UNIT 11   USER STUDIES

Structure

11.0 OBJECTIVES

After reading this Unit, you will be able to:

- explain the concept of user of a library or any information system or service;
- describe characteristics of different users and categorise them into specific groups;
- understand the need for careful and continuous study of,` and contact with the users;
- highlight the relation of user studies in the design of information systems, products and services;
- explain the essential steps necessary in planning of a user study;
- identify and adopt suitable methodologies for user studies; and
- enumerate general variables and characteristics of users and use as subject of study.

11.1 INTRODUCTION

Libraries and information systems are designed and built-with the primary objective of meeting the information needs of a group of people who: constitute their clientele. In the past, information systems and services were developed based more on 'literary warrant' rather than 'users warrant'.

In fact, the key to the aims, direction and contents of any and all information. activities is the user. Talking of information users, P.L: Leggate observes "unlike retrieval systems and computer systems, users are human and therefore difficult to classify. Unfortunately, one can say almost any thing and it will be true of 'some users. Any generalisation which can be made will be true of at least some users". Identifying 'definite user groups to which information is to be provided involves number of complex, costly, and demanding processes. However, the basic questions and problems are not how effective or efficient these processes are, but :

1)   what an information system or information unit or library can do to assist an information user in identifying; clarifying or solving a problem?

2)   what such a system or unit can do to raise the probability that a user will find relevant and useful information with a minimum effort?

The above stated questions form the foundation on which to build or develop information systems or information units including library services. These questions provide a practical operational framework for viewing the objectives, products and services as well as for evaluating the success or failures of such products or services. If this contention is accepted, it follows that the first requirement for designing an information system, service or product would be to study thy users. The users should be studied not only before designing an information system or starting of an information service or product, but also, during the life cycle of the system or service. It might be emphasised here, that while study of users increases the probability of a longer life cycle of such a system, lack of a Careful study may decrease it sharply: Conducting of a user study is a difficult proposition because the related theories, models, and methodologies have not been fully developed and perfected. However, there is a much higher probability that products and services based on user studies will be better designed than those based on intuition, anecdotal evidence or committee deliberations.

It must be stressed that the basic purpose of a user study is to gather information that is useful in design and provision, 'and/or evaluation of specific information products or - services geared to meet the needs of specific users. To emphasise further,user studies are a necessity in all phases of information activities from design to evaluation, to marketing and to management. Therefore, the central question is: What useful information about users or uses should be collected? In other words, what user and use variables should be collected? The choice of such variables for study is wide. Depending on the objective, individual studies will concentrate on a limited number of specific variables. Some of the general variables possible to examine in user studies are :

i)   the factors or variables in the users of information that effect their perception of the problem;

ii)   the specific ways they are most likely to use information and their capacity to use a given type of information;

iii)   the stages in the information transfer process which relate to the knowledge an individual has about a specific idea or innovation;

iv)   environmental or social characteristics; and

v)   communication characteristics, etc.

In the literature of LIS, the term user studies has been interpreted differently. The different interpretations along with other related aspects are discussed in the subsequent sections. The main purpose of this unit is to furnish adequate information to the participants of this programme so that they might be in a position to plan and conduct a user study in course of their professional work.

11.2   USER AND USER STUDIES

As has been mentioned earlier the user is the focal point of all information activities at all levels: User is a broad concept which may include both producers as well as clients of information. In LIS literature, a number of terms have been used to signify users. They are more or less near synonyms. For example, the words patron, client, member, customer are used to signify the concept of a user. Whitaker defines user as a person who uses one or more of the services provided by a library. On the other hand, Guinchat opines that a user can be defined on the basis of two sets of criteria, namely i) objective criteria, such as socio-professional category, specialist field, nature of the activity for which the information is sought, reason for using the information system, and ii) social and psychological criteria such as the user's attitudes and values with regard to information in general and in his relations with information unit in particular. The key factor being reasons behind his particular information seeking and communication behaviour and his professional and general social behaviours. Guinchat categorises users into three broad groups : i) users not yet engaged in active life, such as students; ii) users with a job and whose information needs are related to their work. They are classified by main activity (management research, development, production, services, etc.) i) by branch of activity and/or specialist field (civil

service, agriculture, industry etc.) and by level of education and responsibility (professional staff, technical. workers); and iii} the ordinary citizen needing general information.

Prof. J.D. Bernal provides some sort of classification of users of scientific and technical information from the point of view of the kind of information services required by them. One major aspect of this grouping is combining engineers, architects, medical practioners and agriculturists into the category of technologists. Also, managers (both business and industry) could be conceived as a distinct group of users of information. The two figures are given-below:

Fig. 1

Fig. 2
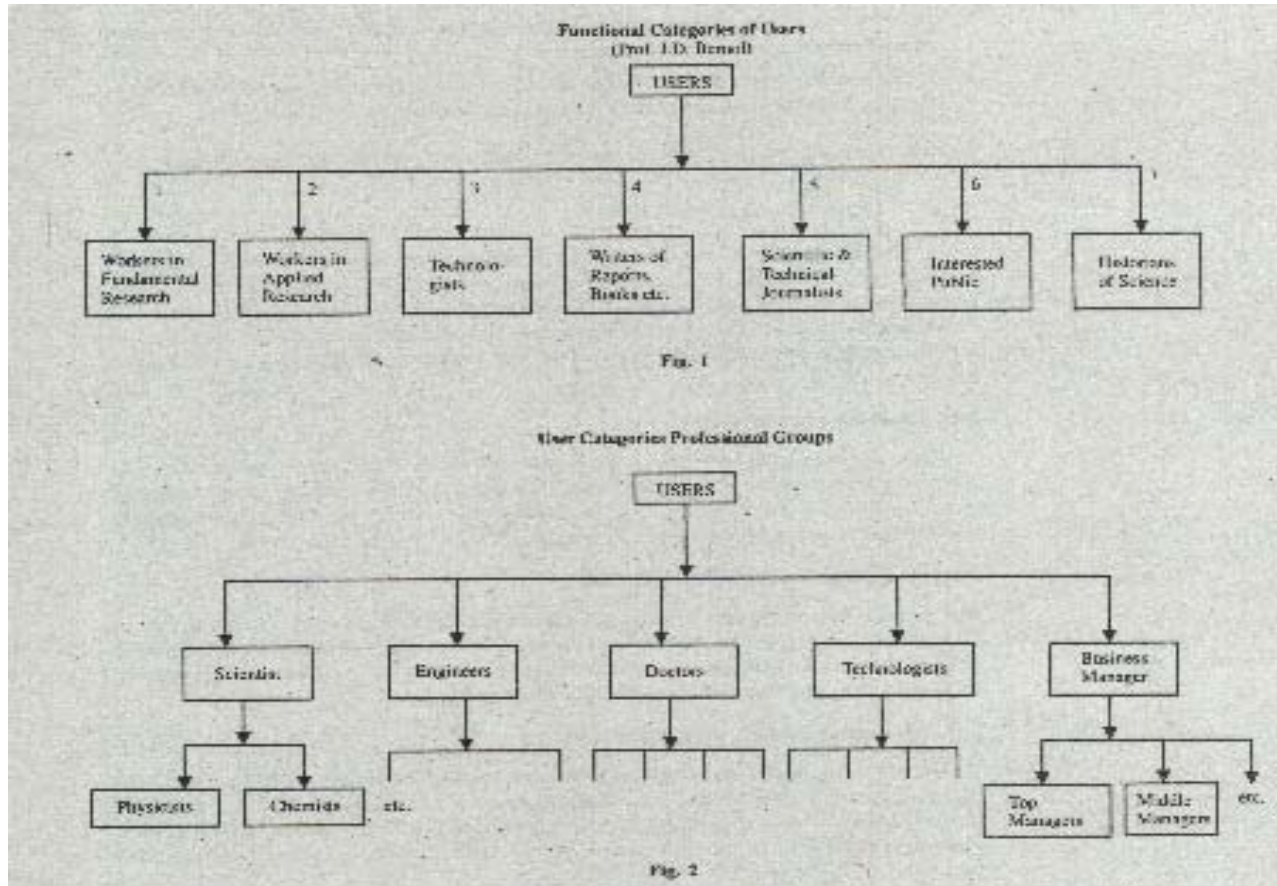
Another method of grouping users is on the basis of their approach to information. They can be classified as :

i)   the potential user - one who needs information which can be provided by specific services;

ii)   the expected user - one who is known to have the intention of using certain information services;

iii) the actual user - one who has actually used an information service regardless of the fact whether he derived advantage from such a service or not; and

iv)   the beneficiary user - one who derives a measurable advantage from information services.

It may be worth noting here that Dr. S.R. Ranganathan has grouped users on the basis of types of services enunciated by him into: the freshman, ordinary inquirer, specialist inquirer, and general reader.

It may be stated that a wise system designer recognises that the user of information must be an active participant in the system whose needs should direct the system design: Therefore, the information service must anticipate, match and be responsive to the requirements of its clientele. In certain situations the' users may not be fully aware of the many advantages of a particular system or service. In such situations the system designer must guide him to the pertinent aspects providing a tailor-made service.

Generally, three important groups of a scientific and technical information system users are distinguishable according to the kind ©f activity in which they are engaged: They are:

a)   researchers

b)   practitioners and technicians engaged in developmental and/or operational activities the different fields of technology, and

c)   managers, planners and other decision makeis who are engaged in co-ordinating development activities at local, national, or international levels.

The above mentioned three groups are very broadly defined and are not exhaustive.

11.2.1   User Characteristics

Since-the main purpose of any user study is to gather information that is useful in design, provision· and evaluation of specific information products or ̄ services geared to specific users,, it becomes necessary to have full understanding of the user characteristics. User characteristics may be studied under the groups i) individual characteristics, ii) stages in the information diffusion, iii) environmental or social characteristics, and iv) communication characteristics.

Individual Characteristics

The individual characteristics of users deal with the factors in the users of information that' effect (a) their perception of the problem and their definition of the problem faced along with their description of the needed information and; (b) the specific ways they are most likely to use information and their capacity to use a particular type of information: ,;

Stages in the Information Diffusion'

This aspect relates to the amount of knowledge an individual (or a group of users) has about a specific idea or innovation. Information needs' at various stages are different and therefore information products and services have to be tailored for each stage. This might be possible only when the capabilities of the user are clearly perceived.

Environmental or Social. Characteristics

The factors in the social system (such as the norms, situation, reference groups, etc.) that have an important effect on the individual's behaviour and communication fall under the category of environmental or social characters pertaining to an individual (or group) of user: Awareness about these factors enables the system designer to precisely gauze the information requirements of the user:

Communication Characteristics

The elements related to the use and diffusion of information constitute what are known as communication characteristics .Some of these include: information sources; information structures, communication channels and information, systems .These aspects need to be correlated with other characteristics.

A proper and systematic user study aims at collecting all the pertinent data concerning the users with the objective of building an efficient information system .Such data enables establishment of close relationship between users and the information system designers.

Self Check Exercises

l)   What do you understand by the expression user of a library, information system , information service or product?

2)   Explain what you understand by the expression 'categories of users'.Mention the different categories of user that an that an information professional generally comes across.

3)   Discuss the main groups under which user characteristics may be studied. How does the knowledge of users help information system designers?

Note: i)   Write your answers in the space given below.
        ii)   Check your answers with the answers given at the end of this Unit.

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11.2.2 User Studies

In the foregoing paragraphs the concept of user and the characteristics associated with users have been described and discussed. In this section let us try to understand what constitutes a user study, and its development. It is the recognition of the paramount importance of users that leads us to user studies.

In the literature of LIS, the earliest reference we come across is to the study conducted by L:R. Wilson in the late 1930s. It was an attempt to investigate the distribution and status of libraries in the USA and was not aimed at obtaining information relating to library use or users.

The concept of users and their information needs found some expression at the first conference of Royal Society held at London and became a subject of discussion at the International Conference on Scientific Information held at Washington in 1958: Prof. J.D. Bernal's paper entitled `The Transmission of Scientific Information: a user's analysis" received a great attention.

It may be mentioned here that a pilot study on the use of scientific literature by scientists was. conducted by R.R. Shaw in 1956 on behalf of National Science Foundation. Shaw's study is considered as one of the pioneering efforts in the direction of user studies. Since then a number of comprehensive studies have emerged on the subject: For example, Davis and Bail compiled a bibliography consisting of 438 such studies as early as in 1964. It has been recorded that by 1977, more than 1000 important studies were conducted on the subject of `user studies'. It must be mentioned that the growth of science and technology and, the importance accorded to the use of scientific information proliferated such attempts of user studies.

An event of great significance in the history of user studies was the establishment of the centre for Research on User Studies (CRUS) in 1975 by The British Library at University of Sheffield. The main objective of this centre was to create a national centre to act as a focus for research in user studies. Let us hope that researchers on different facets of `user studies' will receive encouragement from the centre in future and a theory of user studies would be developed. The establishment of a centre for research on user studies indicates the importance of the subject `user studies'.

11.2.3 The Need for User Studies

Information need surveys or user studies are potentially useful in bridging the gap between the kind of information services needed and the kind of services in existence. Any information system would definitely require identification of user requirements. However,

there had been certain doubts regarding the point whether information needs could really be established through user studies or surveys. For instance, it has been stated that information needs, as distinct from wants, cannot be determined through public opinion poll type surveys. It has been further stated that information service is a professional service (such as medicine) as opposed to a consumer service (such as packaging of breakfast food) and hence users of information services cannot provide correct guidance in the designing or improvement of an information system. This view shifted the emphasis towards the techniques or methodologies for conducting such surveys. This situation led to the efforts for development of reliable methodologies for conducting user studies and further emphasised the need for conducting user studies as necessary requirement for the design and operation of effective and efficient information systems, services and products.

11.2.4 Planning of a User Study

It is important to plan a user study carefully from the beginning to the very end. In this regard, it is necessary to lay out a detailed plan of each step hand before. The various stages of work are to be spelt out along with the general objectives of the study, translation of the objective into a set of questions or means of answering the questions, selection of the tool or appropriate technique for obtaining the answers, the selection of the sample of users to be observed and a plan for getting the necessary co-operation, the pretesting of the technique, the full scale study itself, analysis of data and preparation of the final report: In each stage of work certain decisions are to be taken.

Different Steps in the Plan

Any plan for conducting a user study should consist at least the following steps :

i)   Surveying the previous studies and literature in general and learning about all aspects of user studies;

ii)   Spelling out the objectives of the study;

iii)   Determining the variables to be studied and the specific model to be followed;

iv)   Selecting the sample population to be studied;

v)   Determining the method for collection of data for observation; vi) Determining the method of analysis of data or observations;

vii)   Determining the ways of presentation of data and utilisation of the results including dissemination. of such results.

While setting the objectives of the proposed study one has to spell out in clear terms what exactly one is going to find out from the study. All the subsequent stages will hinge around ' this decision. In this context, it may be pointed out that what are generally referred to as[*] information use or need studies are a composite of many different things. Such studies may be grouped into four broad categories.

Different Categories of User Studies

i)   Studies which are conducted to find out the overall pattern of interaction of the users' community with the communication system, without reference to any specific information receiving event, are categorised as communication behaviour studies;

ii)   In the second category are placed studies which are conducted to find out the use of any. communication medium like primary periodical, secondary periodical, etc. and are called , user studies;

iii}   The third category. includes studies which are conducted to find out the pattern of flow of information in the science communication system as a whole. They constitute studies in the flow of information;

iv)   The fourth category includes studies/surveys which are conducted within the limited context of a library or an information centre, mainly to find out the extent of use of the services and facilities offered by an agency with the ultimate objective of improving the system or services.

It may be mentioned that any particular study/survey may have different aspects and hence overlap each other on the categories mentioned above. Hence, while setting the objectives,

it has to be decided what exactly will be the nature of; the study/survey as per the four categories described above.

11.2.5 Methodologies/Techniques for User Studies

After the need for conducting user studies has been established and the relevant aspects (variables) to be studies are decided, the next logical step would be selection of methods for conducting a user study.

From sizable literature on the subject, it is evident that most of the general surveys, e.g.,, interview, questionnaire, diary, etc., have been extensively used by workers in the field of information use study also. The methods used so far may be grouped as under:

a)   General or Conventional Methods
      i)   questionnaire
      ii)   interview
      iii)   diary
      iv)   observation by self
      v)   operations research study

b)   Indirect Methods in the context of Information Use
      vi)   analysis of library records
      vii) citation analysis

c)   Special and Unconventional Methods,
      viii)   computer-feedback
      ix)   unconventional methods

A description of all the above methods may be found out from literature. Hence, a detailed : discussion is not attempted here. However, the selection of methods depends on previous decisions, on objectives of the study and also on the variables to be studied.   Three important aspects are involved in the selection of methods :

i)   selection of a sample of user population;
ii)   determination of procedures for collection of data from or about the sample;
iii)   determination of procedures for analysis of collected data to derive: or summarise results.

Each one of these, has to be considered in detail before one actually plunges into action regarding user studies: ` One of the most commonly committed mistakes in user studies is to collect data without any idea as to how the data is to be analysed.

It is always useful to consult a statistician and take his help in the selection of appropriate . methods to be followed in the envisaged user study.This would greatly enhance the usefulness of the results derived from the user study .However, the study should avoid incorporation of meaningless statistics in the user study.

As to the question of selection of a sample of user population there are a number of methods available which would facilitate this task. The most common in this regard being . ,

i)   **Convenience Sampling :** which means picking the first 25, 50 etc. users that come along as subject of study;

ii)   **Random Sampling :** which involves picking users for the study from a population at random;

iii)   **Stratified Sampling :** which involves sub-dividing the population into sub-groups and then picking users for study at random;

iv)   **Representative Sampling :**which involves determining beforehand individuals, pairs of individuals, or small groups with some characteristics in common as subject of study.

Similarly, there are a number of methods available for data collection. Some of the commonly used methods are :

i) **Surveying:** This involves questioning users and obtaining answers directly from users User Studies about their behaviour, attributes, values, conditions and/or preferences. This is by far the most often used method in user studies: It leads to somewhat biased results;

ii) **Observation:** Which involves making direct observations on the communication behaviour of users in given situations, practices, and time periods etc.

iii) **Records analysis :** This method involves obtaining written records or other artifacts of previous communications (such as papers, correspondence, statistics) and deriving inferences about users from the records.

iv) **Experimentation:** This method involves introduction of an element defined group of users and observing the results or consequences; possibly also comparing the group with another where the element was not introduced.

Next step involved is identification of some of the data analysis methods. An analysis is informal because it consists of gaining an impression or feeling of what the data indicates and in which direction they point. For formal analysis the most frequently, used methods are :

i) Statistical analysis which comprises application of standard statistical techniques to' summarise, compare and test for significance data which is expressed. numerically;

ii) Semantic analysis involves application of semantic techniques to summarise and compare data which is expressed verbally.

iii) Psycho-social analysis which involves application of psychological; sociological or an- ' thropological techniques to classify or describe the data obtained through an user study, which is represented conceptually, logically or representatively;

iv) Economic analysis which comprises application of macro or micro economic techniques to derive conclusions in economic terms on data expressed in all the above mentioned ways.

Each of these techniques of analysis do require knowledge of the respective fields. Standard statistical packages are widely available which will accomplish the required results: However; use of such packages requires some practical training. Appropriate techniques can also be ` adapted relatively easily from the previous studies.

Self Check Exercises

4) Discuss briefly the need for user studies.

5) What is meant by planning of a user study? Indicate the different steps in conducting a user study.

6) Discuss briefly the different types of user studies.

7) Explain some of the methodologies/techniques employed for conducting user studies.

Note: i) Write your answers in the space given below.

ii) Check your answers with the answers given at the end of this Unit.

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11.3 USER STUDIES : LIMITATIONS AND CRITICISMS

Although a number of studies have been conducted in the past to assess the information needs of scientists, engineers and technologists, the, information needs proved to be extremely complex and varied. As a result, most of these studies proved to be inadequate to the task of completely revealing the precise nature and needs of information users. These investigations have, at best, provided only an a priori approach to the problem and much is needed to be done in this direction.

There have been some criticisms on the methods and techniques used in the user studies/ surveys. For example, it has been stated that the question of sampling in user studies left much to be desired. In other words; in selecting the sample, refined techniques of random sampling have not been taken into account. The usual error of getting into the sample a large number of workers who take `an interest' or are methodical and co-operative to return questionnaires and diaries, is always there. This error should be avoided. Moreover, it is not only the size of the sample that is important but also the composition of it taking into consideration the environments of the participants. One of the critics has suggested as many as seven different environments as follows: i) academic institutions, ii) research organisations, iii) industry, iv) government, v) professional associations, vi) trade unions and political parties, and` vii) the press and broadcasting. Similarly, users can also be categorised according to functions such as : i) research, ii) teaching and training, iii) management, iv) social work and administration, v) the press and broadcasting, vi) politics, vii) business and commerce, viii) study and learning. All these are likely to influence a person's information needs and behaviour.

There are several other variables also. These are demographic (e.g., age, education, length of experience in research) and psychological (such as motivation, intelligence) variables which may well be related to information requirements, needs and users. Hence, it has been mentioned that user psychology must also be taken into account. Aspects of user psychology to be considered include: the search time that can be tolerated, the amount of irrelevant material that can be tolerated, time available for retrospective searching, the ,, preferred form of the search product, user's input channel capacity, work habits, terminological idiosyncrasies, prior knowledge of reference tools and information system and user's judgement about the comfortableness of the physical aspects of the information system.

The importance of including individual variables in studies of information gathering and information seeking behaviours has also been stressed by some experts. Some of the individual variables cited include : i) age, ii) experience in research in a particular job; iii) background qualification, iv) whether solitary or team worker, vii) persistence and thoroughness and viii) motivation, etc.

With appropriate inclusion of some of the above mentioned aspects in user studies, the critics believe that the short comings in them can be minimised and the findings can be made valid and widely applicable.

11.4 CASE STUDIES

Since Prof. J.D. Bernal made his pilot study for the Royal Society's Scientific Information Conference in 1948, there had been several attempts to investigate the methods by which scientists and engineers obtain the information they need and then put them to use. The ' basic assumption behind these efforts was that the conventional information tools and systems currently in use needed improvement and the. improved tools and services of tomorrow would spring from those we have today.

Use studies/surveys have been conducted in different countries at different levels with different samples of population. It is not possible to discuss or present the findings of such studies in this Unit. However, the important findings of some of the studies have been reported in the literature which are provided in this Unit in the form of references.

One of the investigations published in 1995, reported the analysis of some 796 user studies

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noticed through LISA for the period 1969-1989.. This investigation revealed that the contemporary research areas in user studies included areas like direct enquiry of users, assessment of user attitudes, experimental information services and their evaluation and direct observation of users. The weak areas of research in user studies appeared to be use made of information; communication not involving documents, relevance and refinements, etc.

11.4.1 Efforts Made in India

The problems of communication in' science and the user interface have received some attention in this country since last three decades. For instance, INSDOC conducted a use survey relating to its current awareness service entitled "INSDOC List of Current Scientific literature" as early as 1964. As a result of the findings of this survey, INSDOC had to wind up the above mentioned current awareness service' and had to start the compilation of `Indian Science Abstracts'. Another significant effort in this direction is the study conducted by Carl M. White regarding the use of Delhi University Library in 1965. In the same year (i.e. 1965) the Indian Association of Special Libraries and Information Centres (IASLIC) conducted a seminar on "Users and Library and Information Service. Though the seminar did not discuss or, report any worth-while study/survey, it helped in drawing the attention of the authorities of special libraries and information canters towards these problems.

In the year 1967, INSDOC conducted a pilot survey to assess the information potential and the information needs of the research workers engaged in the field of `electronics'. This survey was undertaken in connection with the formation of `Electronics Information Grid'. Interview technique and questionnaire method ʲwere employed in this study. The findings, though essentially empirical in nature; have been published in the form of a report. Yet, another worthwhile effort in this direction was the survey conducted at the Delhi University to determine the reading patterns, information needs and information gathering habits of the teachers and research scholars attached to the chemistry department of the University.. This survey was conducted by means of a questionnaire (see appendix) and also through interviews. The findings of this survey are compatible with the findings of similar studies undertaken in other countries. ` A sample copy of the questionnaire used in this study is - provided in the appendix.

Though libraries exist for users, research in Indian librarianship has taken for granted the user component of the. system. It is only in recent years that extensive and in depth customer related studies began to appear.

One such effort was made by M:S: Sridhar. His doctoral research work was on information seeking behaviour (ISB) of the Indian Space Technologists (IST) of ISRO Satellite Centre (ISAC), Bangalore. The results of this study have been published under the title "Information Behaviour of Scientists and Engineers". This study is a contribution towards user studies and therefore worth considering as one of the case studies: The case studies referred to above are illustrative in nature and not exhaustive.

Self Check Exercises

8) Briefly discuss some of the limitations and criticisms concerning user studies.

9) Describe some of the significant efforts -made in India relating to user studies/ user :-surveys.

Note: i) Write your answers in the space given below.
        ii) Check your answers with the answers given at the end of this Unit.

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11.5 SUMMARY

In this Unit on user studies, an attempt has been made to explain to you the concept of a 'user' of a library or information system. Different connotations to the term `user' have been discussed.

It has been emphasised that libraries or information systems are designed and built with the primary objective of meeting the information needs and requirements of a defined group of people, called users. Users, therefore, become the focal point of all information activities at all levels. This situation calls for acquisition of an intimate knowledge regarding the users of an information system. The users should be studied not only before designing of an information system or starting of an information service or product, but also, during the life cycle of the system or service.

It might be mentioned here, that while the study of users increases the probability of a longer life cycle of an information system, lack of it might decrease it rather sharply.

The efforts made to acquire an indepth knowledge of users constitute what are commonly referred to as user studies. The need for user studies, the planning necessary for a user ;study, the methodologies/or techniques available for conducting user studies, and other important aspects related to user studies have been described and discussed in body of this Unit. Detailed information relating to some significant' efforts made in the development of user studies in developed countries as well as in India, has been furnished. These, along with the self check exercises and model answers are expected to help the students to a large extent, to grasp the basic concepts relating to user studies. The Unit, as a whole, may enable them to gain sufficient insight and skill to plan and conduct user studies, if needed, during the course of their professional work.

11.6 ANSWERS TO SELF CHECK EXERCISES

1)   User is a broad concept, which may include both producers as well as clients of information: In library and information science literature, a number of terms have been used to indicate users of a library or an information system. They are more or less synonyms. For example, the words patron, client, member, customer are used to signify the concept of a user. Whitaker defines user as a person who uses one or more of the services provided by a library. On the other hand, Guinchat opines that a user can be defined according to two sets of criteria namely: i) objective criteria such as socio-professional category, specialist field, nature of the activity for which the information `is sought, reason for using the information system; and ii) social and psychological criteria such as the user's attitudes and values with regard to information in general and in his relations with the information unit in particular. There, are reasons behind his particular T information seeking and communication behaviour and his professional and general social behaviour. Users constitute a very important component of any information syst4m or service.'

2)   Many information scientists attempted classify and group users of library and information systems and services. Different perceptions have been expressed by them.

Prof. J.D. Bernal provides some sort of classification of users of scientific and technical information from the point of view of the kind of information services required by them. They are: scientists, engineers, doctors, technologists and business managers. Guinchat, categorises users into three broad groups : i) users not yet engaged in works such as students; ii) users with a job and whose information needs are related to their work; iii) the ordinary citizen needing general-information. Another way of grouping users is on the

basis of their approach to information as i) potential user; ii) the expected user; iii) the actual user and iv) the beneficiary user. It may be of interest to know that Dr. S.R. Ranganathan grouped users on the basis of types of services enunciated by him into: freshman, ordinary inquirer, specialist inquirer and general reader:

Generally speaking an information professional comes across three important groups of users: a) researchers, b) practitioners and technicians engaged in developmental and/or operational activities in different fields of technology and c) managers, planners and other-decision makers who are engaged in co-ordinating developmental activities at local, national or international levels.

The above mentioned groups very broadly defined and are not exhaustive.

3) Since the main purpose of any user study is to gather information that is useful in design, provision and evaluation of information products and services, it is imperative to have a full understanding of the user characteristics. User characteristics may be studied under the groups: i) individual characteristics; ii) stages in the information diffusion, iii) environmental or social characteristics, and iv) communication characteristics.

   A proper and systematic user study aims at collecting all the pertinent data concerning the users with the objective of building an efficient information system: Study of user characteristics enables establishment of a close relationship between users and information system designers and service providers.

4) Information need surveys or user studies Are potentially useful in briding the gap between the kind of information services needed and the kind of services in existence.

   Any information system would definitely require determination of user requirements, In the past, there had been doubts regarding the point whether information n6eds could be established through user studies. But, subsequent research has proved that it is possible; to find out information needs of users by means of user studies. The availability of reliable ' methodologies for conducting user studies has enabled the profession to establish the fact that design of effective and efficient information systems and services, can be better accomplished through user studies. The establishment of a research centre in U:K. to undertake research on user studies in 1975, proves the importance attached to this subject.

   It may therefore be emphasised that user studies are a pre-requisite for the development of efficient information systems, services and products.

5) Like all serious efforts, conducting of a user study requires prior planning. It is important to plan a user study from the very start to the end. For this purpose, it is necessary to work out a detailed plan of each step in advance. The different stages of work are: the general objectives of the study, translation of the objectives into a set of questions or means of answering the questions, selection of the appropriate techniques for obtaining the answers, the selection of the sample of users to be observed and a plan for obtaining the necessary co-operation, the pre-testing of the technique, the full scale study itself, analysis of data and preparation of the final report need to be clearly conceived after deep "thinking. In each stage of work certain decisions need to be taken.

   Different steps involved in the plan: Any plan for conducting a user study should consist at least the following steps:

   i) surveying the previous studies and literature in general and learning about aspects of user studies;

   ii) determining the objectives pf the study;

   iii) determining the variables to be studied and specific model to be followed;

   iv) selecting the sample of the population to be studied;

   v) determining the method for collection of data for observation;

   vi) determining the method of analysis of data or observations;

   vii) determining the ways of presentation and utilisation of the results including dissemination of such results.

   While establishing the objectives of the proposed study, one has to spell out in clear terms

what exactly one is going to find about: All the subsequent stages will depend on the decision.

6) Different types of user studies:

Information use studies or information need studies are a composite of many things. Such studies may be grouped into four broad categories such as : -

i) studies which are conducted to find out the over all pattern of interaction of the user's community with the communication system, without reference to any specific information receiving event, are categorised as communication behaviour studies;

ii) studies which are conducted to find out the use of any communication medium like primary periodical, secondary periodical, etc. and are called user studies;

iii) the third category includes studies which are conducted to find out the pattern of flow of information in the science communication system as a whole. They constitute studies in the flow of information;

iv) the fourth category, includes studies/surveys which are conducted within the limited context of a library or an information centre, mainly to find out the extent of use of the services and facilities offered by an agency with the ultimate objective of improving the system or service.

It may be pointed out that any particular study/survey may have different aspects and hence overlap over the categories mentioned above: Hence, while setting the objectives, it has to be decided what exactly will be the nature of the study as per the categorisation stated above.

7) Methodologies for user studies:

Once the need for conducting user studies has been established and the relevant aspects (variables) to be studied are decided, the next logical step would be selection of suitable method for conducting a user study.

From the literature available on the subject, it is evident that the majority of user studies adapted three broad categories of methods :

a) General or conventional methods such as:
   i) questionnaire
   ii) interview
   iii) diary
   iv) observation by self
   v) operations research study

b) Indirect methods in the context of information use :
   vi) analysis of library records
   vii) citation analysis

c) Special and Unconventional Methods
   viii) computer-feedback
   ix) unconventional methods.

The important aspects involved in the selection of methods may be mentioned as follows:

i) selection a sample of user population;
ii) determination procedures for collection of data from or about the sample;
iii) determination of procedures for analysis of collected data to derive or summarise results.

Each one of these, has to be considered in details before one actually plunges into action regarding user studies:

As to the question of selection of a sample of user population, there are number of methods available. The most common among them are:

i) Convenience sampling
ii) Random sampling
iii) Stratified sampling
iv) Representative sampling

Similarly a number of methods are available for data collection: Some of them are:

i) surveying

ii) observation

iii) records analysis

iv) experimentation

Next aspect involved is identification of some of the data analysis methods. For formal analysis the frequently used methods are :

i) statistical analysis

ii) semanticanalysis

iii) psycho-social analysis

iv) economic analysis

Each of these formal methods require knowledge of the respective fields. Standard statistical packages are widely available which will accomplish the required results. However, use of such packages requires some practical training on the part of the users. One can also adapt the techniques used in previous studies.

8) Although a number of studies have been conducted in the past to assess the information needs of scientists, engineers and technologists, but the information needs proved to be extremely complex and varie0, as a result, most of these studies proved to be inadequate to the task of completely revealing the precise nature and needs of information users. These investigations have, at best, provided only an a priori approach to the problem and much is needed to be done in this direction.

There have been some criticisms on the methods and techniques used in the user studies/ surveys. For example, it has been said that the question of sampling in user studies has left much to be desired: In other words, in selecting the sample, refined techniques of random sampling have not been taken into account. The usual error of getting into the sample a large number of workers who take `an interest' or are sufficient in being methodical or co-operative to return the questionnaires and diaries, is always there. This error should be avoided. Moreover; it is not the size of the sample that is important but also the composition of it taking into consideration the environments of the participants. There are other variables also that affect the behaviour of users in so far as information use is conceived. Hence, it has been stated the user psychology must also be taken into account. Aspects of user psychology include: the search time that can be tolerated, the amount of irrelevant material that can be tolerated, time available for retrospective searching, the preferred form of the search product and users input channel capacity, work habits etc. all need to be incorporated. The importance, including individual variables in studies of information gathering and information seeking behaviours, has also been stressed by some experts.

With appropriate inclusion of some of the above aspects in user studies, the critics believe that the short comings in them can be minimised and the findings can be made valid and widely applicable.

9) The problem of communication in science and the user interface have received some attention in India since last three decades. For instance INSDOC conducted a use survey', relating to it current awareness service entitled `INSDOC List of Current Scientific Literature, as early as 1964. As a result of the findings of the survey, INSDOC had to wind up the mentioned service and had to start compilation of Indian Science Abstracts (ISA). Another significant effort in this direction is the study conducted by Carl M. White relating to the use of Delhi University Library in 1965. In the same year 91965) IASLIC conducted a seminar on "Users and Library and Information Science". Though the seminar did not discuss or report any worth-while study/survey, it helped in drawing the attention of the , authorities of Special Libraries and Information Centres towards these problems.

In the year 1967, INSDOC conducted a pilot survey to assess the information potential and information needs of research workers engaged in the field of `electronics'. This survey was undertaken in connection with the formation of `Electronics Information Grid'. 'Interview technique and questionnaire method were employed in the study. The findings,

though essentially empirical in nature have been published in the form of a report. Yet another worthwhile effort in this direction was the survey conducted by Prof. Krishan Kumar at the Delhi University to determine the reading patterns, information needs and information gathering habits of the teachers and research scholars attached to the chemistry department of the university: This survey was conducted by means of a questionnaire and also through interviews. The findings of this survey are compatible with the findings of similar studies undertaken in other countries.

In recent years, extensive and indepth customer related studies began to appear, one such effort was made by M:S. Sridhar: His doctoral research work was on Information seeking behaviour (ISB) of the Indian Space Technologists (IST) of ISRO Sattelite Centre (ISAC). Bangalore. The findings of this study have been published under the title `Information Behaviour of Scientists and Engineers'. This study is a contribution towards user studies. The case studies referred to above are illustrative in nature and not exhaustive.

11.7   KEY WORDS

User: A person who utilises the information resources of a library, the services and products of an information system and derives benefit from them. Users are also known as patrons or clientele

User Categories : Users, on account of their educational background, intellectual level, and need for information, may be grouped' into definite categories such as scientists, engineers, doctors, -technologists, business managers, administrators, faculty members and students, etc. This classification is known as categorisation- of user community.

User Characteristics : The factors in users of information that effect:
  i)   their perception of the problem faced and their definition of ̄needed information, and
  ii) the specific ways they are most likely to use information and their capacity to use a given type of information are known as characteristics of users. The can be grouped broadly into :
      i)   individual characteristics;
      ii) environmental or social characteristics; '
      iii) communication characteristics.

User Studies : Systematic efforts undertaken to obtain information on the manner in which information is obtained and used by different categories of users are known as user studies. It is imperative to know the information needs and behaviour of users and the different ways of attaining such knowledge to design and develop tailor made information systems, services and products.

User Warrant: The demand for specific type of information requirements expressed by different categories of users is generally interpreted as user warrant.

11.8   REFERENCES, AND FURTHER READING

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Appendix

Questionnaire used in the users' survey concerning teachers and research scholars in the department of chemistry, University of Delhi.

QUESTIONNAIRE

UNIVERSITY OF DELHI

DEPARTMENT OF LIBRARY SCIENCE

Users' Survey

You are kindly requested to assist in the search for information with regard to the information needs, types of information, and the use of science-technology literature by research workers so as to enable librarians to provide you more effective library services.

Please think over the questions in Part I and we will discuss' them together at some time convenient to you.

Please answer the questions in Part II and make any additional suggestions on the back of these pages or on a :separate sheet of paper.

Your cooperation is appreciated and the information provided will be kept confidential.

Part I for discussion

A) What are your needs for information in terms of amount, kinds, levels, variations at different times such as at the beginning, during, and at the end of a research project.

B) How do you get the information you need?

C) Which types of publications do you use? e.g. books (i.e. monographs), handbooks, literature guides, journals, abstracts, indexes, reviews, research reports, advances in -, Progress in... etc.

For what purpose do you use each of the type of publication used by you.

D) Are you able to keep up with the literature in your field? Do you have any problems in keeping up with you field?

E) Have you ever used a library outside Delhi including the ones located in foreign countries? Give your impression and compare them with the libraries used by you at present. .

Name .... Department ....

Area of research .... Status ....

Date ....

Part II for factual answers

1) How much time on an average do you spend on reading in your field in a week?

    ....

2) How much time on an average do you spend in the laboratory in a week?

    ....

3) Which foreign languages can you read to be able to follow literature in that language?

    ....

4) Of which professional societies are you a member?

    ....

5)   What other subjects besides Chemistry, do you need to consult and
        how often (frequently or rarely or never)?

        ………………………………………………………………………

                        Subject   How often

        5.1

        5.2

        5.3

6)   Have you ever felt the need to improve your skill in the use of science-
        technology literature.

        ………………………………………………………………………

7)   7.1   Do you think training in the use of Chemical literature would
                be helpful to you?

        ………………………………………………………………………

        If yes, when should this training be given:

        7.2   Undergraduate level ....7.3   Pre-Ph.D. Level ………...

        7.4   Postgraduate level..................7.5   Any other level …………

8)   8.1   Which library do you consult most? ....

        8.2   Which library do you borrow from most?..................................

9)   How many hours per week on an average do you spend on reading in
        your field in library and elsewhere, and how often do you do it?
        (Daily, 3 times a week, once a week, fortnightly, monthly, rarely, once
        only).

	How often	**Times spent per week (hours)**
9.1 in the University Library (main)	……………………………………………………...	
9.2 in the Department . of Chemistry	……………………………………………………	
9.3 in other library(ies)	……………………………………………………	
9.4 at home	……………………………………………………	
9.5 enroute between home and department	……………………………………………………	

10)   Do you find the collection in the field of your interest in the libraries
        you use most, strong enough to meet your demands. Indicate below
        names:

                                        Names of the libraries

        10.1 Completely adequate ……………………………………………

        10.2 Partially adequate.   …………………………..……………

        10.3 Not at all adequate…………………………………………………

        10.4 Completely inadequate ……………………………………..

11)   11.1 Do you ask for material not available in the University
        Library/Department Library? ....

        11.2   How many times in the past 12 months did the library succeed
        in satisfying your demand? ....:.

        11.3   How much time did it take to get the material? ....

        11.4   What other libraries have given you such service? ....

12) How far in terms of distance would you go to consult a library for your needs not fulfilled by the libraries you now use?

13) Do you ask for assistance for the reference libraries or other members of the library staff in these libraries:

    13.1   to locate books or other items ....

    13.2   to locate current periodicals...

    13.3   to understand the use of various tools ....

    13.4   other assistance ....

14)   14.1   What service not now provided in the University/Department Library would you like to be made available? (e.g. preparation of a bibliography, getting a photocopy of article, doing literature search etc.)

    14.2   Are you willing to pay for such special services?

15) Can you use a library card catalogue effectively?

16) Can you locate material in a library?

17) Which library do you think is easiest to use:

Name of library

    17.1   Its reference collection ....

    17.2   In searching periodical literature ....

    17.3   For borrowing books ....

    17.4   In locating material on shelves ....

17.5- For consulting its card catalogue ....

    17.6   Other activities ....

    17.7   General comments on what makes a library easy to use
            ....

18) Suppose there were to be two or three lectures on `How to use a library effectively', would you attend these?

19) About how may scientific journals do you:

	Indian	Foreign
19.1 subscribe to		
19.2 read regularly		
19.3 scan regularly		