

# **Usability assessment of Qualitative Methodology in OPAC search**

by

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# 1. INTRODUCTION

## 1.0 OVERVIEW:

The basic premise with which a librarian or information scientist starts designing an information system is that 'any serious inquiry involves sorting and sifting in quest of genuine quality'(Winner 1995) The structure and function of the entire system of any Library / Information System amply depends on what quality of information it wants to cater amongst its target groups and this basic question necessitated libraries to identify the specific needs of their target groups. Over the last five decades it has become one of the most important and popular research areas of Library and Information Science discipline. All of us are well aware that, innumerable studies have already been conducted to identify the users' need, by different scholars and libraries, just to understand, fulfil and satisfy the specific requirements of users. Researches have been conducted to illuminate how the users discover, shape, or create information as part of the ongoing nature of their lives and work, how the resources and rules of users' situations facilitate or limit this discovery of information, and elevate the idea of designing the Information Systems so that they can served better.

## 1.1 STATEMENT OF THE PROBLEM

Nevertheless, the few basic questions which remain at the beneath of all these activities are, how to understand, what shall be the mechanism to ascertain and how to interpret such requirements precisely. In other words, the research methods to use often remains as a basic issue of conducting research on determining the requirements of the users of information systems

Historically, information systems research inherited the natural sciences paradigm (Mumford 1991). Intrinsic psycho-social nature of the problem compelled the researchers to take the refuge of easily available social science research methods, primarily quantitative research methods, without remodelling and developing the much needed theoretical framework of research methodologies. The quantitative models borrowed from natural sciences suited to science laboratories, were transferred directly to information systems in an attempt to gain recognition and legitimisation as a research area. In addition to that "... the demand for accountability and assessment in its various guises has in the past led to the entrenchment of many quantitative methods of investigation."(Gorman and Clayton 1997). The contemplation of the philosophical under-pinning and the question of appropriateness of the methods, however, remain unaddressed.

As a result of which, a large number of studies have been conducted with least judgment of the usability of the methods. In other words, the most of the researchers took it granted that the available quantitative methods are applicable in the user studies, without proper analysis and necessary understanding of the theoretical background of the methodologies. Even, for many information professionals, the outcomes of such researches do not address the issues that are not readily quantifiable

However, they failed in understanding that the need of human being cannot be understood, assessed and interpreted by the natural science paradigms. The concept of CONTEXT in which a human being actually behaves, remained unnoticed. It is basically QUALs who handles such situations, were not utilized. "A more qualitative approach to information issues and problems has the benefit of presenting new answers to old problems, or at least different perspectives derived from potentially richer data. The approach also might be said to provide broader insights not only into existing issues and problems, but also into so far unexamined areas of information work." (Gorman and Clayton 1997)

It is, therefore, an urgent need of the time to have an investigation over the theoretical support of both qualitative and quantitative methodologies, to be used in understanding the users.

In an electronic environment, Online Public Access Catalogues (OPAC) helps the librarians to look in great details at what actually happens when users try to find the desired material in a library. This study, therefore, has investigated and assessed the usability of qualitative method in contrast with a quantitative one, while observing how the users search an OPAC.

We shall, however, start with the definitional aspects of the above mentioned terms, like qualitative methodology, quantitative methodology, users studies, etc. followed the brief analysis of theoretical paradigms of quantitative and qualitative methodologies

## **1.2 Definitions**

A copious number of terms have been used throughout this dissertation. This section has tried to succinctly but clearly define the terms which have significant roles

**1.2.1 Research methods:** Research, as defined by D.Slesinger and M.Stephenson in The Encyclopaedia of Social Sciences, is "The manipulation of things, concepts or symbols for the purpose of generalizing to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art", and "Research methods may be understood as all those methods/techniques that are used for conduction of research. Research methods or techniques, thus, refer to the

methods the researchers use in performing research operations. In other words, all those methods which are used by the researcher during the course of studying his research problem are termed as research methods" (Kothari 1990)

**1.2.2 Research methodology :** Research methodology not only incorporates research methods "but also consider the logic behind the methods we use in the context of our research study and explain why we are using a particular method or technique and why we are not using others so that research results are capable of being evaluated either by the research himself or by others. Why a research study has been undertaken, how the research problem has been defined, in what way and why the hypothesis has been formulated, what data have been collected and what particular method has been adopted, why particular techniques of analyzing data has been used and a host of similar other questions are usually answered when we talk of research methodology concerning a research problem or study." (Kothari 1990) Precisely, with this meaning of Research Methodology we will proceed to analyse other related concepts.

**1.2.3 Qualitative and quantitative methods :** As the propagators of qualitative methods are the last entrants in the domain of social research, it has become their *ouns probandi* to define what it means by quantitative methods, too. As a result of which, most of the definitions of qualitative

methods have been drawn against what is not an quantitative methods. Some authors, instead of defining what is qualitative research, attempted to isolate defining characteristics of qualitative research. Some authors, however, tried to purvey all encompassing definitions, as Van Maanen suggests. "The label qualitative methods has no precise meaning in any of the social sciences. It is at best an umbrella term covering an array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (van Maanen 1983).

In contrast to technical definition of quantitative research which denote any research based on percentage, means, chi-squares, and other statistics appropriate to cardinal, or counting, numbers and qualitative research which denote any research distinguished by the absence of counting, Kirk and Miller preferred to define qualitative research as " an empirical, social located phenomenon, not simply a residual grab-bag comprising all things that are 'not quantitative'. Its diverse expressions include analytic induction, content analysis, semiotics, hermeneutics, elite interviewing, the study of life histories, and certain archival, computer and statistical manipulations" (Kirk and Miller 1986).

Cassell and Symon, in the process of identifying the kernel characteristics of qualitative research, reached to the conclusion that it includes: "a focus on interpretation rather than quantification; an emphasis on subjectivity rather than objectivity; flexibility in the process of conducting research; an orientation towards process rather than outcome; a concern with context - regarding behavior and situation as inextricably linked in forming experience; and finally, an explicit recognition of the impact of the research process on the research situation. (Cassell and Symon 1994)

There seems to be a lot of controversy over the use of the terms like 'quantitative' and 'qualitative', too. Bryman identified that " Guba and Lincoln propose a contrast between rationalistic (i.e. quantitative) and naturalistic (i.e. qualitative) paradigms. While Evered and Louis use a contrast between 'inquire from the outside' and 'inquire from the inside'. Magoon and J.K. Smith refer to 'constructivist' and 'interpretive' approaches. " (Bryman 1988).

These separate and multiple uses and meanings of the methods of qualitative research make it difficult for researchers to agree on any essential definition of the field. However, for the purpose of this discourse a workable definition must be established, which reads like this: **Qualitative research is an interdisciplinary, and transdisciplinary set of methods, which emphasises on interpretation, subjectivity and**

context of research situation than quantification, objectivity and counting of social phenomena. Its practitioners are committed to the naturalistic perspective and to the interpretative understanding of human experience.

**1.2.4 User studies :** The term user studies has been defined variously by different Information Scientists. According to Wysoki, user studies or use studies could be concerned with studying information processing activities of the users (Wysoki 1969). Empirical studies of the use of, demand or need for, information are usually called user studies (Brittain 1970). The working definition of user study adopted by Center for Research on user is that the general objectives of research on users is to further understanding of the processes of information transfer. The research may be expected to lead to the improvement of information transfer systems of all types and to have implications for the organization of communication, the distribution of research and the relationships between systems (Cronin 1981). In the light of the above definition, **a study which is focused on users to understand directly or indirectly their information needs, use behaviour and use pattern is usually called user study.**

**1.2.5 Verbal protocol :** Verbal protocol is a self-report of behaviour which usually includes the individual's reasoning about that behaviour (Johnson and Briggs, 1994, p.61). It is a research method used predominantly as a

way to gain information about the cognitive processes of a participant's internal states using verbal reports. **The working definition, of Verbal protocol analysis for this study is that, it offers a means of gaining insight into the way in which end-users conceive of systems, be they a small software packages, a Online Public Access Catalogue (OPAC) or a entire library system.** Two methods of verbal protocol analysis were used in this study. Concurrent verbal protocols are also referred to as talk aloud, think aloud or thought-listing techniques. Retrospective verbal reports, the second method, rely on gathering information after a task is completed. For this study, the terms Think Aloud and Think After will be used.

**1.2.6 OPAC :** The working definition of OPAC for this study, is that, the Online Public (also used as Patron) Access Catalogues, as the name reveals, allow the users to search and access the library bibliographic data, stored in machine readable format, by means of a number of access points, both conventional (like author, title, class number or call number or subject headings) and unconventional (like word-from-titles, subject headings, authors or other names, and search statements may be compiled by linking search terms using Boolean operators). The data searched and retrieved through such

process are displayed on the terminal screen, which may be housed in the library or elsewhere.

### **1.3 Theoretical paradigms:**

Most of the available methodology textbooks have reduced the methodologies into their mere investigation techniques. Quantitative methods have most of cases been exemplified by the social survey and experimental investigation, whereas, qualitative methods have been associated with participant observation and unstructured interviewing. However, during 1970s the systematic and conscious broader philosophical issues about the differences among these methods started to gain attention. Positivism, which defines that all our knowledge of world derived from sensory experience and the only way of knowledge investigation is through the methods of the sciences, provided the major support for using the quantitative methods in social sciences. With the growing influence and awareness of social phenomenologists, symbolic interactionists and logical positivists, the domination of so-called scientific approach - in the form of survey and experiment - failed to differentiate between people and objects of the natural sciences. In fact, the conflict between the two domains of methodology generated from the controversy of the appropriateness of natural sciences paradigms to be used in social sciences.

These last three decades observed several debates regarding the superiority of one or the other of the two major social science paradigms, known as positivism/empiricism and constructivism/phenomenology. "The positivist paradigm underlies what are called quantitative methods, while the constructivist paradigm underlies qualitative methods. Therefore, the debate between these two paradigms has sometimes been called the qualitative-quantitative debate ... These paradigm wars have been fought across several 'battlefields' concerning important conceptual issues, such as the 'nature of reality' or the 'possibility of causal linkages.'" (Tashakkori and Teddlie 1998). Quantitative methods emphasize the measurement and analysis of causal relationships between variable but not processes. Whereas, "Qualitative researchers stress the socially constructed nature of reality, the intimate relationship between the researcher and what is studied, and the situational constraints that shape inquiry. Such researchers emphasize the value-laden nature of inquiry. They seek answers to questions that stress how social experience is created and given meaning" (Denzin and Lincoln 1994). Let us now try to understand the basic tenets of both paradigms.

**1.3.1 Positivism and Quantitative Methods:** Positivism, the bedrock of quantitative methods or so-called scientific method, credited with providing the outlines of the social scientist's understanding of what science entails. "

The basic point about positivism is that it is a philosophy which proclaims the suitability of the Scientific methods to all forms of knowledge.

Positivism entails a belief that the methods and procedures of the natural sciences are appropriate to the social sciences. This view involves a conviction that the fact that the subjects of the social sciences - people - think, have feelings, communicate through language and otherwise, attribute meaning to their environment, and superficially appear to be uniquely different from one another in terms of their beliefs and personal characteristics - qualities not normally held to describe the objects of the natural scientist - is not an obstacle to the implementation of the scientific methods.

Positivism entails a belief that only those phenomena, which are observable, in the sense of being amenable to the senses, can validly be warranted as knowledge. This means that, phenomena, which cannot be observed either directly through experience and observation or indirectly with the aid of instruments, have no place. Such a position rules out any possibility of incorporating metaphysical notions of 'feelings' or 'subjective experience' into the realms of social scientific knowledge unless they can be rendered observable"(Bryman 1988). These philosophical standpoints ultimately pushed the social scientists to believe that 'We're doing science' and take the refuge of experimental designs and survey researches, well

equipped with the quantification tools, like statistics, and reduced the whole society as a object of understanding only through mere observable facts and numbers. Thus the whole human society or any part of it, which is bound together by interacted invisible forces like 'feelings', 'subjective experiences' became a negligible factor of quantitative researching and failed to differentiate between people and objects of the natural sciences.

**1.3.2 Qualitative research and its intellectual underpinnings:** The positivists received a major setback with the raise of Phenomenology, a distinct sociological school, established by German philosopher Edmund Husserl, according to whom all notions of an external world are mediated through mental consciousness. With the further elaboration of Phenomenology by Alfred Schutz, Max Scheler and their followers, came into existence a totally new set of methods, primarily known as qualitative methods. "The phenomenologist views human behaviour as a product of how people interpret their world. The task of the phenomenologist, and, for us, the qualitative methodologists, is to capture this process of interpretation. In order to grasp the meanings of a person's behaviour, the phenomenologist attempts to see things from that person's point of view (Bogdan and Taylor 1975). For Merriam, "qualitative research assumes that there are multiple realities – that the world is not an objective thing out there but a function of personal interaction and perception" (1988, p. 17). A qualitative

researcher stresses "the socially constructed nature of reality, the intimate relationship between the researcher and what is studied and the situational constraints that shape inquiry" (Denzin & Lincoln, 1998, p. 8). As a result, the qualitative researcher is the primary instrument for data collection, analysis and interpretation (Creswell, 1994).

Qualitative research methods involve the systematic collection, organization and interpretation of textual material derived from talk or observation. It is used in the exploration of meanings of social phenomena as experienced by individuals themselves, in their natural context. Subscribing to Janesick's (Janesick, 1994) interpretations about the qualitative research, following is a set of modified characteristics of qualitative research:

- Qualitative research is holistic. It looks at the larger picture, the whole picture and begins with a search for understanding of the whole
- Qualitative research looks at relationships within a system
- Qualitative research refers to the personal, face-to-face and immediate
- Qualitative research is focused on understanding a given social setting, not necessarily on making predictions about that setting
- Qualitative research demands that researcher stay in the setting over time and get acquainted with the system, thoroughly.

- Qualitative research demands time in analysis equal to the time in the field
- In qualitative research the researcher requires to become the research instruments, which means, the researcher shall have the ability to observe and face-to-face interview
- Qualitative research requires ongoing analyses of the data.

Qualitative research, as a set of interpretative practice, privileges no single methodology over any other. Multiple theoretical paradigms claim use of qualitative research methods and strategies, from Constructivism to cultural studies, feminism, Marxism and ethnic models of study

Qualitative research does not have a distinct set of methods that are entirely its own. Qualitative researchers use semiotics, narrative, content, discourse, archival, and phonemic analysis, even statistics. They also draw upon and utilize the approaches, methods, and techniques of ethno-methodology, phenomenology, hermeneutics, feminism, rhizomatics, deconstructionism, ethnographies, interviews, psychoanalysis, cultural studies, survey research and participant observation, among others. (Nelson, Treichler and Grossberg 1992) All of these research practices can provide important insights and knowledge. No specific method or practice can be privileged over any other, and none can be eliminated out of hand.

**1.3.3 The Triangulation:** There are, however, a number of later sociological schools who subscribed to the qualitative researching, namely, Logical Positivism of Ludwig Wittgenstein and 'Vienna Circle', who believe that "Social phenomena exist not only in the mind but also in the objective-world and that there are some lawful and reasonably stable relations to be found among them"(Miles and Huberman, 1984 p 19), who of course can easily be placed in the center-most position, in this polemic. In fact, this center-most position derived when Campbell and Fiske argued that "In contrast with single operationalism now dominated in psychology, we are advocating ... a methodological triangulation" (Campbell and Fiske, 1959). Denzin, however, was the first to advocate and popularize the use of triangulation in qualitative research (Denzin, 1970).

The term "triangulation" originally adopted from a method of surveying or navigating, "in which people discover their position on a map by taking bearings on two landmarks, lines from which will intersect at the observer's position. If only one landmark were taken, the observer would only know that they were situated somewhere along a line. Triangulation used in this way assumes a single fixed reality that can be known objectively through the use of multiple methods of social research" (Seale, 1999).

Four types of triangulation were identified by Denzin (1978), these are:

- *data triangulation*: uses variety of data sources in a study, so that one seeks out instances of a phenomenon in several different settings, at different time and space so that phenomenon can be described better.
- *investigator triangulation*: use of several different researchers or evaluators so that personal biases can be reduced.
- *theory triangulation*: use of multiple perspectives to interpret a single set of data, in other words, approach a single set of data with several hypotheses in mind.
- *methodological triangulation* using of multiple methods to study a single problem, which is a rationale for mixing qualitative and quantitative methods in study.

This fourth type, is popularly known as "triangulation" and has been widely accepted as meaning of it. This has helped a group of social scientist to employ both qualitative and quantitative methods as complementary to each other, however, without understanding that "quantitative and qualitative methods are more than just differences between research strategies and data collection procedures. The approaches represent fundamentally different epistemological frameworks for conceptualising the nature of knowing, social reality, and procedures for comprehending these

phenomena" (Filstead, 1979, p.45). We, therefore, disagree with this fourth type of "triangulation"

#### **1.4. Significance of the study :**

This study demonstrates that how a qualitative method can be successfully used in OPAC search study and above all library user study especially in an electronic environment. The findings of this research provide significant information for future researchers and librarians who are interested to understand the library users fully and comprehensively in their own context which is otherwise difficult with any quantitative method. An in-depth understanding can inform the researchers and librarians how to successfully understand and facilitate the library services in electronic environments. This study describes how the users interact with and retrieves information from OPAC and how they navigate within that system. It also provides an understanding of the search strategies and search terms the users employ in a variety of information search situations. The researcher and librarians will be able to use the research as a basis to begin their own observations of the information seeking of their users. The use of the Think Aloud method will also be significant. The method has been used infrequently in LIS research.

In the present day scenario of user-studies one of the major concerns for Library and Information Science professionals is how to implementing user-centric research methods. Several options are though open. Qualitative Method. is however a useful answer to that

## **2. LITERATURE REVIEW**

### **2.0. Introduction**

The pivotal theme of this discourse concentrates on the methodological issues of users' reaction to OPAC and users' studies in Library and Information Science Research with an emphasis to qualitative methods. Though innumerable researches have been conducted to determine the nature of information users to guide the library system designer so that efficiently acquiring, processing, storing, retrieving and deliver becomes easy, many of them, however, had to face the criticism of using poor methodological base. In fact, the past decade has seen the information science field starting to undergo this kind of self-examination; raising philosophical issues associated with doing research in information systems, and debating about which philosophical traditions should guide work and which could serve as a legitimate basis for grounding research methods (Klein et al. 1991).

Beginning from late 1940s' till date the excises in the above mentioned direction could loosely be divided into four phases based on the methods used –

- ▶ *First Phase (late 1940s' to mid 1960s')* – Phase of generalization
- ▶ *Second Phase (late 1960s' to late 1970s')* – Phase of early systematic studies
- ▶ *Third Phase (1980's)* – Phase of 'cost-benefit analysis' and 'recall and precision'
- ▶ *Fourth Phase (mid 1990s' to till date)* – Phase of user-centred studies and emergence of Qualitative Research methods.

#### **2.0.1. First Phase**

Primarily with growing awareness of a professional identity in the late 1940s' and fifties, the 'information-providing community' began to realize the necessity of assessing the needs of its users community, in order to improve the service it was offering. "The origin of user studies can be traced back to Royal Society's conference on scientific information in 1948 in London and the Washington conference of 1958"(Prasad 199 ). However the research techniques used in this first phase of user studies, the time span of which is well spread over fifties to mid-sixties, drew a considerable amount of criticisms. "The technique most commonly employed was that of the self-administered questionnaire, and the purpose of enquiry was generally exploratory, in that the desired result was a description in general terms of the information-gathering habits and needs, quantified as far as possible, of the users studied. In the same way that a garment manufacturer collects information about the general proportions of the population and produces suits in a number of standard sizes that will

more or less fit all, so it was hoped that a knowledge of the general characteristics of information users would permit the design of the systems that would more or less meet the majority of the needs of the majority of users. This hope was not fulfilled. Individual respondents expressed clear preferences, but in the aggregate, responses were frequently contradictory. Most important, the range and complexity of information needs and habits proved to be considerably more varied than had been expected. As a result, the possibility of filling almost all the needs of a large number of users by the operation of a single system appeared remote. Most studies failed to provide information that could be used for the purposes of decision making or information-systems design." (Martyn 1974)

### **2.0.2. Second Phase**

The later half of sixties experienced a more systematic way of surveying the users community, however, the whole activity was heavily depended on the questionnaires techniques. Indirect observational techniques such as citation analysis were introduced. To study the information flow channels more sociological methods were introduced. "For the study of literature use alone, indirect methods such as the counting of citations or the analysis of loan records seem to have been preferred." (Wood 1971)

### **2.0.3. Third Phase**

The following decade experienced adaptation of concepts like 'cost-benefit analysis' and 'recall and precision'. Roberts (1985) opined, "in library management, cost-benefit analysis has been used more widely to connote assessments of effectiveness and performance". The concept of 'recall and precision' engendered number of studies assuming that the "average user is interested in retrieving large amounts of relevant materials (producing a high recall performance), while at the same time rejecting a large proportion of the extraneous items (producing high precision)"(Salton 1992). These system-centred studies, however, had to face a major setback with the up coming of user-centred design paradigm, which dominates the present day studies of information needs and information retrieval.

### **2.0.4. Fourth Phase**

Though there had there had been a shift from quantitative methods to qualitative methods since the early 1980s, actual implementations started in late 1980s and early 1990s. The proponents of the new approach, namely Kuhlthán (1988) Wilson (1990) Fidel (1987) accentuated the importance of information-users in an active participation in research and emphasized the need to analyse how information systems fit in the life of the users, but not treat them as passive objects.

After surveying the literature on 'user-centred perspective of information retrieval research and analysis methods' published in 1986 and onwards, Sugar (1995) summarized that " Two main approaches advocate user-centred design theory: (1) the cognitive approach, and (2) the holistic approach. The cognitive approach is based on identifying how users process information and what constitutes an appropriate model to represent this process. The holistic approach considers not only the cognitive aspects of an information search but also affective and psychomotor aspects". The reviewer observed that almost all of the studies that identified cognitive characteristics have used quantitative methods to measure them and therefore suggests that it is needed to have qualitative study and appropriate methods to ascertain these cognitive characteristics. Few have concluded that the central weakness of the cognitive viewpoint is that it pays little attention to the social aspects of information processes, either in terms of the socio-cultural context of the users or the socio-cultural context of the information system (Capurro 1992, Vakkari 1994).

Wilson (1980) is of the opinion that "the practitioners of information work have been disappointed by user-studies research, largely because they fail to find within it recommendations for service provision. Equally, information researchers have generally failed to make an impact within any social scientific discipline because their work lacks integration with theories within

those disciplines.” He therefore suggested “the answer to the first of these problems may lie in turning to a different model of research, where its application or utilization is considered to be part of the process. An answer to the second problem is more difficult to propose because it is bound up with the problems of socialisation into research within a field of practice without a research tradition: ‘qualitative research’ is proposed as a way of confronting directly the issue of the lack of theory in user studies.”

Subsequently, during 1981, under his able editorial guidance a series of articles were published by different researchers in *Social Science Information Studies*, of which, Brenner (1981) was one of the contributors of qualitative research in Library and Information Science and discussed some of the problems, which the information scientists face when having to select a particular social science research strategy. Brenner disfavoured the established measurement approach, as it is incompatible with the actual social and psychological conditions under which data are collected. These initial impetuses to the methodological practices in users’ studies paved the way for qualitative research. The realization developed that the use of melodramatic quantitative methods to understand real-life situation has produced the inconclusive researches and imbalanced use of those methods have either perplexed or oversimplified the results of users studies from the very inception of the idea of determining the needs of the

users. The researchers recognized that the urgent need of the time is to excavate in the unexplored universe of qualitative methodologies, assimilate them in Library and Information Science, corroborate them with essential theoretical framework and utilize them to understand the need of the users, instead of depending on feeble survey methods.

The following survey of literature reveals that the serious endeavours have started within the discipline of Library and Information Science to recognize the utility of qualitative research, only recently. The following few paragraphs shall also highlight the philosophical conflicts of qualitative (abbreviated as QUALs) and quantitative research methods (abbreviated as QUANs), their methods of discovering the social reality and the ramification of such discords on Library and Information Science (LIS) research methods.

## **2.1. Review of Literature**

A thorough recent search on LISA *PLUS*<sup>™</sup> winter 2001 issue and other bibliographic tools resulted about 130 articles and books references, similarly internet search with the help of search engines like Yahoo, Google, Lycos, Rediff and meta-search engine like c4.com retrieved about 30 articles and sites which have, by some means, implemented or discussed or repudiated the qualitative research methods in Library and Information Science. Some have also compared them with quantitative

methods. These articles can be broadly divided into following three categories:

### **2.1.1 The Theoretical Discourses**

These treatises can be considered as serious contributions towards the development of the philosophical grounds of QUALs in Library and Information Science and understanding the core issues of the conflict between QUALs and QUANs. This category, again, can be subcategorised on the following five areas:

- **The Philosophical and Methodological Issues**
- **The Critical Appraisals of QUALs**
- **The Critical Evaluation of QUANs**
- **The Triangulation theorists**
- **The General Aspects and Techniques of QUALs**

2.1.1.0 The early phase: The first appearance of QUALs in Library and Information Science literature dated back as early as 1970. A couple of papers were presented by librarians at a Conference (Stevens 1971) on historical and bibliographic methods in library research. Glossop (1978) discusses phenomenological methods in relation to librarianship, and concludes that a qualitative approach to research which acknowledges the importance of subjective knowledge will enable librarians to adopt a

research and development stance to their work and develop a researcher's role which supports such a stance. Busha and Harter (1980) in their general text on research in library science included discussions of the historical method, case study method, comparative librarianship research and content analysis.

Wilson's work on the INISS Project (Information needs in local authority social services departments) (Wilson & Streatfield, 1977, Wilson, et al., 1979, Streatfield & Wilson, 1982) employed observation and semi-structured questionnaires and the investigative phase were followed by the evaluated implementation of a number of innovations in social services departments. Wilson's experience of information seeking in this very practical context led him to develop a model of information seeking behavior that is prompted by the individual's physiological, cognitive and effective needs (Wilson, 1981). The philosophical and methodological perspectives of QUALs started gaining momentum, however slow but steadily, with the support of these above mentioned research works.

**2.1.1.1. The Philosophical and Methodological Issues:** Few authors have emphasized on the philosophical and methodological intricacies of QUALs and QUANs. Fidel (1993) in a review of literature showed that the number of research projects in information retrieval which employ qualitative methods is on the rise and described qualitative research as

non-controlling, holistic and case oriented, open and flexible, diverse in methods, humanistic, inductive and scientific. Sutton (1993) surveyed some of the theoretical underpinning of various qualitative research methods and discussed methodological issues, like conceptualisation, understanding, pluralism and ambiguity and expression or the writing up of qualitative research. Park (1994) discussed the concept of 'relevance', which has played a major role in the evaluation of information retrieval. The author is of the opinion that the study of 'relevance' suffers from lack of discussions and emphasized the need to develop the concept of 'user based relevance' for the benefit of users and for the meaningful development of future research in information retrieval. Proposal has been made to use of a qualitative research approach as an alternative methodology for studying 'user based relevance' and discussed the essential characteristics and the core philosophical assumptions underlying the inquiry paradigm. Behrens (1996) explored and explained the theoretical sensitivity in qualitative research and defined the grounded theory and investigated the areas where theoretical sensitivity manifests in the grounded theory project. Elucidated how such sensitivity came into play during the initial identification of the problem to be investigated, for the selection of the sample for interview purposes, in the preparation of the

interview guide, during the interviews themselves, and during the data analysis.

**2.1.1.2 The Critical Appraisals of QUALs:** Not to forget that few have abandoned the significance of qualitative methods and applauded the quantitative methods. Olson (1995), through a deconstructive reading of texts on qualitative method and its contrast with quantitative method and through information needs studies, concluded that the focus on method should not drive research and emphasized that the ontological and epistemological stands of researchers are more important for library and information science research.

**2.1.1.3 The Critical Evaluation of QUANs:** Vis-à-vis, several contributors have discarded the quantitative paradigm and appreciated the qualitative methods and also described the salient features of qualitative researches. Hammersley (1981) has highlighted some of the theoretical and applicability aspects. Oldman (1981) argued that the term 'qualitative' is applied to different aspects of research, which are sufficiently independent of each other. Attempt has been made to expose the underlying interests of the critics of qualitative research and suggested that criticisms of qualitative research are 'ideological in the sense that they give support to existing institutions wherein some classes or groups [research sponsors] try to exert control over others'.

Grover and Glazier (1985) offered a conceptual framework for library and information science research, and analysed QUALs. Rationale for use of QUALs in theory building and the use of structured observation for data gathering of information users' behaviour and information needs, were discussed and comparison between QUALs and QUANs, were made. Michael (1986) stressed for abandoning the positivist approach to library and information science research. Bradley (1993) considered some of the methodological issues arising from empirical enquiries conducted within the framework of qualitative assumptions of the nature of reality. Issues raised include the researcher as interpreter, the emergent nature of qualitative research and trustworthiness in qualitative research. Yeh (1996) are of the view that most of the researches into library and information science over past decades has employed quantitative methods, which however, are not without flaws. The characteristics and limitations of both the quantitative and qualitative methods and the different approaches of the two research paradigms were discussed and expressed the view that the qualitative method should be utilized to a greater extent in order to enrich library and information science research.

**2.1.1.4 The Triangulation theorists:** Few have hold up the 'between methods', which try to extract the positive features of both the methods. While discussing about the course contents of library and information science

Master's program. Liebscher (1998) proposed that the integration of both quantitative and qualitative methods through 'between methods' triangulation, allows to explore research problems from multiple perspectives and stressed on the needs for such an integrated approach. Considering the value of qualitative research, which derives primarily from its emphasis on words rather than numbers, Riggs (1998) asserted that qualitative research has been regarded too negatively for too long, definitions have tended to carry a tone of apology and concluded that both qualitative research and quantitative research should be evaluated on the same basis. Elaborating with the help of examples of qualitative elaborations of statistical analyses or quantitative data analyses of interview protocols, Suedfeld and Soriano (1998) recommended that instead of debating the appropriateness of qualitative versus quantitative research, investigators should benefit from the strengths of both.

2.1.1.5 The General Aspects and Techniques of QUALs: Quite a few articles have discussed the techniques and other general aspects of qualitative research methods. Chatman (1984), based on personal fieldwork experiences described the field research related issues, like researcher's role, empathy, reciprocity, etc. Payne (1988) reported a lecture delivered by Margaret Slate on QUALs, which comprise a range of most commonly used techniques like depth interviews and group discussions and also of

the view that qualitative research methods are concerned with developing insights, facilitating understanding, looking for solutions to problems and building theory. Slater's (1990) treatise on research methods offered a useful but brief overview on quantitative-qualitative conflict, different data-gathering techniques, non-verbal behaviour, reporting, etc. Westbrook (1994) investigated the canons of qualitative or naturalistic research methods in terms of their original grounding in the basic social sciences and their value to library and information science research. The literature review examined five salient components of qualitative research: the research problem, data gathering, content analysis, theory development, and validity techniques. Hannabuss (1995) in a generalized discussion about library and information science researches, along with other aspects highlighted the distinction between quantitative and qualitative research.

### **2.1.2. Discourses about Particular QUALs**

A few literatures came into the notice at the time of searching different databases, which have discussed about the theoretical and philosophical intricacy of various qualitative research methods.

Hill (1987) has exclusively dealt with 'Methods of analysis of information needs'. In her dissertation, the author identified nine types of useful methods, namely, "ought-to-need" statements, potential need statements,

demand studies, goal-oriented analyses, demographic studies, user studies, life style investigations, required output studies, and effectiveness studies.

Gratification theory was applied by Chatman (1991) with the intention that whether it sheds light on the phenomenon of the information seeking behaviour of lower class working population and found that gratification theory provides a means for information researchers to explore questions such as what defines a problematic situation for the poor and what factors influence their choice of information seeking strategies.

Ellis (1993) focused on the employment of the grounded theory approach to derive models of the information seeking patterns of academic researchers and reviewed results obtained in 4 research studies, employing the grounded theory approach and conducted at Sheffield University, UK, into the information seeking patterns of users in the fields of social sciences, sciences and the humanities.

Kerslake and Goulding (1996) considered the role of focus groups in light of their application as the research method to investigate the training of information workers and discussed the role of focus groups as a method of gathering qualitative data and information for use in LIS research. While discussing on the same technique Glitz (1997) highlighted that the information gathered with the help of focus group technique can provide

important clues to human attitudes and values and such information can be extremely useful to libraries that are trying to gain a better understanding of their users' needs and thus make better management decisions to help satisfy those needs.

### **2.1.3. Implementation of QUAL Methodologies**

With the development of theoretical background for QUALs in LIS implementation of the same in different research projects have become evident. Though QUALs have been put into practice in different types and areas of LIS the following review have concentrated only the researches related with 'users' studies', 'information seeking behaviour', 'search behaviour', etc.

In the early stage of implementing QUALs, Tedd, Cook, Guy and Keen (1977) made qualitative assessment of the various methods of teaching on-line bibliographic searching to undergraduate and postgraduate students

Gary (1980) used qualitative methods to study the patterns of information requests, types of questions asked, time of day, time to complete requests and to collect demographic and other information about library users and users making requests.

Tefko, Mokros and Su (1990) conducted observations and experiments under real-life conditions on the nature, effects and patterns in the

discourse between users and intermediary searchers and in the related computer commands in the context of on-line searching and responses. The study involved videotaping interactions between users and intermediaries. Data is analysed both quantitatively, using standard and innovative statistical techniques, and qualitatively, through a grounded theory approach using micro-analytic and observational methods.

Dotz, Bishop and McClure (1990) studied the use of electronic networks by scientists and engineers to make policy recommendations for the proposed National Research and Education Network. The authors argued that qualitative techniques, such as semi-structured interviews and focus groups, provide data important to the development of user-based policies and that social and behavioural issues must be given more attention by network policy makers.

Reneker (1993) used tape recorder, which was supplemented by interviews to examine the information seeking activities of the Stanford University academic community. Qualitative and quantitative analysis was used to examine the information needs in relation to perceived environment, source use, personal characteristics, and satisfaction with the result of information seeking. Results revealed information seeking to be embedded in day-to-day tasks and relationships and triggered both by articulation of need and availability of information.

Jacobs (1996) investigated the behaviour and motivations of university students and delineated an account of the qualitative research methodology employed to look beyond the survey results, which involved semi-structured interviews with students and tutors. This methodology was found to be a valuable addition to the information gathering strategies of library management, revealing patterns of user attitudes that are difficult if not impossible to access using traditional survey techniques alone.

Barry (1997) studied a team of theoretical physicists over 2 years using a qualitative, context situation, user centred methodology to examine the effects of information technology, the electronic library and the Internet on the information seeking behaviour and research behaviour of academics in higher education and found that electronic resources, primarily electronic bulletin boards and electronic mail, were used to access information in 80 per cent cases.

## **2.2. Review of Literature on Verbal Protocol**

One of the mainstays of this research, the Verbal Protocol technique (alternatively known as 'think aloud' or 'concurrent verbalization' technique), a lately popular qualitative research method, has been used to collect the data about library users. Verbal protocol method is frequently used in Communications, Psychology and education. Ransdell (1995) pointed out that protocol analysis "is one of the few methods available in

cognitive psychology that gathers data with sufficient temporal density to test models of online, second-by-second behaviour” (p. 89).

Ericsson and Simon (1984) discussed the history of verbal reports and suggested that the method is a very old one. Philosophers such as Aristotle and Plato used introspection to inquire about the nature of man by examining their own cognitive processes. van Someren, Barnard & Sandberg (1994) explained that the main advancement with the method over the years was that verbal reports began to be treated as data instead of conscious processes. It was near the end of the 1960s that the method was revived again. As interest in cognitive processes grew, the interest in methods that could provide information about these processes grew as well. Newell and Simon (1972) used this methodology to build very detailed models of problem-solving processes. The method continued to be accepted, as designing of expert computer systems began to grow. The need to find out about a human expert's knowledge to create these computer systems made the method more popular.

The Think Aloud method is now accepted by a large part of the scientific community and is being used in a variety of different research areas. Whitney and Budd (1996) used the method to study text comprehension and other researchers have used the method to study reading comprehension strategies (Davey, 1983; Garner, 1982; Kavale &

Schreiner, 1979). Cacioppo, von Hippel and Ernst (1997) cite the many uses of verbal protocol research in clinical and counseling psychology.

Hughes, Packard and Pearson (1997) also used the Think Aloud method in looking at reading in a hypertext environment. They introduced the method to the participants using a video of other computer tasks so that the method was demonstrated without "suggesting strategies for using the intended target of research"

The greatest strength of the method is the ability to use it to generate hypotheses. According to Cacioppo, von Hippel, & Ernst (1997), the method is "particularly useful when one either has no predetermined ideas about the cognitive dimensions that are relevant or has only a few untested hunches" (p. 929). Pressley and Afflerbach (1995) note that verbal protocol analysis provides a way of gathering data on cognitive processes that, otherwise, could only be studied second hand. The method also allows an insight into affective processes as well as cognitive processes. Wilson (1994) made a point of mentioning the method's versatility and this can be seen in the variety of research areas in which the method has been used. The method can be used successfully with naïve users as well as experts.

For qualitative researchers interested in getting a rich source of data, the verbal protocol methodology is a wonderful choice. Wilson (1994)

emphasized that "people's conscious thoughts can be an excellent source of inspirations" (p. 251). Pressley and Afflerbach (1995) expanded the idea by noting that "spoken language is the data used in protocol analysis and the richness and variability of language are the greatest assets and liabilities of the verbal reporting methodology" (p. 2).

However, this method has a long history and has experienced much criticism. The first and most often cited criticism states that verbal data is incomplete and that behavioural and performance changes cannot be gathered by the method. For Hayes and Flower (1983), because the method is so idiosyncratic, a participant "may fail to verbalize a considerable part of the information that passes through the short term memory" (p. 61). The researchers added that this type of reporting would cause the distortion of cognitive processes even if a person were to be aware of the processes. Ericsson and Simon (1984) suggested another criticism that they call the epiphenomenality or irrelevance argument. This argument "is that the verbalizations may report an activity that occurs in parallel with, but independent of, the actual thought process, hence provides no reliable information about the latter" (p. 61).

Researchers have suggested that the production of verbal reports may change the cognitive processes being studied. Fawcett (1993) felt that in certain situations the participants will be so focused on the task that they

will be either unable to think aloud or the thinking aloud will interfere with the process (p. 97). Verbal reports have also been criticized as not being generalizable because they are so idiosyncratic. Hayes and Flower (1983) suggested that verbal reports are not objective and are not scientific. Steinberg (1986) also suggested, that "the presence of the person arranging for the protocol and of the tape recorder and the very nature of the protocol session distort the cognitive processes of the [subject] giving the protocol" (p. 699). These criticisms have been levelled at almost all research involving fieldwork such as observation and interviews. The Think Aloud method has been better received than the Think After method. Many of the concerns about retrospective protocols focus around the problem of forgetting and fabrication. Retrospective protocols may be influenced by a "motivational shift [that] can occur whenever subjects are informed that they will have to generate a subsequent verbal report" (Russo, Johnson, & Stephens, 1989, p. 765). Ericsson and Simon (1984) based their work on the constructs of short-term and long-term memory from information processing theory. They require the reader and researcher to accept their hypothesis that all human cognition is information processing. Further, Ericsson and Simon noted "that a cognitive process can be seen as a sequence of internal states successively transformed by a series of information processes" (p. 11).

Long-term memory contains a vast amount of knowledge, both procedural and factual, that can be accessed. The way this information is organized is highly individual. Short-term memory, on the other hand, is extremely limited if the information is not acted upon. External stimulation and associations from long-term memory are the basis of short-term memory. According to Pressley and Afflerbach (1995), "an important property of short-term memory is that people can quickly access the contents of short-term memory and report them" (p. 6). So it is this short-term memory that verbal reports tap.

### **2.2.1 Review of Literature on Verbal Protocol in LIS**

The use of this method in library and information studies, however, is still very limited. But qualitative researchers interested in getting a rich source of data, the verbal protocol analysis method is an excellent choice. In this regard, Wilson (1994) emphasized that inspiration can be gained from people's conscious thoughts.

Few researchers interested in information-seeking behaviour have used verbal protocol analysis. Sullivan and Seiden (1995) assessed the online catalogue user education needs using the method. Nahl and Tenopir (1996) used the Think Aloud method as faculty and graduate students searched a full-text online database of magazines. The researchers were interested in the search strategies and the affective, cognitive and sensori-

motor behaviours of the participants. Yang (1997) used verbal protocol analysis and observation to study six cases of information-seeking behaviour in university students as they accessed information in the Hypertext System. Xie and Cool (1998) used think aloud to study end-user online searching. They found, through the use of this method, "much insight is gained into the problems encountered by searchers and the adaptive strategies they employ in such situations" (p. 329). Hirsh (1999) used the think aloud method to study elementary students' relevance criteria and search strategies during a school project. Her results have implications for how we teach students about information literacy and for the design of systems.

With the aim to create a database of information on the actual behaviours that are involved in using the library, Nahl and James (c 1999), used the technique for the collection of data by self-witnessing report, which consists of micro-descriptions of one's own feelings, thoughts, and actions. This involves tape-recording one's own thinking-aloud protocols while using the library. Tapes were transcribed, annotated, coded and entered into an automated database suitable for testing out hypotheses about the nature of search behaviour. Authors are of the opinion that this study can help psychologists, librarians, and information specialists to better

understand the thoughts, feelings, and actions that go along with using a library or database.

Branch (2000) compared and contrasted the analysis of 130 concurrent verbal protocols (Think Alouds) gathered from twelve junior high school students from Inuvik, Canada. These Think Alouds are from a case study of the information-seeking processes of junior high students when accessing information from CD-ROM encyclopaedias.

It may be observed that the verbal protocol method is gaining popularity in LIS research as well, as its inherent nature helps to get rich data about the users' behaviour.

### **2.3. Review of Literature on OPAC Studies**

Automated Catalogues, in its very rudimentary form, first started to appear in mid-1960s and early 1970s, when few libraries were using computers to produce printed catalogues with the help of 80-column punched cards. This kind of automated catalogues were, however in no way could be searched online, as those day computer systems were running in batch mode. Catalogue output on microforms, like, on microfiche, microfilm, became popular in mid-1970s.

The first-generation of Online Catalogue appeared in the late-1970s and early-1980s. These first generation OPACs were phrase-indexed or pre-ordinate OPACs with access points similar to those of a traditional card,

i.e. author, title (as a phrase), class mark or call number (as a phrase) or subject headings (as a phrase). This generation OPACs were developed to find book holdings of a particular library. Hildreth (1982) has described, in details, about the catalogue designs of early-1980.

OPACs became very popular during 1980s and as a result, by mid and late-1980s, many new integrated library management software with the modules of acquisitions, cataloguing, circulation, serials control, interlibrary lending and OPAC, came into the market. Many of these new software provided the keyword or post-co-ordinate OPACs, or second-generation OPACs, the with the facilities to retrieve and access records with the help of words in titles, in subject headings, in author or other names as well as by search statements using Boolean Operators.

The third-generation OPAC appeared in the 1990s with the features, like, best-match technique or non-Boolean retrieval technique, ordinary language search expressions, displaying the most relevant records first, etc. This generation software provided the architecture of "server-client" model, in which the database are managed in a remotely located server and "client" software, normally loaded on a network-connected computer or workstation, provide the interface to the users to access and search the database.

Today, the library resources are accessible remotely through web-OPAC via graphical browser such as Microsoft Internet Explorer or Netscape Navigator. This new and fourth-generation OPACs emerged during the late 1990s and is the state-of-the-art, till date. These interactive GUI (Graphical User Interface) based web-OPACs allows the users to access various resources of other libraries connected to Internet. It presents the library catalogues in a hypertext format, which can be linked to the full-text electronic resources.

The advent of the online catalogue provided the opportunity to interact with the users in finding the required item or items. As the number of users grows so do the automation needs of the libraries and their services. With the increase of availability of Library Software and OPAC systems in the market the libraries introduced the same with the assumption that user usually comes to the OPAC with a particular need for information. However, evaluating the performances of the automated systems, based on the criteria like, ease of use, reliability, etc., became a necessity to assess whether the new or updated systems are up to the performance as claimed while purchased, whether the output quality are up to the satisfaction of the users or some refinements are required. Two major approaches were identified by Lancaster & Sandore (1997), by which evaluation of automated system can be categorised, these are:

- I. **User-Free Evaluation:** Though this type of evaluations involved the users inputs, are concerned with the systems those are yet to be fully operational.
- II. **User-Involved Evaluation:** This type of evaluation involves the fully operating systems by assessing the systems characteristics, how the users communities make use of the systems and with what degree of success.

However, as the first category of evaluation focuses on system features rather than on how these are used by the library users, and used for decision-making in software selection, acceptance, etc., therefore this category of OPAC studies are beyond the purview of this research.

In the second category of OPAC studies, i.e. User-Involved Evaluation, users were involved to gain a better understanding of how users interact with systems and the results of those interactions. The goal is to collect and analyse information about how the systems are used and to improve its performance. Manifold (2000) has observed that OPAC users are more and more becoming partners in the use of systems; their involvement is thus increasingly critical to the success of a system implementation. Therefore, emphasis has been given in following section on this category of OPAC studies.

A number of studies have been undertaken over the last couple of decade on users' reactions to OPAC. One of the first major study was by Matthews *et al.*(1983) of some 8,000 users and 4,000 non-users of OPAC

in 31 libraries in the USA. The general results showed that "over 90 per cent of users liked the OPAC" and that 80 per cent were satisfied with the results of their search. However, it was also found that most users were searching by topic or subject (and not for known items) and that subject searching was difficult. Crawford (1987) provides much practical guidance, with many examples of OPAC screens and suggestions for good OPAC design. The use and effectiveness of online help facilities for subject searching in British academic was investigated by Slack (1991). Dyer (1990) outlines the problems that can be caused by poor workstation design and suggests various solutions. The survey by Crawford *et al.* (1993) revealed a wide variety of access points, namely, author, keyword, corporate name, class number, title, series file, author/title acronym, subject heading, etc. It was revealed by them, that "most OPACs were not found to be particularly easy to use and consequently are still dependent on users' expertise for reasonably successful operation".

Hancock-Beaulieu and Hancock-Beaulieu (1990) discussed evaluation and methods of evaluation of OPACs (On-line public access catalogues) in the context of user orientated qualitative research. They suggested the development of more effective diagnostic, monitoring and prototyping tools.

## **2.4. CONCLUSION**

This chapter reviewed the literature on methodological aspects of the Library and Information Science, its development through different phases, the theoretical and implementation aspects and uses in different perspectives. The above discussion has also included the reviews on literature of Verbal Protocol method and its uses in Library and Information Science. The OPAC studies have also been reviewed. However, it was found the use of Verbal Protocol in Library and Information Science is rare and till date no study has been conducted to compare of the same with any of the existing quantitative methods.

## **3. METHODOLOGY**

### **3.0. Introduction**

The frustrating performances of the users study researches over last five decades have made the library administrators and managers realize that much of the data they collect relates to inputs and outputs. It does not provide information about the degree to which the library is achieving desired results (Jurow, 1993). This problem has led to increased efforts to find more meaningful methods. The most suitable answer to which is qualitative methodologies.

To fulfill the defined objectives, this research was conducted within the qualitative paradigm, as well as, within the conventional quantitative paradigm to determine the users' understanding and perception about the OPAC of the library of which they are users. We have adopted two diagonally opposite kind of methods, namely 'Verbal Protocol' and 'Questionnaire Method' for this research.

### **3.1. Objectives**

The major objectives of the present study is mainly as follows:

- a. to assess the usability of qualitative research methods in OPAC use studies and above all, user studies, which were so long remained obscured in the field of Library and Information Science.

- b. to prove that qualitative methods provide better tools to assess the performances of libraries through user studies, than quantitative ones.
- c. to search a better user- centered qualitative research method, which facilitates to interpret and analyses the needs of the users from the subjects' perspective.

### **3.2. Hypothesis**

For the purpose of this study, two types of research methods have been used. The first is a qualitative method, namely, Verbal Protocol Method. The second was a conventional quantitative method. A brief questionnaire was circulated amongst the participant of the verbal protocol method. The assumption is that qualitative methods help the librarians better to determine the users' understanding and perception about the online catalogue. Keeping in view the above assumptions main hypothesis to be tested are as follows:

H<sub>0</sub>: Conditions remaining the same both qualitative and quantitative methods provide equally efficient tools to analyses and interpret the need of the users

H<sub>1</sub>: Conditions remaining the same, qualitative methods provide efficient tools to analyses and interpret the need of the users as compared to quantitative methods

H<sub>2</sub>: Conditions remaining the same quantitative methods provide efficient tools to analyses and interpret the need of the users as compared to qualitative methods

### 3.3. The Research Site

The British Council Library, Kolkata, was selected for the purpose of this. The Library has implemented the Online Catalogue system about three years back with the help of an Indian library software, known as LibSys

There were few steps necessary to gain entry to the research setting. For this study, the first step was to apply for research permission to The British Council Library, Kolkata (Appendix I). The initial approval was received on October 20, 2001 (Appendix II) by e-mail. The final approval from the Library side was received on October 23, 2001 (Appendix III). The study was conducted all working days of the Library, from November 16, 2001 to November 30, 2001.

#### 3.3.1 The British Council Library, Kolkata

The Library maintains a substantial collection of books, periodicals and other non-book materials. A small statistical details of the Library collection, membership and issue / return transactions are given below:

**Table 3.1 Statistical Details of The British Council Library, Kolkata:**

Collection		Membership		Monthly average transactions	
Books	31751	Individual	4348	Books	18832
Periodicals	87 (British)	Institutional	176	Periodicals	1663
Back Set	1 to 2 years	Classic	242	Back Set	Not
Periodicals		Membership		Periodicals	issueable
Educational	448	Home Vedio	12	Educational	68
Vedio Tapes				Vedio Tapes	
Home Vedio	2370	Reference	192	Home Vedio	985
Tapes				Tapes	

The Library uses the LibSys software version 4.0 on SCO UNIX and hosted on DELPOWER EDGE 2300 server. It has four dummy OPAC terminals and the terminals are connected on a Local Area Network. The following two are photographs of the OPAC terminals. The different options and interface screens of LibSys OPAC, have been shown in Appendix-IV.



Photo 3.1 – OPAC terminal

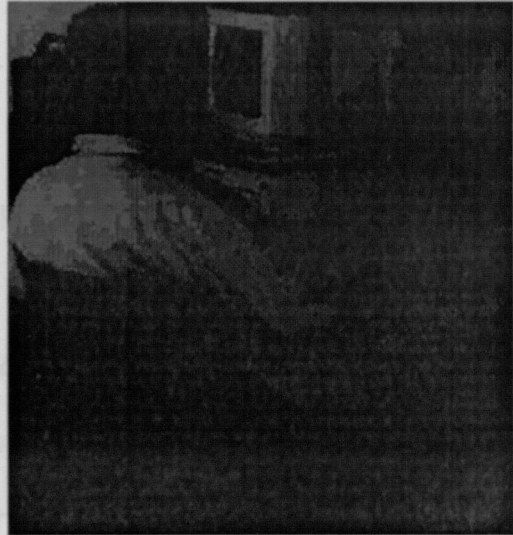


Photo 3.2 – OPAC terminal

#### 3.4. Sample :

The users of the online catalogue station were asked if they would participate in the study. An attempt was made to minimize bias in the sample by selecting times to approach potential participants in advance, numbering the online catalogue terminals and selecting the order of online catalogue stations at which to approach people on a rotation basis. Total 32 users were approached during the period of the study, of which 18 participants had accepted the proposal. The sample size for the purpose of the study was found satisfactory, as Virzi (1992) has suggested that

approximately a sample size of fifteen is enough for this purpose. Using the Verbal Protocol method Branch (2001) has also performed the study with a sample size of twelve participants

### **3.5. The method for Qualitative Research**

Originally developed as a research tool in the field of cognitive psychology, the verbal protocol method was initially used as a means of studying human problem-solving processes. Verbal protocol is now used extensively in computer usability studies. Protocols done properly, according to Russo, Johnson and Stephens (1989), "ask subjects to report their thoughts, not to explain them" (p. 759).

This study was designed to understand the perception and problems of the library users while using online catalogue. Eighteen users conducted their searches on the OPAC. As they searched, they talked aloud about what keys they were pressing, what was happening on the screen, and their reactions. Transcripts of sessions were analyzed. A total of 524 protocols were noted during search sessions.

Major advantages of the verbal protocol method are the quality and quantity of data obtained. Protocol analysis is particularly useful in studying areas where little is currently known. According to Cacioppo, von Hippel, & Ernst (1997), the method is "particularly useful when one either has no predetermined ideas about the cognitive dimensions that are relevant or has only a few untested hunches" (p. 929). Pressley and Afflerbach (1995)

note that verbal protocol analysis provides a way of gathering data on cognitive processes that, otherwise, could only be studied second hand. The method also allows an insight into affective processes as well as cognitive processes. Wilson (1994) made a point of mentioning the method's versatility and this can be seen in the variety of research areas in which the method has been used. The method can be used successfully with naive users as well as experts

For qualitative researchers interested in getting a rich source of data, the verbal protocol methodology is a wonderful choice. Wilson (1994) emphasized that "people's conscious thoughts can be an excellent source of inspirations" (p. 251). Pressley and Afflerbach (1995) expanded the idea by noting that "spoken language is the data used in protocol analysis and the richness and variability of language are the greatest assets and liabilities of the verbal reporting methodology" (p. 2).

### **3.6. Collecting the data for Verbal Protocol**

Participants conducted their own searches in the OPAC stations with the researcher present while talking aloud about their searches what keys they were pressing and how they reacted to information on the screen. Search sessions were recorded on audiotape

### **3.6.1. Following is the narration of the researcher's self introduction**

Hallo I'm conducting a research study on the online catalogue May I take about a minute of your time to briefly explain my project and ask for your participation?

My name is Tamal Kumar Guha I am an working as an Assistant Librarian in the Indian Institute of Technology Guwahati I am also working on a doctoral programme in Library and Information Science at the North Eastern Hill University As part of my work towards this degree I am conducting a study to find out how an user faces problem and solve the same or ask for guidance while searching an online catalogue What I am asking people to do is to conduct the searches they came to the library to do while talking aloud about what they're doing and how they react to the computer interface This would be done in this computer station itself Participation is purely voluntary please feel free to say no if you would rather not participate The search session will be recorded on audiotape and is completely confidential After the search session there will be a small questionnaire handed over to you which can subsequently fill up and send to me We have enclosed a self addressed and stamped envelopes for your convenience No information that would identify you as an individual would be collected

The time required for this study is about the same as your search is likely to take plus about five extra minutes for talking and questions including this time

Are you willing to participate in this study?

If said no then "thanks for your time and good luck with your search"

If said yes then "I'd like to give you a copy of this brief summary of this research project including the name and phone number of my research guide should you have any concerns or questions about the study"

### **3.6.2.Guidance during the "think aloud":**

The main focus of my study is evaluating the computer interface of the online catalogue that is does it help people to find the information or materials they need or does it need improvement?

So what I'd like you to do is to conduct your search as you usually would but talk aloud about what you're doing that is what keys you're pressing what you're seeing on the screen what you're looking for on the screen that type of thing as well as how you feel about the information the computer is giving you Do you have any questions before we start?

Any comments to participants if needed both at this time and during session are restricted to

- talking about what they are doing
- commenting on the reasons for what they re doing.
- comments about how they feel about what s on the computer

## **Finally:**

I'd like to thank you very much for participating. If you'd like a copy of the final report of my research, it should be available in mid of next year.

You can pick up a copy here at the Circulation Desk.

## **3.7. Method for Quantitative Research**

### **3.7.1. The questionnaire**

A questionnaire booklet (Appendix-V) based on the Van House *et al.* (1990) and SUMI questionnaire (Kirakowski, and Corbett, 1993). The Software Usability Measurement Inventory (SUMI) is a rigorously tested and proven method of measuring software quality from the end user's point of view.

There were total of 25 items, which were divided into two sections. The first 16 items were pertaining to various information about the online searches and opinions. The scale items were averaged on 5 point Likert type rating scale ranging from 1 = to a very great extent; 2 = to a great extent; 3 = to some extent; 4 = to small extent; 5 = not at all.

Section II of the questionnaire consists of 9 items of background variables. The background variables taken into consideration are : present age, sex, marital status, profession, linguistic group, specialization, experience of the OPAC of The British Council Library, Kolkata and experience of using any other OPAC system. Single item measure was named for background variables having scales ranging from 1 to 13.

### **3.7.2. Collecting the quantitative data**

After each session all the participants were provided with a questionnaire, which basically asked about the same online catalogue search. Out of 18 participants two collected the questionnaire to submit later and rest all filled up the same within half-an-hour. The two questionnaires were received by post, subsequently.

### **3.7.3. Statistical analysis**

To analyze the statistical data mainly following the techniques were employed:

- a) Cross-tabulation among the background variables.
- b) Partial Correlation among background and the usability variables.
- c) Bivariate Pearson's Correlation among the usability variables.

All statistical techniques were performed using SPSS for Windows (ver.10.1.4), 2001.