yet a signatory to the treaty. The treaty recognizes the profound impact of the development and convergence of information and communication technologies on the creation and use of literary and artistic works. It mentions two subject matters to be protected by copyright, (i) computer programs, whatever may be the mode or form of their expression, and (ii) compilations of data or other material (“databases”), in any form, which by reason of the selection or arrangement of their contents constitute intellectual creations. (Where a database does not constitute such a creation, it is outside the scope of this Treaty [28].

Trade Related Aspects of the Intellectual Property Rights (TRIPS)

The TRIPS agreement, negotiated in the General Agreement on Tariffs and Trade (GATT), represents a complex balance between conflicting national perspectives and interests with respect to the protection of intellectual property rights (IPR). The principles of National Treatment and Most-Favoured National Treatment (MFN) are amongst the key obligations under TRIPS with respect to IPR [29]. According to the principle of national treatment, each Member country is required to accord to the nationals of other Members treatment no less favourable than that it accords to its own nationals with regard to the protection of intellectual property. The MFN principle implies that any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members. The areas of intellectual property that it covers are: copyright and related rights (i.e. the rights of performers, producers of sound recordings and broadcasting organizations); trademarks including service marks; geographical indications including appellations of origin; industrial designs, patents including the protection of new varieties of plants; the layout-designs of integrated circuits, and undisclosed information including trade secrets and test data. The TRIPS Agreement came into effect on 1 January 1995. India is a signatory to the Agreement. The World Trade Organization (WTO) is responsible for administering the TRIPS Agreement, in particular monitoring the operation of the Agreement. There were 150 countries member of TRIPS till 15 December 2005.

TRIPS, with its focus on technology, is a watershed in international economic relations because a) Technology is accepted as the driving force behind competitiveness of any nation; b) Research and development (R & D) is becoming increasingly costly, accentuated by stringent environmental needs; and c) Several developing countries including India are being perceived as highly competent to decipher, absorb and reproduce technologies developed by the industrially-advanced countries which consider this as a piracy causing serious economic losses to them and, therefore, must be stopped through instruments and agreements. There are several implications of WTO and IPR for R&D management [30].

The three main features of the Agreement are: (i) **Standards:** In respect of each of the main areas of intellectual property covered by the TRIPS Agreement, the Agreement sets out the minimum standards of protection to be provided by each Member. Each of the main elements of protection is defined, namely the subject-matter to be protected, the rights to be conferred and permissible exceptions to those rights, and the minimum duration of protection; (ii) **Enforcement:** The second main set of provisions deals with domestic procedures and remedies for the enforcement of intellectual property rights. The Agreement lays down certain general principles applicable to all IPR enforcement procedures; and (iii) **Dispute settlement:** The Agreement makes disputes between WTO Members about the respect of the TRIPS obligations subject to the WTO's dispute settlement procedures.

The developing countries pressed for public health concerns to be taken care of by TRIPS As a result, the Doha Declaration of November 2001 stressed to implement and interpret the TRIPS Agreement in a way that supported public health — by promoting both access to existing medicines and the creation of new medicines [31]. A separate declaration on TRIPS and public health, designed to respond to concerns about the possible implications of the TRIPS Agreement for access to medicines was also issued. Paragraph 6 of this declaration dealt with some unfinished business — how to help poorer countries to have access to cheaper generics made under compulsory licensing.

Annexure - International Treaties and Agreements concerning Intellectual Property

A India is a Member

- 1 Convention Establishing the World Intellectual Property Organization (WIPO) (established: 14 July 1967)

- 2 Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) (established: 1 January 1995; Administered by WTO)
- 3 Paris Convention for the Protection of Industrial Property (established: 20 March 1883; revised 1900, 1911, 1925, 1934, 1958, 1967 and 1979; administered by WIPO)
- 4 Patent Cooperation Treaty (PCT) (established: 1970; amended 1979 and 1984; administered by WIPO)
- 5 Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure (Budapest Treaty) (established: 1977; amended 1980)
- 6 International Convention on Biological Diversity (established: June 1992)
- 7 Berne Convention for the Protection of Literary and Artistic Works (established: 9 September 1886; revised 1908, 1914, 1928, 1948, 1967, 1971 and 1979)
- 8 Universal Copyright Convention (UCC) (established: 6 September 1952; revised 1971)
- 9 Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms (established: 29 October 1971; administered by WIPO)
- 10 Treaty on Intellectual Property in Respect of Integrated Circuits (established: 1989 (not yet in force))
- 11 Nairobi Treaty on the Protection of the Olympic Symbol (established: 1981)

B India is not a member

- 1 Strasbourg Agreement Concerning the International Patent Classification (IPC Union) (established: 24 March 1971; amended 1979; administered by WIPO)
- 2 International Convention for the Protection of New Varieties of Plant (UPOV Convention) (established: 2 December 1961; amended 1972, 1978 and 1991)
- 3 International Convention for the Protection of Performers, Producers of Phonograms and

Broadcasting Organizations (Rome Convention) (established: 26 October 1961; administered by WIPO)

4 Convention Relating to Distribution of Programme Carrying Signals Transmitted by Satellite (established: 1974; administered by WIPO)

5 Treaty on International Registration of Audio Visual Works (Film Register Treaty) (established: 1989; administered by WIPO)

6 Hague Agreement Concerning the International Deposit of Industrial Designs (established: 6 November 1925; revised 1934, 1960, 1967, 1975 and 1979; administered by WIPO)

7 Locarno Agreement Establishing an International Classification for Industrial Designs (Locarno Union) (established: 8 October 1968; amended 1979)

8 Madrid Agreement Concerning the International Registration of Marks (established: 14 April 1891; revised 1900, 1911, 1925, 1934, 1957, 1967 and 1979; administered by WIPO)

Protocol relating to the Madrid Agreement Concerning the International Registration of Marks was established in 1989.

9 Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods (established: 14 April 1891; revised 1911, 1925, 1934, 1958 and 1967; administered by WIPO)

10 Trademarks Law Treaty (established: October 1994)

11 Nice Agreement Concerning the International Classification of Goods and Services for the Registration of Marks (Nice Union) (established: 15 June 1957; revised 1967, 1977 and 1979; administered by WIPO)

12 Lisbon Agreement for the Protection of Appellations of Origin & their International Registration (Lisbon Union) (established: 31 October 1958; revised 1967 and 1979; administered by WIPO)

13 Vienna Agreement Establishing an International Classification of the Figurative Elements of

Marks (Vienna Agreement) (established: 12 June 1973; revised 1985; administered by WIPO)

14. The Copyright Treaty (established: December 1996)
15. The Phonogram and Performers Rights Treaty (established: December 1996)

C Other regional treaties (Membership open on regional basis)

- 1 European Patent Convention
- 2 The African Intellectual Property Convention (OAPI)
- 3 The African Regional Industrial Property Organization (ARIPO)
- 4 The Cartagena Agreement Legislation on Industrial Property
- 5 North American Free Trade Agreement (NAFTA)

Exercise

- 13) **What are the main international treaties relating to protection of copyright?**
- 14) **Give a brief description about the Berne Convention?**
- 15) **Describe in brief about the TRIPS agreement.**

14.5 Summary

Giving an overview of the intellectual property rights, this unit presents the following aspects:

- Basic concepts of intellectual property rights including patent, copyright, trademark, design, geographical indication, layout design of integrated circuits, trade secrets and unfair competition;
- Significant international treaties and conventions on IPR including those related to copyright and TRIPS;
- How the IPR laws have evolved in India? A review of the developments in this regard has been made since independence. The current status of these laws is now in line with India's commitments under TRIPS;

- Patent information means the bibliographic and technical information contained in patent documents;
- Software and databases are best protected under the existing copyright laws in India. There is a debate on the ways and means to protect the traditional knowledge. TKDL is an important initiative of the Government of India in documenting the traditional knowledge in the public domain;
- New issues and challenges are being faced by the library and information science professional in the context of the Internet and IPR. A brief idea of such issues has been provided.

14.6 Answer to self-check exercises

1) Describe the importance of intellectual property rights in the economic development.

The subject of intellectual property (IP) has assumed international importance especially in view of the globalisation of national economies, emergence of new technologies such as biotechnology, nanotechnologies, microelectronics, and information and communication technologies, and the increasing global competition in the world trade. Intellectual property rights play a significant role in the international transfer of technology. The advances made through organized research and development (R&D) leading to inventions, innovations, and new knowledge are major instruments of human survival and progress.

2) State the IPR issues of concern to library and information science.

The intellectual property issues of direct concerns to library and information activities mainly relate to scholarly publications, databases, digital contents, rights and responsibilities of content creators, providers and users, protection of such works through copyright and balancing fair use and commercial interests. Most important of these issues, is the issue of fair use exception under the IPR laws, which provide freedom of operation to library and information professionals to provide service of photocopying and access to information on digital media for being used for personal purposes for the users in the library.

3) What is meant by Patent?

A patent is a government granted and secured legal right to prevent others from 'practicing' i.e. making, using, selling or importing the inventions covered by the patent. An invention is patentable if it is new, involves an inventive step, and is industrially applicable in the sense that it

can be industrially manufactured and used. The new means the some new characteristic which is not known in the body of existing knowledge in its technical field i.e. the "prior art".

4) How claims are important in a patent?

An invention is protected through claims in a patent that precisely define what the invention is. The legal protection is awarded only to what is included in the claims. If the patent limits the scope of the inventor's claims, he would not receive adequate legal protection for the contribution made by him. On the contrary, further experimentation by others is discouraged if the patent claims are made very broad, which in turn would violate the general purpose of the patent laws. A proper balance should thus be maintained while formulating the scope of claims in a patent document.

5) What is meant by Copyright?

The copyright protects the labour, skill and judgement of author, artist or other creator in the creation of an original piece of work. Copyright protection extends only to expressions of ideas, and not to ideas, procedures, methods of operation or mathematical concepts as such. The copyright and its related rights are essential to human creativity, by giving creators incentives in the form of recognition and fair economic rewards. Under this system of rights, creators are assured that their works can be disseminated without fear of unauthorized copying or piracy.

6) Describe the salient features of the fair use in the copyright law.

Fair Dealing or Fair Use is intended as a defence against an infringement action, and relies on the argument that the individual made the copy (or under certain circumstances, even multiple copies) of not too substantial a part of the literary work and the copying would not damage the legitimate interests of the copyright owner. What is Fair Dealing is specified in the legislation. Fair Dealing/Use is permitted for such purposes as private research, private study, criticism and book reviewing, reporting current events, and educational purposes. In many countries, librarians and information officers are also entitled to make copies on behalf of a patron. Fair dealing cannot be used for commercial purposes.

7) What is meant by trademark?

A trademark is an identification symbol, which is used in the course of trade to enable the purchasing public to distinguish one trader's goods from the similar goods of other traders and repeat their order by using the trademark if they are satisfied with the purchase. In order to be eligible for protection, a mark is to be distinctive of the proprietor so as to identify the proprietor's good, for

example, KODAK for photographic films or COMPAQ for personal computers. The registration for a mark is for ten years and is renewable from time to time.

8) What is meant by protection of design?

The expression 'Design' means only the features of shape, configuration, pattern or ornament applied to any article by any industrial process or manually or by mechanical or chemical means. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color. Industrial designs are applied to a wide variety of products of industry and handicraft. To be protected under most national laws, an industrial design must be original and should appeal to the eye.

9) What is meant by protection of a geographical indication?

A geographical indication is an indication that identifies a good as originating in a territory where a given quality, reputation or other characteristics of the good is essentially attributable to its geographical origin. The geographical indication may be simple and need not be associated with any obligation other than of production in a specified geographical area.

10) What is meant by protection of layout design of integrated circuits?

Integrated circuits are creations of human mind. The creation of new layout designs is protected under the law. The protection is given for designs that are original and is inherently distinctive. The law prohibits reproducing, importing, selling or otherwise distribution for commercial purposes of a protected layout design or an integrated circuit.

11) What is trade secret?

A trade secret is a formula, practice, process, design, instrument, or compilation of information used by a business firm or an to obtain an advantage over competitors who do not know or use the trade secret or such confidential information. It is also referred to as know-how or confidential information, and in others is a subset or example of confidential information.

12) What is meant by unfair competition?

The acts of unfair competition are those that create confusion with the goods or commercial activities of a competitor. The false allegations in the course of trade that discredit the goods or commercial activities of a competitor, or indications, which mislead the public about the properties of the goods, are prohibited by the law. In the context of industrial property protection, acts of unfair competition are prohibited by the law.

13) What are the main international treaties relating to protection of copyright?

The main international treaties relating to protection of copyright are the Berne Convention for the Protection of Literary and Artistic Works, Universal Copyright Convention, and the World Copyright Treaty. The other conventions relate to related rights and include the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms, International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, and the Phonogram and Performers Rights Treaty. The Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) established on 1 January 1995 and administered by WTO also provides for the minimum standards of protection for copyright.

14) Give a brief description about the Berne Convention?

The Berne Convention was established in 1886 relating to Copyright Protection. The last revision took place in 1971. It is administered by World Intellectual Property Organisation (WIPO). The Convention also deals with definitions, literary and artistic work, scope of rights and protection, term of copyright and freedom of Member States.

The Convention rests on three basic viz., (a) Works originating in one of the contracting States (that is, works the author of which is a national of such a State or works which were first published in such a State) must be given the same protection in each of the other contracting States as the latter grants to the works of its own nationals (principle of “national treatment”), (b) Such protection must not be conditional upon compliance with any formality (principle of “automatic” protection), and (c) Such protection is independent of the existence of protection in the country of origin of the work (principle of the “independence” of protection).

15) Describe in brief about the TRIPS agreement.

The Agreement on Trade related Aspects of Intellectual Property Rights, popularly known as the TRIPS agreement, was formally established on 1 January 1995. The Agreement is administered by the World Trade Organization (WTO).

It represents a complex balance between conflicting national perspectives and interests with respect to the protection of intellectual property rights (IPR). The principles of National Treatment and Most-Favoured National Treatment (MFN) are amongst the key obligations under TRIPS. According to the principle of national treatment, each Member country is required to accord to the nationals of other Members treatment no less favourable than that it accords to its own nationals with regard to the

protection of intellectual property. The MFN principle implies that any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members. The areas of intellectual property that it covers are: copyright and related rights (i.e. the rights of performers, producers of sound recordings and broadcasting organizations); trademarks including service marks; geographical indications including appellations of origin; industrial designs, patents including the protection of new varieties of plants; the layout-designs of integrated circuits, and undisclosed information including trade secrets and test data. India is a signatory to the Agreement.

The setting up of the dispute settlement mechanism is one of its important features. In the main Doha Declaration of November 2001, it was stressed to implement and interpret the TRIPS Agreement in a way that supports public health.

16) What are the laws relating to IPR in India?

The laws relating to IPR in India include the Patents Act, 1970 as amended in 1999, 2002 and 2005 for patents, the Indian Copyright Act, 1957 as amended in 1983, 1984, 1992, 1994, and in 1999 for copyrights, the Design Act 2000 for industrial designs, the Trademarks Act, 1999 for trade marks for goods and trade marks for services, and the Geographical Indications of Goods (Registration & Protection) Act, 1999 for the registration and better protection of geographical indications. relating to goods in India. The Semiconductor Integrated Circuit Layout Design Act was enacted in 2000. As a first step, Government of India has decided to bring to force sections 3 and 5 of the Act w.e.f. 1.5.2004. There is no exclusive legislation on protection of undisclosed information but the matter would be generally covered under the Contract Act, 1872.

17) Mention the administrative authorities responsible to administer the respective IPR laws in India?

The Government of India has taken various steps to bring about changes in the administration of Intellectual Property Rights (IPR). The Department of Industrial Policy & Promotion of the Government of India is responsible for the formulation of policies relating to Intellectual Property Rights in the fields of Patents, Trademarks, Industrial Designs and Geographical Indications of Goods and administration of regulations, rules made thereunder. The laws on Patents, designs, trademarks and geographical indications are administered by the Controller General of Patents,

Designs and Trademarks which is under the control of this Department. The law on Copyright is under the charge of the Ministry of Human Resource Development. The Act on Layout Design of Integrated Circuits is implemented by the Ministry of Information Technology, Government of India. For the administration of the Act, a Layout-Design Registry for registering layout-designs of integrated circuits is being set up under the Department of Information Technology, Government of India.

18) How are software protected in Indian laws?

In India, the computer software is covered by the Copyright Act of 1999. The Act in India accords copyright protection to computer programmes by including it within the ambit of original literary works. It is the underlying software code, which is protected as a literary work. According to the Act, “computer programme” means a set of instructions expressed in words, codes, schemes or in any other form, including machine-readable medium, capable of causing a computer to perform a particular task or achieve a particular result. Under the provisions of the Act, software enjoys protection provided all the aspects required for the protection of an original literary work is present i.e. the work is original and involves the expenditure of independent labour and skill, the work is recorded in some form, the term of protection has not expired, protection is not debarred owing to the foreign origin of the work.

The Copyright in software shall subsist within the lifetime of the programmer until 60 years from the beginning of the calendar year following the year in which the programmer dies. Copyright being a property right can be bought, sold, left as inheritance etc. The Act enables the copyright holder to assign whole or part of his rights to others to exploit economically for a lump sum consideration. It also enables him to license some or all of his rights usually on the basis of a royalty payment.

19) What are the penalties for its infringement?

Giving an unauthorised copy to another person, if caught with pirated software, the copyright infringer may be tried under civil and/or criminal law. Civil and criminal action may be instituted for injunction, actual damages (including infringer’s profits), or statutory damages per infringement. The Act has substantially increased the criminal penalties. There is a minimum jail term of 7 days for copyright infringement. The Act further provides for fines up to Rs.2,00,000 and jail term up to three years or both.

20) What are the approaches to protection of databases?

The approaches for the protection of databases are:

i. Protection of databases through "Contracts"

Protection of databases through Contracts permit an user to use the database under a license from the database owner on payment of a fee based upon the amount of usage and or royalty. License does not pass the ownership of the database to the user. A contract may be used in addition to the protection of the database under the copyright laws.

ii. Database protection through copyright laws

Most countries have accorded protection to databases under the copyright laws. The definitions of databases and legal interpretations of the protection under copyrights are considerably varied amongst different countries. The question of intellectual skills involved in the creation of databases has been debated. Many databases do not qualify basic conditions for being protectable under the copyright laws.

iii. Sui generis system of protection for databases

Sue generis protection of databases is largely guided by the European Community Directive on the legal protection of databases. The Directive was passed by the European Parliament on 11 March 1996. The Draft Database Treaty was proposed for adoption at the diplomatic conference of the member countries organised by World Intellectual Property Organisation (WIPO) in December 1996 as a *sui generis* system. The treaty established a new form of protection of databases in which rights were given to the makers of databases on the basis of the criteria of investments made. The databases with substantial investment were protected irrespective of their being original.

21) How are databases protected in Indian laws?

The Indian Copyright Act 1999 included databases as a literary work. As the protection of any literary work depends upon its originality and the amount of skill and labour used, thus also the question of whether a database is to have copyright protection or not depends upon whether it satisfies the requirements of originality, skill and labour. Here it would be pertinent to note that the collection of information of the type contained in a database would anyhow involve the application of a substantial amount of skill and labour irrespective of the fact that a computer is being used to assist in the task.

22) Describe the salient features of the TKDL for the documentation of traditional knowledge.

The traditional knowledge was passed on from one generation to another and in many cases the culture, tradition and livelihood of a particular community reflected in the nature and content of

the traditional knowledge. The documentation of traditional knowledge is thus important for its protection as well as identifying the collective rights of the communities, artisans, farmers, tribes or other grassroots innovators. In order to protect patents being taken based on traditional knowledge, the Government of India took a major initiative in 1999 to document traditional knowledge by setting up a Traditional Knowledge Digital Library (TKDL). An inter-disciplinary team of Traditional Medicine (Ayurveda, Unani, Siddha, Yoga) experts, patent examiners, IT experts, scientists and technical officers are involved in creation of TKDL for Indian Systems of Medicine. The project TKDL involves documentation of the knowledge available in public domain on traditional knowledge from the existing literature related to Ayurveda, Unani and Siddha, in digitized format in five international languages which are English, German, French, Japanese and Spanish.

Traditional Knowledge Resource Classification (TKRC), an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval has been evolved for about 10,500 subgroups against one group in International Patent Classification (IPC), i.e. *AK61K35/78* related to medicinal plants. TKDL will give legitimacy to the existing traditional knowledge and enable protection of such information from getting patented by the fly-by-night inventors acquiring patents on our traditional knowledge systems. It will prevent misappropriation of Indian traditional knowledge, mainly, by breaking the format and language barrier and making it accessible to patent examiners at International Patent Offices.

23) Describe the key issues of interest to library and information science professionals in the context of IPR and the Internet.

There are several issues of interest to Information and library professionals that are becoming important in the context of Internet and IPR. Traditionally, making copies beyond certain limits was available to libraries under the fair dealing concept that are now under strong attack by copyright owners. Other issues include issuing copies to the public; playing; performing; broadcasting; and making adaptations and translations. Some of these have very complex legal complications and need to be considered before any material is acquired by the library. The new electronic environment is very different from the analogue print environment. It requires new understanding of words such as browse and browsers. Making a photocopy of a print product is very different from creating a digital version of the same work. Digital versions of works need copyright protection that is adequate to their nature.

Unrestricted library document delivery violates article 9(2) of the Berne Copyright

Convention. Lending electronic products carries more risk than lending print products as the transmission of copyright works to remote locations is a copyright violation. The acquisition of materials such as CD-ROMs, material on disk, and multimedia works needs to be considered carefully and governed by contract. Scanning of material in preparation for sending it down a network without permission is “adaptation” of the work, and is therefore infringement. Sending material via a telecom network, although virtually instantaneous, is infringement. Similarly, printing out copies at a remote terminal without permission is again infringement.

How can these issues be addressed? An obvious way forward is through site licensing, although other models may develop. Many national and regional libraries contemplate digitizing their print collections to facilitate a virtual library to provide service to patrons in remote locations and facilitate resource sharing. Digital document delivery is a new service being offered by publishers and is not same as print based inter library loan. Libraries that copy digitally and store copyright works electronically, even temporarily, as part of electronic document delivery services are infringing copyright law.

14.7 References and further reading

1. Gupta, V.K. 2004. Multi-disciplinary Studies on IPR in R&D: A Review. *Journal of Intellectual Property* 9: 34-42.
2. Rangachari, S. Subba Rao and Duvvuri. 1998. Bio-diversity and IPR: Ethical dimensions. *The Economic Times*. March 17: 6.
3. David, M. G. and William, C. G. 1996. The role of intellectual property rights in economic growth. *Journal of Development Economics* 48: 323-350.
4. Oppenheim, Charles. 1997. Intellectual property: legal and other issues. *Information Studies* 3(1): 5-22. Also in: *World Information Report*, 1997-1998. Paris: Unesco; 1997: 349-60.
5. Aggarwal, D. 1996. Libraries and library services under the Indian copyright law. *DESIDOC Bulletin of Information Technology* 16: 21-24.
6. Hendrickson, K. and Strauch, K. 1991. Intellectual property rights and scholarly publishing in the twenty-first century. *Library Acquisitions: Practice and Theory* 15: 419-421.

7. Intellectual Property Rights (IPR). 1995 Nov. A Bulletin from TIFAC. New Delhi. 1(1): 1.
8. *World Intellectual Property Organization*, WIPO web site [<http://www.wipo.int>]
9. *The Patents Act, 1970 and Patents Rules, 1972, and the amendments to the act in 1999, 2002, and 2005*, Government of India.
10. Gupta V.K. and Pangannaya, N.B. 1999. IPR Information: Analysis and drafting of patent claims for R&D scientists. *Journal of Intellectual Property Rights* 4(6): 325-338.
11. *The Copyright Act, 1957, The Copyright Amendment Act, 1994 along with the Copyright Rules, 1958 and International Copyright Order, 1991, Short notes*. Universal Book Traders, New Delhi, 1995.
12. Oppenheim, Charles. 1997 Jan. Intellectual property: legal and other issues. *Information Studies* 3(1): 5-22. Also in: *World Information Report, 1997-1998*. Paris: Unesco: 349-60.
13. *The Copyright Act, 1957, The Copyright Amendment Act, 1994 along with the Copyright Rules, 1958 and International Copyright Order, 1991, Short notes*. Universal Book Traders, New Delhi, 1995.
14. *The Trademarks Act, 1999*. Government of India, 1999.
15. *The Designs Act, 2000*, Gazette of India, Extraordinary part II-Section I, 2002.
16. *The Geographical indications of goods (registration and protection) act, 1999*. Gazette of India, Extraordinary, Part II-Section I, 1999.
17. *The Semiconductor Integrated Circuits layout-design Act, 2000*, Government of India, 2000.
18. Gupta, V.K. 1999. Protecting confidential R&D information. *Asia and Pacific Tech Monitor* 17: 37-42.
19. World Trade Organisation (WTO), TRIPS Gateway, Intellectual Property. [<http://www.wto.org>]
20. *The Protection of Plant Variety and Farmers' Rights Act. 2001*. Government of India, 2001.
21. *World Intellectual Property Organization*, WIPO web site [<http://www.wipo.int>]
22. Gupta V.K. 2000. Negotiating IPR in International Science and Technology Cooperation. *Journal of Intellectual Property Rights* 5: 61-71

23. Berne convention for the protection of literary and artistic works. WIPO web site [<http://www.wipo.int>]
24. Universal Copyright Convention (UCC). Unesco web site [<http://www.unesco.org>]
25. Paris Convention for the protection of industrial property. WIPO web site [<http://www.wipo.int>]
26. Patent Cooperation Treaty (PCT). WIPO web site [<http://www.wipo.int>]
27. Madrid Agreement concerning the International Registration of Marks. WIPO web site [<http://www.wipo.int>]
28. World Copyright Treaty (WCT). WIPO web site [<http://www.wipo.int>]
29. World Trade Organisation (WTO), TRIPS Gateway, Intellectual Property. [<http://www.wto.org>]
30. Gupta V.K. 1998. WTO and IPR: Implications for R&D Management. *Journal of Intellectual Property Rights* **3**: 271-280.
31. The Doha Ministerial Declaration on TRIPS and Public Health. 2001. World Trade Organisation (WTO), TRIPS Gateway, Intellectual Property. [<http://www.wto.org>]
32. India, Department of Science and Technology. Technology Information, Forecasting and Assessment Council and Council of Scientific and Industrial Research. Intellectual property protection in India: a practical guide for scientists, technologists and other users. New Delhi: TIFAC; 1993.
33. Intellectual Property Rights. A Bulletin from TIFAC, DST, GOI. **2(3)**; 1996 Mar.; 4-5. *Please also see TIFAC web site* [<http://www.tifac.org.in>]
34. Gupta V.K. and Pangannaya, N.B. 2000. Carbon Nanotubes: Bibliometric Analysis Of Patents. *World Patent Information* **22**:185-189.
35. Gupta V.K. 1999. Technological Trends in the Area of Fullerenes using Bibliometric Analysis of Patents. *Scientometrics* **44(1)**: 17-31.
36. *NASSCOM's guide to IPR law in India*. New Delhi: NASSCOM; 1996: 4.

Further Readings

- Subbaram, N.R., What everyone should know about patents. 2nd edition, Pharma Book Syndicate, 4-3-375, ansuya bhavan, Bank Street, Hyderabad 500 095. 2005.

- Alikhan, Shahid, and Mashelkar, R.A., *Intellectual property and comparative strategies in the 21st century*, Kluwer Law International, UK, 2004.
- Alikhan, Shahid, *Socio-economic benefits of intellectual property protection in developing countries*. WIPO, Geneva; 2000.
- *Protection of industrial property rights*. Bombay: Purushottamdas Gokuldas; 1973.
- Information policy: copyright and intellectual property, Electronic Collections, INFLANET, International Federation of Library Associations and Institutions web site [<http://www.ifla.org/II/copyright.htm>]
- Journal of Intellectual Property Rights published by NISCAIR (CSIR), New Delhi [<http://www.niscom.res.in>]

Unit -15

Cyber laws and IT Act of India

Structure

- 1.0 Objectives
- 1.1 Introduction
- 1.2 What is Cyberlaw
- 1.3 Cyberlaws in India: IT Act, 2000
 - 1.3.1 Digital Signature
 - 1.3.2 Electronic Records
 - 1.3.3 Retention of Information in Electronic Format
 - 1.3.4 Electronic Gazette
 - 1.3.5 Secure Electronic Records
 - 1.3.6 Secure Digital Signatures
 - 1.3.7 Security
 - 1.3.8 Penalties
 - 1.3.9 Network Service Providers not to be liable in certain cases
- 1.4 What is Domain Name
 - 1.4.1 Internet Corporation for Assigned Names and Numbers (ICANN)
 - 1.4.2 Cybersquatting
- 1.5 Intellectual Property Issues and Cyberspace
 - 1.5.1 Trademarks vs. Domain Names
 - 1.5.2 Domain names disputes
 - 1.5.3 Copyright and cyberspace
 - 1.5.4 Trade secrets in cyberspace
 - 1.5.5 Patents and cyberspace
 - 1.5.6 Framing
 - 1.5.7 Deep linking
 - 1.5.8 Spidering

- 1.6 Cyber crime
 - 1.6.1 Financial crime
 - 1.6.2 Cyber pornography
 - 1.6.3 Sale of illegal articles
 - 1.6.4 Online fraud
 - 1.6.5 Intellectual property crimes
 - 1.6.6 E-mail spoofing
 - 1.6.7 Forgery
 - 1.6.8 Cyber defamation
 - 1.6.9 Cyber stalking
 - 1.6.10 Hacking
 - 1.6.11 E-mail bombing
 - 1.6.12 Data diddling
 - 1.6.13 Salami attacks
 - 1.6.14 Denial of service attacks
 - 1.6.15 Virus/ worm attacks
 - 1.6.16 Logic bombs
 - 1.6.17 Trojan attacks
 - 1.6.18 Internet time thefts
 - 1.6.19 Web jacking
 - 1.6.20 Theft of computer system
 - 1.6.21 Physically damaging a computer system
 - 1.6.22 Cyber Crime Investigation Cell
- 1.7 Data Protection
 - 1.7.1 Digital Millennium Copyright Act
- 1.8 Cyber law for library and information professionals
 - 1.8.1 Salient points for librarians
 - 1.8.2 Licensing principles (approved by IFLA, 2001)
- 1.9 Summary
- 1.10 Answer to self-check exercises
- 1.11 References and further reading

1.0 Objectives

After reading this Unit, you will be able to:

- understand the importance of Internet, need to regulate the domain of Internet, and the basic concept of the Cyber Laws;
- indicate the substantive features of the information technology Act of 2000 in India;
- describe the basic provisions of the IT Act, particularly, the provisions relating to Digital Signature, Electronic Records, Retention of Information in Electronic Format, Electronic Gazette, Secure Electronic Records, Secure Digital Signatures, Security, and Penalties;
- delve on the concept of domain names, agency responsible for registration of domain names, and cybersquatting;
- indicate the nature of intellectual property issues in cyberspace, and discuss the issues related to domain names vs. trademarks, domain name disputes, copyright, trade secret and patent in cyberspace;
- understand the several actions considered as cyber crime and indicate the functions of the crime investigation cell,
- describe the legal initiatives in the data protection and the protection of privacy in cyberspace; and
- focus on some of the dimensions of cyber law for library and information professionals including the licensing principles applicable to electronic medium.

1.1 Introduction

The Internet, or simply the Net, is the worldwide, publicly accessible system of interconnected computer networks that transmit data by packet switching using the standard Internet Protocol (IP). It consists of millions of smaller business, academic, domestic, and government networks, which together carry various information and services, such as electronic mail, online chat, and the interlinked Web pages and other documents of the World Wide Web. Contrary to some common usage, the Internet and the World Wide Web are not synonymous: the Internet is a collection of interconnected computer networks, linked by copper wires, fiber-optic cables, wireless connections etc.; the Web is a collection of interconnected documents, linked by hyperlinks and URLs, and is accessible using the Internet.

With the emergence of the internet and recent high speed connections becoming available to the public, the internet has altered the way many people work in significant ways. Contrary to the

traditional workday where employees commute to and from work, the internet has allowed greater flexibility both in terms of working hours and work location. Many use the Internet to access and download music, movies and other works for their enjoyment and relaxation. Many use the World Wide Web to access news, weather and sports reports, to plan and book holidays and to find out more about their random ideas and casual interests. People use chat, messaging and email to make and stay in touch with friends worldwide. The Internet has also become a large market for companies; some of the biggest companies today have grown by taking advantage of the efficient nature of low-cost advertising and commerce through the Internet; also known as e-commerce. It is the fastest way to spread information to a vast amount of people simultaneously. The Internet has also revolutionized shopping—for example; a person can order a CD online and receive it in the mail within a couple of days, or download it directly in some cases. In addition, almost all transactions in shares are in demat form. Most companies extensively depend upon their computer networks and keep their valuable data in electronic form. In India, the Government forms including income tax returns, company law forms etc. are now filled in electronic form. The consumers are increasingly using credit cards for online and offline shopping. Digital signatures and e-contracts are fast replacing conventional methods of transacting business.

Thus, as the information age becomes a reality an increasing amount of human activity is taking place in computer-generated space (cyberspace). Facilitated by the Internet, cyberspace is becoming the site where many work-based, leisure, business and educational activities are now taking place. The instantaneity and trans-border qualities of the cyber space cut across traditional patterns of legal regulation. Numerous debates may arise over the intersection of law and the Internet – e.g., should the Internet be regulated, and if so, by whom? Popular regulation questions include: who has or should have jurisdiction over Internet; should content on the Internet be subject to regulation; should Internet functions themselves be regulated to ensure privacy or, alternatively, legal liability when infractions against third parties are committed over the Net? Many arguments over Internet governance arise over the proper scope of both governmental and international participation in standard-setting and infrastructure maintenance. Internet services now extend across the globe, and documents contained in the web may originate from almost anywhere. The growing needs to regulate the domain of Internet necessitated the Cyber Laws. The Cyber Laws are the laws governing computers and the Internet. In today's highly digitalized world, almost everyone is affected by cyber laws.

Exercise

- 1) Describe the importance of Internet and the need of its regulation.**

1.2 What is Cyberlaw

There is no one exhaustive definition of the term "Cyberlaw." However, simply put, Cyberlaw is a term that refers to all the legal and regulatory aspects of Internet and the World Wide Web. Anything concerned with or related to, or emanating from, any legal aspects or issues concerning any activity of netizens and others, in Cyberspace comes within the ambit of Cyberlaw. Cyberlaw is at an early stage of its development. Though Internet access is growing rapidly throughout the world, yet a majority of countries are debating on whether or not to legislate regarding regulating cyberspace within their national territorial boundaries. India, USA, UK, Malaysia, Singapore are some of the countries that have legislated Cyberlaws. Even amongst the different nations, there is a diversion of opinion on the issue of how much to legislate in the field of Cyberlaws. In principle, the Cyber Law must provide for (i) authentication of instruments, (ii) prevent countermanding or reversal of instructions, (iii) operational security for the systems, (iv) frauds, technical failures and errors, (v) evidence, data protection and record preservation, and (vi) deal with the unique aspects of this business e.g. deal with the problems relating to domain names, meta-tags, hyperlinks, digital copyright etc.

- 2) Explain the meaning of the term 'Cyber laws'.**

1.3 Cyberlaws in India: Information Technology Act, 2000

The Government of India enacted the Information Technology (IT) Act on 9th June 2000. The Act provided legal recognition for the transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "Electronic Commerce", which involved the use of alternatives to paper based methods of communication and storage of information, and to facilitate electronic filings of documents with the Government agencies. The passage of the Act created a legal recognition for electronic documents. In the light of this provision, every act of a Company on the Internet, Intranet or Extranet may now be legally binding on the Company. More importantly, every e-mail received and replied by the secretaries of Company executives, may actually create liabilities on the Company at some point of time in the future if handled without care. This can happen to individuals also. The records and signatures in

electronic form now have complete legal validity in all types of transactions except in negotiable instruments such as the cheque, bill of exchange, promissory note, power of attorney, trust deeds, and wills. For any contract of sale or conveyance of immovable property, electronic agreements are now legally valid. Computer crimes are now punishable. In order to make eBusiness possible, amendments have been made to several legislations viz., Indian Evidence Act, 1872 – enabling it to accept eRecords as evidence, Indian Penal Code, 1860 – enabling punishment to forgery of documents, General Clauses Act, 1897 – including eDocuments within the scope of documents, RBI Act, 1934 – promote, establish and permit banking companies, financial institutions to carry out refund transfer system, and Bankers Book Evidence Act, 1891 – which includes records kept in electronic form. The IT Act 2000 attempts to change outdated laws and provides ways to deal with cyber crimes. We need such laws so that people can perform purchase transactions over the Net through credit cards without fear of misuse. The Act offers the much-needed legal framework so that information is not denied legal effect, validity or enforceability, solely on the ground that it is in the form of electronic records. The key features of the Act are described below.

1.3.1 Digital Signature

According to the IT Act, affixing “Digital Signature” with its grammatical variations and cognate expressions means adoption of any methodology or procedure by a person for the purpose of authenticating an electronic record by means of digital signature. The digital signature is used to authenticate electronic records. Any subscriber may authenticate an electronic record by affixing his digital signature. The authentication of the electronic record is effected by the use of asymmetric crypto system and hash function which envelop and transform the initial electronic record into another electronic record. Any person by the use of a public key of the subscriber can verify the electronic record. The private key and the public key are unique to the subscriber and constitute a functioning key pair.

1.3.2 Electronic Records

In respect to matters affecting electronic governance, the Act provides legal recognition of electronic records, electronic signature, use of electronic records and digital signatures in Government and its agencies, and the retention of electronic records. Where any law provides that information or any other matter shall be in writing or in the typewritten or printed form, then, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied if such information or matter is (a) rendered or made available in an electronic form; and

(b) accessible so as to be usable for a subsequent reference. Where any law provides that information or any other matter shall be authenticated by affixing the signature or any document should be signed or bear the signature of any person then, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied, if such information or matter is authenticated by means of digital signature affixed in such manner as may be prescribed by the Central Government. Where any law provides for (a) the filing of any form, application or any other document with any office, authority, body or agency owned or controlled by the appropriate Government in a particular manner; (b) the issue or grant of any licence, permit, sanction or approval by whatever name called in a particular manner; (c) the receipt or payment of money in a particular manner, then, notwithstanding anything contained in any other law for the time being in force, such requirement shall be deemed to have been satisfied if such filing, issue, grant, receipt or payment, as the case may be, is effected by means of such electronic form as may be prescribed by the Government.

1.3.3 Retention of Information in Electronic Format

Where any law provides that documents, records or information shall be retained for any specific period, then, that requirement shall be deemed to have been satisfied if such documents, records or information are retained in the electronic form provided (a) the information contained therein remains accessible so as to be usable for a subsequent reference; (b) the electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent accurately the information originally generated, sent or received; (c) the details which will facilitate the identification of the origin, destination, date and time of dispatch or receipt of such electronic record are available in the electronic record.

1.3.4 Electronic Gazette

Where any law provides that any rule, regulation, order, bye-law, notification or any other matter shall be published in the Official Gazette, then, such requirement shall be deemed to have been satisfied if such rule, regulation, order, bye-law, notification or any other matter is published in the Official Gazette or Electronic Gazette, provided that where any rule, regulation, order, bye-law, notification or any other matters published in the Official Gazette or Electronic Gazette, the date of publication shall be deemed to be the date of the Gazette which was first published in any form.

1.3.5 Secure Electronic Records

Where any security procedure has been applied to an electronic record at a specific point of time, then such record shall be deemed to be a secure electronic record from such point of time to the time of verification.

1.3.6 Secure Digital Signatures

If, by application of a security procedure agreed to by the parties concerned, it can be verified that a digital signature, at the time it was affixed, was (a) unique to the subscriber affixing it; (b) capable of identifying such subscriber; (c) created in a manner or using a means under the exclusive control of the subscriber and is linked to the electronic record to which it relates in such a manner that if the electronic record was altered the digital signature would be invalidated, then such digital signature shall be deemed to be a secure digital signature.

1.3.7 Security

The Central Government shall for the purposes of the IT Act prescribe the security procedure having regard to commercial circumstances prevailing at the time when the procedure was used, including (a) the nature of the transaction; (b) the level of sophistication of the parties with reference to their technological capacity; (c) the volume of similar transactions engaged in by other parties; (d) the availability of alternatives offered to but rejected by any party; (e) the cost of alternative procedures; and (f) the procedures in general use for similar types of transactions or communications.

1.3.8 Penalties

The Act provides for the penalty for damage to computer, computer system, etc.. If any person without permission of the owner or any other person who is in charge of a computer, computer system or computer network performs any of the acts mentioned below, he shall be liable to pay damages by way of compensation not exceeding one crore rupees to the person so affected. These acts are:

- (a) accesses or secures access to such computer, computer system or computer network;
- (b) downloads, copies or extracts any data, computer data base or information from such computer, computer system or computer network including information or data held or stored in any removable storage medium;
- (c) introduces or causes to be introduced any computer contaminant or computer virus into any computer, computer system or computer network;

- (d) damages or causes to be damaged any computer, computer system or computer network, data, computer data base or any other programmes residing in such computer, computer system or computer network;
- (e) disrupts or causes disruption of any computer, computer system or computer network;
- (f) denies or causes the denial of access to any person authorised to access any computer, computer system or computer network by any means;
- (g) provides any assistance to any person to facilitate access to a computer, computer system or computer network in contravention of the provisions of this Act, rules or regulations made thereunder; and
- (h) charges the services availed of by a person to the account of another person by tampering with or manipulating any computer, computer system, or computer network.

For this purpose, the "Computer Contaminant" means any set of computer instructions that are designed to modify, destroy, record, transmit data or programme residing within a computer, computer system or computer network; or by any means to usurp the normal operation of the computer, computer system, or computer network. The "Computer Database" means a representation of information, knowledge, facts, concepts or instructions in text, image, audio, video that are being prepared or have been prepared in a formalised manner or have been produced by a computer, computer system or computer network and are intended for use in a computer, computer system or computer network. The "Computer Virus" means any computer instruction, information, data or programme that destroys, damages, degrades or adversely affects the performance of a computer resource or attaches itself to another computer resource and operates when a programme, data or instruction is executed or some other event takes place in that computer resource. The "Damage" means to destroy, alter, delete, add, modify or re-arrange any computer resource by any means.

The Act provides for penalty for failure to furnish information, return, etc. to the Controller or the Certifying Authority. In such a case, a penalty not exceeding one lakh and fifty thousand rupees for each such failure can be charged. If the failure is to file any return or furnish any information, books or other documents within the time specified, the liability is to a penalty not exceeding five thousand rupees for every day during which such failure continues.

1.3.9 Network Service Providers not to be liable in certain cases

For the removal of doubts, the Act declares that no person providing any service as a Network Service Provider shall be liable for any third party information or data made available by

him if he proves that the offence or contravention was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence or contravention. The "Network Service Provider" means an intermediary. The "Third Party Information" means any information dealt with by a network service provider in his capacity as an intermediary.

- 3) **Give the salient components of the Information Technology (IT) Act, 2000, of India.**
- 4) **What are electronic records and how these are secured in the digital medium?**
- 5) **What is the legal provision with respect to the retention of information in Electronic Format?**
- 6) **Indicate the acts which are penalized according to the IT Act in India.**

1.4 What is Domain Name

Domain names are the human-friendly forms of Internet addresses, and are commonly used to find web sites. These are the familiar and easy-to-remember names for Internet computers e.g., "www.ecommerce.gov" or wipo.int for WIPO web site at <http://www.wipo.int> or www.timesjob.com, a site for jobs and recruitment in India. These domain names map to unique Internet Protocol (IP) numbers (e.g., 98.37.241.30) that serve as routing addresses on the Internet. The domain name system (DNS) translates Internet names into the IP numbers needed for transmission of information across the network. It is essentially a global addressing system.

The domain name space is constructed as a hierarchy. It is divided into top-level domains (TLDs), with each TLD then divided into second-level domains (SLDs), and so on. A gTLD is a generic top-level domain. The generic top-level domains (gTLDs) do not carry any national identifier, but denote the intended function of that portion of the domain space. For example, .com was established for commercial users, .org for not-for-profit organizations, and .net for network service providers. In addition, new gTLDs are also selected by ICANN (the Internet Corporation for Assigned Names and Numbers). Some of these include: .aero (for the entire aviation community); .biz (for business purposes); .coop (for cooperatives); .info (unrestricted); .museum (for museums); .name (for personal names); .pro (for professionals). New gTLDs registered recently include .jobs (for human resource managers), .mobi (for consumers and providers of mobile products and services), .travel (for entities engaged in travel industry), and .int (for registering organizations established by international treaties between governments).

A ccTLD is a country code top-level domain, for example: .in for India. These ccTLDs are administered independently by nationally designated registration authorities. There are about 248

ccTLDs reflected in the database of the Internet Assigned Numbers Authority (<http://www.iana.org/cctld/cctld-whois.htm>). WIPO, which has a ccTLD Program, has launched a database portal, facilitating online searches for information related to country code top-level domains.

7) What is meant by the domain names. Give examples of the generic top level domain names.

8) What is the country code top-level domain name for India.

1.4.1 Internet Corporation for Assigned Names and Numbers (ICANN)

The Internet Corporation for Assigned Names and Numbers (ICANN) is an internationally organized, non-profit corporation that has responsibility for Internet Protocol (IP) address space allocation, protocol identifier assignment, generic (gTLD) and country code (ccTLD) Top-Level Domain name system management, and root server system management functions. ICANN is responsible for coordinating the management of the technical elements of the DNS to ensure universal resolvability so that all users of the Internet can find all valid addresses. It does this by overseeing the distribution of unique technical identifiers used in the Internet's operations, and delegation of Top-Level Domain names. Other issues of concern to Internet users, such as the rules for financial transactions, Internet content control, unsolicited commercial email (spam), and data protection are outside the range of ICANN's mission of technical coordination. The Uniform Domain Name Dispute Resolution Policy was adopted by the ICANN, on October 24, 1999, and was incorporated by reference into Registration Agreement, defining the terms and conditions in connection with a dispute between the parties under the agreement, other than the registrar i.e. ICANN, over the registration and use of registered Internet domain name.

ICANN is governed by an internationally diverse Board of Directors overseeing the policy development process. There are three Supporting Organizations. These are (i) Address Supporting Organization (ASO)-<www.aso.icann.org>, (ii) Country Code Domain Name Supporting Organization (CCNSO)-<www.ccnso.icann.org>, and (iii) Generic Names Supporting Organization (GNSO)-<www.gnso.icann.org>. Advisory Committees from individual user organizations, and technical communities work with the Supporting Organizations to create appropriate and effective policies. Over eighty Governments closely advise the Board of Directors via the Governmental Advisory Committee. Participation in ICANN is open to all who have an interest in global Internet policy as it relates to ICANN's mission of technical coordination The advisory committees are (i) At-

Large Advisory Committee-<www.alac.icann.org>, and (ii) Governmental Advisory Committee-<www.gac.icann.org>. More information on ICANN can be found on ICANN's website-<<http://www.icann.org>>.

9) Describe the functions of the international agency responsible for registering the domain names.

1.4.2 Cybersquatting

Cybersquatting is the abusive registration of domain names by bad faith actors who seek to capitalize on the goodwill earned by trademark owners by hijacking Internet addresses. Domain names of successful businesses may be manipulated by predators who claim rights to use the domain names of well-known brands to exploit the goodwill that businesses have spent considerable years and financial investment creating. The predators who engage in this practice generally do so in order to mislead consumers who think that they are accessing the website of a reputable establishment, or to extort payment from the rightful trademark owner for the right to use their own name in online commerce.

10) What is cybersquatting?

1.5 Intellectual Property Issues and Cyberspace

Intellectual property refers to creations of the mind: inventions, literary and artistic works, and symbols, names, images, and designs used in commerce. In legal terms, it includes the property protected by patents, trademarks, industrial designs, copyright, geographic indications, trade secrets or confidential information, and layout design of integrated circuits. The application of these instruments for the protection of intellectual property in the cyberspace has posed unique issues in intellectual property law. Who owns what information on the Internet? Who should own what information on the Internet? How the concepts of trademarks, copyrights, trade secrets, patents, and layout design of integrated circuits could be extended for protection in the cyber world? Some of these issues are being addressed in this section.

1.5.1 Trademarks vs. Domain Names

As commercial activities have increased on the Internet, domain names have become part of the standard communication apparatus used by businesses to identify themselves, their products and their activities. Advertisements appearing in the media now routinely include a domain name address, along with other means of identification and communication, such as the corporate name, trademark and telephone and facsimile numbers. But, whereas the telephone and facsimile numbers

consist of an anonymous string of numbers without any other significance, the domain name, because of its purpose of being easy to remember and to identify, often carries an additional significance, which is connected with the name or mark of a business or its product or services.

Intellectual property protection in the Domain Name System (DNS) has focused on trademarks, a specific category of identifiers, which serve to distinguish the goods or services of one company from those of another. Given the value of trademarks and other identifiers and the importance of the Internet as a commercial communication and marketing channel, rights owners are understandably worried that their identifiers fall victim to deceptive and abusive practices on the Internet. The domain names sometimes conflict with trademarks and other traditional business identifiers. Two factors exacerbate this conflict. First, domain names are global and must be unique - a particular string of letters can link to only one site - while trademarks may overlap in different industries or different geographical locations. Second, it is common practice for many Internet users to guess at domain names. Thus, domain names based on intuition become valuable corporate assets. The rapid growth of the Internet and the use of web sites have generated a rapidly growing set of disputes between firms asserting traditional trademark entitlements and the registrants of identical or confusingly similar domain names. Typically, the trademark owner demands that the domain-name registrant cease using the name and/or relinquish it to the trademark owner. Domain names have become increasingly valuable assets, in some respects more valuable than trademarks. The management of the Internet should also respond to the needs of the Internet community as a whole, and not trademark owners exclusively. For cyberspace to function as an effective commercial market, businesses must have confidence that their trademarks can be protected.

1.5.2 Domain name disputes

Domain name disputes arise largely from the practice of cybersquatting, which involves the pre-emptive registration of trademarks by third parties as domain names. Cybersquatters exploit the first-come, first-served nature of the domain name registration system to register names of trademarks, famous people or businesses with which they have no connection. Since registration of domain names is relatively simple, cybersquatters can register numerous examples of such names as domain names. As the holders of these registrations, cybersquatters often then put the domain names up for auction, or offer them for sale directly to the company or person involved, at prices far beyond the cost of registration. Alternatively, they can keep the registration and use the name of the person

or business associated with that domain name to attract business for their own sites. Most of the new registry operators have developed, or are in the process of developing, specific dispute resolution policies designed to resolve disputes occurring during a start-up, or "sunrise" phase. There is no agreement within the Internet community that would allow organizations that register domain names to pre-screen the filing of potentially problematic names. Although, there are a very few reported judgments on cyber-squatting in India, newspaper reports indicate that there are several disputes pertaining to domain names pending before the various High Courts.

In the case of Rediff Communication Limited v/s Cyberbooth, the Bombay High Court has held that the Internet domain names are of importance and are a valuable corporate asset. A domain name is more than an Internet address and is entitled to protection as a trademark. With the advancement and progress in technology, the services rendered in the Internet site have also come to be recognised and accepted and are being given protection so as to protect such provider of service from passing-off the services rendered by others as his service. In Titan Industries Ltd. v/s Prashant Kooapati, the defendant registered the domain name 'tanishq.com'. The plaintiff Company, which has been using the trade mark 'TANISHQ' with respect to watches manufactured by it, sued for passing-off and alleged that the use of the domain name by the defendants would lead to confusion and deception and damage the goodwill and reputation of the plaintiffs. The Delhi High Court has granted an ex-parte ad-interim injunction restraining the defendants for using the name 'TANISHQ' on the Internet or otherwise and from committing any other act as is likely to lead to passing-off of the business and goods of the defendants as the business and goods of the plaintiff.

1.5.3 Copyright and cyberspace

Who, if anyone, "owns" the content that travels through cyberspace? What rights flow from such ownership? How much control should content owners have over the use and dissemination of their works over the Internet? What does it mean to "reproduce a work in copies"? The photocopying an entire work would certainly qualify for copyright infringement. What about sending an attachment via email or posting a work on a Web server or loading a program into a computer's hard drive? The advent of digital communications has required courts to address whether those who perform these acts without the copyright owner's permission have "reproduced ... copies" in violation of the owner's exclusive rights. In the absence of ownership of the copyright or express permission by license, such acts constitute copyright infringement. Also, individuals who upload copyrighted material onto a

Bulletin Board Service or Web site without the copyright owner's permission have committed copyright infringement. Merely placing copyrighted material on the Internet without the permission of the author may violate the author's display rights.

An Internet service provider ("ISP") makes the copying, display, and distribution of the copyrighted work possible. There are issues of the copyright infringement by such service providers. If an ISP monitors content and successfully prevents the reproduction, display, or distribution of copyrighted works the subscriber does not have rights to use, then the ISP avoids liability. However, if the ISP is unsuccessful in this attempt, then the ISP will be liable in both jurisdictions which apply the normal test and jurisdictions which have adopted the publishers/printers exception standard, because the ISP now does have methods and policies to control content.

An ISP most often provides Internet access and he may be held liable for copyright infringement if he allowed the same directly or indirectly. He will, however, not liable for mere providing of services or when the infringement occurred without his knowledge and participation. An ISP/NSP can escape his liability by showing that he exercised a "due diligence" to prevent the copyright infringement. The Bulletin Board Services (BBSs) are more vulnerable to copyright infringement litigations than the ISPs. These BBSs may allow the subscribers to view, upload, and download copyrighted material of others. They are in direct control of the contents posted, uploaded and downloaded and it is difficult to prove that they were not aware of these activities. The Web Page owners must be cautious of the things they post on their Web Pages so that they do not violate the stringent provisions of the copyright laws. A Web Page owner cannot successfully plead and prove that they were unaware about the copyrighted material because copyright notices are prominently given in authorized software. They also have the controlling power over the content of their pages. The owner are usually the parties that actually perform the uploads to their pages. A computer user who uploads copyrighted material to the Internet is liable for direct infringement. This liability could be avoided only if he can prove the fair use doctrine. Thus, an Internet user should not post copyrighted material on the Internet in a casual manner.

Can a user commit copyright infringement simply by browsing through Web sites on the Internet? The digital browsing is probably a fair use if there is no commercial or profit-depriving in the browsing. Unless such a use is commercial, such as where someone reads a copyrighted work online and therefore decides not to purchase a copy from the copyright owner, fair use is likely. "Deep links" occur when a party links users directly to an internal Web page, thereby bypassing the

welcome page or "home page" for the site. Site owners dislike this practice because it prevents users from viewing the advertisements on their opening page; it also deprives the site owners of home page "hits," which often form the basis for advertising revenues. "Framing" is the practice of linking to another party's site, while maintaining a "frame" with the linking party's advertising and/or other materials surrounding the linked site. Frames often cut off the advertising and other content on the linked party's site, thereby again annoying the framed site's owner. The legality of "deep linking" under the copyright laws has not yet been addressed by the courts. Until reading a work online becomes as easy and convenient as reading a paperback, copyright owners do not have much to fear from digital browsing and there will not likely be much market effect.

1.5.4 Trade Secret in cyberspace

A trade secret is a useful compilation of information, technique, process, or method of doing business that is not generally known or easily derived by persons in the same business or profession. The owner must take reasonable steps to protect the trade secret from unauthorized disclosure such as security measures, copy control, distribution control, and agreements for non-disclosure and non-use. The instantaneous transfer of information on the Internet is likely to become a great problem for trade secret holders. A disgruntled former employee or contractor can, in a moment, distribute a trade secret to millions. While the individual who misappropriated the trade secret would be liable, the recipients could freely use the trade secret so long as these individuals did not know that the information had been improperly acquired. The trade secret is destroyed. There are also issues of privacy and the trade secrets which are related to the right of the system operator to monitor the postings and the messages. The law may contemplate that employers may access messages sent on their behalf by employees. But the question whether a system operator should monitor "private" email messages is different. Enticing users to send messages they come to consider "private" (i.e., expect to be disclosed only to addressees), but then monitoring those messages systematically, is, at a minimum, impolite. Arguably, it ought to be considered to violate a general principle favoring the protection of private communications on the net. The policy questions all come down to (1) what is meant by "private" and (2) what kinds of expectations of privacy (or public disclosure) sysops want to create with respect to particular sets of messages and users. We need public "bulletin boards" -- like usenet newsgroups. And we need private email. Insofar as employees act as the agents of their employers, there is an argument that the employer (the "principal" on whose behalf the employee acts) should have the right to access the employee's emails or to consent to their disclosure to others.

But some employers see the wisdom of providing employee's with a private workspace. These employers typically either provide a means for employees to label incidental personal email or impose restrictions on any actions taken to access employee email without prior consent of the employee concerned. Some employers argue that the fact that they own or pay for the equipment used by employees gives them the right to monitor or access any employee messages. This argument proves too much. Employers regularly supply pens and paper and telephones. But that doesn't give them the right to access any personal communications. And most employers do not seek to ban any incidental use of company property, because attempting to do so would hurt morale. In general, the use of email and other electronic communication tools in a work setting does raise special issues relating to the duties of the employer and employee to others. But most of questions can be resolved reasonably by application of common sense, clear communication of applicable rules, and implementation of procedures that responsibly and thoughtfully take the interests of all concerned into account.

1.5.5 Patents and cyberspace

Software patents are patents on computer implemented inventions. The European Patent Office (EPO) provides a general definition of a computer implemented invention as "an expression intended to cover claims which involve computers, computer networks or other conventional programmable apparatus whereby prima facie the novel features of the claimed invention are realised by means of a program or programs". There is intense debate as to what extent such patents should be granted, if at all. In US, the computer programs embodied in a tangible medium may be eligible for patent. In India, a computer program per se is not patentable.

Problems involving the Internet could arise when a user downloads a patented computer program from the World Wide Web. If the computer program is downloaded without the permission of the patent owner, the user of the unauthorized copy of the computer program could be liable for patent infringement, by way of violating the patent owner's exclusive right to "use" the invention. Computer-generated icons embodied on computer screens may be granted a design patent in US. Graphical user interfaces (GUI) first appeared on visual window-type software applications as icons or images that portrayed a function to the computer user. One of the most famous GUI is the garbage can that Apple Computer uses to delete files. When the user drags files onto the garbage can, the can actually bulges to indicate that files are in the garbage, and the user then has the option to "take out

the garbage" or permanently delete the files, which returns the garbage can back to its original shape. The ease of using such an icon for the computer user removes the difficulty and time of typing in a series of computer commands, when the user makes the association between a GUI depicting a garbage can and the series of commands to "delete a file." The value of the inventor's innovation and creativity to save the computer time and effort deserves to be protected under the design patent standard of "any new, original, and ornamental design for an article of manufacture." However, three considerations under the design patent standards must be made, (1) ornamental, (2) design, and (3) article of manufacture. Thus, a design patent should be issued to protect the inventor's creativity in the appearance of the icon design on a computer screen, similar to the expression protected in copyright, but not the utility and functionality of the icon design which would be more the subject of a utility patent rather than design. The Internet user must be careful not to download patented computer-generated icons, or the exclusive rights of the patent owner could be violated.

One of the key issues in Cyberspace is the Internet patent or business method patent. A business method may be defined as "a method of operating any aspect of an economic enterprise". In essence, Internet patents protect a particular way of doing business online. There is a sustained debate as to what extent such patents should be granted. They may be constituted as very important assets of some Internet-related companies. Internet patents can be used offensively against a major competitor or they can be used defensively as a bargaining chip against an aggressive competitor who threatens to sue based on one of its patents. Company A and Company B both sell concert tickets online, including services for exchanging unwanted tickets and earning rewards for frequent purchases. Company A holds a patent on a method of exchanging concert tickets. Company B has a patent on a method of offering rewards to concert promoters for group ticket purchases. Although each company believes the other is infringing its patent, neither seeks to enforce its rights in court, fearing that the other is almost sure to file a lawsuit in response. Instead, after a few months of legal posturing, Company A and B agree to share, or "cross-license," their technology. For example, Amazon.com devised a method for expediting online orders, known as the "1-Click" system. The method allows a repeat customer to bypass address and credit card data entry forms, because Amazon can access that information directly from the customer's account. Amazon was granted a patent on this business method in September 1999 (U.S. Pat No. 5,960,411).

1.5.6 Framing

Framing as a technology developed with the launch of the Network Legally speaking, there are a number of questions on the legality of framing, since it allows you to embed independently scrollable windows within the border of the Web page or a Web site. This can give the surfer the feeling that he is actually viewing the contents of the site which he has visited and not the contents of the framed site. Framing creates confusion as to the source of the framed Web site and the source of goods and services. Legally speaking, framing can be equated with deceptive association and presentation. Another argument against framing is the fact that a Web site's presentation of the framed page as a whole could be considered as an unlawful derivative work of the original content. Through framing, a lot of Web sites pass off the contents belonging to the other sites as their own. Framing becomes of critical importance in the context of news sites, as the person visiting the home page of the Web site may not distinguish the contents of the site visited from the contents of the framed site.

1.5.7 Deep linking

Deep linking means linking to a Web page deep in another site. Deep linking bypasses the home page of the linked site and links directly to the interior pages of the linked site. This has led to a lot of legal controversy. It is prudent in the case of news sites that linking sites must seek consent and permission of the Web site owner whose site is sought to be linked from their own Web site. Further, specific permission needs to be taken with respect to deep linking.

1.5.8 Spidering

Spidering as a phenomenon exists on the World Wide Web, and their legality or otherwise is presently being debated. It can be argued that spidering amounts to violation of the interest of news sites. Others feel that spidering is basically a technology that does not violate any Intellectual Property Rights. Spidering for information and representing them in a manner that the user would be able to easily access the information he wants is nothing but a Search Engine function. This is an essential service for the Net community and no Copyright violation is to be ascribed for such activities. Even in case where a value added service is created out of such search and index services, it is not a violation of any rights of the original publisher since the link ultimately acknowledges the source and drives a customer to the publisher's site.

11) What are the significant issues of intellectual property rights in cyberspace?

12) Describe in brief the nature of domain name disputes.

1.6 Cyber crime

The computer crime can involve criminal activities that are traditional in nature, such as theft, fraud, forgery, defamation and mischief, all of which are subject to the Indian Penal Code. The abuse of computers has also given birth to a gamut of new age crimes that are addressed by the Information Technology Act, 2000. A simple definition of cyber crime would be "unlawful acts wherein the computer is either a tool or a target or both". The Cyber crimes are the darker side of Cyberspace. There are several examples of the use of the computer as a tool for an unlawful act. This kind of activity usually involves a modification of a conventional crime by using computers. The cybercrimes include computer intrusions and attacks, theft of service, interception of electronic communications, online stalking, online fraud, computer viruses, time bombs, trojans and malicious code, infrastructure security, and hacktivism. Some of these are described below.

1.6.1 Financial crimes

This includes cheating, credit card frauds, money laundering etc. For example, a website offered to sell Alphonso mangoes at a throwaway price. Distrusting such a transaction, very few people responded to or supplied the website with their credit card numbers. These people were actually sent the Alphonso mangoes. The word about this website now spread like wildfire. Thousands of people from all over the country responded and ordered mangoes by providing their credit card numbers. The owners of what was later proven to be a bogus website then fled taking the numerous credit card numbers and misused the same.

1.6.2 Cyber pornography

This includes pornographic websites; pornographic magazines produced using computers (to publish and print the material) and the Internet (to download and transmit pornographic pictures, photos, writings etc). For example, a student of a school in Delhi, was teased by his classmates for having a pockmarked face. Tired of the cruel jokes, he decided to get back at his tormentors. He scanned photographs of his classmates and teachers, morphed them with nude photographs and put them up on a website that he uploaded on to a free web hosting service. It was only after the father of one of the class girls featured on the website objected and lodged a complaint with the police that any action was taken.

1.6.3 Sale of illegal articles

This includes sale of narcotics, weapons and wildlife etc., by posting information on websites, auction websites, and bulletin boards or simply by using email communication. e.g. many of the auction sites may be selling such banned items.

1.6.4 Online gambling

There are several websites; all hosted on servers abroad, that offer online gambling; which in fact is a crime under the cyber laws of India.

1.6.5 Intellectual Property crimes

These include software piracy, copyright infringement, trademarks violations, theft of computer source code etc.

1.6.6 Email spoofing

A spoofed email is one that appears to originate from one source but actually has been sent from another source. e.g. X has an e-mail address X@asianlaws.org. His enemy, Y spoofs the e-mail and sends obscene messages to all of the acquaintances of X. Since the e-mails appear to have originated from X, his friends could take offence and relationships could be spoiled. Email spoofing can also cause monetary damage.

1.6.7 Forgery

Counterfeit currency notes, postage and revenue stamps, mark sheets etc may be forged using sophisticated computers, printers and scanners. Also, fake mark sheets or even certificates may be made using computers, and high quality scanners and printers, the acts which amount to forgery.

1.6.8 Cyber Defamation

This occurs when defamation takes place with the help of computers and or the Internet. e.g. someone publishes defamatory matter about someone on a website or sends e-mails containing defamatory information to all of that person's friends.

1.6.9 Cyber stalking

The Oxford dictionary defines stalking as "pursuing stealthily". Cyber stalking involves following a person's movements across the Internet by posting messages (sometimes threatening) on the bulletin boards frequented by the victim, entering the chat-rooms frequented by the victim, constantly bombarding the victim with emails etc. In addition, a web "pirate" may be more difficult to track down and stop than he would be in "real space," due to the ability of online users to mask their identities through anonymous e-mail accounts and the like.

1.6.10 Hacking

Unauthorized access to computer systems or networks is commonly referred to as hacking.

1.6.11 E-mail Bombing

Email bombing refers to sending a large number of emails to the victim resulting in the victim's email account (in case of an individual) or mail servers (in case of a company or an email service provider) crashing.

1.6.12 Data diddling

This kind of an attack involves altering raw data just before it is processed by a computer and then changing it back after the processing is completed.

1.6.13 Salami attacks

These attacks are used for the commission of financial crimes. The key here is to make the alteration so insignificant that in a single case it would go completely unnoticed. E.g. a bank employee inserts a program, into the bank's servers, that deducts a small amount of money (say Rs. 5 a month) from the account of every customer. No account holder will probably notice this unauthorized debit, but the bank employee will make a sizable amount of money every month.

1.6.14 Denial of Service attack

This involves flooding a computer resource with more requests than it can handle. This causes the resource (e.g. a web server) to crash thereby denying authorized users the service offered by the resource. Another variation to a typical denial of service attack is known as a Distributed Denial of Service (DDoS) attack wherein the perpetrators are many and are geographically widespread. It is very difficult to control such attacks. The attack is initiated by sending excessive demands to the victim's computer(s), exceeding the limit that the victim's servers can support and making the servers crash.

1.6.15 Virus / worm attacks

Viruses are programs that attach themselves to a computer or a file and then circulate themselves to other files and to other computers on a network. They usually affect the data on a computer, either by altering or deleting it. Worms, unlike viruses do not need the host to attach themselves to. They merely make functional copies of themselves and do this repeatedly till they eat up all the available space on a computer's memory.

1.6.16 Logic bombs

These are event dependent programs. This implies that these programs are created to do something only when a certain event (known as a trigger event) occurs e.g. even some viruses may

be termed logic bombs because they lie dormant all through the year and become active only on a particular date (like the Chernobyl virus).

1.6.17 Trojan attacks

A Trojan is an unauthorized program which functions from inside what seems to be an authorized program, thereby concealing what it is actually doing.

There are many simple ways of installing a Trojan in someone's computer.

1.6.18 Internet time thefts

This connotes the usage by an unauthorized person of the Internet hours paid for by another person. In a case reported before the enactment of the Information Technology Act, 2000, a resident of New Delhi, asked a nearby net café owner to come and set up his Internet connection. For this purpose, the net café owner needed to know his username and password. After having set up the connection he went away with knowing the present username and password. He then sold this information to another net café. Later, it was found that his Internet hours were almost over. Out of the 100 hours that he had bought, 94 hours had been used up within the span of that week. Surprised, he reported the incident to the Delhi police. The police took action as per the Indian Penal Code.

1.6.19 Web jacking

This occurs when someone forcefully takes control of a website (by cracking the password and later changing it). The actual owner of the website does not have any more control over what appears on that website.

1.6.20 Theft of computer system

This type of offence involves the theft of a computer, some part(s) of a computer or a peripheral attached to the computer including information stored in computer hard disks, removable storage media or in electronic form.

1.6.21 Physically damaging a computer system

This crime is committed by physically damaging a computer or its peripherals.

1.5.22 Cyber Crime Investigation Cell

In keeping with the demand of the times, the Cyber Crime Investigation Cell (CCIC) of the Central Bureau of Investigation (CBI), notified in September 1999, started functioning w.e.f. 3.3.2000. The Cell is headed by a Superintendent of Police. The jurisdiction of this Cell is all India, and besides the offences punishable under Chapter XI, IT Act, 2000, it also has power to look into other high-tech crimes. Its e-mail address is cbiccic@bol.net.in, and the postal address is Supdt. of Police, Cyber Crime Investigation Cell, Central Bureau of Investigation, 5th Floor, Block No.3, CGO Complex Lodhi Road, New Delhi – 110003. <http://cybercrime.planetindia.net/intro.htm>

13) What do you understand by cyber crime? Indicate any five acts which can be termed as cyber crime.

1.7 Data Protection

The needs of privacy of individuals and their personal information are felt in all societies. The issues of privacy are widely interpreted in terms of management of personal information, or 'data protection'. Various countries developed specific protections for privacy in their respective contexts. These concerns have become much more significant with the emergence of computers, databases, Internet and the cyberspace. There are several sources of personal data that are compiled for various functional purposes such as membership in libraries, insurance policy records, bank records, list of clients in a business, credit card users and so on. Personal data have also become an economic resource that many businesses need and use for the supply of their products and services. In the light of these developments a number of solutions are advanced in the literature for providing greater protection to personal data in cyberspace. Discussions at various fora have been taking place to consider whether the law should play a greater role in promoting greater information privacy in general and in cyberspace in particular. Both economic and non-economic considerations, which favour greater protection for personal data, have been put forward. The right to privacy in Internet activity is a serious issue facing society. Some users of the 'net wish to shield their identities while participating in frank discussions of sensitive topics.

Since no formal law exists within cyberspace, Internet users can find recourse only through the applicable laws of their own government. Data management and safekeeping of the customer and employee information are fundamental to the well-being of corporations today, especially since customer information is one of the most valuable assets of most companies. In many countries around the world, there is a general law that governs the collection, use and dissemination of personal information by both, the public and private sectors. The Council of Europe's (CoE) 1981

Convention for the Protection of Individuals with regard to the Automatic Processing of Personal Data, and the Organization for Economic Cooperation and Development's (OECD) Guidelines Governing the Protection of Privacy and Transborder Data Flows of Personal Data, set out specific rules covering the handling of electronic data. These rules describe personal information as data that are given protection at every step from collection to storage and dissemination.

Personal aspects of individuals are protected under the Article 21 of the Constitution of India. This provision has two aspects viz. a personal aspect of privacy right and a commercial aspect of right to livelihood. The definitions of data and computer databases along with their protection and enforcement provisions are sufficient to take care of data property violations in the cyberspace. The present legal system in India protects sufficiently both the paper based as well as computer based data property. If a person contravenes the data and privacy rights of an individual by means of computer, computer system or computer network located in India, he would be liable under the IT act. Data property is presently protected under the Indian Copyright Act, 1957 and the Information Technology Act. The following principles should be kept in mind while receiving the data:

- The data should be processed fairly and lawfully
- The data should be obtained for specific and lawful purpose
- The data should be adequate, relevant and not excessive
- The data should not be kept for longer than necessary
- The data should be processed in accordance with the rights of data subjects
- Measures should be taken against unauthorised or unlawful processing
- It should not be used in a manner not authorized by the holder of the data property.

14) Describe the nature of the data protection in cyberspace. Indicate the principles to be kept in mind while receiving the data.

1.7.1 Digital Millennium Copyright Act (DMCA)

The Digital Millennium Copyright Act (DMCA) was adopted in 1998 in United States. The Act is designed to implement the treaties signed in December 1996 at the World Intellectual Property Organization (WIPO) Geneva conference, but also contains additional provisions addressing related matters. The act criminalizes production and dissemination of technology that can circumvent measures taken to protect copyright, not merely infringement of copyright itself, and heightens the penalties for copyright infringement on the Internet. On May 22, 2001 the European Union passed

the EU Copyright Directive similar in many ways to the DMCA. In general, limits Internet service providers from copyright infringement liability for simply transmitting information over the Internet. Service providers, however, are expected to remove material from users' web sites that appears to constitute copyright infringement. Limits liability of nonprofit institutions of higher education -- when they serve as online service providers and under certain circumstances -- for copyright infringement by faculty members or graduate students. Requires that "webcasters" pay licensing fees to record companies.

1.8 Cyberlaw for library and information professionals

Cyber laws have impact on most of what libraries do. It affects the services that libraries can provide to their users and the conditions on which they can provide access to certain websites. Libraries have crucial role to play in controlling as well as facilitating access to the increasing numbers of local and remote electronic information resources. Librarians and information professionals promote respect for cyber laws and actively defend cyberlaws especially in relation to piracy, unfair use and unauthorized exploitation in the digital environment. Libraries have long acknowledged that they have a role in informing and educating users about the importance of cyberlaws and in encouraging compliance.

1.8.1 Salient features for librarians

Some of the salient points that the librarians should know about the role of network and service providers, protection of personal data and privacy,

- Network and Service Providers must not intercept or interfere with any contents except where explicit law requires it. Insofar as Network or Service Providers provide contents themselves, responsibilities for the respective functions have to be separated. Network and Service Providers must not disclose any information on contents or data traffic except for the purposes of telecommunications or where explicit law requires it. Network and Service Providers have to offer to any user the option to use the network or to access the services anonymously or using a pseudonym. Pseudonyms, which are used for this reason, must not be revealed except where explicit law requires it. Network and Service Providers have to publish in a reasonable way, all necessary explanations that is necessary for users to recognize the structure of the network of service, the respective responsibilities, the amount of personal data being processed, and the planned disclosure.

- Nobody must be forced to let his or her personal data be published in directories or other indices. Every user has to be given the right to object to his or her data being collected by a search engine or other agents. Every user has to be given the right and the technical means to prevent the intrusion of external software into his own devices. Every user has to be given the right and the technical means to communicate his methods such as encryption. Telecommunications has to be designed in a way that as few personal data are used to run the networks and services as technically possible. Every user has to be given the individual right to be informed on all personal data, which are processed, about him or her to run the network or service on-line. Traffic data must not be used for other purposes than those, which are necessary to run the networks or services without explicit consent of the use.
- Facing the international aspects of all network and service activities every user has to be given the right to complain to an authority with transborder powers of investigation and enforcement if national legislation is not sufficient to guarantee his or her rights.

In the paper environment, the librarian buys books to which its users have potentially unlimited access. Once bought, the book is the library's forever. By contrast, in the digital environment, the librarian is in many cases expected to buy *access* to the electronic copy for a specific period of time and under certain conditions of use. Access is mostly bought via a licence. A licence is a formal authority to do something which would otherwise be unlawful. Licences are mostly regulated by contract law. The degree of access to and use permitted of an electronic journal depends heavily on the terms and conditions negotiated in the licence for that specific product. Some of the common clause which may be contained in the agreement are described below.

1.8.2 Licensing Principles (*Approved by IFLA's Executive Board, March 2001*)

The worldwide marketplace for all types of electronic information resources is rapidly being developed as publishers and vendors who create electronic information seek to attract libraries of all types (public, academic, special, national) as their customers. Today, libraries around the world continue in their role as mediators between citizens, including those affiliated with specific institutions, and information and cultural expression - roles that persist even more energetically, it appears, for electronic information than for print. And, just as libraries advance the archiving and preservation of traditional media, so they are seeking ways to ensure that electronic resources will be archived and preserved to be accessible over a long period of time. Pricing also remains an issue:

libraries continue to express concerns about the fact that a number of electronic resources appear to be priced higher than were their print counterparts.

While the library community strongly supports the continuation into the digital environment of exceptions that have been granted under copyright law, there are some areas where different procedures and policies need to be developed to handle electronic publications. Of particular interest to IFLA in the development of licenses is the following:

- Use of electronic information everywhere in the world is, at this time, usually defined and described by contractual agreements, otherwise known as licenses. These licenses describe comprehensively the terms of the provider/library relationship. Contracting is a comparatively new (1990s) way of doing business for most parties in the information chain.
- Licenses are pure marketplace arrangements in which a willing information provider and a willing purchaser of information access come together to make arrangements, deal by deal, resource by resource.
- User rights are defined within the terms and conditions of the licenses. They are not governed by (comparatively well understood) copyright legislation to the same extent as is the use of "fixed" or traditional information formats.
- Libraries generally provide patron access to such information via access to remote publisher or vendor sites, rather than library-controlled sites. Yet, the tasks and costs of libraries and information providers with regard to long-term archiving and preservation of electronic resources are disturbingly unclear. While a license cannot resolve this complicated set of electronic archiving issues, it will, generally, recognize them and express a set of commitments or expectations on the part of the contracting parties.

IFLA views the licensing arena positively, although key issues remain to be resolved. In particular, licensing is showing itself responsive to the complex business arrangements being entered into between information providers and library consortia of different types and sizes. IFLA encourages and supports the evolution of all types of libraries negotiating as consortia. Nonetheless, even with the current move to licensing as a complementary means of regulating the use of electronic information, libraries and their users need effective, well-balanced national copyright laws that recognize not only the copyright owners' need for remuneration and recognition, but also the critical purposes of public information, education and research. This balance, struck in carefully crafted copyright legislation, must find expression in all information resource licenses.

IFLA hereby presents a set of basic principles that should prevail in the contractual relationship and written contracts between libraries and information providers. These are:

Licenses and the Law

P1: Licenses represent an agreement between the library that seeks to make an electronic resource available for its readers or constituents, and a publisher or vendor who has the rights to such resources and seeks to make them available in the library marketplace. License terms and conditions must be fully available to customers in advance of their contracting for said resources. Every license is subject to discussion of terms and to negotiation between the parties.

P2: In the case of "shrink-wrapped" and "click-through" non-negotiated licenses, the terms should support public policies in such areas as copyright, privacy, intellectual freedom, and consumer rights.

P3: Licenses (contracts) for information should not exclude or negatively impact for users of the information any statutory rights that may be granted by applicable copyright law.

P4: The choice of applicable law should be acceptable for both parties. Preferably it should be the national or state law of the licensee.

P5: Licenses should be negotiated and written in the primary language of the library customer.

Licenses and Values

P6: The license agreement should be clear and comprehensive, recognizing the needs of the concerned parties. In particular, important terms should be defined so as to be clearly understood.

P7: The license should balance the rights and responsibilities of both parties.

P8: The license should provide for remedy periods and other modes of resolution before either cancellation or litigation is contemplated.

P9: The contracting parties should have the right to back out of the arrangement under appropriate and defined circumstances.

Licenses: Access and Use

P10: The license should provide access for all of the users affiliated with a licensee, whether institution or consortium, regardless of whether they are on the licensee's premises or away from them.

P11: The license should provide access to individual, unaffiliated users when on the licensee's premises.

P12: The license should provide access for geographically remote sites if they are part of the licensee's organization.

- P13: Remote access should be provided by way of a web-based, user friendly interface.
- P14: Data that is downloaded locally should be available in multiple standard formats (e.g. PDF, HTML, and SGML), portable to all major computing platforms and networked environments.
- P15: At a minimum the license should permit users to read, download, and print materials for their own personal purposes, without restrictions.
- P16: Resources provided via remote access to providers' sites should be available on a 24-hour basis, with appropriate "help" or service support, except for short scheduled downtimes announced with adequate notice to the customer library(ies). Penalties may accrue if service commitments are not met.
- P17: A high degree of content stability, both in single and in aggregated resources, should be guaranteed and the institutional customer should be notified of changes. Penalties may accrue if content commitments are not met.

Licenses and End Users

- P18: Libraries should work with users to educate them about proper use of electronic resources and take reasonable measures to prevent unlawful use, as well as with providers to halt infringing activities if such become known. Nonetheless, the library should not incur legal liability for actions of individual users.
- P19: It is not appropriate to ask the individual user to agree to a contract, such as a "click" contract, where the institution/library has already made -- or may engage in making -- an agreement on behalf of its patrons.
- P20: Users' privacy should be protected and respected in the license and in any intervention made by information providers or intermediaries.
- P21: The networked information provider should offer usage (as opposed to user) data so that the library licensee may assess the effectiveness of the use of the resource.

Licenses and Perpetual Access

- P22: A license should include provision for affordable, perpetual access to the licensed information by some appropriate and workable means.
- P23: A license should address provisions for long-term access and archiving of the electronic information resource(s) under consideration and should identify responsibilities for these.

Licenses And Pricing

- P24: Prices should be established so as to encourage use rather than discourage it. For example:

Many suppliers price electronic information at lower than the print equivalent (if there is one)

Many suppliers now offer incentives, such as consortia pricing, a choice of pricing models, and the like.

P25: Prices should be fully disclosed with no hidden charges.

P26: An unbundled (from print) price should be offered for electronic versions; a bundled price may be offered as well where this offers advantages for the licensee.

P27: There should be no penalty for canceling print in order to take up the electronic version of a resource.

P28: Requirements for non-disclosure of license terms are generally inappropriate.

Interlibrary Loan

P29: Provisions for interlibrary loan or equivalent services should be included.

P30: In general, libraries should be able to deliver reasonable length extracts from licensed information to libraries that have not signed a contract for that information for use by a specific patron.

Teaching and Learning

P31: Licenses should support local teaching and learning efforts, from elementary through university level, by permitting links to, or copies of, specific course-related information to appear in online course-support activities such as electronic reserve.

P32: Distance Independent Learning poses a challenge to providers and libraries. Licensors should recognize the affiliation of users with a given library or institution, regardless of users' physical location and should permit them routine access to licensed electronic information resources (see also clause 8).

15) Mention some of the principles that librarians should know while developing a contractual relationship with the information providers on the electronic medium.

1.9 Summary

Giving an overview of the cyberlaws and Information Technology Act, 2000 of India, this unit presents the following aspects:

- the basic concept of the Cyber Laws, and the substantive features of the information technology Act of 2000 in India; particularly, the provisions relating to Digital Signature,

Electronic Records, Retention of Information in Electronic Format, Electronic Gazette, Secure Electronic Records, Secure Digital Signatures, Security, and Penalties,

- the concept of domain names, agency responsible for registration of domain names, and cybersquatting,
- the nature of intellectual property issues in cyberspace, and the issues related to domain names vs. trademarks, domain name disputes, copyright, trade secret and patent in cyberspace,
- the concept of cybercrime and several actions considered as cyber crime. Also, it indicates the functions of the crime investigation cell,
- the legal initiatives in the data protection and the protection of privacy in cyberspace, and
- some of the dimensions of cyber law for library and information professionals including the licensing principles applicable to electronic medium.

1.10 Answer to self-check exercises

1) Describe the importance of Internet and the need of its regulation.

The Internet is the worldwide, publicly accessible system of interconnected computer networks that transmit data. It consists of millions of smaller business, academic, domestic, and government networks, which together carry various information and services, such as electronic mail, online chat, and the interlinked Web pages and other documents of the World Wide Web. The internet has altered the way many people work in significant ways. It has allowed greater flexibility both in terms of working hours and work location. Many use the Internet to access and download music, movies and other works for their enjoyment and relaxation. Facilitated by the Internet, cyberspace is becoming the site where many work-based, leisure, business and educational activities are now taking place. In India, the Government forms including income tax returns, company law forms etc. are now filled in electronic form. The consumers are increasingly using credit cards for online and offline shopping. Digital signatures and e-contracts are fast replacing conventional methods of transacting business. The instantaneity and trans-border qualities of the cyber space cut across traditional patterns of legal regulation. Numerous debates may arise over the intersection of law and the Internet – e.g., should the Internet be regulated, and if so, by whom? The needs of regulating the Internet arise to answer questions like: who has or should have jurisdiction over Internet; should content on the Internet be subject to regulation; should Internet functions themselves be regulated to ensure privacy or, alternatively, legal liability when infractions against third parties

are committed over the Net? The growing needs to regulate the domain of Internet necessitated the Cyber Laws.

2) Explain the meaning of the term 'Cyber laws'.

The Cyber Laws are the laws governing computers and the Internet. There is no one exhaustive definition of the term "Cyberlaw." However, simply put, Cyberlaw is a term that refers to all the legal and regulatory aspects of Internet and the World Wide Web. In principle, the Cyber Law must provide for (i) authentication of instruments, (ii) prevent countermanding or reversal of instructions, (iii) operational security for the systems, (iv) frauds, technical failures and errors, (v) evidence, data protection and record preservation, and (vi) deal with the unique aspects of this business e.g. deal with the problems relating to domain names, meta-tags, hyperlinks, digital copyright etc.

3) Give the salient components of the Information Technology (IT) Act, 2000, of India.

The Government of India enacted the Information Technology (IT) Act on 9th June 2000. The Act provided legal recognition for the transactions carried out by means of electronic data interchange and other means of electronic communication, commonly referred to as "Electronic Commerce", which involved the use of alternatives to paper based methods of communication and storage of information, and to facilitate electronic filings of documents with the Government agencies. The passage of the Act created a legal recognition for electronic documents. The records and signatures in electronic form now have complete legal validity in all types of transactions except in negotiable instruments such as the cheque, bill of exchange, promissory note, power of attorney, trust deeds, and wills. The Act provides ways to deal with cyber crimes by making provisions for penalties .

4) What are electronic records?

The electronic records are created as per the provisions of the IT Act of India. According to the Act, where any law provides that information or any other matter is to be in writing or in the typewritten or printed form, then, notwithstanding anything contained in such law, such requirement shall be deemed to have been satisfied if such information or matter is (a) rendered or made available in an electronic form; and (b) accessible so as to be usable for a subsequent reference.

5) What is the legal provision with respect to the retention of information in Electronic Format?

Where any law provides that documents, records or information shall be retained for any specific period, then, that requirement shall be deemed to have been satisfied if such documents, records or information are retained in the electronic form provided (a) the information contained therein remains accessible so as to be usable for a subsequent reference; (b) the electronic record is retained in the format in which it was originally generated, sent or received or in a format which can be demonstrated to represent accurately the information originally generated, sent or received; (c) the details which will facilitate the identification of the origin, destination, date and time of dispatch or receipt of such electronic record are available in the electronic record.

6) Indicate the acts, which are penalized according to the IT Act in India.

The IT Act provides for the penalty for damage to computer, computer system, etc.. The actions for which a person shall be liable to pay the penalties, if the person

- (a) accesses or secures access to such computer, computer system or computer network;
- (b) downloads, copies or extracts any data, computer data base or information from such computer, computer system or computer network including information or data held or stored in any removable storage medium;
- (c) introduces or causes to be introduced any computer contaminant or computer virus into any computer, computer system or computer network;
- (d) damages or causes to be damaged any computer, computer system or computer network, data, computer data base or any other programmes residing in such computer, computer system or computer network;
- (e) disrupts or causes disruption of any computer, computer system or computer network;
- (f) denies or causes the denial of access to any person authorised to access any computer, computer system or computer network by any means;
- (g) provides any assistance to any person to facilitate access to a computer, computer system or computer network in contravention of the provisions of this Act, rules or regulations made thereunder; and
- (h) charges the services availed of by a person to the account of another person by tampering with or manipulating any computer, computer system, or computer network.

7) What is meant by the domain names. Give examples of the generic top-level domain names.

Domain names are the human-friendly forms of Internet addresses, and are commonly used to find web sites. The domain names map to unique Internet Protocol (IP) numbers (e.g., 98.37.241.30) that serve as routing addresses on the Internet. The domain name space is divided into top-level domains (TLDs), with each TLD then divided into second-level domains (SLDs), and so on. A gTLD is a generic top-level domain, for example, .com was established for commercial users, .org for not-for-profit organizations, and .net for network service providers.

8) What is the country code top-level domain name for India.

A ccTLD is a country code top-level domain, administered independently by nationally designated registration authorities. For example, .in is the country code top-level domains for India.

9) Describe the functions of the international agency responsible for registering the domain names.

The Internet Corporation for Assigned Names and Numbers (ICANN) is an internationally organized, non-profit corporation that has responsibility for Internet Protocol (IP) address space allocation, protocol identifier assignment, generic (gTLD) and country code (ccTLD) Top-Level Domain name system management, and root server system management functions. ICANN oversees the distribution of unique technical identifiers used in the Internet's operations, and delegation of Top-Level Domain names. The Uniform Domain Name Dispute Resolution Policy was adopted by the ICANN, on October 24, 1999, and was incorporated by reference into Registration Agreement, defining the terms and conditions in connection with a dispute between the parties under the agreement, other than the registrar i.e. ICANN, over the registration and use of registered Internet domain name.

10) What is cybersquatting?

Cybersquatting is the abusive registration of domain names by bad faith actors who seek to capitalize on the goodwill earned by trademark owners by hijacking Internet addresses. The predators who engage in this practice generally do so in order to mislead consumers who think that they are accessing the website of a reputable establishment, or to extort payment from the rightful trademark owner for the right to use their own name in online commerce.

11) What are the significant issues of intellectual property rights in cyberspace?

Intellectual property refers to the property protected by patents, trademarks, industrial designs, copyright, geographic indications, and trade secrets or confidential information. The application of these instruments for the protection of intellectual property in the cyberspace has

posed unique issues in intellectual property law. Who owns what information on the Internet? Who should own what information on the Internet? How the concepts of trademarks, copyrights, trade secrets, patents, and layout design of integrated circuits could be extended for protection in the cyber world? The other significant issues of intellectual property in cyberspace relate to

i. Trademarks vs. Domain Names: As commercial activities have increased on the Internet, domain names have become part of the standard communication apparatus used by businesses to identify themselves, their products and their activities. The domain names sometimes conflict with trademarks and other traditional business identifiers.

ii. Copyright and cyberspace: Who owns the content that travels through cyberspace? What rights flow from such ownership? How much control should content owners have over the use and dissemination of their works over the Internet? What does it mean to "reproduce a work in copies"?

iii. Trade Secret in cyberspace: The instantaneous transfer of information on the Internet is likely to become a great problem for trade secret holders. There are also issues of privacy and the trade secrets which are related to the right of the system operator to monitor the postings and the messages.

iv. Patents and cyberspace: Problems involving the Internet could arise when a user downloads a patented computer program. If the computer program is downloaded without the permission of the patent owner, the user of the unauthorized copy of the computer program could be liable for patent infringement, by way of violating the patent owner's exclusive right to "use" the invention. One of the key issues in Cyberspace is the Internet patent or business method patent.

v. Framing: There are a number of questions on the legality of framing, since it allows you to embed independently scrollable windows within the border of the Web page or a Web site.

vi. Deep linking: It bypasses the home page of the linked site and links directly to the interior pages of the linked site, which has led to a lot of legal controversy.

vii. Spidering: Spidering as a phenomenon exists on the World Wide Web, and their legality or otherwise is presently being debated. It can be argued that spidering amounts to violation of the interest of news sites. Others feel that spidering is basically a technology that does not violate any Intellectual Property Rights.

12) Describe in brief the nature of domain name disputes.

Domain name disputes arise largely from the practice of cybersquatting, which involves the pre-emptive registration of trademarks by third parties as domain names. Cybersquatters exploit the

first-come, first-served nature of the domain name registration system to register names of trademarks, famous people or businesses with which they have no connection. Since registration of domain names is relatively simple, cybersquatters can register numerous examples of such names as domain names. As the holders of these registrations, cybersquatters often then put the domain names up for auction, or offer them for sale directly to the company or person involved, at prices far beyond the cost of registration.

To give an example, in Titan Industries Ltd. v/s Prashant Kooapati, the defendant registered the domain name 'tanishq.com'. The plaintiff Company, which has been using the trade mark 'TANISHQ' with respect to watches manufactured by it, sued for passing-off and alleged that the use of the domain name by the defendants would lead to confusion and deception and damage the goodwill and reputation of the plaintiffs. The Delhi High Court has granted an ex-parte ad-interim injunction restraining the defendants for using the name 'TANISHQ' on the Internet or otherwise and from committing any other act as is likely to lead to passing-off of the business and goods of the defendants as the business and goods of the plaintiff.

13) What do you understand by cyber crime? Describe any five acts that can be termed as cyber crime.

A simple definition of cyber crime would be "unlawful acts wherein the computer is either a tool or a target or both". The Cyber crimes are the darker side of Cyberspace. There are several examples of the use of the computer as a tool for an unlawful act. This kind of activity usually involves a modification of a conventional crime by using computers. The cybercrimes include computer intrusions and attacks, theft of service, interception of electronic communications, online stalking, online fraud, computer viruses, time bombs, trojans and malicious code, infrastructure security, and hacktivism.

Five significant act of cybercrime are described below.

i. Forgery

Counterfeit currency notes, postage and revenue stamps, mark sheets etc may be forged using sophisticated computers, printers and scanners. Also, fake mark sheets or even certificates may be made using computers, and high quality scanners and printers, the acts which amount to forgery.

ii. Cyber Defamation

This occurs when defamation takes place with the help of computers and or the Internet. e.g. someone publishes defamatory matter about someone on a website or sends e-mails containing defamatory information to all of that person's friends.

iii. **Hacking**

Unauthorized access to computer systems or networks is commonly referred to as hacking.

iv. **E-mail Bombing**

Email bombing refers to sending a large number of emails to the victim resulting in the victim's email account (in case of an individual) or mail servers (in case of a company or an email service provider) crashing.

v. **Virus / worm attacks**

Viruses are programs that attach themselves to a computer or a file and then circulate themselves to other files and to other computers on a network. They usually affect the data on a computer, either by altering or deleting it. Worms, unlike viruses do not need the host to attach themselves to. They merely make functional copies of themselves and do this repeatedly till they eat up all the available space on a computer's memory.

14) Describe the nature of the data protection in cyberspace. Indicate the principles to be kept in mind while receiving the data.

The needs of privacy of individuals and their personal information are felt in all societies. The issues of privacy are widely interpreted in terms of management of personal information, or 'data protection'. There are several sources of personal data that are compiled for various functional purposes such as membership in libraries, insurance policy records, bank records, list of clients in a business, credit card users and so on. Personal data have also become an economic resource that many businesses need and use for the supply of their products and services. In the light of these developments a number of solutions are advanced in the literature for providing greater protection to personal data in cyberspace.

Internet users can find recourse through the applicable laws of their own government. In many countries around the world, there is a general law that governs the collection, use and dissemination of personal information by both, the public and private sectors. These rules describe personal information as data that are given protection at every step from collection to storage and dissemination. Personal aspects of individuals are protected under the Article 21 or the Constitution

of India. This provision has two aspects viz. a personal aspect of privacy right and a commercial aspect of right to livelihood.

The principles to be kept in mind while receiving the data include

- The data should be processed fairly and lawfully
- The data should be obtained for specific and lawful purpose
- The data should be adequate, relevant and not excessive
- The data should not be kept for longer than necessary
- The data should be processed in accordance with the rights of data subjects
- Measures should be taken against unauthorised or unlawful processing
- It should not be used in a manner not authorized by the holder of the data property.

15) What is the role of librarians and information professionals in cyberspace. Indicate some of the principles that librarians should know while developing a contractual relationship with the information providers on the electronic medium.

Cyber laws have impact on most of what libraries do. Librarians and information professionals promote respect for cyber laws and actively defend cyberlaws especially in relation to piracy, unfair use and unauthorized exploitation in the digital environment. In the paper environment, the librarian buys books to which its users have potentially unlimited access. Today, libraries around the world continue in their role as mediators between citizens, including those affiliated with specific institutions, and information and cultural expression - roles that persist even more energetically, it appears, for electronic information than for print. And, just as libraries advance the archiving and preservation of traditional media, so they are seeking ways to ensure that electronic resources will be archived and preserved to be accessible over a long period of time. Once bought, the book is the library's forever. By contrast, in the digital environment, the librarian is in many cases expected to buy *access* to the electronic copy for a specific period of time and under certain conditions of use. Access is mostly bought via a licence. A licence is a formal authority to do something which would otherwise be unlawful.

Some of the licensing principles as approved by IFLA's Executive Board in March 2001 are given below.

Licenses and the Law

- License terms and conditions must be fully available to customers in advance of their contracting for said resources. Every license is subject to discussion of terms and to negotiation between the parties.
- Licenses (contracts) for information should not exclude or negatively impact for users of the information any statutory rights that may be granted by applicable copyright law.

Licenses and Values

- The license agreement should be clear and comprehensive, recognizing the needs of the concerned parties. In particular, important terms should be defined so as to be clearly understood.
- The license should balance the rights and responsibilities of both parties.

Licenses: Access and Use

- The license should provide access to individual, unaffiliated users when on the licensee's premises.
- The license should provide access for geographically remote sites if they are part of the licensee's organization.
- Remote access should be provided by way of a web-based, user friendly interface.
- At a minimum the license should permit users to read, download, and print materials for their own personal purposes, without restrictions.

Licenses and End Users

- Libraries should work with users to educate them about proper use of electronic resources and take reasonable measures to prevent unlawful use, as well as with providers to halt infringing activities if such become known. Nonetheless, the library should not incur legal liability for actions of individual users.
- Users' privacy should be protected and respected in the license and in any intervention made by information providers or intermediaries.

Licenses And Pricing

- Prices should be established so as to encourage use rather than discourage it.
- Prices should be fully disclosed with no hidden charges.

Interlibrary Loan

- Provisions for interlibrary loan or equivalent services should be included.

- In general, libraries should be able to deliver reasonable length extracts from licensed information to libraries that have not signed a contract for that information for use by a specific patron.

Teaching and Learning

- Licenses should support local teaching and learning efforts, from elementary through university level, by permitting links to, or copies of, specific course-related information to appear in online course-support activities such as electronic reserve.

1.11 References and further reading

Karki, M M S, Technical Notes: Personal Data Privacy And Intellectual property, Journal of Intellectual Property Rights, Vol. 10, January 2005, pp. 59-63

Praveen Dalal, Data Protection law in India: The TRIPS Perspective, Journal of Intellectual Property Rights, 11 (March 2006, 125-131)

Joga Rao, S.V. Law of Cyber Crimes and Information Technology Law; (Policy, Law & Practice alongwith the text of global legislations focusing on cyber crimes, etc. etc.) 2004 Nagpur (www.saujanyabooks.com/Law.htm)

Pavan Duggal, Cyberlaw - The Indian Perspective, Saakshar Law Publications.

On-Line Refernces

<http://www.cyberlaws.net>

<http://www.naavi.com>

<http://www.cyberlawsindia.com>

<http://www.indiainfoline.com>

<http://www.gltreach.com/globstats>

<http://www.wired.com/news/culture>

<http://www.ciol.com/content/news/interviews>

<http://www.nua.ic/surveys>

www.cyberlawcollege.com

IFLA Licensing Principles, 2001: <http://www.ifla.org/V/ebpb/copy.htm>

Privacy & human rights 2000-Overview:

www.privacyinternational.org/survey/phr2000/overview.html

MLISc – 4
Management of Information resources

Block – 4
Intellectual Property Rights and Cyber Laws

Unit - 16
IPR Laws in India

Structure

- 16.0 Objectives
- 16.1 Introduction
- 16.2 IPR Laws in India
 - 16.2.1 Historical Development
 - 16.2.2 Administration of IPR
 - 16.2.3 Recent changes and current status
- 16.3 Meaning of Patent Information
- 16.4 Protection of Software
- 16.5 Protection of Databases
- 16.6 Protection of Traditional Knowledge
- 16.7 Internet, IPR and Libraries
- 16.8 Emerging Issues of IPR
- 16.9 Summary
- 16.10 Answer to self-check exercises
- 16.11 References and further reading

16.0 Objectives

- Describe the current status and recent changes of IPR law in India;
- Indicate the meaning of patent information;
- Elaborate the salient issues in the protection of software, databases, and traditional knowledge
- Understand the implications of IPR and Internet for library and information science professionals
- Describe the emerging issues of IPR

16.1 Introduction

There are two distinct schools of thought on intellectual property rights (IPR). Most scholars argue that stronger intellectual property system is one of the cornerstones of modern economic policy. In contrast, other scholars argue that intellectual property rights are constraints on development [1]. They feel that the developed countries are using IPR for establishing their political and economic superiority over the developing countries [2]. The differences in perceptions about the importance of intellectual property are largely due to differences in the developmental needs of developed and developing countries. However, in a global economy, a global system of IPR is needed that reflects the needs of both the developed and the developing countries.

16.5 IPR Laws in India

16.5.1 Historical Development

India was among the very first countries to have a Patent Law. The first legislation on the protection of inventions based on the British Patent Law of 1852 was enacted in 1856. As per this law, certain privileges were given to an inventor of new manufacture for a period of 14 years. This was the time when the British Empire was taking interest in the application of Western technology, especially in the field of communications and railways, and needed the law to protect such technologies in India. The Patents and Designs Protection Act was passed in 1872, which was followed by the Protection of Inventions Act of 1883 and the Inventions and Designs Act of 1888. Subsequently, the Indian Patent and Design Act of 1911 established a more

formal system of patents and design protection under the management of a Controller of Patents and Design. The Act was in force when India became independent in 1947 [32, 33].

At the time of independence, it was felt that the pre - independence intellectual property laws did not encourage innovative activities in the country or facilitated commercial utilization of the patented inventions. They were considered inadequate for the developmental requirements of the country and extensive exercise was initiated for their modifications. The question of the revision of the patent law was examined by Justice Rajagopala Ayyangar who submitted his report in 1959. A comprehensive patent law was drafted and passed by the Indian Parliament on 19th August 1970. The law came into effect from 20th April 1972. The law was considered a step forward in the legal systems surrounding the grant of patents and contributing to the developmental and technological needs of the country. The act provided for exclusions from patenting in some of the areas of national interest. For example, no patent was allowed in the area of atomic energy. Methods of agriculture or horticulture were also not patentable. The life forms, specially with respect to plant and animal varieties or micro - organisms were excluded from patenting. In key areas of social importance, namely, food, drugs and pharmaceuticals, and chemicals which included agro-chemicals, the grant of product patent was considered to inhibit the discovery of more efficient and economical processes. No product patent was thus allowed in these areas. The law allowed only process patents for inventions in these areas. This meant that the given product could be manufactured by totally new and different processes in the country. The Indian law fixed the duration of a patent to fourteen years, in general, and seven years for the sectors of food, drugs and pharmaceuticals and chemicals. The rationale for this was that the enormous technological gap between the industrialised and the developing countries warranted a shorter duration of patent than being given in other countries.

The respective laws for the protection of designs, trademarks, and copyrights have similarly evolved from the British times and modified from time to time to meet the emerging technological and industrial development requirements. The Designs act, 1911 was modified in 1972. The Trade and Merchandise Marks Act was revised in 1958 and was brought into force in 1959. The first Copyright Act was passed in 1914. The act was revised in 1957 and came into force in 1958. A number of amendments have since been made, in response to technological

advances. These laws have further changed in view of India's commitments under TRIPS since 1995. These changes have been reviewed in the following section.

16.5.2 Recent changes and current status

There is a well-established statutory, administrative and judicial framework to safeguard intellectual property rights in India, whether they relate to patents, trademarks, copyright or industrial designs. The Government has brought its IPR laws in line with its commitments under the international agreement on TRIPS. Accordingly the Patents Act, 1970 was amended in 1999, 2002 and 2005. These changes introduced a new definition of "Invention" i.e. a new product or process involving inventive step and capable of industrial application; extension of product patent protection to all fields of technology implying product patent regime for food, chemicals and pharmaceuticals. A method or process of testing during the process of manufacture will now be patentable. The source of Geographical origin of the biological material used in invention is also required to be disclosed in the patent application. A new provision for enabling grant of compulsory license for export of medicines to countries which have insufficient or no manufacturing capacity, to meet emergent public health situations (in accordance with the Doha Declaration on TRIPS and Public Health) has been introduced. Also, the provisions relating to national security to guard against patenting abroad of dual use technologies have been strengthened.

The Indian Copyright Act, 1957 was amended in 1983, 1984, 1992, 1994, and in 1999 keeping in view the latest developments in the field of technology, especially in the field of computer and digital technologies. A new Design Act 2000 has been enacted superseding the earlier Designs Act 1911. India achieved a mature status in the field of industrial designs and in view of globalization of the economy, the present legislation is aligned with the changed technical and commercial scenario and made to conform to international trends in design administration. A new Trademarks Act, 1999 has been enacted superseding the earlier Trade and Merchandise Marks Act, 1958. It has enlarged the definition of trade mark. It now includes shape of goods, packaging and combination of colours which can be adopted as a trademark. It provides for registration of trade mark for services in addition to goods and prohibits use of some one else's trade marks as part of corporate names or name of business concern.

India, as a member of the World Trade Organization (WTO), enacted the Geographical Indications of Goods (Registration & Protection) Act, 1999 that has come into force with effect from 15th September 2003. This Act seeks to provide for the registration and better protection of geographical indications relating to goods in India. The Act would be administered by the Controller General of Patents, Designs and Trade Marks- who is the Registrar of Geographical Indications. The Semiconductor Integrated Circuit Layout Design Act was enacted in 2000. The rules under the Act have been published in the Gazette of India dated December 11, 2001. As a first step, Government of India has decided to bring to force sections 3 and 5 of the Act w.e.f. 1.5.2004. There is no exclusive legislation on protection of undisclosed information but the matter would be generally covered under the Contract Act, 1872.

In addition to the above legislative changes, the Government of India has taken several measures to streamline and strengthen the intellectual property administration system in the country. Projects relating to the modernization of patent information services and trademarks registry have been implemented with help from WIPO/UNDP. As regards the enforcement, Indian enforcement agencies are now working very effectively and there has been a notable decline in the levels of piracy in India. In addition to intensifying raids against copyright infringers, the Government has taken a number of measures to strengthen the enforcement of copyright law. Special cells for copyright enforcement have been set up in 23 States and Union Territories. In addition, for collective administration of copyright, copyright societies have been set up for different classes of works.

16.5.3 Administration of IPR

The Government of India has taken various steps to bring about changes in the administration of Intellectual Property Rights (IPR) in the country. The Department of Industrial Policy & Promotion of the Government of India, reconstituted in the year 2000, is responsible for the formulation of policies relating to Intellectual Property Rights in the fields of Patents, Trademarks, Industrial Designs and Geographical Indications of Goods and administration of regulations, rules made thereunder. The laws on Patents, designs, trademarks and geographical indications are administered by the Controller General of Patents, Designs and Trademarks, which is under the control of this Department. The law on Copyright is under the charge of the

Ministry of Human Resource Development. The Act on Layout Design of Integrated Circuits is to be implemented by the Ministry of Information Technology, Government of India. A Layout-Design Registry for registering layout-designs of integrated circuits is being set up under the Department of Information Technology, Government of India.

Exercise

16) What are the laws relating to IPR in India?

17) Mention the administrative authorities responsible to administer the respective IPR laws in India?

16.6 Meaning of Patent Information

The patent information refers to information contained in patent documents. There are two types of information in patent documents. One is the bibliographic information concerning patents like title of patents, patent number or date of publication. The other is technical information about the invention. The Patent documents contain the most recent information about technological inventions. The technical information includes scientific and technical concepts as well as practical details about the invention [34, 35].

Patent documents generally have a fairly uniform structure that facilitates the extracting of information: the claims give the essence of what is new; the description gives the background to the invention (what was known before the invention, i.e., the "prior art"), and defines the difference between the pre-existent technology and what the invention contributes, as a new matter, as a step forward, to technology development; often patent documents contain also drawings, that illustrate the invention that is claimed. Technological information is disclosed by describing the inventions in accordance with the requirements of the applicable patent law and by indicating the claimed novelty and inventiveness by reference to the existing state of the art. The main user groups of patent information are industry, and in particular R&D intensive industry; research and development institutions; governmental authorities; small and medium-size enterprises; individual inventors; professionals in the field of industrial property, e.g. administrators of technical libraries, patent agents, researchers, producers of data banks; and educational institutions and university students.

16.7 Protection of Software

In India, computer software is covered by the Copyright Act of 1999. Major changes to Indian Copyright Law were introduced in June 1994. The amendments included definition of computer programmes. The amended Act (1994) clearly explains the rights of copyright holder, position on rentals of software, the rights of the user to make backup copies and the heavy punishment and fines on infringement of copyright of software. The Act in India accords copyright protection to computer programmes by including it within the ambit of original literary works. It is the underlying software code which is protected as a literary work. According to the Act, “computer programme” means a set of instructions expressed in words, codes, schemes or in any other form, including machine-readable medium, capable of causing a computer to perform a particular task or achieve a particular result. Under the provisions of the Act, software enjoys protection provided all the aspects required for the protection of an original literary work is present i.e. the work is original and involves the expenditure of independent labour and skill, the work is recorded in some form, the term of protection has not expired, protection is not debarred owing to the foreign origin of the work [36, 37].

The Copyright in software shall subsist within the lifetime of the programmer until 60 years from the beginning of the calendar year following the year in which the programmer dies. Copyright being a property right can be bought, sold, left as inheritance etc. The Act enables the copyright holder to assign whole or part of his rights to others to exploit economically for a lump sum consideration. It also enables him to license some or all of his rights usually on the basis of a royalty payment.

The Copyright Act makes it illegal to make or distribute copies of copyrighted software without proper or specific authorisation. An exception is provided by the Act which allows a backup copy purely as a temporary protection against loss or damage to original copy. The 1994 amendment to Copyright Act also prohibits the sale or to give on hire, or offer for sale or hire, any copy of a computer programme without specific authorisation of the Copyright holder. Indian law prohibits unauthorised duplication of software, making multiple copies for use by different users within an organization. Giving an unauthorised copy to another person, if caught with pirated software, the copyright infringer may be tried under civil and/or criminal law. Civil and criminal action may be instituted for injunction, actual damages (including infringer’s profits), or statutory damages per infringement. The Act has substantially increased the criminal

penalties. There is a minimum jail term of 7 days for copyright infringement. The Act further provides for fines up to Rs.2,00,000 and jail term upto three years or both.

If the software is developed by employees of an Indian Corporation, under the provisions of the Copyright Act, the employees would be the authors of the copyright, and if created by the employees in course of their employment, the Indian Corporation will be the first owner of the copyright. Copyright is deemed to be infringed when any person without a license granted by the owner of the copyright or the Registrar of Copyrights commits any act which violated any exclusive right granted to the author under the Act. The following acts would amount to infringement:

i. Copying: The Copyright Act gives the author the exclusive right of reproduction of software. Copying of the software by one not authorized to do so will amount to infringement. The mode of reproduction is of no consequence. Further it does not matter if the reproduction is of a temporary nature. Thus the mere loading of a computer programme into the memory without authorization will amount to infringement. One might argue that this is mere 'using' of the work and traditionally this does not amount to infringement.

ii. Communicate the software to the public: The Act gives the author the exclusive right to make the work known to the public. In the realm of computer software, the mere act of downloading software from the Internet often means that the contents are displayed publicly thereby violating the copyright holder's exclusive right

iii. Selling or Renting the Software: The copyright holder has the exclusive right of transfer of property of the software either by sale or rental or otherwise. The problem which arises is that not only would rental or sale of a pirated copy infringement if it is a legitimate copy (made with the copyright holder's consent) but if the act of rental or sale itself is unauthorized.

Acts Not Amounting To Infringement

The following acts do not amount to infringement:

i. Fair Use:

- Making copies of a computer programme by one who is the lawful possessor of the copy so as to utilize the computer programme for the purpose for which it was intended.
- Making of backup copies for professional use as protection against loss, destruction or damage. Trying to decompile a computer programme in order to obtain information necessary to create an independent programme which can be operated with the

programme decompiled or with another programme which has been specifically permitted by one who is the lawful possessor of the programme.

- The observation, study or test of functioning of the computer programme in order to determine the ideas and principles which underline it.
- Making copies or adaptations of the computer programme from a personally legally obtained copy for non-commercial personal use.

Protection of Software by Patents

There is a global debate whether the software patents are useful or harmful for the growth of software industry. The organizations like Free Software Foundations (FSF) and League for Programming Freedom (LPF) have raised their voice against software patenting. There is another school of thought, which feels that granting of patents to software will help industry to grow. While the debate on software patenting is still open, several countries grant software related patents. The interpretations for granting patents vary from the technical requirement that software be attached to hardware to the requirement of only functionality of software. USA leads in grants of software patents on later grounds that may be pure abstract. The interpretation in Europe requires technical effect of the software. The Government of India has clarified its position on software patenting by stating that a generic computer program using a simple calculation or algorithm or business process cannot be patented. But patents can be granted if software solves a technical problem in an innovative way. This means software algorithms per se are not patentable [38].

Exercise

18) How are software protected in Indian laws?

19) What are the penalties for its infringement?

16.8 Protection of Databases

Databases have tremendous potential for growth of the information industry and services. In the field of science and technology information, S&T organisations and institutions have extensive capabilities for development and exploitation of S&T information resources. There is an increasing awareness on the utilisation of modern computer communication technologies including on - line databases and information systems and networks like NICNET, ERNET, INFLIBNET, ENVIS, BTIS. Initiatives have been taken in the country to provide services based on CD -ROM databases

e.g. by NIC, INSDOC, DOE, NISSAT and other organisations. There is an ample scope for developing the value added products and services.

One of the functions of the library and information science professionals is to handle data and information in order to provide timely and effective services to the users of the information. The basic tools to perform such a function include concepts and techniques of collection, classification, cataloguing, indexing and abstracting, referencing, retrieval, and dissemination of information to the users. With the advent of computer and information technologies, radical transformation is taking place in the way data and information are handled, organised and disseminated. The computer - based databases have made significant value addition in information products and services, which has enabled the user fast access to information.

In essence, there are three broad approaches used for database protection [39, 40, 41]. These are as follows.

i. Protection of databases through "Contracts"

Protection of databases through Contracts permit an user to use the database under a license from the database owner on payment of a fee based upon the amount of usage and or royalty. License does not pass the ownership of the database to the user. A contract may be used in addition to the protection of the database under the copyright laws.

ii. Database protection through copyright laws

Most countries have accorded protection to databases under the copyright laws. The definitions of databases and legal interpretations of the protection under copyrights are considerably varied amongst different countries. The question of intellectual skills involved in the creation of databases has been debated. Many databases do not qualify basic conditions for being protectable under the copyright laws.

iii. Sui generis system of protection for databases

Sue generis protection of databases is largely guided by the European Community Directive on the legal protection of databases. The Directive was passed by the European Parliament on 11 March 1996 (1). The Draft Database Treaty was proposed for adoption at the diplomatic conference of the member countries organised by World Intellectual Property Organisation (WIPO) in December 1996. The treaty established a new form of protection of databases in which rights were given to the makers of databases on the basis of the criteria of investments made. The databases with substantial investment were protected irrespective of their being original. The decision on the

proposal of draft database treaty was deferred in December 1996. Since then, the issues are far from being clear and no conclusive agreement has been reached.

The International Council for Science (ICSU) established an ad-hoc Group on Data and Information to deal with problems of intellectual property rights and free access to data [42, 43]. The group has been following national and international developments in database protection, and is working to present the views of science and education in intergovernmental forums. ICSU's Committee on Data for Science and Technology (CODATA), which is concerned with both technical and policy issues in providing data to users, has had a longstanding interest in the international exchange of scientific data. CODATA established a Commission on Data Access to act promptly in the face of fast-breaking issues. The efforts of ICSU reflect the strong interest of the scientists and research community that none of the approaches to database protection should impede its interests which predominantly lie in sharing and exchange of data and information for the conduct of scientific research.

Database protection in Indian law

Database refers to a collection of information of a large size and considerable value stored in such a way that it can be systematically searched and retrieved by the computer. The Indian Copyright Act 1999 included databases as a literary work. As the protection of any literary work depends upon its originality and the amount of skill and labour used, thus also the question of whether a database is to have copyright protection or not depends upon whether it satisfies the requirements of originality, skill and labour. Here it would be pertinent to note that the collection of information of the type contained in a database would anyhow involve the application of a substantial amount of skill and labour irrespective of the fact that a computer is being used to assist in the task. It would thus obviously enjoy copyright e.g. to create a database of a hundred medical journals is costly business and an investment which would be shattered by copying.

Exercise

- 20) What are the approaches to protection of databases?**
- 21) How are databases protected in Indian laws?**

16.9 Protection of Traditional Knowledge

Traditional knowledge can generally be described as useful information that are passed on by the members of the society from generation to generation. The important feature of this knowledge base is the difficulty to identify the person who has created or developed it. This knowledge base is scattered over different sphere of human and animal lives and is largely community based. This exists in the form of literature, music, dance, art forms, designs, articles, method or manner of production of articles or substances, use of plants and animals for various purposes etc. and it sometimes differs from community to community. The possessor uses such knowledge for the benefit of the community. In many cases the culture, tradition and livelihood of a particular community is reflected in the nature and content of the traditional knowledge. They are collectively owned and used for the benefit of the community [44].

Historically, the communities survived on their traditional knowledge base. The products they manufactured formed part of their livelihood. Even today many local and indigenous communities in the Asian countries meet their basic needs from the products they manufacture and sell based on their traditional knowledge. The development of new technology and the new use of traditional knowledge based products today is the major threat to the survival of many of these communities. The modern cultural industries (printing, film and record) as well as the manufacturing industries (textile, handicrafts, pharmaceutical, seed etc.) now commercially exploit the traditional knowledge based products using new technology with out the permission and sharing of profits with the communities. It is possible today to bring out new products or find out new use of existing products based on traditional knowledge utilizing the technological developments in the field of biotechnology. Similarly traditional designs of the articles are reproduced by the modern industries for its application in the consumer products.

The development of new products or new use of existing products enable the industries to get protection for these products on the formal intellectual property laws like copyright, patent, design etc. However, these legal norms do not appropriately protect the traditional knowledge. This is mainly due to varied requirements of ‘originality’, ‘novelty’, or inventive step etc., used in the formal system, which are not met by traditional knowledge. The later are considered outside the scope of formal system of intellectual property, which treats traditional knowledge in the public domain. In fact, the traditional knowledge is owned collectively by the communities, artisans, farmers, tribes or other grassroots innovators. A different approach for the protection of traditional knowledge is thus called for. One possible approach is benefit-sharing models for

indigenous innovations. For example, an experience in India related to sharing of benefits with Kani tribal people in southwestern India. Scientists at the Tropical Botanic Garden and Research Institute (TBGRI) in Kerala developed a tonic named, "Jeevani", the giver of life. They learned of the tonic, which claimed to bolster the immune system and provide additional energy, while on an expedition with the Kani tribe in 1987. The tonic is being manufactured by a major Ayurvedic drug company in Kerala. An agreement was struck in 1995 for the institute and the tribal community to share a license fee and 2% of net profits [45]. The documentation of traditional knowledge is another approach for its protection. In India, the Department of Science and Technology has established the National Innovation Foundation (NIF) of India, on March 1 2000, with the main goal of providing institutional support in scouting, spawning, sustaining and scaling up grassroots green innovations, helping their transition to self supporting activities, and mobilizing intellectual property protection [46].

Traditional Knowledge Documentation

There are several patents reported for innovations based on, for example, clove. [Gupta] India fought successfully for the revocation of turmeric and basmati patents granted by United States Patent and Trademark Office (US PTO) and neem patent granted by European Patent Office (EPO). In order to protect such patents, the Government of India took a major initiative in 1999 to document traditional knowledge by setting up a Traditional Knowledge Digital Library (TKDL). TKDL is a collaborative project between National Institute of Science Communication and Information Resources (NISCAIR), Council of Scientific and Industrial Research, Ministry of Science & Technology and Department of AYUSH, Ministry of Health and Family Welfare, which is being implemented at NISCAIR. An inter-disciplinary team of Traditional Medicine (Ayurveda, Unani, Siddha, Yoga) experts, patent examiners, IT experts, scientists and technical officers are involved in creation of TKDL for Indian Systems of Medicine. The project TKDL involves documentation of the knowledge available in public domain on traditional knowledge from the existing literature related to Ayurveda, Unani and Siddha, in digitized format in five international languages which are English, German, French, Japanese and Spanish [47].

Traditional Knowledge Resource Classification (TKRC), an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval has been evolved for about 10,500 subgroups against one group in International Patent Classification

(IPC), i.e. *AK61K35/78* related to medicinal plants. A WIPO-TK Task Force consisting of United States Patent Office (USPTO), European Patent Office (EPO), Japanese Patent Office (JPO), China and India has been set up by IPC Union for enhancing the sub-groups in IPC for classifying the TK related subject matter and considering the linking of TKRC with IPC. In February 2002, Committee of Experts recommended: (i) inclusion of 200 subgroups on TK against earlier single group on medicinal plants, (ii) linking of TKRC to IPC and (iii) continuation of work on biodiversity, TK and TCE. Later in October 2004, in the 35th IPC Union Meeting linking of Traditional Knowledge Resource Classification with International Patent Classification was approved. This linkage of TKRC-IPC will provide a better information retrieval tool during *prior art* search by patent examiners. TKDL will give legitimacy to the existing traditional knowledge and enable protection of such information from getting patented by the fly-by-night inventors acquiring patents on our traditional knowledge systems. It will prevent misappropriation of Indian traditional knowledge, mainly, by breaking the format and language barrier and making it accessible to patent examiners at International Patent Offices. TKDL may also help R&D scientists in identifying R&D opportunities [48,49].

International Legal Framework

Working in co-operation with other international organizations and in dialogue with NGOs, WIPO provides a forum for international policy debate concerning the interplay between intellectual property (IP) and traditional knowledge, genetic resources, traditional cultural expressions (folklore). The debate is focused on the need of putting in place a legally binding international instrument that holistically takes into account the concerns of misappropriation of these materials. While most developing countries including India and Brazil support such a need, the leading developed countries like USA, Canada, and Australia think it otherwise. The later broadly encouraged continued consideration of ways to enhance the participation of indigenous and local communities in the deliberations of the WIPO committee. The Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore under WIPO has been mandated to continue its work based on the renewed mandate established by the General Assembly in 2005, and will consider revised texts of policy objectives and principles for the protection of traditional knowledge and traditional cultural expressions/folklore [50].

Exercise

22) Describe the salient features of the TKDL for documentation of traditional knowledge.

16.10 Internet, IPR and Libraries

The Internet as an "international network of interconnected computers and connects these numerous computer networks using "global internet backbones," each of which is itself comprised of interconnected computers. Collectively these global backbones comprise the "Internet backbone". Individual users typically gain access to the Internet through an Internet Service Provider (ISP). Consumers have their choice of which ISP to use. Different ISPs offer different services at differing rates. The technology utilized by the Internet, although conducted across traditional telecommunications lines and fiber optic networks, differs significantly from any other existing communication medium. The key to this difference is the use of a standard protocol, known as TCP/IP, which divides large chunks of information into tiny packets so that they may be quickly routed separately to the destination address.

The "Internet" and the "World Wide Web" are not synonymous. Although the two terms are often used interchangeably, they actually describe two discrete functions. While the Internet acts as a facilitator for the exchange of information, the web itself contains merely one type of information which can be transported over the Net. The web is a collection of interlinked documents written in a common format known as hypertext markup language, or HTML. Individuals can use personal computers to gain access to the web via the Internet, by using clients known as web browsers. Search engines use several methods for obtaining information on particular sites on the web. No two search engines are likely to produce identical results for the same search query because of the differing methods employed by administrators in gathering and classifying information about specific web sites.

The Internet has opened up a world of opportunities for artistic and literary creation. Ease of transmission from creator to viewer, and re-transmission from viewer to viewer, makes the Internet an ideal medium for artistic and academic creators to disseminate their work, and for commercial creators to reach wider audiences. As the Internet continues its remarkable expansion, its capacity to disseminate information, knowledge and content has thrust the intellectual property system to the center of the debate over the future shape of the online world.

In this new and rapidly changing environment, information and knowledge are increasingly the source of value; hence the intellectual property system - the body of law protecting creations of the mind - is crucial in maintaining a stable and equitable foundation for the development of the digital society.

Technology has provided the means for people to innovate -- along with the means for viewers to edit, alter, distort, and redistribute the words, sounds, and images they find on the Internet. For this reason, authors may find their creations altered and posted, or simply re-posted, in unlikely new places. This raises issues of "respect and integrity." To fully appreciate the importance of "respect and integrity" in protecting intellectual property on the Internet, we should consider the many different ways in which protected images or writings can be appropriated -- either legally or illegally -- in this medium. It is argued that the technical nature of the Internet has essentially transformed it into a global copying machine. Indeed, with the advent of digital technology people are readily able to make copies of works and disseminate them not to one, but many other persons, at virtually no cost. Significantly though, these copies are perfect copies of the original and, in some cases, may be even better than the original. It is increasingly difficult to monitor and enforce compliance with the intellectual property laws [51].

Here are a few examples: A copier may pass off an original creator's work as his own; A copier might produce an on-line parody, which criticizes the work of the original creator, or alternatively, an on-line endorsement, which shows admiration for the original creator; A copier might reproduce an image exactly, alter it slightly, or distort it until it is not recognizable as the original; A copier may reproduce the *style* of the original creator and thereby lead readers to believe, falsely, that his work is the original creator's; A copier may fail to credit the original creator on his website, or may give the creator unwanted credit for a distorted copy; A copier might appropriate an image for financial gain, or might simply use it to make a not-for-profit statement; Those who alter and/or re-transmit the works of others on the Internet enter the core of the copyright and trademark laws, whose doctrines are well-explored but whose parameters remain relatively untested on the Internet. The relative ease of transmitting music files over the Internet has generated an intense debate concerning the proper role and scope of copyright in a digital environment.

By far the most popular method of digital distribution, the MP3 file format has already become the subject of several copyright suits in US and Europe and has spurred millions of

dollars of investment in online music ventures. The development of MP3 technology has enabled people to listen to, download, transfer and exchange audio files whilst online. Similarly, a broad range of cultural and educational materials can be found on the Internet ranging from television shows and news items through to esoteric academic and professional journals. Nevertheless, despite these developments, a number of content providers have shown a certain apprehension or reluctance to using the Internet as a means for distributing their works. Primarily, this nervousness stems from the uncertainty that traditional intellectual property doctrines offer them as a means of protecting their investments online.

How are copyright and related rights protected on the Internet? The WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT) have dealt with the issues of intellectual property rights and are known as the Internet treaties. Two treaties were concluded in 1996 at the World Intellectual Property Organization (WIPO) in Geneva. The WIPO Copyright Treaty (WCT) deals with protection for authors of literary and artistic works, such as writings and computer programs; original databases; musical works; audiovisual works; works of fine art and photographs. The WIPO Performances and Phonograms Treaty (WPPT), protects certain “related rights” (that is, rights related to copyright): in the WPPT, these are rights of performers and producers of phonograms. The purpose of the two treaties is to update and supplement the major existing WIPO treaties on copyright and related rights, primarily in order to respond to developments in technology and in the marketplace.

Issues of interest to library and information professionals

Over the past few years, the importance and interest in copyright has changed out of all recognition. Information and library professionals make their daily living out of using and exploiting the intellectual property of others. There are several issues of interest to them that are becoming important [52]. Traditionally, making copies beyond certain limits was available to libraries under the fair dealing concept that are now under strong attack by copyright owners. Other issues include issuing copies to the public; playing; performing; broadcasting; and making adaptations and translations. Some of these have very complex legal complications and need to be considered before any material is acquired by the library. In planning for the future electronic environment, creators (authors and publishers); users; intermediaries (libraries, retailers, electronic service and access producers); legislators and other policy makers; and the courts need to consider the role of copyright. Copyright is a necessary building block without which no

meaningful content is made available, and not an obstacle for the information society. The new electronic environment is very different from the analogue print environment. It requires new understanding of words such as browse and browsers.

Making a photocopy of a print product is very different from creating a digital version of the same work. Digital versions of works need copyright protection that is adequate to their nature. Unrestricted library document delivery violates article 9(2) of the Berne Copyright Convention. Lending electronic products carries more risk than lending print products as the transmission of copyright works to remote locations is a copyright violation. The acquisition of materials such as CD-ROMs, material on disk, and multimedia works needs to be considered carefully and governed by contract. Copyright could be infringed if work is performed in public. Transferring material from another medium, language, or programme is a copyright infringement and needs the agreement of the copyright owner. Scanning of material in preparation for sending it down a network without permission is “adaptation” of the work, and is therefore infringement. Sending material via a telecom network, although virtually instantaneous, is infringement. Similarly, printing out copies at a remote terminal without permission is again infringement.

How can these issues be addressed? An obvious way forward is through site licensing, although other models may develop. Many national and regional libraries contemplate digitizing their print collections to facilitate a virtual library to provide service to patrons in remote locations and facilitate resource sharing. The concept could destroy the incentive to create new copyright works and reduce the revenue available for investment in new works. Digital document delivery is a new service being offered by publishers and is not same as print based inter library loan. Libraries that copy digitally and store copyright works electronically, even temporarily, as part of electronic document delivery services are infringing copyright law. In addition, transmission of copyright works to remote locations is a violation of copyright. Lending electronic products carries more risks than lending print products.

Exercise

23) Describe the key issues of interest to library and information science professionals in the context of IPR and the Internet.

16.11 Emerging Issues of IPR

Intellectual property plays an important role in an increasingly broad range of areas, ranging from the Internet to health care to nearly all aspects of science and technology and literature and the arts. There are several issues of current interest about intellectual property that require continued interaction and debate. Many of these issues relate to the electronic commerce, Internet domain names, software patenting, digital information, data protection, small-and medium enterprises, competition and patents, standards and patents, protection of life forms, and IPR information. Equally important are the issues relevant to the role of library and information professional in managing intellectual property rights like rights of reproduction, fair use, digital libraries and electronic information. Many of such issues are still emerging and need understanding and may often require significant new research and study.

16.12 Summary

- Patent information means the bibliographic and technical information contained in patent documents;
- Software and databases are best protected under the existing copyright laws in India. There is a debate on the ways and means to protect the traditional knowledge. TKDL is an important initiative of the Government of India in documenting the traditional knowledge in the public domain;
- New issues and challenges are being faced by the library and information science professional in the context of the Internet and IPR. A brief idea of such issues has been provided.

16.11 Answer to self-check exercises

What are the laws relating to IPR in India?

The laws relating to IPR in India include the Patents Act, 1970 as amended in 1999, 2002 and 2005 for patents, the Indian Copyright Act, 1957 as amended in 1983, 1984, 1992, 1994, and in 1999 for copyrights, the Design Act 2000 for industrial designs, the Trademarks Act, 1999 for trade marks for goods and trade marks for services, and the Geographical Indications of Goods (Registration & Protection) Act, 1999 for the registration and better protection of geographical indications. relating to goods in India. The Semiconductor Integrated Circuit Layout Design Act was enacted in 2000. As a first step, Government of India has decided to bring to force sections 3

and 5 of the Act w.e.f. 1.5.2004. There is no exclusive legislation on protection of undisclosed information but the matter would be generally covered under the Contract Act, 1872.

17) Mention the administrative authorities responsible to administer the respective IPR laws in India?

The Government of India has taken various steps to bring about changes in the administration of Intellectual Property Rights (IPR). The Department of Industrial Policy & Promotion of the Government of India is responsible for the formulation of policies relating to Intellectual Property Rights in the fields of Patents, Trademarks, Industrial Designs and Geographical Indications of Goods and administration of regulations, rules made thereunder. The laws on Patents, designs, trademarks and geographical indications are administered by the Controller General of Patents, Designs and Trademarks which is under the control of this Department. The law on Copyright is under the charge of the Ministry of Human Resource Development. The Act on Layout Design of Integrated Circuits is implemented by the Ministry of Information Technology, Government of India. For the administration of the Act, a Layout-Design Registry for registering layout-designs of integrated circuits is being set up under the Department of Information Technology, Government of India.

18) How are software protected in Indian laws?

In India, the computer software is covered by the Copyright Act of 1999. The Act in India accords copyright protection to computer programmes by including it within the ambit of original literary works. It is the underlying software code, which is protected as a literary work. According to the Act, “computer programme” means a set of instructions expressed in words, codes, schemes or in any other form, including machine-readable medium, capable of causing a computer to perform a particular task or achieve a particular result. Under the provisions of the Act, software enjoys protection provided all the aspects required for the protection of an original literary work is present i.e. the work is original and involves the expenditure of independent

labour and skill, the work is recorded in some form, the term of protection has not expired, protection is not debarred owing to the foreign origin of the work.

The Copyright in software shall subsist within the lifetime of the programmer until 60 years from the beginning of the calendar year following the year in which the programmer dies. Copyright being a property right can be bought, sold, left as inheritance etc. The Act enables the copyright holder to assign whole or part of his rights to others to exploit economically for a lump sum consideration. It also enables him to license some or all of his rights usually on the basis of a royalty payment.

19) What are the penalties for its infringement?

Giving an unauthorised copy to another person, if caught with pirated software, the copyright infringer may be tried under civil and/or criminal law. Civil and criminal action may be instituted for injunction, actual damages (including infringer's profits), or statutory damages per infringement. The Act has substantially increased the criminal penalties. There is a minimum jail term of 7 days for copyright infringement. The Act further provides for fines up to Rs.2,00,000 and jail term up to three years or both.

20) What are the approaches to protection of databases?

The approaches for the protection of databases are:

i. Protection of databases through "Contracts"

Protection of databases through Contracts permit an user to use the database under a license from the database owner on payment of a fee based upon the amount of usage and or royalty. License does not pass the ownership of the database to the user. A contract may be used in addition to the protection of the database under the copyright laws.

ii. Database protection through copyright laws

Most countries have accorded protection to databases under the copyright laws. The definitions of databases and legal interpretations of the protection under copyrights are considerably varied amongst different countries. The question of intellectual skills involved in the creation of databases has been debated. Many databases do not qualify basic conditions for being protectable under the copyright laws.

iii. Sui generis system of protection for databases

Sue generis protection of databases is largely guided by the European Community Directive on the legal protection of databases. The Directive was passed by the European Parliament on 11

March 1996. The Draft Database Treaty was proposed for adoption at the diplomatic conference of the member countries organised by World Intellectual Property Organisation (WIPO) in December 1996 as a *sui generis* system. The treaty established a new form of protection of databases in which rights were given to the makers of databases on the basis of the criteria of investments made. The databases with substantial investment were protected irrespective of their being original.

21) How are databases protected in Indian laws?

The Indian Copyright Act 1999 included databases as a literary work. As the protection of any literary work depends upon its originality and the amount of skill and labour used, thus also the question of whether a database is to have copyright protection or not depends upon whether it satisfies the requirements of originality, skill and labour. Here it would be pertinent to note that the collection of information of the type contained in a database would anyhow involve the application of a substantial amount of skill and labour irrespective of the fact that a computer is being used to assist in the task.

22) Describe the salient features of the TKDL for the documentation of traditional knowledge.

The traditional knowledge was passed on from one generation to another and in many cases the culture, tradition and livelihood of a particular community reflected in the nature and content of the traditional knowledge. The documentation of traditional knowledge is thus important for its protection as well as identifying the collective rights of the communities, artisans, farmers, tribes or other grassroot innovators. In order to protect patents being taken based on traditional knowledge, the Government of India took a major initiative in 1999 to document traditional knowledge by setting up a Traditional Knowledge Digital Library (TKDL). An inter-disciplinary team of Traditional Medicine (Ayurveda, Unani, Siddha, Yoga) experts, patent examiners, IT experts, scientists and technical officers are involved in creation of TKDL for Indian Systems of Medicine. The project TKDL involves documentation of the knowledge available in public domain on traditional knowledge from the existing literature related to Ayurveda, Unani and Siddha, in digitized format in five international languages which are English, German, French, Japanese and Spanish.

Traditional Knowledge Resource Classification (TKRC), an innovative structured classification system for the purpose of systematic arrangement, dissemination and retrieval has been evolved for about 10,500 subgroups against one group in International Patent Classification

(IPC), i.e. *AK61K35/78* related to medicinal plants. TKDL will give legitimacy to the existing traditional knowledge and enable protection of such information from getting patented by the fly-by-night inventors acquiring patents on our traditional knowledge systems. It will prevent misappropriation of Indian traditional knowledge, mainly, by breaking the format and language barrier and making it accessible to patent examiners at International Patent Offices.

23) Describe the key issues of interest to library and information science professionals in the context of IPR and the Internet.

There are several issues of interest to Information and library professionals that are becoming important in the context of Internet and IPR. Traditionally, making copies beyond certain limits was available to libraries under the fair dealing concept that are now under strong attack by copyright owners. Other issues include issuing copies to the public; playing; performing; broadcasting; and making adaptations and translations. Some of these have very complex legal complications and need to be considered before any material is acquired by the library. The new electronic environment is very different from the analogue print environment. It requires new understanding of words such as browse and browsers. Making a photocopy of a print product is very different from creating a digital version of the same work. Digital versions of works need copyright protection that is adequate to their nature.

Unrestricted library document delivery violates article 9(2) of the Berne Copyright Convention. Lending electronic products carries more risk than lending print products as the transmission of copyright works to remote locations is a copyright violation. The acquisition of materials such as CD-ROMs, material on disk, and multimedia works needs to be considered carefully and governed by contract. Scanning of material in preparation for sending it down a network without permission is “adaptation” of the work, and is therefore infringement. Sending material via a telecom network, although virtually instantaneous, is infringement. Similarly, printing out copies at a remote terminal without permission is again infringement.

How can these issues be addressed? An obvious way forward is through site licensing, although other models may develop. Many national and regional libraries contemplate digitizing their print collections to facilitate a virtual library to provide service to patrons in remote locations and facilitate resource sharing. Digital document delivery is a new service being offered by publishers and is not same as print based inter library loan. Libraries that copy

digitally and store copyright works electronically, even temporarily, as part of electronic document delivery services are infringing copyright law.

References and further reading

1. Gupta V.K. 1996. Protection of Computer Software/Algorithms. *Journal of Intellectual Property Rights* **1**: 76-86.
2. Suman Yogesh and Gupta V.K. 2002. Patenting issues in software industry. *Journal of Intellectual Property Rights* **17**: 516-525.
3. Gupta V.K. and Pangannaya, N.B. 2000. Legal Protection of Databases. *Malaysian Journal of Library & Information Science* **5 (2)**: 19 –29.
4. Gupta V.K. 1997. WIPO Draft Database Treaty: Issues and Implications in Indian Context. *Journal of Intellectual Property Rights* **2**: 60-70.
5. Gupta V.K. 1997. Copyright Issues relating to database use. *DESIDOC Bulletin of Information Technology* **17 (4)**: 11-16.
6. Scientific access to data and information. CODATA, The Committee on data for science and technology, International Council of Science. [<http://www.codata.org>]
7. Thyagarajan, G. 1997 July 11. A threat to the integrity of science. *The Hindu (Chennai)* : 10.
8. Traditional knowledge, genetic resources and folklore. *World Intellectual Property Organization*, WIPO web site [<http://www.wipo.int>]
9. Mashelkar R. A. 2000. The Role of Intellectual Property in Building Capacity for Innovation for Development: A Developing World Perspective. *Paper prepared for World Intellectual Property Organization (WIPO), as a contribution to the ECOSOC high-level segment theme on the role of information technology in knowledge based economy.*
10. National Innovation Foundation Web site [<http://www.nifindia.org/>]
11. NISCAIR web site on TKDL
[<http://203.200.90.6/tkdl/langdefault/common/Abouttkdl.asp?GL=>]
12. Meenakshi Prajneshu and Gupta, V.K. 2001. Traditional Knowledge Database: IPR and Opportunities for R&D. *Journal of Intellectual Property Rights* **6**: 449-458.
13. Gupta V.K. 2005. Intellectual property in Ayurveda and Sidha. *Invention Intelligence* September-October: 6-13.

- 14.** Traditional knowledge, genetic resources and folklore. *World Intellectual Property Organization*, WIPO web site [<http://www.wipo.int>]
- 15.** Kumar, Arvind. 1997. Problems of copyright enforcement in India. *Information Today and Tomorrow* **16(2)**: 19-21.
- 16.** Eisenschitz, T.S. 1994. Legal issues for information professionals. In Kent A. (ed.) *Encyclopaedia of Library and Information Science* **54**: 224-261.