मङ्गलायतन विश्वविद्यालय

॥ विश्वं ज्ञाने प्रतिष्ठितम् ॥

MANGALAYATAN
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Learn Today to Lead Tomorrow

Information Sources and Systems

MLIS-104

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CONTENT

UNIT 1

Note

Information Users and their Information Needs

1.1 Introduction

In this chapter we will study information and information users. Why does the user need information? Users will also study about the methods of study. In addition we will study the Delphi method. Will study its repertory method.

1.2 Information

The functions performed by different centers are aimed at meeting the needs of a certain user group. This user group is sometimes a highly organized group of a certain number of knowledgeable individuals who have very similar information needs. For example, the users of a specific research library and their group are made up of so many different individuals and information needs that it becomes extremely difficult to estimate the different users and their information needs. Such as the public library user of a multilingual, multi-religious, industrial city.

1.2.1 Need for Information

The idea of information requirement is like the first step in the development of an information system. The main purpose of any information system is to satisfy some specific information needs. The main object of study of the user is also to know his information needs. In fact, the interest of information professionals in the user is only because of his information needs, otherwise he as an individual has no importance in the context of the information system. Information requirements have been defined in different terms by different experts.

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"Information need can be seen as the-information [that] would further this job or this research and would be recognized as doing so by the recipient."

—MB Line

M.B. Line, who is a famous informatician of England, says that the information requirement can be seen in such a way that information leads to this work or research and in doing so provides user identity. It is this information by which a person does his work effectively, solves problems satisfactorily or fulfills his interest and field in a pleasurable way.

"It is the information that individuals ought to have to do their job effectively, solve a problem satisfactorily or pursue a hobby or interest happily."

—David Nicholas

Therefore, it is only the information that each person needs to do his work effectively, find a satisfactory solution to a problem or to pursue a hobby or interest happily.

On the basis of the above definitions it can be said that information requirement is the information that he needs to do a job successfully. In other words, the difference between what a person knows and what he needs to know in order to do the job successfully. The difference is his information requirement. To fill this gap, individuals use various formal and informal information systems. All the actions that a person does in this process are collectively called his information behavior.

1.2.2 Communication between Information Specialist and Users

Libraries and information centers exist as long as they are used by its users. For continuous use of information and information services, it is necessary that there is a strong communication between the information experts and the users. However, this is possible only when there is trust between both of them and remove their pre-conceptions and establish understanding among themselves. Even today, many user communications are not classified as a categorical specific use of techniques and team work. They keep themselves busy in searching the desired information and shy away from taking the services of the staff. At the same time it is also alleged that the information staff gives more importance to their work, and their interest is less in understanding and fulfilling the need of information by the user. This situation can be dealt with in two ways.

If the information specialist feels that the purpose of his business is to serve the users, he should provide appropriate advice and assistance to the users in converting their needs into specific requests. These experts also need to be ready to make changes in their services as per the requirements of the users.

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If the user wants any service according to the demand of his work or subject, then he should not hesitate to inform the knowledge transfer technology related to it to the information specialist. If any training related to information science is given, then definitely be ready to participate and develop understanding among themselves.

1.2.3 User Study

The study of user's information behavior and its related aspects has been traditionally done under user studies in the field of library and information science. Herbert Mengele has divided different types of user studies into three groups - Behavior Studies, Use Studies and Flow Studies.

Those surveys can be placed under information behavior studies, which study the interaction of the user group with the information communication system. The purpose of their study is to identify a common pattern in the context of a specific user group and specific communication system. A pattern by which the general information behavior of users can be understood.

On the other hand, some such surveys are also conducted whose purpose is to study the use of an information medium or source, they can be placed in the group of use studies. A user can use various means to meet any information requirement of the Internet. For example, personal collection, expert advice, general examination of research journals etc., abstract and indexing, search in journals, etc. Their purpose is to study these different mediums in detail and try to identify a common pattern based on it.

The third category includes information flow studies which aim to study the flow of information in various sources of communication. The findings of such surveys reveal that the information sources and systems that there is a surprising orderliness in a complete knowledge communication system. According to a study by the American Psychological Association conducted by Garvey and Griffith, it is believed that the study published this month in the journal Research may have been started about 30 to 36 months ago. In the meantime, he/she must have gone through various phases such as preparation of the report, oral presentation, presentation in conference, technical report and finally writing for a research journal. Similarly, in the next 21 months, that article will flow to the Summarization and Review Services. Such studies have helped in developing a more effective information system for the user and in reducing the time taken for the flow of information across different media.

1.2.4 Other Names Used for Information User

Although the term information user refers to a general category, it is not the only term used in this context. The user of information or its physical

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medium, document, has been called by different names in different contexts or at different times. The names used other than User or User are—Client, Customer, Reader, Member, Patron, Stakeholder etc. Of these, the word Patron is more commonly used in western countries at the present time. The words reader and member are used with reference to the library. Whereas terms like client and customer are a product of the field of business management. The word user or user being a term used in a broader perspective remains relevant and acceptable. Recently David Nicholls has suggested using a new term Information Player or 1-Player in place of User. According to Nichols, "User has lost much of its meaning. It is a tired, overused, cheap and misused word, which provides the information profession with a debased currency. It no longer reflects the close and complex engagement that takes place between a person and today's interactive information in systems, according to him, Player is a term much richer in meaning, one that conveys action and individually.

1.2.5 Relation between User and Information Unit

The relationship between the user and the information unit depends on the kind of needs and behavior of the user and the efforts made by the information unit to satisfy these needs and the general policies of this unit towards the users. How its rules help the users in fulfilling their needs. Sometimes in this information source and system it is observed that the information unit is fulfilling the needs of the users properly yet the number of actual users is less than the number of potential users. There can be both physical and psychological reasons for this. Another where students and researchers have access to more information it is observed that the information unit is fulfilling the needs of the users properly yet the number of actual users is less than the number of potential users. There can be both physical and psychological reasons for this. Another where students and researchers make more use of information than other workers. The direct reason for this is that the service provided is directly accessible to the first class users. Second, the services of these information units have been developed keeping in mind the future needs of these users. Other workers need quick and very precise information. Because services are generally lacking for such users.

This user contacts the information unit only when he needs any kind of information. The user is generally not concerned with other activities of processing the information. Although it is a universally accepted truth that these users have a central place in all activities, whether it is the creation of an activity or its maintenance or use (utilization). Decisions are made based on general assumptions in information units.

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Therefore, there is an urgent need to establish a close relationship between the information specialist and the users, so that the understanding between the two parties is developed. Based on their intellectual needs, services should be started, extension, presentation. Study of needs should be done keeping in view the past and present needs and estimating the future needs. This requires special study in user behavior.

1.2.6 Users of Information Service and Products

Traditionally, libraries have played a major role in the field of information collection and dissemination. Libraries have been known as a storehouse of knowledge for centuries. In the last century, after the Second World War, the information palace came to be accepted all over the world, especially with the formation of responsible governments in the newly-independent developing countries. The need was felt to use the information available in these countries for development works. Apart from some traditional information users like students and researchers, various groups of new users like industrialists, managers and policy makers etc. The information needs of some users could have been met through the availability of information sources and services in libraries, but the needs of these new consumer groups would be very different. For their fulfillment, new methods of processing and consolidation of information are needed, The newly generated information is suitable as per the requirement of the potential user information sources and systems, language, dialect, style, quantity, place and time began to be presented as well as in the desired form and medium. UNESCO also organized several workshops for proper consideration of these changes and their process. In which the definition and method of information integration were considered by experts from different countries. Identification of users of information integration products under this process was also tried.

Attempts have been made to categorize users of information integration products by various information experts. According to Tafco Sarasevik, these users can be divided into the following types of groups :

1. Scientists, engineers and other professionals concerned with research and development, construction, health services, planning, education, etc.
2. Managers and businessmen who are related to small and big business, commercial marketing, etc.
3. People engaged in policy making and decisive roles in government.
4. Technician, Supervisor, Paraprofessionals
5. Communicators such as extension workers, teachers, local people leading the way in adapting technology or methods.
6. Agricultural and industrial shortage of rural and urban areas.

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According to Pauline Atherton, the users of scientific and technical information systems can be divided into the following three groups on the basis of their functions :

1. Researchers in Basic and Applied Sciences.
2. Professionals and technicians engaged in developmental and/or operational activities in various fields of technology and industry such as agriculture, medical, industrial production, communication, etc.
3. Managers, policy makers and other decision-makers who are involved in coordinating the developmental activities of science and technology in the private and public sector at the local, national or international level.

S. Sitharama has grouped users of information integration services into the following four groups : 1. Researchers and scientists, 2. Policy makers/ planners, 3. Communicators/mediators, 4. Community groups.

1.2.7 Researcher and Scientist

Researchers, scientists, engineers and users of scientific and technology related information and other professional groups come under this category. They seek new information on various aspects of a specific subject.

1. Users of this category are mainly associated with three types of activities.
2. The first group consists of teachers engaged in academic activities, who perform both research and teaching responsibilities.
3. The second group is mainly made up of experts engaged in research work with the research and development mind of research institutes or commercial establishments.

In the third subcategory, there are such professional persons who have to keep themselves updated professionally in new ideas, techniques etc. These include professionals related to all professions like doctors, engineers, etc.

There are many similarities in the information needs of the above three groups. In the field of library and information science, the study of their information behaviour has been done continuously for the last half a century. been going. This has resulted in the identification of a number of general facts about the information behavior of these groups, and in the design and delivery of information centers' services and products as per their needs.

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Mainly four types of information approaches of researchers and scientists have been identified.

(a) **Current Approach :** Under this approach the user wants to make himself aware of the latest information about his subject. He wants to be aware of new ideas, techniques, processes etc. not just searching for any specific information so that he can be competent and successful in the role of a conscious professional in any respect. For the satisfaction of this approach of the users in the information centres, current awareness tables, notifications of future seminars etc., research-progress bulletins and selected information dissemination services, etc. are provided.

(b) **Everyday Approach :** Under this, there seems to be a need for specific factual information mainly related to the business activities of the day-to-day. The nature of the information sought in this is such that less testing, more specific facts are required immediately, in the absence of which the normal work gets interrupted. To satisfy this approach, information centers manufacture or acquire products such as handbooks, manuals, critical data collections, data banks, etc. In addition, referral services are also provided.

(c) **Exhaustive Approach :** This approach is used in the initiation of a new research project and in the arrangement of report writing. Under this, before doing research on any new topic, all possible available till now. An attempt is made to be aware of the literature, so that all aspects of the problem are covered so far. Based on the work done, a proper description of the problem can be prepared. Similarly, at the stage of report writing, a detailed approach is also used for verification of specific words of citation, verification of bibliographic details, etc. Various bibliographical products like verse catalog, indexing and abstracting services, library catalogue, federal catalog etc. are created or acquired.

(d) **Catching-up Approach :** This approach is used by researchers before starting a research project. Nowadays the nature of research is multidisciplinary and interdisciplinary. He would like to be aware of their latest knowledge before embarking on a new research project. Here the priority of the researcher is to get the latest knowledge of those subjects as soon as possible so that he can proceed on his project. To satisfy this approach, various types of critical documents such as state-of-the-report and trend reports are prepared by the information centers to satisfy this approach.

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According to Seetarama, the following types of information are needed by researchers and scientists :

1. Scientific and technical information
2. Experimental information
3. Know-why information
4. Know-how information
5. Know-who information.

1.2.8 Policy Makers/planners

In the context of information users, apart from the field of research and development, another important group is policy makers, planners, decision-makers, managers, administrators, industrialists, entrepreneurs, etc. The size of their scope and information requirements are very wide, yet two distinct areas of work can be identified in the form of all types of industrial units, small and large, and local, state and national governments.

Two main elements can also be identified according to the information requirements. This is Decision Making and Problem Solving. Problem solving here means searching for the answer to a specific question or questions while in the decision making process the possibility of all others except one of the various options available is eliminated. Every step in the process of problem solving requires decision making, but both the decision work for problem solving is information based work. Proper information of the actions of all the members of the system may not identify the date, the problem and its magnitude. Similarly, the selection of the appropriate option without complete information is related to various indirect consequences.
According to S. Seetarama, the Information Consolidation Center should provide information related to the following areas for taking proper decisions in the industrial sector :

1. Engineering / Design
2. Manufacture/Process
3. Marketing
4. Finance / Administration
5. Project Appropriation / Delimitation.

1.2.9 Communicator / moderator

Apart from the group of policy makers and managers of researchers and scientists, there are various community groups as the target users of utilizing the available technical knowledge. There are often so many educational, social, economic, geographical and linguistic differences among these groups that no one service or product may be useful for the whole group.

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For example, the target users of any new research related to agriculture are different farmer groups, but that discovery is published in an international research journal. Whose vocabulary is the specific technical terminology of the English language, which is far from the understanding of anyone other than agricultural experts, even a person having good knowledge of the English language. Now if this research is converted into common language and a new information product is made, then its usefulness is also possible in a limited scope. Because there is a lot of variation among different farming groups. Some people have higher education, some are semi-literate and some are illiterate. Some people can write or speak normal Hindi language words, while some people are semi literate and some are illiterate. Some people can write and speak normal Hindi language words, while some people can speak and understand only the local dialect. Some people have the means of information like TV and computer, while some others do not even have the facility to listen to the radio. The population of some villages is in thousands, while in other areas especially inaccessible hilly areas, after walking, a small group of ten or twelve families meet. Due to such wide variation, it is not possible that any one service or product will be useful for the whole farmer group.

In these circumstances, individual mediators' groups can successfully serve as a useful alternative. Some of these groups such as teachers have traditionally been instrumental in the transmission of knowledge. In the last few decades the role of some other groups has also become clear. Among them, agricultural extension workers, people with knowledge of agriculture. In the field of health, paramedicals, rural development workers in the field of public welfare, etc. are prominent.

The main feature of mediator groups is that they are well acquainted with the scientific background of the concerned subject as well as the social, economic and educational environment of the local people and can establish effective communication with the local people at their level. Being from the same social and cultural background, they are more acceptable to the local people of these groups. The information requirement is mainly consolidated information related to their work. In which all necessary information related to new process technology, planning etc., if possible, is displayed in a single product. Like the process of producing a crop from a new hybrid seed. In this, in the product made for the agricultural extension worker, there should be special precautions related to seeds and all the important things related to them, from the characteristics of the role to the storage of the crop.

Similarly, any infectious prophylactic product made for auxiliary health workers may include possible conditions of disease, advanced methods of prevention of those conditions, government or other assistance related to

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them and the latest sources thereof and the main symptoms of the disease and the precautions required by a specialist medical facility before disease.

1.2.9 Community Group

With reference to the information needs of different user groups, it can be said that the information needs of the general public have probably not been given the required attention. Whereas in the concept of development, improving the standard of living of the economically weaker sections is an important component and this can be done by conveying useful technology and technical knowledge to these sections at the earliest in their acceptable medium and language style.

To increase the permeability of information to these target user groups, there is a need to use the latest techniques of restructuring and repackaging. For this, various experts such as experts in information presentation, creation of communication media. The cooperation of experts etc. is also required. For example, if there is a large number of illiterate and semi-literate members in a local group, then it can be effectively explained to them through some new method of farming and its benefits through audio-visual media such as film. However, assistance is taken from experts in these fields to present the film in an entertaining manner and for the technical aspects of production.

1.3 Definitions of User Studies

User study refers to the study of the behavioral characteristics of the users. The highest and ultimate goal of libraries and information centers is user satisfaction. Therefore, user learning is directly related to the performance and effectiveness of the services provided by the libraries and information centres. In user study, not only is the study of the users of the library done, but through research, an attempt is made to find that there is a complementarity between the needs of the users and the available products and services. That is, whether they complement each other or not. Along with this, what are the improvements in the information transfer system, it is known. Today such studies are being done in abundance in the field of library and information science. User studies from these studies and satisfaction and dissatisfaction with existing products and services. level is known. Along with this, it is very important to conduct user studies to organize suitable and correct reader services. H.N. Prasad writes that user studies are similar to market research surveys in correlating products with demand and satisfaction. User studies have been defined in different ways by different scholars.

1. According to Bowden, user study refers to systematic examination of the characteristics and behavior of users (and if possible non-users) of systems and services.

Note

2. According to A. Wysoki – User study or usage study can be related with the study of the information processing activities of the users.
3. J. M. Britain, The empirical study of the use of information demand or need is often done by user studies.
4. According to G. Devarajan - In fact, a study that focuses on understanding the information needs, use behavior or usage patterns of the readers directly or indirectly, it is often called user study.

Thus, in order to know about the users, the way they use the library and information services, information gathering methods etc.,the library should have the information which can be collected through user studies.

1.3.1 Genesis and Development of User Studies

International level

If we look at the early efforts in the field of user studies, they appear in the 1930s and 1940s. In 1938, Louis R. Wilson (Louis R. Wilson) made an early attempt at user study under the name 'The Geography of Reading'. In this he studied the level and distribution of libraries in the United States. Considering its origin, initially two international conferences were held on user studies. The first was the Conference on Scientific Information of the Real Society in London in 1948 and the second Washington conference in 1958. Another major study by Rolf R. Shaw (Ralph R Shaw) did an important study in the field of user studies named "Pilot Study on the Use of Scientific Literature by Scientists".

In 1964, Davis and Bailey compiled "A Comprehensive Bibliography on User Studies". This bibliography is a compilation of 438 studies. Crawford said in a report that by 1977 over 1000 major studies had been done on user studies. Apart from this, Price, Shineborune, Taylor etc. worked on topics like user requirement, its relation to library etc. In 1965 W. J. Paisley (W. J. Paisley) reviewed the research literature on the flow of applied science information. In his study, he studied the literature related to the information gathering and dissemination behavior of scientists.

After this, in 1979, Hensley and Nelson focused their review on the elements related to reader success in educational processes. It emerged in this study that the researchers were of the opinion that the available information is not being fully utilized. In 1981, B. Cronin (B. Cronin) said in his article "Assessing User Need" that in the last five years the emphasis is shifting from systems or service oriented research to user oriented research.

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1.3.2 Indian effort

Considering the Indian scenario, there have been studies in the field of user studies in India since 1962. A title named "Users and Library and Information Service" was included in the Second ASLIC Seminar held in 1962. Krishna Kumar made a significant effort in this direction in 1968. He wrote "The Users Survey Concerning Teachers and Research Scholar" in the presented study titled "Field on Chemistry". After that Dr. S. R. Ranganathan did a study in 1970 under the name "Annotation of Users Survey". This was a critical evaluation of the authors' surveys. After 1970, many studies have been done in this direction. The main studies in which are :

1. In 1988 R. Lahiri studied university library users.
2. B. Guha published an article in Iaslic Bulletin in 1995 titled "Ranganathan's Fourth Law and Contemporary User Study".
3. In 1998 A. Prasad and M. Tripathi wrote an article titled "Information Seeking Behavior of Physical Scientists and Social Scientists".
4. In 2003, P. Sethi Kumaran and V. Vadivel wrote an article titled "Use Pattern Information Channels by the Scientists and Engineers: A Case Study" which was published in the SRELS Journal of Information Management.

The Library Association of India titled its 19th All India Library Conference: Responding to Users' Need in Changing Information Landscapes. This conference was completely related to user studies. Similarly, the 21st National Seminar of ISLIC Kolkata held in 2004-05 titled "Information Support for Rural Development". In this, several articles were published on the information needs and information seeking behavior of rural people of different regions of India. The study was carried out with the financial support of Indian Council of Social Research, New Delhi, under the name "Information Seeking Behavior of Rural People". Studies are being done on topics like flow pattern, user information requirement and behavior etc.

1.3.3 Need and Objectives of User Studies

User study is needed because of the following reasons :

1. To understand the psychology of information search of users.
2. There is a need to know the user attitude for the creation of library and information products and services.
3. Users not only think differently, but their way of working is also different. Knowing this the services can be scheduled accordingly.

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4. To know the level of users.
5. To improve the quality of existing services and products.
6. To develop user oriented information systems and services.
7. To satisfy the first four sources of library science.

A major component of the library and information system is the consumer. In the past, the focus was on document oriented services rather than on the development of user-oriented or product-oriented services and products. Much attention was paid to bibliographic organization and control. Today libraries and information services are becoming user oriented. Dr. S.R. Ranganathan not only recognized the importance of the user long ago, but also propounded his first four sutras keeping the user at the center.

Sangameswaran and Gupta have described the objectives of the user study as follows :

1. Identification of potential users and their categories.
2. Identification of information needs.
3. Identification of existing resources and services.
4. Evaluation of various existing services.
5. To achieve complete reform of information systems.

The objectives of the user study are described by M. Krishnamurthy as follows :

1. Identifying the types and levels of user needs.
2. To increase the quality of resources and services.
3. Evaluate the limitations of library systems and its services.
4. To develop and design need based and user oriented information systems and services.
5. Reducing the time spent on information gathering.

The following areas of study have been included under user studies :

1. Information Requirements
2. Study Trends of Users
3. Information Seeking Behavior of Users
4. Evaluation of systems and services
5. Information Dispersion Studies
6. Elements hindering information dissemination
7. Channels of communication or media of communication.

1.4 User Studies Methods

In today's information age the user is the focal point. It is very important to assess his information needs. On the basis of this assessment, the library and information center can organize the products and services accordingly. Readers' information needs, study habits, characteristics are different in different subjects. The information demand of the readers is different in every subject and situation. The second point is that in user studies we are studying human beings. The feelings of the honour cannot be controlled and it is not possible to exercise it under controlled conditions. In addition, social, psychological, etc. are also involved in user studies. Therefore, the follow-up of any one method or technique will not fulfill the objectives even in the society. Clemens, Kathleen, Parkhi, Raghavendra Sab etc. have used questionnaire methods for assessment of user information requirements. The following methods can be used for user study :

1.4.1 Survey Method

Survey method is used to collect data in social and behavioral sciences. This method is used for user study. By using the survey method, user information needs, information seeking behavior, user study trends, communication channels and services can be assessed. In this, many techniques are used to collect primary information. They are questionnaire, interview, observation, schedule and diary maintenance. One or several of these techniques may be used for the purpose.

1.4.2 Citation Analysis

Quotation analysis is an indirect method of assessing the information needed of the users. Bensman has reviewed the available literature on bibliographic formulas and citation analysis and its validity for user studies.

1.4.3 Bibliometrics Study

In bibliography, the numerical or numerical study of various aspects of a subject or literature is done. It is used to model authorship citation publications and to identify secondary journals. Also it can be used in any field. It is also used in the field of user studies.

Magyar considered bibliographic analysis as an important tool for the study of literature. He says that the annual analysis shows the growth of research and scientific activities.

1.4.4 Computer Content Analysis

Computer content analysis method can be used by the readers to analyze the literature using the internet and computer and by using this method the information requirement of the readers can be determined.

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1.4.5 Techniques of User Studies

The same techniques are used to collect primary data for user studies as are used in other areas of the social sciences. Krishna Kumar has described the techniques used for data collection as follows :

1. Questionnaire and Interview
2. Observation,
3. Measurement

N.S. Guha divided the techniques used for user studies into three major headings, these are :

(a) **Common or traditional methods :** Common or traditional methods include questionnaire, interview, observation, etc.

(b) **Indirect Methods :** Indirect method includes analysis of library records and citation analysis. The main records of the library are : circulation statistics, inter-exchange records, reference department records, etc. These records provide the details of the user's requirement. Additionally citation analysis can be used as a user study technique.

(c) **Specialized and non-conventional methods :** Special and non-conventional methods include computer feedback. Today computers are being used extensively in libraries for information retrieval. The analysis of information searched by the reader on the Internet and in databases is helpful in determining user information needs.

Today, questionnaire, interview and observation techniques are being used extensively for user studies. Their details are as follows :

1.4.6 Questionnaire

Questionnaire techniques are used to collect primary information on users' information needs, methods of information search, information-searching behaviour, reader satisfaction, dissemination of library products and services, etc. In questionnaire technique, facts are collected by asking questions to the users. There are many types of questionnaire technique, structured questionnaire and unstructured questionnaire, depending on the nature of questions it can be divided into limited, open, graphical, mixed questionnaires.

Mac Cornum has divided questionnaires into mail, group administered and personal contact.

Construction of Questionnaire : The following points should be kept in mind while preparing the questionnaire :

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1. Before preparing the questionnaire, other tests should be studied and the advice of peers and scholars should be consulted.
2. Build the questionnaire according to the research objectives. Enumerate all the questions necessary to fulfill the objectives.
3. The questionnaire should be as short as possible.
4. The combination of questions in the questionnaire should be in a logical order. That is, if the topic is wide and the number of questions is more, then after dividing the topic into sections and subsections, the questions should be arranged in a logical order according to the title of the respective section.
5. Emotional or controversial questions should be avoided in the questionnaire. Such questions should also not be put which the respondent cannot understand.
6. The language of the questions should be simple so that the respondent can understand easily.
7. Avoid the use of double meaning and vague meaning words.
8. Which of the following is to be given as a limited or open option for the answer while framing the questions. It should be determined by the nature of the question.
9. Respondents should not be compelled to answer such questions which are not socially and psychologically appropriate to answer.
10. Questions in the questionnaire should be objective. They should not show any inclination or hatred towards anyone.

1.4.7 Pre-test

Before finalizing the questionnaire, it is necessary to conduct a pretest or pilot survey. There are many benefits to doing this pretest or pilot study. Through these, the researcher can remove the mistakes made in the questionnaire, unwanted levels, shortcomings etc., as well as the important suggestions given by the respondents while filling the questionnaire can be included in the final questionnaire. Also, it helps the researcher to test the validity and reliability of statistical techniques adopted for data processing and analysis. Through pretest or pilot study, linguistic deficiencies such as incomplete sentence structure, spelling errors, lack of semantic expression, disjointed words, dichotomous words etc. can be overcome in the questionnaire. The questionnaire must be pre-tested. Because with this necessary amendments and corrections can be done in the questionnaire.

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1.4.8 Cover Page

After the questionnaire is finally prepared, it should be sent to the respondents. A cover page or letter must be attached with the respondent while sending it. This letter should contain the title of the research, the purpose and the assurance of the confidentiality of the answers and a thank you note for the cooperation.

Along with this self-addressed envelope (with stamps affixed on it) should also be sent along with the questionnaire. If the respondent is working in any organization, institution etc., then he should send the questionnaire through the president or administrative officer of that organization, institute etc.

1.4.9 Distribution of Questionnaire

Questionnaires can be distributed in person, by post or by e-mail. Their detailed description is as follows :

(a) **Personally :** The researcher can personally answer the questionnaire to the respondents. In this, the researcher goes to the respondent wherever available and gives the questionnaire to be filled. For example, if a research scholar has to fill out questionnaires from the staff or users of the library, he can personally go to the library and give the questionnaires to the users or staff. For this the researcher has to go again.

(b) **By post :** The questionnaire can be sent to the selected respondents by post. In this, it must be kept in mind that along with the questionnaire, you must keep a self-addressed, stamped or pre-paid envelope. So that the respondent can send the questionnaire by dying the answer. In this, a letter or page must be included in which the title of the research, purpose, polite request for cooperation from the respondent, assurance of confidentiality of answers and full address of the researcher should be written.

(c) **By e-mail :** Questionnaires are also sent to the respondant by e-mail. For this, it is very necessary for the respondent to have a computer etc.

(d) **Response Rate :** Questionnaires, especially those sent by post, have a very low rate of return. This rate is further compounded by the low interest of the respondents. Therefore, if the questionnaire is not returned even after four to six weeks, the researcher should send the reminder letter again. Sending reminders increases the response rate.

1.4.10 Interview

Interviewing has been considered as a primary data gathering technique. Interviewing has also been considered a tool of user study or a technique

Note

for collecting research data. This technique is used in social sciences. Through interview technique, the researcher collects facts and information by interacting with the user. Many social science data are collected using this technique.

The following steps should be followed during the process of interview :

(a) **Planning :** In this stage the researcher or interviewer plans the interview. Under this, he decides the date, time and place of the interview. The cost and travel time are also ensured. If more respondents are to be interviewed, then research assistants should be appointed and trained for that. Whatever instructions are to be given, they should be prepared.

(b) **Construction of Interview Schedule :** The interview schedule is more or less a list of questions to be asked to the respondent. On this interview schedule the interviewer records questions from the respondent. The interview schedule should be prepared in time. While preparing the interview schedule, keep certain things in mind like :

1. The sequence of questions in the interview schedule should be in a systematic order *i.e.* question subject sequence as well as their consistency among themselves. Otherwise it may throw up.
2. While preparing the interview schedule, the research objectives and limitations should be clear in the mind of the researcher.
3. Consideration of the ability of the respondent and his emotions while formulating the questions.
4. Structured and unstructured, open or closed type questions should be made in the interview schedule.
5. The Schedule should assure the Respondent of the confidentiality of the information received from him.

(c) **Pilot Test of Interview Schedule :** Before the actual interview, the researcher should conduct a pilot test of his interview schedule. For this a small group can be selected and questions can be asked and the suggestions, shortcomings and observations obtained from this pilot test should be incorporated in the final interview schedule. It should be noted that this is an important function.

(d) **Conduct of Interview :** While conducting the interview, the questioner or researcher should be very careful. Clarification of questions, counter questioning, encouraging, not getting angry, avoiding criticism, behaving in a timely manner, asking emotional questions etc. are such things which should be kept in mind during the

Note

interview. Taking interviews is truly an art. Gradually, mastery comes in this art, so the interviewer should not only understand its process before taking the interview but should also acquire proficiency in it.

Word selection, tone, facial expressions, ascents, demeanor, body language, politeness, linguistic knowledge, etc., are some of the factors that can greatly influence the research results while conducting an interview. A successful interview can be done only on the basis of balance in all these things. The interviewer should talk less and listen more. As far as possible, the respondent should get full opportunity to express his point of view because conclusions will be drawn on the answers received from him. While interviewing, keep the following things in mind :

1. **Word Selection :** The interviewer should pay special attention to the words in the conversation. Linguistic words should be adapted to the circumstances. The language should be such that it suits the tone and understanding of the respondent.

2. **Voice :** In voice communication, the voice is more important than the word. The same type of words when spoken in different tones leave different effects. Therefore, the researcher or the interviewer should pay special attention to the tone while conducting the interview with the respondent. The tone should be effective, but it should not reflect the emotion of anger or annoyance.

3. **Facial Expressions :** While doing the interview, there should be due control over the facial expressions. Successful interviewers can easily convey many things with their faces. It is important in the interview. Your facial expression may encourage or even discourage the respondent. Your facial expressions communicate more than words.

4. **Body Gestures :** In the interview, the operation of the body parts *i.e.* the movement of the hands, walking, sitting, etc. are such things on which it is necessary to pay attention. The researcher should keep this in mind while doing the interview.

5. **Knowledge of the Subject :** The researcher or the interviewer is doing structured or unstructured interview on any subject or topic, he needs specific knowledge of the related subject or topic. Otherwise the respondent may create a subject-matter. Whatever statement or facts are being asked should have a general familiarity with them.

Note

(e) **Data collection :** Whenever the interview is to be conducted with the responsibility, the date, time, place should be determined in advance. The interviewer should create a pleasant atmosphere while doing the interview. The interview process should take place in a smooth and easy environment. At the time of interview, permission for recording of the interview should be obtained from the person being interviewed. That is, if the voice recording or video recording of the interview is to be done, then its information and prior permission should be obtained from the respondent. In case the recording is not being done, the probable answers in the structured interview schedule should be ticked off immediately. Similarly, if the researcher is using an unstructured interview schedule, the respondents' statements should be recorded as they are at the time of interview or immediately after. The respondent avoids answering many personal, family or other questions correctly if it is being recorded while conducting the interview. Therefore, the researcher should decide the nature of the questions according to the situation of the self-respondents.

(f) **Analysis of the Data :** The data should be analyzed using appropriate statistical techniques.

(g) **Report Writing :** The last task of the researcher is writing the report.

1.4.11 Obsrvation

Observation is a technique of data collection in user study, in which the researcher observes a research situation. This method is useful whenever the behavior of a group or individual is to be observed. In libraries and information centers, various situations such as use of library catalogue, searching for books on funds, behavior of students in the study room, etc., can be observed. Reliable facts and data can be collected with the help of this technique.

Observation is done with the help of eyes. Eyes have their limits, but this human can be overcome with the help of modern equipment. In science, the help of microscopes and telescopes are taken to observe the subtle and very distant things. In the laboratory The scientist observes the events happening by observing the finer things with the help of a microscope. Similarly, observation of events and children is done with the help of binoculars. Along with this, the help of devices like tape recorder, thermometer, camera, video camera, stopwatch, etc. is taken. With the help of these devices, the truth and reliability of the incident can be tested again. For the success and reliability of observation, the researcher should keep in mind the following suggestions :

Note

1. Personal influences and subjectivity should be avoided while observing.
2. While observing, observe the event closely so that no important fact is missed.
3. The observer should use audio-visual devices such as tape recorder, camera, video camera while observing. With the use of these devices, the user will not be completely dependent on his memory power.
4. The observer should be free from all prejudices while observing.
5. In observation the groups or individuals to be observed should be taken maximum from the heterogeneous background.
6. The observer should take minimum time to observe and record it.

1.4.12 Classification and Planning of User Studies

Pro. Herbert Mazley has broadly divided the users into three categories, these are :

1. Behavioral Studies
2. Usage Studies
3. Information Drift Studies.

The study, which is done to find out the way of total interaction with the communication system of the user community, without any context of the event, is called information behavior study. The study which is done to find out the use of a communication medium like primary journals, secondary journals etc. is called use study whereas information flow study is the study which is done to find out the pattern of flow of information in the communication system. Mazel made another classification of user studies in information needs and uses in his 1966 article Science and Technology, which is as follows :

1. Channel Studies
2. Critical Context Studies
3. Extension studies have classified user studies under three heads :
   (i) Behavior Studies
   (ii) User Studies
   (iii) Information Flow Studies

Saracevic and Wood under a plan in the context of user studies,

1. Surveying prior studies and literature in general and learning about all aspects of user studies.

Note

2. Statement of the objectives of the study.
3. Determining the model to be adopted around the area being studied.
4. Selecting a sample from the whole being studied.
5. Determining the method of collecting data and observations.
6. Determining the method of observations and data analysis.
7. Determining the way results are presented and used, including dissemination.

Here it needs to be kept in mind that the information requirement of the users is not constant but like a continuously flowing stream, that is, it is constantly changing. Therefore, whatever method is adopted, it will have to be amended and changed continuously according to the need.

The following steps should be followed by the researcher while planning the user study :

1.4.13 Determining the Objectives of the Study

The first thing to do is to set clear objectives. These objectives should clearly state what kind of information is desired and the goals to be achieved. Determination of clear objectives will provide the foundation for future studies.

Literature Survey

In this, the available literature related to the subject being studied should be surveyed. This survey will not only clarify all the aspects about that topic. But it will also facilitate future studies.

Sample Selection

In this step the sample is selected from the whole. Care should be taken that the size of the sample and the method of selection should be based on certain criteria. Sampling should be done with a view to the quality, nature, time, resources, etc. of the desired information, whether representational or random or purposeful.

Data Collection

In data collection, it should be mentioned how the facts and data will be collected. If questionnaire technique is to be adopted, then structured questionnaires or unstructured questionnaires are limited or open, structured interview, interview, effective, clinical etc. Observation techniques include participant non-participatory structural, non-structural, controlled, uncontrolled controlled observation, *i.e.* whatever technique or combination of techniques is to be used for data collection, it should be clearly mentioned.

Note

Also, what is to be used for data collection should be clearly mentioned. Also, whatever procedure is to be followed for data collection. It should be clearly mentioned.

Data analysis and Interpretation

In this phase the data will be analyzed manually or with the help of a computer. Appropriate statistical methods for data analysis should be mentioned. With the help of these techniques, the researcher can present a logical and correct interpretation of the data and can draw authentic conclusions.

Report Writing

The final stage of user study is report writing. In this, the researcher presents the work done by him in a scientific and logical order.

Evaluation of User Studies

Research work is being done on user studies continuously. These research work is being done in various areas of user studies like information need, information search behaviour, information channel, barriers to information dissemination etc. Detailed comment on these studies by P.S. Yes. Kumar in his book "Library and Users Earth". The details of which are as follows :

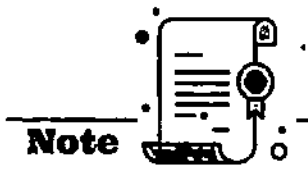
User Studies are not User Oriented

For the last three decades, research work has been done in the areas of user studies. Even after this, no universally accepted theory has been developed today. J. M. Britain (1982) states that user information sources and systems.

Studies have neglected potential users. The information needs assessed are general in nature and very few user studies have been related to information and data needs in a way. In fact the research being done in this area has been library and document oriented. Whereas they should have been user oriented. Along with this, he has not given much attention to the process of generation and use of information.

Studies Should be Behavioural Oriented

Critics are of the view that user research needs to be applied science oriented. Parker and Paisley (1966) had pointed out the shortcomings of user studies almost two decades ago. He said that the scientists propounded the need for psychological research for the achievement of the mission of providing effective flow of information. In fact, psychological research is needed. Psychological research is necessary to test the behavioral presumptions of system builders.



Priorities to Users that Researches

Britain (1975) has stated that the questions in the study should be based on the user preferences rather than the researcher should reflect. Questions should be asked that the user can answer. Today there is so much data gathering over the user requirement that it is touching the level of saturation. What is needed today is that studies support user preferences, not the information needed themselves.

Need for Research in Cognitive Style

Atherton (1975) has pointed out that cognitive style and other personality variables of information seekers such as the amount of motivation, opinions, eagerness, frustration, reassurance and reward requirement, task orientation and situational contexts such as time pressure, to obtain information. There is a need for research into motivation etc.

Role of Environmental and Situational Constraints

Mick et al. (1980) examined, for example, information used by scientists versus personal characteristics, work environment characteristics, assigned task characteristics, and concluded that environmental-situational constraints play an important role in determining information behavior.

Psychology of Information Use

Sarah Fine (1984) in her review titled "Research and the Psychology of Information Use" expressed the observation that this much larger question pertains to the way in which people interact with information in the environment. and affect each other under psychological conditions.

Examination of Information Traits of Users

Today there is an urgent need to test the acquired information characteristics of the users.

Factors that Influence User Behaviour

Versing and Wedel (1985) state that economic and cultural aspects and status, respect, group dynamics also influence behaviour. He proposed a complex model of information processing that includes individual, group and process methods, individual situations and psychological elements such as characteristics values, motivations, attitudes etc. and group dynamics such as level of work, organizational needs, etc.

Better Understanding of users' information behavior Information Behaviour of Users.

If a comprehensive study of the information usage attitudes of the users is done, it will come to the fore that how far the users are psychologically

Note

compatible with the process of using the information source. The study done in this direction will throw light on better understanding of the information behavior of the readers.

Feelings Users Need

User studies have been found to lack the fact that they have not focused on deeply experiencing the user's needs. The needs of the reader are constantly changing.

1.5 Delphi Method

Definition

The Delphi method is a forecasting process based on the results of several rounds of questionnaires sent to a panel of users. Several rounds of questionnaires are sent to a group of users and a large number of responses are collected with the group. Users are allowed to adjust their answers in subsequent rounds based on how they interpret the 'group feedback' that is provided to them. Apart from this, questions of multiple rounds are asked. And the panel is told what the group as a whole thinks, the Delphi method tries to reach a consensus response.

A review of Delphi studies published between the years 1971 and 2019, using studies obtained from library and information science source databases. A total of 122 articles were studied and evaluated on a population basis. The means of identifying experts, the number of participants for each study round, the type of Delphi and the type of findings required, etc.

The Delphi method is used regularly by LIS when the area of investigation is nobel or highly specialized or in cases when researchers are attempting to forecast future trends.

Westbrook used a Delphi method to conduct an exploratory study on the information needs of researchers in Women's studies. More recently, the Delphi method was used to investigate areas that are highly specialized.

1.5.1 Types of Delphi Methods

There are three types of Delphi methods :

(i) **Policy :** Where, there is a need to device a strategy to address a specific problem.

(ii) **Classical :** The used to forecast future trends.

(iii) **Decision-making :** The used to achieve better decision making.

It is a systematic interactive way of gaining opinions or forecasts from a panel of anonymous participants with relevant expertise to answer two or more sequential surveys to identify consensus or convergence. The methods

Note

can be used to identify issues or outcomes of importance to stakeholder groups, allowing participants to reconsider their own views in the second survey round in light of those of other participants. The process is intended to lead to convergence towards identifying preliminary sets of core outcome domains. In healthcare, it is a good means to collate consensus on outcomes or care that is consistent with professional knowledge. The idea is that respondents can leran from view of others without being influenced by who speaks the loudest at a meeting (or has more prestige). Ideally, dissenters from consensus should be given the opportunity to explain their viewpoint as this is useful intelligence and can help debate and make expert's tacit knowledge more explicit.

The Delphi method is a type of consensus method which does not require face to face meetings. It can bring together and synthesize the knowledge of a group of geographically scattered participants that never meet. A large number of individuals across diverse locations and areas of expertise can be included anonymously, thus avoiding domination of the consensus process by one or a few experts.

1.5.2 Use of Delphi Methods

As a didactic process, the Delphi method has been designed to offer the benefits of sharing and exchanging opinions, so that respondents can discover the opinions of others, without excessive influence of visual confrontations (which are usually dominated by those who speak powerfully or have the most prestige). The technique allows participants to deal with a complex problem in a systematic way. During each round, the relevant information is shared and enriches the knowledge of the panel members. They are then in a position to make recommendations based on more complete information.

Usually, one or more of these characteristics require the use of the Delphi method :

(i) **Subjectivity of the subject :** The problem is not suited for precise analytical techniques but can take advantage of subjective judgements on a collective basis.

(ii) **Need to engage people from different backgrounds :** People who are required to participate in the examination of a large or complex problem may lack communication experience and have different careers, expertise and skills.

(iii) **Logistical constraints :** There are too many participants to interact effectively in a face-to-face exchange.

(iv) **Need to prepare before a meeting :** The effectiveness of face-to-face meetings can be enhanced by an additional collective communication

Note

process. As a tool for decision-making, the method implicitly or explicitly leads to the creation of a consensus on the results of the process (choice, recommendations, opinions or action plans).

(v) **Need for social acceptability of decisions :** Disagreements are so important or politically unacceptable that the communication process must be arbitrated and/or anonymity must be guaranteed. The procedure may also aim at raising the collective awareness of the public, as well as academic experts, industrialists or public agencies.

(vi) **Collection of a plurality of opinions :** The heterogeneity of the participants must be preserved in order to guarantee the validity of the results, that is to say in order to avoid any domination imposed by a large group or by a strong personality. The emergence of the greatest possible diversity of opinions is promoted along with an awareness of the convergence and/or divergence of these opinions.

(vii) **Exploration of possible scenarios :** Participation promotes the reduction of uncertainty and facilitates decision-making in complex and/or uncertain contexts. The actors associated with the panel are mobilized around possible and desirable future scenarios. They can co-construct them, or position themselves in relation to predefined futures, projecting themselves within them to establish a plan of action. The method allows the organization of the transition from collective reflection to joint action, through the definition and coordination of concerted action.

(viii) **Seeking to gain knowledge :** Conducting a survey in several rounds promotes learning among the participants but also learning about the problem. For example, consultation can be a first approach to an adversarial debate within the panel before it is disseminated to public space.

1.5.3 Characteristics of Delphi Method

The Delphi method usually takes the form of a written questionnaire. This allows for anonymous and independent consultation and debate, thus avoiding pitfalls of direct confrontations, both social (e.g. power relations in a group) and practical (time-consuming activity, especially when it comes to geographically dispersed participants). The responses are only visible to the moderator and not to the participants, to avoid self-moderation bias.

In summary, the method allows an iterative consultation of experts and/or stakeholders, in the written form, with the aim of obtaining an increasingly consensual response (the ultimate goal being to get closer to a consensus among experts). The experts, ranging from a dozen up to hundreds of

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people, are invited, as the rounds go on (2, 3 or more) to position themselves in relation to a question according to the answers of the other participants. All answers are based on the principle of anonymity and independence of judgement. The presentation of the questions can vary: it can be open and/ or closed questions (qualitative and/or quantitative).

(i) Consensus / dissension

The method has been constructed to encourage consensus on specific themes such as priority setting, technological foresight, or decisions about certain technical or medical issues. More precisely, the Delphi method creates conditions that are favourable to a convergence of opinions, while at the same time making it possible to clearly discern the points of dissension. The study of the latter is important, as it legitimize the method and often leads to redefining the initial problem, again leading to consensus. Also, the key feature of the Delphi method is its controlled feedback process through several rounds.

(ii) Multiple rounds and controlled feedback

Unlike conventional surveys, the Delphi method consists of an iterative and interactive consultation: a panel of participants is consulted during several rounds, and in each of these rounds the panel receives the results from the previous round. They position themselves again in regard to the previous results (controlled feedback process). In addition to giving their opinion, participants should provide additional feedback to justify their responses. It is also important to preserve the anonymity of respondents. By combining closed questions (e.g. multiple choice) and open questions, the Delphi method produces both quantitative and qualitative results.

1.5.4 Tools of Delphi

Delphi tools are a specific set of tools that have been designed to work with pin and sleeve terminals. More accurately, they work with Delphi pin and sleeve terminals. Delphi tools, when used with Delphi terminals and seals, create environmentally sealed, disconnect-able connections. These inline connections can only be achieved by using the proper tools. This is why we carry Delphi tools. They are an important part of multiple industries and as such, they are important to our customers.

Delphi tools are available in several different styles including crimpers and removal tools to meet the needs of various electrical connections. Below we will take a quick look at the different types of Delphi tools and where you might want to use them.

Note

(i) **Delphi Crimper MP 150/280 :** The Delphi crimper MP 150/280 is ideal for use with metri-pack 150 or 280 series terminals. This tool is designed to crimp the core and insulation wings in a separate motion. Simply place the terminal over the stripped wire and place the core of the terminal into the proper nest on the tool. Close the tool to achieve the proper crimp. Now you repeat the same process with the wings, and you are done.

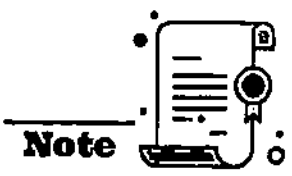
(ii) **WP Core INS :** Our Delphi WP core crimping tool is built to crimp terminals and seals in a single motion. This ratchet style crimper is made to work with: Weather-Pack Series, 20-14 AWG. Additionally, it is made to work with metri-Pack 280 Series 20-14 AWG terminals once the terminal locator has been removed. This tool is known for its repeatability and longevity making it the perfect choice for use in field service or in hazardous job sites.

(iii) **Weather pack Terminal Remover :** Once inserted into a connector, Delphi terminals are made to stay there. That is unless you have the weather pack terminal remover. With this tool, you can easily remove terminals from your connector. To use the tool, you would depress the terminal retention bar with the tip of the tool and extract the terminal. It really is that easy. The weather pack terminal remover is built to work with all three sizes of weather pack terminals 22-18 AWG, 16-14 AWG, and 12-10 AWG.

Research Design

The design of this research followed the steps and addressed the anonymity of panelists, the interations facilitated the researcher, the optimum numbers of rounds and the justifications of panelists of their choices.

1. **The Experts :** Experts were recruited by personal invitation from the researcher. The research process, the time allocated to complete each round, the time allocated to complete each round, the number of expected rounds the duration of the entire study and the time commitment required were all communicated in advance. All experts accepted the offer to participate. Participants signed an informed consent prior to completing the first round.
2. **The Rounds :** In each round the experts were presented with a list of reference sources and were asked to answer a single question. The researcher developed the list of references sources using several sources. It featured reference materials covered intwo popular reference textbooks as well as a textbook for online searching and



panelists suggestion. The list of sources was designed for LIS students who are taking a required general reference course and have no clear idea of where they will be working in the future.

3. **Limitations :** The research design took into account the short comings and weaknesses previously identified in Delphi studies and addressed them in the planning stages. Panelists used this to express reservations and very characteristically.

Check / Result

Any type of general librarian, academic librarian, and information science researcher is the most common population in the LIS Delphi study. An average of 14-36 experts are used in the first round of the LIS Delphi study. Employment in a specific role and publication in scholarly journals is the most popular means of identifying experts. Variants of the e-Delphi (online survey/e-mail) method are common in LIS Delphi studies that focus on general informatics. Although the LIS Delphi studies are a relatively small number, they have a consistent record of being published in some of the most prestigious LIS journals.

This paper provides an introduction to the Delphi method for LIS research and also provides an overview of the literature available in LIS. No overview of this limitation is available in the LIS literature and thus the method serves as an important information source for LIS researchers.

1.6 Repertory Grid

1.6.1 Repertory grid technique

RGT represents the practical application of George Kelly's personal construct theory (Kelly, 1955). Kelly argued that we understand the world through our own personal construct systems which are formed of a "personal, internal set of theories, which in turn become hypotheses, governing our expectations of the world" (Crudge and Johnson, 2004). This theory is cognitive constructivist in nature (Gergen, 1999 p. 20), constructivism being the idea that the mind creates an understanding of reality, "within a systematic relationship to the external world" (Talja, Tuominen, and Savolainen, 2004). Kelly's theory was influential on Kuhlthau's information search model (1993). It was Kuhlthau's work along with an early version of Dervin's sense-making theory (1983) that have been particularly influential in driving the adoption of constructivism in information science (Talja, Tuominen, and Savolainen, 2004) and have informed the author's own view of information seeking.

Note

RGT in the context of mental models of information retrieval is suited to the inductive, flexible qualitative approach advocated by Fidel (1993), because we expect that a picture of parti-cipants' individual mental models will only be elicited during testing. RGT uses a semi-structured interview including a 'grid construction' phase that will compare catalogue interfaces by rating each construct on a scale (Fransella, Bell, and Bannister, 2004). Also, it was anticipated that much qualitative data would be generated at this stage. This combination of methods will provide a measure of methodological triangulation (Fidel, 1993). Because the RGT interview provides a structured framework which allows the participant to describe their understanding of the subject in their own terms rather than using the interviewer's, it is seen as a particularly good way of avoiding bias introduced by the interviewer's own understanding of the topic at hand (Pervin, 1973).

1.6.2 Repertory grid Technique Methods

The topic under discussion was library catalogues, with the more specific intention of looking at user experience of a next-generation library catalogue. This was pre-determined by the author as the area of research of interest. Within this topic, elements were chosen for investigation that represent the sample in some way. It was expected that at least Encore and the previous WebPAC Pro OPAC interface would serve as elements. In addition, the concept of the participant's 'ideal' library catalogue was introduced. This follows Crudge and Johnson's (2007) approach of using an ideal search engine introduced due to the low number of elements involved, which gives a useful "comparison anchor" (Hunter, 1997) to relate the real elements to the participant's conception of the ideal catalogue. It was expected that the concept of an ideal library catalogue would vary widely between participants and there is no suggestion of considering the ideal catalogue to be the same across grids; the ideal is used within the individual participant's grid only.

Although a baseline of elements was provided, some participants wanted to include their own elements – search engines or library catalogues they had used elsewhere including the Copac union catalogue of UK national, academic, and specialist libraries (Mimas, 2010), the WebVoyage OPAC from the Voyager library system and the Web OPAC from the Aleph library system. Including elements generated by the participant was very welcome as this improves the extent to which the topic under discussion is seen from their point of view.

The basic method of the repertory grid technique used was to create a grid where the participant will rate elicited 'constructs' on a five-point bipolar

scale. This scale is similar to the rating scales used when constructing questionnaires. A construct, or personal construct, is in Kelly's terms "a way in which some things are construed as being alike and yet different from others". Constructs can be thought of as representing contrasts between different things - perhaps opposites (Jankowicz, 2004 p. 11), as they are bipolar. Kelly theorised that constructs actually exist within an individual's complete personal construct system which is evolved out of hierarchical relationships between different constructs

Constructs elicited during an interview can only really be considered as giving an insight into the way the individual perceives and construes the world, not a full picture of the individual's understanding of the topic.

In the context of a library catalogue, the following are some example constructs :

Simple, clear interface	*versus*	*Unclear, cluttered and busy interface*
A specialist tool	*versus*	*A general search tool*
Terms in catalogue are easy to understand	*versus*	*Stuffy or outdated jargon*

This basic method is Kelly's original "triadic difference" approach (1955, p. 223). Other approaches have been devised since, for example a "triadic opposite" where the participant is asked for a way in which two elements are alike, but different from a third element, then asked what the opposite of that difference is (paraphrased from Fransella, Bell, and Bannister, 2004 p. 29). It was decided to concentrate on the triadic difference method to elicit constructs as this remains the most widely-used approach in RGT work and it was expected any future studies on RGT in library catalogues would likely use this same approach, additionally there is some evidence the "difference" approach produces a better-differentiated picture of the relationships between the elements investigated than do the more extreme contrasts invited by the "opposite" approach (Neimeyer and Hagans, 2002). It was found in a few cases the participant had trouble comparing Encore and the WebPAC with a hypothetical ideal catalogue, so to keep the interview moving a "dyadic difference" approach was also employed. This is based on asking for a difference or similarity between two elements which is used to find the two poles of the construct (Fransella, Bell, and Bannister, 2004 p. 29-30).

Note

The model for this study is Crudge and Johnson's (2004; 2007) use of RGT to determine user mental models of search engines, a novel use of this methodology. Their earlier study demonstrated that RGT is, "a suitable method for elicitation of a finite set of constructs from an ordinary information seeker", and furthermore that a relatively small sample size produced a set of constructs that was considered a good representation of the complete set of constructs that would be elicited from the population the sample was drawn from (Crudge and Johnson, 2004). Their later study built upon this and used the RGT technique of laddering. This technique is used to elicit constructs of a higher and lower order of abstraction than those elicited from the original elements. Laddering upwards is done by probing the interviewee about which side of the elicited construct is preferred, and why that is. Laddering downwards is based on asking 'how' questions about the emergent pole of the construct to find more detail out about it, for example for the above, "How can I tell a catalogue is a specialist tool?", might be used. (Fransella, Bell, and Bannister, 2004 pp. 39-43; Jankowicz, 2004 pp. 64-67).

Using data gathered using laddering techniques, Crudge and Johnson were able to describe a composite mental model from their interviewees based on three layers :

(i) The evaluation layer, which represents the user's assessment of the search engine. The authors describe this is a pyramid of increasingly complex evaluations of the catalogue. Examples of evaluative constructs are: Finds relevant results and Offers additional information to judge item.

(ii) The affective layer, representing the user's emotional response. An example of an affective construct is Pleasant look and feel.

(iii) The procedural layer, representing the user's actions or processes while using the search engines to carry out queries. Examples of procedural constructs are :

Ability to pre-limit search and Has working save / export features.

(Paraphrased from Crudge and Johnson, 2007 with own examples added)

Note

A graphical representation of this model is shown below.

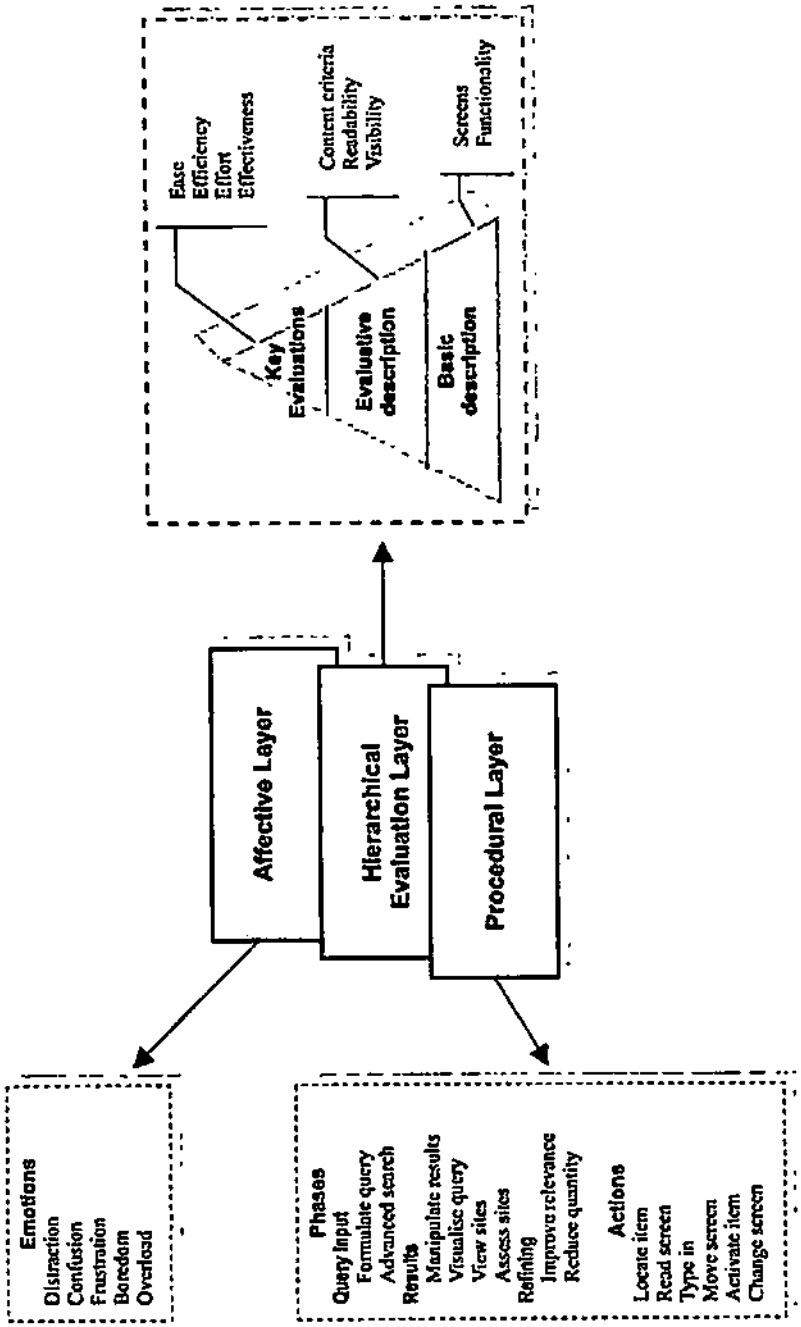


Figure : Representation of users' "evaluative mental model" of search engines, showing hierarchy of affective, evaluative and procedural layers (from Crudge and Johnson, 2007).

Laddering was not used in this investigation due to the wish to keep the interview sessions reasonably short. A normal RGT interview can be expected to last up to an hour (Jankowicz, 2004 pp.15-16), but laddering

Note

is more difficult, described by Fransella, Bell, and Bannister as "an art not a science" and one that should be considered a skilled rather than a standard procedure in RGT interviews (2004, p. 42). However, Crudge and Johnson's coding approach that allowed for describing a model including layers or emergent themed groupings from the RGT interview was key to analysing the data gathered during this investigation.

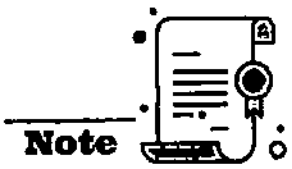
1.6.3 Repertory Grid Software

An initial questionnaire was used to gather information about existing familiarity with IR systems and information about the subject's background (for example, their area of study), this is shown in Appendix B. This also acted as a final filter check to confirm they did actually make use of the current library catalogue at ULRLS.

The questionnaire included some demographic data and questions about use of the Web as a possible aid to understanding and analysing replies given during the interview. There was no plan to carry out data analysis on the basis of this information, but it was thought this might assist with the understanding of replies given during the interviews and was therefore worth collecting.

Although most repertory grid software includes functions to assist in eliciting a grid, the researcher felt it would be quicker and less intimidating to record the grid on a paper template, allowing the participant to see what was recorded and show how the grid developed over the course of the interview.

Additionally, sessions were recorded on tape to provide a high fidelity record of what subjects said during walkthroughs and interviews, plus their non-verbal communication including any gestures at the computer screen. A small MiniDV video camera was mounted on a tripod and placed in a corner of the room, this provided an adequate field of view while minimising the intrusion of the camera into the interview session. Camstudio software (Smith, 2010) was used to record Web browsing activity in more detail than was possible using a camcorder. For coding and analysing data, recorded sessions were transferred to a PC from the camcorder which allowed them to be viewed side-by-side. At the start of the searching part of the session, the participant's Web browser was maximised on the screen which allowed the video recording and the screen capture to be synchronised. Written notes made during the session were later scanned and transferred to a PC so they could be easily linked to the video and screen captures. These effectively formed field notes including both observation and more subjective analytical notes, and were intended to bring an additional element of trustworthiness to the interview process (Gorman and Clayton, 2005 pp. 186-192). In line



with requirements of Northumbria University's Ethics Policy (Northumbria University, 2009a), subject data was anonymised. Further, participant data was kept confidential, stored securely and in the case of electronic documents on a password-protected computer, and will be disposed of in accordance with the guidelines in the Northumbria University Research and Ethics handbook.

1.6.4 Advantages and disadvantages of the Repertory grid Method

The presented two-stage repertory grid method is a suitable alternative to exploratory methods such as the Delphi method and extends them by quantitative evaluations. Here, the main advantage is that construct systems - that have to be evaluated by the experts - are not named by the survey organizer rather by various experts. The clear structure of this method allows a goal-oriented approach and minimized - through the development of a common terminology - misunderstandings during the interviews. An upstream consultation with technical experts in terms of the considered innovation field to specify the element types (here the expert brainstorming) is however advisable to ensure a common understanding of the questionnaires by the subjects. The achievement of overindividual comparable levels of abstraction is also promoted by using the laddering technique in the interviews.

However, the repertory grid method also shows some weaknesses. So generally, the determination of classes for elements and constructs results an information loss. As work continues in the featured two-staged method, using only the most named elements and construct classes, also the risk exists that special innovative and important constructs and elements are not considered. For example, the construct of 'Detectability' of civil drones which was only named twice in the presented survey - is currently hotly debated in the media and an essential element in the - outstanding - determination of a complete legal framework for the use of civil drones. However, an additional specification of the constructs by the interviewer is inadvisable because in this case the creative and knowledge-generating triad comparison and the method itself would be reduced to a semantic differential.

Furthermore, the high demands on the interviewer can be considered as a negative point of the repertory grid method. Especially when applying the laddering technique, the quality of the results depends largely on the interview management.

Note

A final criticism of the presented investigation is certainly the highly complex innovation field of civil drones. The diverse application areas have - also in differentiation according to user groups - a considerable room for interpretation and thus are responsible for different evaluations of the requirements by the expert subjects.

1.6.5 Repertory Psychology

Repertory grid is a technique developed in psychology in the 1950s but it is scarcely known amongst management researchers. This is surprising, as it has important advantages for exploratory research, since it significantly reduces researcher bias by eliciting constructs from respondents, and it generates both qualitative and quantitative data. Through this paper we aim to promote a more widespread use of the repertory grid technique and to enhance rigor in its application. To do so, we build on the experience gained from three major empirical studies we conducted over the past 15 years in which we utilised multiple repertory grids to elicit key constructs. Specifically, we describe how to analyze and present grid data; how the ratings in repertory grids can be used to identify key constructs; how data coding by different researchers can lead to greater reliability; how Pareto analysis can be used to demonstrate theoretical saturation; and how conceptual models can be derived from multiple grid data. Our findings have significant implications for both scholars using multiple repertory grid interviews, and researchers looking for more effective ways to conduct qualitative research.

1.6.6 Main Component of Repertory Grid

The main components of a repertory grid are :

1. **The Topic :** What the interview is about
2. **Elements :** A set of elements are examples of the topic. The grid has been used in much wider settings and well-defined set of words, phrases or even brief behavioural vigettes can be used as elements.
3. **A Set of Constructs :** These are the basic terms that the client uses to make sense of the elements and are always expressed as a contrast.
4. **A Set of Ratings of Elements on Constructs :** Each elements is positioned between the two extremes of the construct using a 5 or 7 point rating scale system. So its meaning to the client is modeled and statistical analysis varying from simple counting, to more complex multivariate analysis of meaning is made possible.

A major advantage of the repertory grid technique is that it allows interviewees to articulate their experience in the way they see the world

according to their own personal constructs. In doing so the interviewer avoids biases, as it also uses differences and similarities with other examples. So it becomes easier to tease out the thoughts of the interviewer than to talk in abstract words. It is also good for teasing out different dimensions of a question.

For example, a student is asked about their lecture experience. If the student struggles to respond, the interviewer can mention a few pointers. With the repertory grid technique, the student and the interviewer agree on a range of particular interpretations and then use the technique of compare and contrast as a way of talking to the student.

Hence, repertory grid technology is a rich source of qualitative data and allows people to express things according to their own terms. It also uses rating scales so it is analyzed statistically which combines both qualitative and quantitative methods.

Conclusion

In this chapter we studied information and information users. We also studied the relation of the user to the information unit. At the same time, we also studied in depth the methods of user study. Apart from this we also studied the Delphi method and the Repertory method.

Important Terms

1. User study is called empirical study of the use of information demand or need.
2. User study is done by survey method, citation, bibliographic study etc.
3. User studies are classified on the basis of behavior, information flow, etc. on the basis of usage.
4. The Delphi method is the method based on the results of a questionnaire sent to a panel of users.
5. The repertory grid is the method in which the interviewer allows one to articulate one's own experiences.

Note

Exercises

Very Short Type Questions

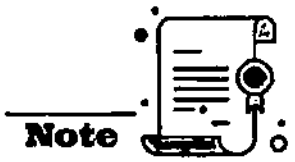
1. Why is information needed?
2. What do you understand by user study?
3. State the definition of user study.

Short Type Questions

1. Write a short note on the classification of user studies.
2. Write a short note on the repertory method.

Long Type Questions

1. Explaining the classification of user studies, describe in detail the evaluation of user studies.
2. Write a detailed note on the Delphi method.



UNIT 2

Information Sources

2.1 Introduction

In this chapter, we will also deal with information sources. Also learn about the documentary source and how the descriptive source is different from the documentary source. Will study about this too. We will study in depth about primary, secondary and tertiary sources of information.

2.2 Sources of Information

Literature is the basis of any subject. Through this information about human achievements can be obtained. Generally the nature of literature is varied and multilingual. In modern times literature is being published in more than 80 languages. Therefore, due to this explosion of knowledge, the nature of literature is becoming interdisciplinary. This sharp intelligence of literature can be experienced in such a way that in the field of science, literature doubles in 8 years and in the field of social science this growth takes place between 8-10 years.

Documents are various sources of information and important means of information dissemination and communication. The collection and retrieval of information through these sources provides a non-dual, expeditious service to the nascent subtle thoughts. Therefore, information fields mean such documents. The sophisticatedly presented sources of data and information meet a variety of creative needs of the users.

2.2.1 Type of Documents

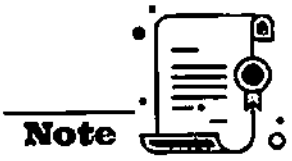
There are many sources of knowledge and information sources. Full knowledge of development of script, paper and printing arts and from the original sources of information, the original and the means of hearing were the main ones information sources from many scholars.

Note

2.2.2 Classified or Graded in Many Ways

1. According to Dr. Ranganathan, documents can be divided into the following four categories on the basis of physical appearance, nature of presentation, similar characteristics, behavior, etc.
   (a) **Conventional Document :** Under this, books, contemporary forms, maps, cartography etc. are included.
   (b) **Neo-conventional Document :** Standard, Authenticator, Specification facts etc.
   (c) **Non-conventional Document :** Audio-visual material etc.
   (d) **Meta Documents :** These are direct documents, in which there is no human arrangement.
2. According to Grogan,
   (a) **Primary Resource :** journals, research reports, conference proceedings, monopoly, standards, professional literature research dissertations, etc.
   (b) **Secondary Sources :** abstracting and indexing magazines, progress reviews, reference books (encyclopedias, handbooks, tables, formulas etc.), management, essays, text-books, etc.
   (c) **Tertiary Sources :** glossary, directory, bibliography, guides of literature, list of progress in research, guides of libraries and other organizations, list of progress in research, guides of libraries and other organizations.
3. According to Hension : The personal service rendered to persons engaged in the search of information for any purpose within the library and various activities carried out for the purpose of making information easily accessible are also called reference work."
4. There is a need to review and categorize these information sources in the context of the modern era because today new and latest types of sources are emerging in the source of information. Therefore, these latest information sources can be divided into the following two categories :
   (a) Documentary sources
   (b) Non-documentary sources.

   (a) **Documentary Sources :** These are the printed forms of documents. These are documents that are a means of exchanging ideas in print form information sources and systems. Traditional documents include books, magazines, newspapers, etc., which



are considered as original documents. In the modern era, there is a continuous change and increase in the nature and nature of the sources of information. On the basis of which documentary sources can be divided into the following three parts :

(i) **Primary Sources :** The major examples of this source are : Magazines, research reports, conference proceedings, standards, patents, dissertations, specifications, business literature, unpublished literature, etc.

(ii) **Secondary Sources :** The main sources of secondary sources are as follows : periodical publications, indexing and abstracting journals, reference books, text-books, monographs, tables, handbooks, progress reviews, etc.

(iii) **Tertiary Sources :** Under tertiary sources, directories, research progress list, list of bibliographies, annuities etc. are included.

2. Non-documentary Sources : Non-documentary sources are those sources which are not usually in printed or published form. These forms are in obscure forms and these sources are not easily accessible. Much important information is contained in these non-documentary sources. These sources form an important part of communication, especially in the field of science and technology. These sources can be divided into two parts :

(i) **Formal Sources :** In formal sources, research institutions, scholarly institutions, industrial institutions, state departments, university consultants etc. are included. Information is obtained by these organizations in the form of pamphlets, newspaper clippings, plans and charts, manuscripts, dissertation retrieval and print copies.

(ii) **Informal Sources :** Informal sources are living sources. Formal sources include conversations with classmates, meeting in person, attending business conferences, telephone messages, work progress, etc.

Non-documentary sources are more convenient because direct explanation cannot be obtained from documentary sources whereas information needs can be clarified by direct explanation in non-documentary sources.

Note

Different Types and Examples of Information Sources

Information Sources				
Documented			Non-documented	
Informal	Formal	Tertiary	Secondary	Primary
Periodical Publication	Secondary Periodical Publications	List of reference bibliographies	Half Institutions	Conversation with classmates
Half report	Indexing Journals	Directories	Delinquent entities	Conferences & Committees Membership
Conference Papers	Abstract magazines	Annuities	Industrial Institutions	Meeting with persons
Half-Disposal	Reference Text	Literary Guides	University	Technical gatekeeper
Authenticator	Text-Book	Half Progress Lists	State Department	Telephone messages
Standard	Disposal			
Business Literature	Reviews			
Unpublished Literature	Bibliography			
Half-Mangement				

2.2.3 Classification of Information Sources

Information is a power. Information is said to be that information or specific knowledge which is related to a specific subject, fact or event and can be communicated for use. Source means the medium to provide information which can be any document. Information source and reference source are the same but in modern perspective information source is more important and their utility is also more than reference sources.

According to Denny Grogan the three-category division of documents can be done as follows :

(i) Primary source

(ii) Secondary source

(iii) Tertiary source

2.2.4 Primary Sources

Any information/knowledge that is published for the first time is the primary source. That is, the documents in which the findings of the original research and the information related to the use of the findings in the field of industry and technology are published for the first time, those documents are called primary sources.

In this way, original research, development of new methods or new interpretation of old ideas, etc., include the first published document in the category of primary source.

Latest information is stored in these sources. A researcher gets the latest information with the help of a source. These sources are widely scattered, discrete and disorganized. The information contained in these is not adjusted with the mainstream of scientific and technical knowledge. Although such sources are very important. But finding them and using them would have been very difficult. The secondary source helps in utilizing these.

The primary source is the most important of the information sources. At present, basic reports of science, technical and social science research form the main part of the primary source. Some of these are in the form of records of observations and some are descriptive. Thus, with the help of these sources, the researcher benefits by getting up-to-date information. With its help, the researcher avoids duplication.

1. Periodicals : Among the primary sources, periodical publications are the most important. Periodical magazines are published in weekly, fortnightly, monthly, quarterly, semi-annual or annual forms. A large proportion of primary sources are published in the form of periodicals. Generally, research results are first published in current publications. Articles in these publications are the main means of communication and exchange of scientific information. Current publications have different subject information and objectives. On the basis of information characteristics, periodical publications can be of different types, such as specialized research journals, technical, business, popular and institution journals.

   The information contained in periodical publications is more up-to-date than texts. The main feature of primary periodical publications is that they are used in two different forms. The information contained in periodical publications is more up-to-date than texts. The main feature of primary periodicals is that they can be used in two different forms. Its new issues meet the contemporary needs of the readers of the region and at the same time old issues are also important means

Note

of providing specific information. Therefore, current publications serve to provide both new and insightful information, for example,

(i) Indian Journal of Pure and Applied Physics,

(ii) Nature,

(iii) Journal of Documentation;

(iv) Journal of Librarianship,

(v) Journal of Electronics Engineering.

2. **Research Reports :** At present, research reports are being used more than journals. According to one study, in the first decade, such reports accounted for more than 10% of all documents collected. Thus research reports became a powerful medium of scientific communication. In the midst of the Second World War, the discovery report appeared. The main reasons for the emergence of these types of documents have been the lack of paper, limited distribution and long time taken in magazine publication etc. Therefore it was thought to develop such a medium which could be distributed in limited copies on less paper and at a faster speed and these documents were very useful. The information contained in research reports is original. Sometimes these are available only as typed copies on the report. Some reports contain haphazard preliminary information about a work, while others give authentic and detailed information about a work, which is difficult to get from any other source. Most of the literature on subjects like Legal (Acronaulet) and Applied Atomic Energy is available in the form of reports. In social science, government reports which are published under a project, they fall in this category. Reports published in the field of education and economics come under this.

The NASSDOC has a large collection of such research reports. The institution encourages research work by being the financial assistant of the individual and the institution. ICSS publishes regular reports on research work. for example :

(i) Scientific and Technical Aerospace Report, National Astronaut and Space Administration (NASA);

(ii) Government Reports, Announcement and Index (GRA & 1),

(iii) Physics Reports, Amsterdom.

3. **Conference Proceedings :** Conferences, seminars, studies organized at various national and international levels are the primary sources of information articles written in seminars. It is not right for every person or researcher to be present in these events himself.

Note

Therefore, proceedings are published in these conferences, which the researcher can use in his research work.

The articles presented in such conferences bring the latest inventions, discoveries to light first. Apart from this, questions and answers related to the article are also included in the proceedings. In addition to the conference proceedings, the objectives of the seminar include the presidential speech, the list of participants and the suggestions of the conference, etc. for example,

(i) Proceeding of Science Conference,

(ii) Communication : A Conference Proceeding Report,

(iii) ICCP : A Conference Proceeding.

4. **Patents :** This is a certificate of agreement between the authentic government and the investigator. Through this, he gets a monopoly for a certain period to make, sell and use the patent process, machine creation, production. The government provides such a certificate to encourage the new discovery of scholars and workers to produce the latest work or production. It is a government document and government currency is also attached to it. It is published by government and semi-government organizations from time to time.

Authenticators are the result of the latest research, so they are an important form of primary source. Certified chemists are very useful for engineers and doctors. Patent papers in India are granted and published by the Indian Patent Office. Indexing and versioning services are also included regularly to Authenticator. for example :

World Patent Index

5. **Standard :** Standardization is a simple means of maintaining uniformity. This uniformity should be in each area and in each side of the functions. This maintains uniformity and equality in the form of activity and commodity, there is a definite and continuous increase in production and there is a direct vision of efficiency. Therefore, the macro body, government or authorized body, fixes the standard of every work or thing and the thing manufactured according to it is called standard commodity. Such standard goods get confidence in the consumers. The result is that the goods which do not follow the standard are eliminated from the market.

Standards are such official standards, which are prepared by an industrialist, businessman or specialist to test the size, type, importance etc. of a particular item. Their development takes place

Note

after an extensive research programme. Generally, a standard is a booklet of a few pages, in which definition, method, properties, measurement, etc. are included. They are also depicted with tables and pictures. They can be classified as follows :

(i) Dimensional Standard,

(ii) Quality Standard,

(iii) Standard Test Methods,

(iv) Standard Terminology,

(v) Code of Practice,

6. **Physical and Scientific Standards :** These records are very important for research work. National level institutions have been established in different countries only for standardization. For example, British Standards Institution (BSI), Indian Standard Institution (ISI). This organization provides 300 standards annually to the International Standards Organization (ISO).

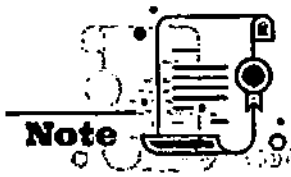
7. **Industrial and Trade Literature :** Commercial literature is an important source in getting information about a particular product. When no material is to be found, specialized commercial literature is useful as a primary source.

   The main purpose of the commercial literature is to elaborate on its production equipment, commodities system. The main reason for this is that in order to increase the sales of its products, it is necessary to establish credit in the market before production. This information is provided by the dealers of the producers. They are available in the form of literature, technical bulletins, price lists, jata seats, scent lists, hand booklets, magazines, etc.

   Generally booksellers do not reduce this type of literature. Because of this, such literature could not get a proper place in the library. But this is the only literature through which a complete description of the description, principle and procedure of a highly sophisticated device is obtained. Sometimes this type of information is not published in any other source.

   Organization magazines are the main source of such documents. Such magazines are Shell Magazine, Atom News (UKARA), Shri Ram Patrika etc.

8. **Clippings of Newspapers :** Newspaper-magazine clippings are a major primary source. The specific, intended information published in dailies or magazines or specific articles or pieces of account are collected and adjusted in view of various library needs and utilities.



9. **Dissertation or Thesis :** Generally, the university gets the dissertation written for the degree of doctor, which is prepared under the direction of a scholar. It is believed to contain information about original work done in a specific subject. Its main objective is to test the proficiency of the researcher in that subject and research method.

A new technical method or principle is invented from the findings in these thesis. It is difficult to get information about them due to their lack of public publication. Various measures are being taken to overcome this difficulty. The NASSDOC is collecting a large collection of such dissertations. About 2,000 dissertations have been collected by NASSDOC, ICSSR, New Delhi has prepared a classified list of this type of literature. Similarly, 'Dissertation Abstract International' is being published by Microfilm University of America. The importance of research dissertations has increased significantly in such services.

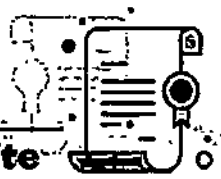
10. **Correspondence File :** Correspondence file also has an important utility of its own in various industrial organizations. It is related to technical issues, sometimes information on old subjects is obtained through them.

11. **Maps, Atlas and Charts :** The depiction of the surface of the earth on any flat object is a map and their collection is called cartography. They are needed for carrying out various types of research work about tourism, excursion, civilization and culture. These sources provide geographic information.

12. **Manuscripts and Unpublished Material :** Many primary sources are also unpublished, these sources are used for historical interest. In social science, 10% of the total literature is unpublished and handwritten. These sources include handwritten texts, manuscripts, unprinted texts, personal diaries, inscriptions, old coins, etc., which are very useful for research work.

2.2.5 Secondary Sources

Information published in primary sources on a particular subject is widely scattered and is available in large number of sources like primary periodicals, technical reports, dissertations, conference paper, patents, standards and so on. The research results are published in different languages. This makes it is very difficult for a researcher to keep track of what is latest in his field of interest. To solve this problem there are other set of publications called secondary sources. Secondary periodicals, bibligraphies, books, reviews, treatises, state of the art reports, reference sources etc. come under secondary sources.



Note

The material to be collected from primary sources to refer to the primary sources is called secondary source. This material is arranged according to a definite plan. In these sources the basic information is selected for a certain information or user.

Secondary sources are easier to obtain than primary sources. It not only provides a compendium, but also serves as a bibliographical key for the primary source, which facilitates access to the primary source. Secondary sources are divided into the following categories :

1. **Periodicals :** There are many periodical publications which do not provide original information. These publications are specialized in interpreting and providing feedback on developments recorded in primary information sources.

2. **Indexing Periodicals :** Indexing periodicals are important secondary sources. In this type of journals, reports of articles published in primary journals are regularly compiled. Under these, stories of new texts, pamphlets, etc., are also included.

   A large part of the primary sources are not accessible to the readers. Therefore, this new method of information transmission between information generation and information user has been presented.

   Example :

   (i) Library Literature,

   (ii) Reader's Guide to Periodical Literature.

3. **Abstracting Periodicals :** This is the best method to save the invaluable time of scholars and users. In this type of journals, a summary of articles published in primary sources is provided. Its main purpose is to provide information to such readers who cannot read or access the original document due to busyness or any reason. Under abstract journals, important articles of primary journals, new dissertations, proofs, reports and other publications of the field are compiled. Abstract magazine acts as an index to get information on a specific topic and through this it also helps in solving the language barrier to an extent. Example;

   (i) Chemical Abstract,

   (ii) Biological Abstract,

   (iii) Library and Information Science Abstract

   (iv) Physics Abstract,

   (v) Engineering Abstract.

Note

4. **Secondary Periodicals :** Secondary periodicals regularly scan the literature published in primary sources, select the relevant items, arrange them in helful sequence and bring them to the notice of researchers at weekly, fortnightly or monthly intervals. These publicatons contain bibliographical references of each item with or without abstracts.

5. **Bibliographies :** A bibliography is a systematic list of documents that share a common factor that may be a subject, a language, a period, an author or some other criteria. The list may be comprehensive or selective. The list is arranged by some order.

   Such bibliography known as enumerative or systematic bibliography, attempts to record or list. Each entry provides bibliographical details of the document.

6. **Books :** A book can be broadly defined as a written or published document of at least 49 text pages that communicates thoughts, ideas or information. Pages of the book are glued or sewn together along one side called the spine or back. Two covers of the book are joined by hinges to the spine. Books are either hardbound or softbound, depending on the cover. Most of the hardbound books have a cover made of cloth, plastic or leather cover cardboard. A paper cover jacket is often added to protect the cover of a a hardbound book. Most of the softbound books are called paperbacks.

7. **Reviews of Progress :** Progress review, different from book review, is a critical summary, which is an account of the progress and development made by a scholar of a particular subject in this subject. The importance of this type of literature is increasing significantly and reviews are being used more for literary search in many fields than indexes and abstracts.

   Ranganathan called these reviews descriptive bibliographies. After analyzing and evaluating the information, it is arranged in the proper context. In this, only important information in a large part of primary literature is conveyed to the readers along with bibliographic details. This literature is published in many titles. Like – Annual Review, Year Progress or Work, Advances, Progress in Development of and Survey of.

8. **Book Review :** Under this, the critical details of the published books are given. Hence they are called book critical social journals. The opinion of scholars about newly published books is published in these journals. Example,

Note

(i) Prakhar, Delhi (Navbharat Prakashan, Monthly),

(ii) Book Introduction, Delhi (Rajkamal Publications, Monthly).

9. **Reference Books :** These sources of information present the information published in the primary sources in a very systematic order. These are also kept in the category of secondary sources.

Definitions

A reference book is a book that the researcher uses only when necessary. In simple words, it can be said that a book which is immediately helpful in clarifying or confirming any subject or topic is called a book.

According to Dr. Ranganathan, "Reference books compiles and organizes knowledge information in such a way that the intended information comes to the fore immediately and in a specific form." Reference books can be divided into the following categories :

(a) Dictionary,

(b) Encyclopaedia,

(c) Hand Book, Manual,

(d) Tables etc.

(a) Dictionary : A dictionary is an important secondary source. These dictionaries are needed to know the meaning and usage of any general or specific word. These dictionaries can also be related to specific subjects.

Example :

(i) McGraw Hill Dictionary of Scientific and Technical Terms,

(ii) Dictionary of English Language.

(b) Encyclopaedia : The synthesis of all knowledge in encyclopedias is presented in an organized and systematic way. Encyclopedias are storehouses of knowledge. Generally used to find information related to background and history. In this type of reference texts, long articles on subjects and sub-topics are presented. They are arranged alphabetically. Encyclopedias are of both general and specific types. Under the general encyclopedia, knowledge of all subjects and subject areas is provided..A specific encyclopedia is organized by collecting information related to a topic or subject group.

Example :

(i) British Encyclopaedia,

(ii) Encyclopaedia Americana,

Note

(iii) Encyclopaedia of Library and Information Science,

(iv) Encyclopaedia of Physics.

(c) **And Book, Manual :** This is a short book, in which the depth of the subtle subjects of knowledge is revealed briefly. Most commonly used by scientists and technicians. Handbooks contain factual information, data, drawings and formulas. There are two types of handbooks :

(i) General Handbook,

(ii) Handbook on the subject.

(iii) Tables : The books in which facts are presented in the form of tables are called tables.

Example :

(i) Tables of Logs,

(ii) Table of Atomic Weights,

(iii) Table of Melting and Boiling Points,

(iv) Steme Tables.

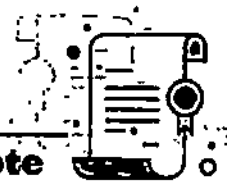
2.2.6 Tertiary Sources

Tertiary Sources : Tertiary sources are based on primary and secondary sources and serves as a key to the primary and secondary sources. These sources consist of information which is distillation and collection of primary and secondary sources. Tertiary sources are third in the order of appearance. First in the order of appearance are primary sources, next are secondary sources and come the tertiary sources.

Tertiary sources help to locate primary and secondary sources. Sources like bibliography of bibliographies; guides to the literature; directories listing primary and secondary periodicals etc., are placed under tetiary sources.

The sources of information, which help the reader to use primary and secondary sources, are called tertiary sources. Such sources do not provide most of the subject knowledge but provide additional information. The main function of these sources is to assist the researcher and experts in obtaining and searching the desired information for the use of primary and secondary sources. These sources are as follows :

1. List of Bibliography (Bibliography),
2. Directories,
3. List of Research in Progress,
4. Guides.



Note

(i) **Bibliography of Bibliographies :** When bibliography indexes tertiary sources, it is used as tertiary source at that time. This is called a list of bibliographic lists. *E.g.* A World Bibliography of Bibliography by Besterman, T.

(ii) **Directories :** Directories are the list of names and addresses of individuals, organizations, institutions, producers and current publications. The information of this reference source is arranged alphabetically or classified as per the requirement of the consumer. Directories also provide information other than names and addresses. As,

(a) Information about the various products of a company,

(b) Information about the activities of employees of national and international organizations,

(c) Educational qualification, designation etc. of scientists etc.

The directories are of the following types

(a) Industrial and business directories,

(b) Directories of Scientific and Technical Organizations.

Conclusion

In this chapter, we have studied information sources and learned about non-documentary sources along with documentary sources. The primary sources of information, secondary sources and tertiary sources were also studied in depth.

Important Terms

1. Information source refers to the documents that separate the data and information to meet the different needs of the users.
2. The sources which are available with us in print form are called documentary sources.
3. The source which is not available with us in print form is called a non-documentary source.
4. The primary sources include magazines, research reports, etc.
5. Summary journals and indexing journals in secondary sources. Text-books etc. are included.
6. Tertiary sources include dictionaries, encyclopaedias, etc.

Exercises

Very Short Type Questions

1. What is an information source?
2. What is the primary information source?
3. What is a secondary information source?

Short Type Questions

1. Explain the usefulness of information sources in a library.
2. Explain the source of documentary information.

Long Type Questions

1. Explaining the different types of information sources, explain their usefulness in the library.
2. What are the sources of information called? What do you understand by documentary and non-documentary sources? Explain in detail.

UNIT 3

Note

Different Type of Information Sources

3.1 Introduction

In this chapter, we will learn about human resources and also study about institutional information sources. Also what is a database and what are its types? Will study them too. What are information sources? Will study about them too.

3.2 Human Resource

The result of effective participation and qualitative performance of human groups in various activities of an organization or institute is related to the process of human resource development which is built into the managerial operating structure and which gives credibility to the organization and for its future growth and development provides guidelines. It is essential for organizational success and it suggests diversity in products and services and directs them to advance growth. As a result, this thinking benefits the employees of the organization in many ways. Hence, human resource at all levels of an organization is desirable for every group and individual. Human resource organization is the process of helping the employees of the organization to continuously enhance their skills and competitive spirit. The organization should provide the following facilities to its employees systematically and sequentially :

1. for the effective enhancement of their abilities and skills to perform various tasks related to their present and future roles;
2. to discover and harness their inherent strengths for the purpose of developing common abilities for their own sake and/or for organizational development;