USABILITY ASSESSMENT OF QUALITATIVE METHODOLOGY IN OPAC SEARCH

ABSTRACT

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Background

The structure and function of any Library / Information System fully 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 these 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.

Nevertheless, the few basic questions which remain at the beneath of all these exercises 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. The quantitative models, borrowed from natural sciences suited to science laboratories, were transferred directly to information science research in an attempt to gain recognition and legitimisation. 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, not addressed properly.

As a result of which, most of the researchers took it granted that the available quantitative methods are applicable in the user studies. The concept of CONTEXT in which a human being actually behaves, remained unnoticed. It is basically qualitative research methods, which handle such situations, were not utilized, though "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)

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 on an OPAC.

Literature Review

The review of related literature, in this regard, has covered the following areas, summed up as below:

i) Phases of User study methods: Different user studies, beginning from late 1940s' till date, could be loosely 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.

ii) The Theoretical Discourses: These treatises can be considered as serious contributions towards the development of the philosophical grounds of qualitative methods in Library and Information Science and understanding the core issues of the conflict between qualitative and quantitative methods.

iii) Review of Literature on Verbal Protocol in LIS: Though the use of this method in library and information studies, is still very limited, it was observed that the verbal protocol method is gaining popularity in LIS research, as its inherent nature helps to get rich data about the users' behaviour.

iv) Review Of Literature On OPAC Studies: Literature on different generations of OPAC and OPAC studies were reviewed and four generations of OPACs were

identified based on the features of the software systems. The latest trend in this direction is the development of Web-OPAC.

With this background, the present study was carried out to compare the findings of both the quantitative and qualitative research methods while the users' are performing their own searches on an OPAC system.

Methodology

The methodology adopted for the study include the following considerations:

Objectives: The objectives of the present study:

a. to assess the usability of qualitative research methods in OPAC use studies,
b. to ascertain that qualitative methods provide better tools to assess the performances of libraries through user studies, than quantitative ones,
c. to ascertain the suitability of Verbal Protocol method, which facilitates to interpret and analyses the needs of the users from the subjects' perspective.

Hypotheses: The study was carried out with consideration to the following hypotheses:

H_0: Conditions remaining the same, both qualitative and quantitative methods provide equally efficient tools to analyses and interpret the need of the users.

H_1: Conditions remaining the same, qualitative methods provide efficient tools to analyses and interpret the need of the users as compared to quantitative methods.

H_2: Conditions remaining the same, quantitative methods provide efficient tools to analyses and interpret the need of the users as compared to qualitative methods.

The Research Site

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

The Library uses the LibSys software version 4.0 on SCOUNIX and hosted on DELPOWER EDGE 2300 server. It has four dummy OPAC terminals and the terminals are connected on a Local Area Network.

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, Shaw (1995) conducted study with a sample size of ten graduate students. Branch (2001) has also performed the study with a sample size of twelve participants.

Collection Of Verbal Protocol Data

Participants conducted their own searches in the OPAC stations in presence of the researcher. While the users were talking aloud about their searches, notes were taken about what keys they were pressing and how they reacted to information on the screen. Search sessions were recorded on audiotape.

Collection Of Quantitative Data

After the search 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. The questionnaire were prepared based on the Van House *et al.*(1990) and SUMI questionnaire (Kirakowski, and Corbett, 1993).

Data analysis

Quantitative and qualitative data analyses have been made using appropriate techniques and tools. The hypotheses were tested by comparing the findings of both qualitative and quantitative research methods.

Findings

To fulfil the objectives of the study and to test the hypotheses, two contrasting methods applied in the study are Questionnaire Method, under the quantitative paradigm, and Verbal Protocol Method under the paradigm of qualitative research. The finding of these two methods was analysed separately and subsequently the findings of the both the methods were compared.

The inter-correlation analysis of quantitative data of the OPAC search satisfaction and the background variables revealed that, with the improvement of educational qualification, higher professional status, and most importantly, with more experience of the OPAC, the users found the system more satisfactory and user friendly, as well as, followed the instructions, better; understood the layout, easily; retrieved thorough information, quickly. Users with higher educational qualifications and higher professional status use more online catalogues and opt for multiple libraries to fulfil their information needs. It was also revealed that the users of the OPAC feel satisfied, not only when the layout is better, but also when it is user-friendly, responsive to their search, suitable for their purpose, quick to retrieve thoroughness and up-to-dated information.

However, while analysing the qualitative data, it was observed that more detailed information about the searching process could be revealed with the help of Verbal Protocol Method.

While comparing the findings of both methods, it was found that the context and user-centred approach of the Verbal Protocol Method, has helped to analyse and interpret the satisfaction, dissatisfaction and confusions of the online catalogue users, more in detail. It was observed from questionnaire data that, experience of OPAC has substantial influence on the users satisfaction, the analysis of verbal protocol data, however, has indicated that, most of users have actually expressed their dissatisfactions while using the OPAC system.

This piece of work has reached to a conclusion that Verbal Protocol Method (Qualitative Method) is more revealing about the actual satisfaction of individual users as compared to Questionnaire Method (Quantitative Method). Therefore, it will be safe to say that Verbal Protocol Method is an efficient tool to analyse and interpret the needs of the users as compare to Questionnaire Methods. However, in order to generalize the statement more studies need to be conducted.

The main contribution of this work, is the implementation of the verbal protocol method for analyzing the OPAC users' satisfaction. While implementing the methodology, this study has developed a scheme of coding.

With the help of this scheme the verbal protocol data were analyzed and a generic model of Online Catalogue Searching Process Flow were developed. This model explains how the online catalogue users conduct their searches.

The findings of this research have academic and practical values. The verbal protocol method, which is new to Library and Information Science, has been successfully used in the field of Ergonomics, Marine Navigation, Aircraft Traffic Controlling and Human Computer Interactions. This method helps to evaluate and assess the clients or users' need, satisfaction, problems, difficulties, etc. The library professionals are also trying to assess the same for quite a long time, by now. This method will help them to understand the library users, better.

This method offers great potential while designing library web pages, intranets and customized interfaces for various library databases.

Suggestions

This research suggests that further research should be conducted with the help of qualitative methods and especially with verbal protocol method, to find how people find and retrieve information on the Internet and even how do the library users locate a particular piece of information from a book, journal or other library material.

A series of research can also be conducted on different aspects related to electronic information retrieval systems, like Web-OPACs, in-house databases, library automation software and its interface aspects and a generalized model of information searching process can be developed.

It is also suggested to have, at least one, centralized laboratory in India, for this purpose, which shall be well equipped with all necessary software and hardware infrastructure. If such arrangement and series of research can be done, it will not be difficult for the Library and Information Science professional to understand and satisfy their users.

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I, Tamal Kumar Guha, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else, and the thesis has not been submitted by me for any research degree in any other University / Institute.

This is being submitted to the North-Eastern Hill University for the degree of Doctor of Philosophy in Library and Information Science.

24/10/2002

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INTRODUCTION

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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 these 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, many 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 the 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 works, 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 the users can be 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 science research 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, not addressed properly.

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 to understand that the need of human being could not be comprehended, assessed and interpreted by the natural science paradigms. The concept of CONTEXT in which a human being actually behaves, remained unnoticed. It is basically the qualitative research methods, which handle such situations, were not utilized, though "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 usability of qualitative methods, to be used in understanding the library and information users.

In an electronic environment, Online Public Access Catalogues (OPAC) helps the librarians to look in great details, 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 frameworks 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, as defined by Kothari (1990), "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". Therefore, the **Research Method can be defined as the method/technique to conduct a research for the purpose of generalization to extend, correct or verify knowledge.**

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 analysing 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

The positivist paradigm – also called empiricism, objectivism, quantitative, or scientific paradigm – can be traced back to the early nineteenth century. The positivist philosophy "assumes that there are social *facts* with an objective reality apart from the beliefs of individuals" (Firestone, 1987). Therefore, quantitative methods attempt to explain social phenomena through the use of objective measures and statistical analysis. Quantitative researchers attempt to achieve objectivity by using experimental designs and correlation studies, thinking that these techniques will reduce or eliminate error and bias. They, therefore, place heavy emphasis on procedures and statistics.

These quantitative methods are built on positivism, an epistemological stance, which has been severely criticized for more than four decades (Howe, 1985). As the propagators of qualitative methods are the last entrants in the domain of social research, most of the definitions of qualitative method have been drawn against what is not a quantitative method. 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 denotes any research based on percentage, means, chi-squares, and other statistics appropriate to cardinal, or counting, numbers and qualitative research which denotes 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 behaviour 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 trans-disciplinary 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

As discussed earlier, in the positivist or quantitative tradition, observation is concerned only with the overt behaviours. However, Ingwersen has emphasised on the cognitive aspects of information retrieval and emphasised that it is important to have knowledge about the underlying thoughts and cognitive processes related to search behaviour (Ingwersen, 1982). A verbalization technique, known as 'Verbal Protocol' or 'Think-aloud Protocol', was developed to

provide valid and reliable thought data for studying thoughts and cognitive processes while performing tasks (Wang, 1999). Verbal protocol is a self-report of behaviour, which usually includes the individual's reasoning about that behaviour. According to Johnson and Briggs, verbal protocol "is the term given to the commentary or verbalization produced by an individual or small team when asked to described what they are doing, why they are doing it, what they are about to do, what they hope to achieve, etc. with respect to a particular task or behaviour" (Johnson and Briggs, 1994). Protocol analysis is a qualitative method that may be applied to results from "talk aloud" so as to categorise verbal behaviour elicited during completion of a task. Protocol analysis has largely been applied in the context of problem-solving and other fields of cognitive science (Mason, 2002). 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. Therefore, the operational 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.**

The Verbal Protocol method is also known as 'think aloud', 'talk aloud', 'concurrent verbalization' or thought-listing techniques. Gathering information after a task is completed is called Retrospective Verbal Reports

or 'think after'. For this study, we have used only the first method, that is, 'think aloud' and has been used with the term 'talk aloud', interchangeably.

1.2.6 OPAC

The Online Public (also used as Patron) Access Catalogues (OPAC), 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. In most of cases, quantitative methods have 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 – it was realized that quantitative methods 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 and 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 scientists' understanding of what science entails. The basic point about positivism is that it is a philosophy that 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 is 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" (Merriam, 1988). 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). 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 gets 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, namely, Logical Positivism of Ludwig Wittgenstein and 'Vienna Circle', who subscribed to the qualitative researching and 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), who of course can easily be placed in the centre-most position, in this polemic. In fact, this centre-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 popularise 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).

Denzin identified four types of triangulation (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 scientists 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). 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 researchers 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, one of the major concerns for Library and Information Science professionals is how to implement user-centric research methods. Several options are though open, Qualitative Method, is however, a useful answer to that.

CHAPTER 2

LITERATURE REVIEW

CHAPTER 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 many 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 exercises 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, 1992). 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 that, "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 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 Kuhlthan (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 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, 1981). 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 research methods (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*™ winter 2001 issue and other bibliographic tools resulted about hundred 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 another thirty 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: By early 1970s the QUALs appeared in Library and Information Science literature. 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 investigation 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 behaviour that is prompted by the individual's physiological, cognitive and effective needs (Wilson, 1981b). 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'.

A conceptual framework was offered by Grover and Glazier (1985) 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 are 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.

The behaviour and motivations of university students were investigated by Jacobs (1996) 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.

A team of theoretical physicists was studied by Barry (1997) for 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 be 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".

Ericsson and Simon (1984, 1992) 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 counselling psychology.

Hughes, Packard and Pearson (1997) also used the Think Aloud method 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"

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". 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". 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".

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". 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".

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. 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". 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).

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". 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". 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.

Few researchers, interested in information-seeking behaviour, have used verbal protocol analysis. Shaw (1995) used Think Aloud method, while conducting a study on search strategies, system interfaces and relevance judgements of CD-ROM based databases searches by 10 graduate students in language and literature. 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". 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 Online Public Access Catalogues (OPACs) were phrase-indexed or pre-co-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, these 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, that is, 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) provided 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 was investigated by Slack (1991). Dyer (1990) outlined 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 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 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 method in Library and Information Science is rare and till date no study has been conducted to the compare the same with any of the existing quantitative methods.

CHAPTER 3

METHODOLOGY

CHAPTER 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 the 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,

b. to ascertain that qualitative methods provide better tools to assess the performances of libraries through user studies, than quantitative ones,

c. to ascertain the suitability of Verbal Protocol method, which facilitates to interpret and analyses the needs of the users from the subjects' perspective.

3.2 HYPOTHESES

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 hypotheses to be tested are as follows:

H_o : Conditions remaining the same, both qualitative and quantitative methods provide equally efficient tools to analyses and interpret the need of the users.

H_1 : Conditions remaining the same, qualitative methods provide efficient tools to analyses and interpret the need of the users as compared to quantitative methods.

H_2 : 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 study. The Library has implemented the Online Catalogue system, about three years back, with the help of an Indian library software, known as LibSys, a product of LIBSYS Corporation, New Delhi.

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 on 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
(as on October, 2001)

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

The Library uses the LibSys software version 4.0 on SCOUNIX and hosted on DELPOWER EDGE 2300 server. It has four dummy OPAC terminals and the terminals are connected through 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.

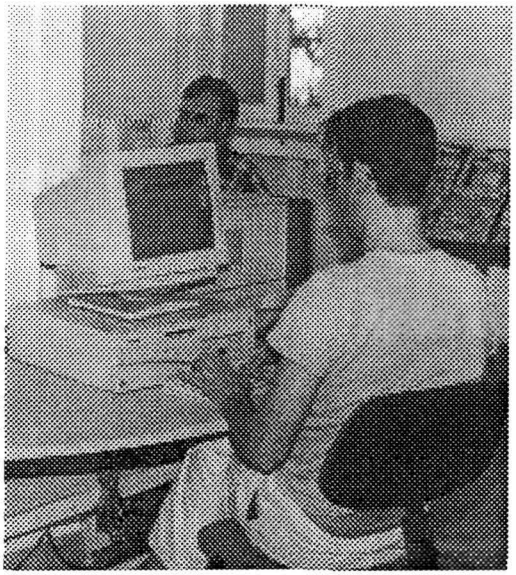


Photo 3.1 – OPAC terminal

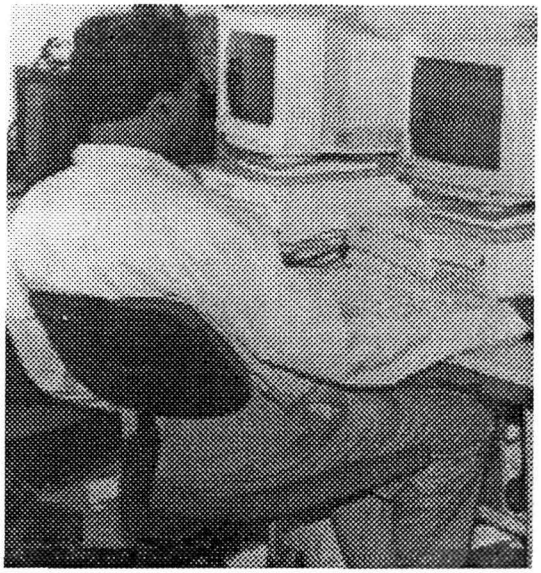


Photo 3.2 – OPAC terminal

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, Shaw (1995) conducted study with a sample size of ten graduate students. 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. The cognitive approach, as observed by Wilson (1984), "draws attention to the need for a bridge between the meanings of everyday life and the information that may have relevance for everyday life".

While discussing about the research methods of Project INISS, Wilson (1981a), one of early researchers in Library and Information Science who have used qualitative research methods, has proposed that there are a number of advantages in combining quantitative and qualitative modes of analysis and reporting. The same proposition has reflected in one of his latest publications, where some degree of integration of different models was proposed. Wilson (1999) has proposed a problem-solving model as a way of integrating the research in the field, where 'person-in-context' and 'Context of information need' treated as basic mainstay of the model of information behaviour. It is noticeable that the qualitative research

methods emphasizes on the CONTEXT, most to understand the complex and interactive environment in which a user search, locate and collect information.

The increasing appreciation for and acceptance of qualitative research methods in the domain of social sciences was observed by Shaw (1995). She has also observed that these methods "are being touted for computer-based system design as well". While using the Think Aloud method, Shaw pointed out that the method helped to provide in-depth information about each participant user and "rich sense of the nature of searching and the context and evolution of information need".

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.

3.6 COLLECTION OF VERBAL PROTOCOL DATA

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 a 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 envelops 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;
- Comments 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.

3.7. Method for Quantitative Research

3.7.1 The questionnaire

The questionnaire booklet (Appendix-V) were prepared 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 Collection of Quantitative Data

After each session all the participants were provided with a questionnaire booklet, 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.

CHAPTER 4

ANALYSIS – I: QUANTITATIVE DATA

CHAPTER 4

ANALYSIS – I: QUANTITATIVE DATA

4.1 BACKGROUND VARIABLES

The data pertaining to the socio-economic factors and on the personal characteristics were collected from the participants. These background variables, namely age, sex, mother tongue, educational qualification, profession, experience of using the OPAC under study, experience of using any other OPAC, etc. to assess the OPAC users' search satisfaction. While assessing users' search performance for online catalogue Hildreth (2001) found that these variables were useful. Saracevic, *et.al.* (1988) also emphasized on the searcher's experience while studying information seeking and retrieving behaviour. The present study has taken nine items representing background variables into consideration in order to study the impact of these variables on search satisfaction while using the online catalogue.

Nine variables in the Section II 'Personal Data" of questionnaire represent the background variables. The variables are: present age, sex, marital status, profession, mother tongue, qualification, specialization, experience of using the OPAC under study, experience of using other OPACs. These variables were measured on different scale points depending upon the type

of the variable. Details of the background variables are presented the following tables:

4.1.1. AGE

Present age group of the participants is presented in the Table-4.1. (Age Group of the participants).

Table 4.1.: Age Group of the Participants (Frequency count into %) [n=18]

Age Group	Frequency	Percent	Cumulative Percent
15-30	10	55.6%	55.6%
30-35	3	16.7%	72.2%
35-40	2	11.1%	83.3%
55-60	2	11.1%	94.4%
Above 60	1	5.6%	100.0%
Total	**18**	**100.0%**	**100.0%**

The above table indicates that though 55.6% of the participants are up to the age group of 30 years, 83.3% of the participants are up to 40 years age group. There is only one participant whose age is above 60 years age group. Thus, it can be observed that, majority of the participants are from younger age group.

4.1.2. SEX

The sex-wise distribution of the participants is presented in the Table-4.2. (Sex-wise distribution of the Participants).

Table 4.2.: Sex-wise distribution of the Participants (Frequency count into %) [n=18]

Sex	Frequency	Percent
Male	14	77.8%
Female	4	22.2%
Total	**18**	**100.0%**

The above table shows that only 22.2% participants are female and rest 77.8% participants are male. In other words, 4 are female participants and 14 are male participants.

4.1.3. MARITAL STATUS

Marital status of the participants is presented in the Table 4.3. (Marital Status of the Participants).

Table 4.3.: Marital Status of the Participants (Frequency count into %) [n=18]

Marital Status	Frequency	Percent
Unmarried	12	66.7%
Married	6	33.3%
Total	**18**	**100.0%**

The above table indicates that out 18 participants 12 (66.7%) are unmarried and 6 (33.3%) are married.

4.1.4. PROFESSION

The professions of the participants are reported in Table 4.4 (Profession of the Participants).

Table 4.4.: Profession of the Participants (Frequency count into %) [n=18]

Profession	Frequency	Percent	Cumulative Percent
Teacher/Lecturer/ Reader/Professor	1	5.6%	5.6%
Research Scholar	1	5.6%	11.1%
Undergraduate Student	9	50.0%	61.1%
Others	7	38.9%	100.0%
Total	**18**	**100.0%**	**100.0%**

The above table indicates that 9 out of 18, that is 50% of the participants are undergraduate students, one participant is a Research Scholar, one participant is in teaching and rest 7 participants (38.9%) are related with various other professions.

4.1.5. LINGUISTIC GROUPS

The linguistic groups of the participants are presented in Table 4.5 (Linguistic Group of the Participants).

Table 4.5.: Linguistic Group of the Participants (Frequency count into %) [n=18]

Language	Frequency	Percent	Cumulative Percent
Bengali	12	66.7%	66.7%
English	1	5.6%	72.2%
Gujrati	1	5.6%	77.8%
Hindi	2	11.1%	88.9%
Oriya	1	5.6%	94.4%
Telugu	1	5.6%	100.0%
Total	**18**	**100.0%**	**100.0%**

The above table points out that, there are total 66.7% participants whose mother tongue is Bengali, there are two participants who speak Hindi. There was one participant each from English, Gujrati, Oriya and Telugu linguistic groups.

4.1.6. QUALIFICATIONS

The educational qualifications of the participants are presented in the Table 4.6 (Qualification of the Participants).

Table – 4.6 : Qualification of the Participants (Frequency count into %) [n=18]

Qualification	Frequency	Percent	Cumulative Percent
12th Standard	8	44.4%	44.4%
Graduation	4	22.2%	66.7%
Post Graduation	5	27.8%	94.4%
M. Phil.	1	5.6%	100.0%
Total	**18**	**100.0%**	**100.0%**

The above table indicates that total 44.4% participants have qualified 12th Standard, 22.2% participants have qualified Graduation degree, 27.8% participants have qualified the Post Graduation level and there is only one participant who has qualified M.Phil.

4.1.7. SPECIALIZATION

The various specializations of the participants are presented in the Table 4.7 (Specialization of Participants). The cross-tabulation of the specialization and qualification, which describes the specializations of the participants at their own level of qualification, are presented in Table 4.8 (Specialization - Qualification Cross-tabulation). Similarly, the cross-tabulation of the specialization and profession, describing the specialization

and present profession of the participants, are presented in Table 4.9 (Specialization - Profession Cross-tabulation)

Table – 4.7.: Specialization of Participants (Frequency count into %) [n=18]

Sl.No.	Specialization	Frequency	Percent
1.	Commerce	1	5.6%
2.	Engg. & Management Consultancy	1	5.6%
3.	Engineering	3	16.7%
4.	English Literature	2	11.1%
5.	Geography	1	5.6%
6.	Law	2	11.1%
7.	Marketing and Sales	1	5.6%
8.	Monetary Economics	1	5.6%
9.	Science	5	27.8%
10.	Zoology	1	5.6%
	Total	**18**	**100.0**

Table-4.8.: Specialization-Qualification Cross-tabulation (Frequency count into %) [n=18]

Specialization	Qualification				Total	% of Specialization
	M.Phil	Post Graduation	Graduation	12th Standard		
Commerce				1	**1**	5.6%
Engg. & Management Consultancy		1			**1**	5.6%
Engineering			1	2	**3**	16.7%
English Literature		1		1	**2**	11.1%
Geography	1				**1**	5.6%
Law			1	1	**2**	11.1%
Marketing and Sales		1			**1**	5.6%
Monetary Economics		1			**1**	5.6%
Science		1	2	2	**5**	27.8%
Zoology				1	**1**	5.6%
Total	**1**	**5**	**4**	**8**	**18**	100.0%
% of Qualification	5.6%	27.8%	22.2%	44.4%	100.0%	

Table-4.9.: Specialization-Profession Cross-tabulation
(Frequency count into %) [n=18]

Specialization	Profession				Total	% of Specialization
	Teacher/ Lecturer/ Reader/ Professor	Research Scholar	Undergra-duate Student	Others		
Commerce			1		1	5.6%
Engg. & Management Consultancy				1	1	5.6%
Engineering			2	1	3	16.7%
English Literature			1	1	2	11.1%
Geography		1			1	5.6%
Law			1	1	2	11.1%
Marketing and Sales				1	1	5.6%
Monetary Economics				1	1	5.6%
Science	1		3	1	5	27.8%
Zoology			1		1	5.6%
Total	1	1	9	7	18	100.0%
% of Profession	5.6%	5.6%	50.0%	38.9%	100.0%	

Since this question was an open-ended one, participants have mentioned their specializations in different fashion, out of which total ten specializations have been identified. The specialization in 'Engineering' includes Computer Science & Engineering and 'Science' includes Chemistry and Mathematics.

The Specialization-Qualification Cross-tabulation reflects that out of eight 12th standard students, two each are from Engineering and Science specialization and one each from Commerce, English Literature, Law and

Zoology. Similarly, out of four graduated students two are from Science and one each from Engineering and Law. There are five participants who have qualified the post-graduation level and each of them is from different specialization, namely, Engineering & Management Consultancy, English Literature, Marketing and Sales, Monetary Economics and Science. The lone participant, who has qualified M.Phil., is from Geography.

The Specialization-Profession Cross-tabulation reveals the fact that the only participant who is in teaching profession, is from Science, similarly the Research scholar is from Geography. Out of nine undergraduate students, 3 are from Science, two from Engineering and one each from Commerce, English Literature, Law and Zoology. There is one participant each from Engineering & Management Consultancy, Engineering, English Literature, Law, Marketing and Sales, Monetary Economics and Science specialization who are involved in 'Other' professions.

4.1.8. EXPERIENCE OF THE OPAC UNDER STUDY

The Table 4.10 (Participants' Experience of use of the OPAC under study) shows the experience of the participants of using the LIBSYS OPAC in British Council Library, Calcutta (BCLC).

Table–4.10.: Participants' Experience of use of the OPAC under study (Frequency count into %) [n=18]

Experience of the Present OPAC	Frequency	Percent	Cumulative Percent
Less than 1 year	9	50.0%	50.0%
1-2 years	1	5.6%	55.6%
2-3 years	8	44.4%	100.0%
Total	**18**	**100.0%**	**100.0%**

The previous table shows that 50%, or nine participants have used the OPAC for less than one year, whereas 44.4% or nine participants have used the OPAC for two to three years. There is only one participant who has used the OPAC for more that one year but less than two years.

4.1.9. EXPERIENCE OF ANY OTHER OPAC

It was asked to the participants that whether they have used or currently using any OPAC system, other than that of BCLC. The answers are presented in Table 4.11 (Other OPAC/s used by the Participants).

Table– 4.11.: Other OPAC/s used by the Participants (Frequency count into %) [n=18]

Other OPAC used	Frequency	Percent
Yes	7	38.9%
No	11	61.1%
Total	**18**	**100.0%**

The table shows that total 38.9% of the participants have used or using some OPAC system other than that of BCL, Calcutta, whereas rest 61.1% of participants have not used any other OPAC.

The Experience of the Present OPAC and Other OPAC used have been cross tabulated and present in Table 4.12 (Experience of the Present OPAC - Other OPAC used - Cross-tabulation).

Table-4.12.: Experience of the Present OPAC - Other OPAC used - Cross-tabulation (Frequency count into %) [n=18]

Experience of the Present OPAC	Other OPAC used		Total	% of experience of present OPAC
	Yes	No		
Less than 1 year	2	7	9	50.0%
% of Total	11.1%	38.9%		
1-2 years		1	1	5.6%
% of Total		5.6%		
2-3 years	5	3	8	44.4%
% of Total	27.8%	11.1%		
Total	**7**	**10**	**18**	100.0%
% of Other OPAC used	38.9%	61.1%	100.0%	

The above table reveals the fact that, mostly those who have used present OPAC for more than two years have also used other OPAC systems, similarly, mostly those who have not used the present OPAC more than a year, also have not used other OPAC systems. Out of seven participants, who have used other OPACs, 2 have used the OPAC of BCLC for less that one-year and rest 5, that is 27.8% of the sample, have used the same for more that two years. On the other hand, out of 10 participants, who have not used any other OPACs, 7 participants, that is 38.9% of the sample, have used the OPAC of BCLC for less than 1 year and rest 4 have used the same for more than one year.

It was also asked to the participants that if they have used any other OPAC system or systems, then, where they have used, how is their experience and for how many years they have used the same. The answers of these have been presented in the Table 4.13 (Experience of other OPAC/s used)

Table-4.13.: Experience of other OPAC/s used

Participants	Library	How is the OPAC/s	Years of experience
User-02	Not in India	Little more efficient	3 years
User-05	USIS Calcutta	Very helpful and informative	5 to 6 years
User-09	British Council in Delhi	Similar	2 years
	American Library in Calcutta		
	American Library in Delhi		
User-11	USIS Calcutta	Very good with mouse support, however doesn't show the check-in/out	2 years
	BCL Bangalore	Similar with BCL Calcutta	Once only
	National Law School, Bangalore	It is great for Law students	
User-12	British Library in London- the National Library's own system	Excellent	13 years
	University of London	Good+	
	London Guildhall University	Good	
User-15	Alice for Windows in XLRI, Jamshedpur Library	Fairly OK	Now and then
	CDS/ISIS in KMC, Hubli (Karnataka)	Not so user friendly	
User-17	USIS Calcutta	Much better	Sometimes

The above table enumerates, in its first column, who are the participants, followed by, in which library or libraries they have used the OPAC systems, which is then followed by their evaluation of those systems and then the last column explains the years of experience in using those OPACs.

It reveals from the table that out of the seven participants three have used only one more OPAC system in addition to the OPAC under study, whereas rest four participants have used multiple OPAC systems in different libraries. Again out of these seven participants, five are using or used, other OPAC systems for more than 2 years and rest two participants are casual user of other OPAC systems.

4.1.10. INTER-CORRELATIONS AMONGST THE BACKGROUND VARIABLES OF THE OPAC USERS

Inter-correlations amongst the background variables of the OPAC users are presented in the Table 4.14 (Inter-correlations amongst the Background Variables of the OPAC Users). While calculating the inter-correlations the nominal variables like mother tongue and specialization has been dropped has these are nominal in nature. The table is as follows:

Table-4.14: Inter-correlations amongst Background Variables of the OPAC Users [n=18]

SL. No.	Background Variables	1	2	3	4	5	6	7
1	Age	X						
2	Sex	.104	X					
3	Marital Status	.686****	.378*	X				
4	Qualification	.386*	-.444**	.405**	X			
5	Profession	.517***	.245	.530***	.191	X		
6	Experience of the OPAC under study	.511***	.245	.405**	.292	.162	X	
7	Other OPAC/s used	.343	-.122	.161	.398*	.190	.398*	X

Note: n=18

**** Correlation is significant at the 0.01 level (2-tailed).

*** Correlation is significant at the 0.05 level (2-tailed).

** correlation is significant at the 0.10 level (2-tailed).

* correlation is significant at the 0.20 level (2-tailed).

The above table shows that inter-correlations amongst various background variables are significant, however at different levels. The age of the participants has highest positive significant relation with marital status, which is quite reasonable understandable that, with the increase of age people gets married, in general. It also has strong positive relation with profession and experience of the OPAC under study. It also shows some relationship with qualification. Therefore, it can be derived that the professional status as well as experience of using the OPAC under study have improved with the increase of age. Similar trend is also visible in case of age – qualification relationship.

As mentioned earlier, age and marital status are highly correlated; therefore, similar pattern of correlation, as that of in the case of age, is also visible with marital status. It also has positive correlations with qualification,

profession and experience of the OPAC under study. Surprisingly, sex has a negative correlation with qualification. Other OPAC/s used have shown positive correlation with qualification as well as with experience of using the present OPAC.

Thus, we can conclude that, with the increase of age, educational qualification and profession improves and as the educational qualification improves people uses more online catalogues and they also go for multiple libraries to fulfil their information need.

4.2 THE OPAC SEARCH SATISFACTION VARIABLES

Total sixteen variables were identified as OPAC Search Satisfaction variables, for the purpose of this study. Sixteen variables in the Section I 'OPAC Related Data" of questionnaire represent the OPAC Search Satisfaction variables. These variables are, Ease of following Instructions, options and commands of the OPAC, Layout and presentation of the OPAC system, Ease of movement within the system, Flexibility of the system, Responsiveness of the OPAC, Suitability of the OPAC system for the purpose of search, Frequency at which OPAC will be used in future, Frequency of Present Use of the system, how far the user Understood the OPAC, Satisfaction with the relevant terms, Thoroughness of the retrieved information, Amount of information retrieved, Up-to-datedness of Information retrieved, Time taken to retrieve

information, Satisfied with OPAC use and the User friendliness of the OPAC system.

4.2.1 INTER-CORRELATIONS AMONGST THE OPAC SEARCH SATISFACTION VARIABLES

Inter-correlations amongst the OPAC search satisfaction variables have been calculated and presented in the Table 4.15 (Inter-correlations among the OPAC search satisfaction variables).

Table 4.15 Inter-correlations among the OPAC search satisfaction variables [n=18]

Sl. No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Ease of following instructions, options and commands	X															
2	Layout and presentation	.528***	X														
3	Ease of movement	.305	.336*	X													
4	Flexibility	-.168	.221	.258	X												
5	Responsiveness	.107	.442**	-.038	.375*	X											
6	Suitability	-.218	.373*	-.093	.520***	.399*	X										
7	Frequency at which OPAC will be used	.161	.631****	.206	.143	.458**	.616****	X									
8	Frequency of Present Use	.118	.254	.194	-.020	-.073	.148	.401**	X								
9	Understood the OPAC	.342*	.301	.136	.077	-.172	.028	.111	.581***	X							
10	Satisfaction with the relevant terms	.241	.386*	.179	-.094	.042	.007	.144	.269	.481***	X						
11	Thorough	.026	.351*	-.308	.000	.026	.675****	.474***	.285	.276	.040	X					
12	Amount of information retrieved	.088	.175	-.174	.362*	.309	.394*	.426**	-.223	-.281	-.342*	.283	X				
13	Up-to-datedness of information retrieved	.248	.439**	.549***	.040	.303	.188	.593****	.211	.038	.055	.000	.049	X			
14	Time taken to retrieve information	.301	.546***	.317	.159	.116	.514***	.621****	.594****	.341*	.117	.343*	.000	.471***	X		
15	Satisfied with OPAC	.311	.499***	.000	-.061	.478***	.576***	.585***	.058	-.087	.265	.460**	.334*	.360*	.428**	X	
16	User friendliness	.187	.543***	-.061	.096	.316	.638****	.623****	-.166	-.163	.073	.575***	.558***	.197	.367*	.734****	X

****** Correlation is significant at the 0.01 level (2-tailed).**
***** Correlation is significant at the 0.05 level (2-tailed).**
**** correlation is significant at the 0.10 level (2-tailed).**
*** correlation is significant at the 0.20 level (2-tailed).**

From the above table it is clearly understood that, better layout of the OPAC system appeals the users to use it more frequently. Better layout makes it user-friendly, as well as, helps to retrieve required and up-to-dated information, quickly. In addition to that, better layout helps to follow the instructions, options and commands, easily. If the system is flexible, users felt that it is suitable for their purpose. The users also found the OPAC suitable, if it is user-friendly and retrieves thorough information, instantaneously.

The frequency, at which the users use the OPAC presently, is mainly because it saves the time to verify availability of the required documents. The frequency at which the users will use the system in future, are related with, the user-friendliness of the OPAC system, instantaneousness, up-to-datedness of retrieved information, suitability of the OPAC, thoroughness of retrieved information, satisfaction of using the OPAC system, responsiveness of the OPAC system and the amount of information retrieved.

Satisfaction of using the OPAC is highly correlated with user friendliness of the system and also correlated with the layout, responsiveness and suitability. Besides those, it has some correlation with instantaneousness of the software, thoroughness, up-to-datedness and amount retrieved

information. In the similar way, thoroughness and amount of retrieved information show high correlations with the user-friendliness of the OPAC.

4.3 BACKGROUND VARIABLES AND OPAC SEARCH SATISFACTION

4.3.1 CORRELATIONS BETWEEN BACKGROUND VARIABLES AND OPAC SEARCH SATISFACTION VARIABLES

To identify the relationship between the background variables, or independent variables, and search satisfaction of OPAC variables or the dependent variables, Pearson's correlations has been calculated and presented in the Table 4.16 (Correlations among Background Variables and OPAC use satisfaction variables).

Table-4.16: Correlations among Background Variables and OPAC search satisfaction variables [n=18]

Background Variables / Dependent Variables	Age	Sex	Marital Status	Qualification	Profession	Experience of the OPAC under study	Other OPAC/s used
Ease of following Instructions, options and commands	-.018	-.214	.052	.334*	.353*	.259	.283
Layout and presentation	-.054	-.062	-.165	-.157	.185	.144	-.206
Ease of movement	.127	.000	-.246	-.150	.319*	-.030	-.179
Flexibility	-.391*	-.176	-.581***	-.217	-.110	-.329*	-.244
Responsiveness	-.029	-.098	-.104	.122	.282	.122	-.042
Suitability	.006	.271	.084	-.017	.010	.290	-.252
Frequency of Present Use	.229	.265	.175	-.227	-.072	.412**	-.014
Frequency at which OPAC will be used	.157	.232	.111	.086	.092	.411**	-.063
Understood the OPAC	-.250	.376*	-.110	-.402**	-.156	.080	-.160
Satisfaction with the relevant terms	-.119	.259	-.282	-.339*	-.133	.248	-.065
Thorough	.086	.331*	.375*	.081	-.118	.385*	-.282
Amount of information retrieved	-.204	-.160	-.141	.309	-.067	.034	.205
Up-to-datedness of Information retrieved	.294	-.130	.000	.236	.162	.319*	-.138
Time taken to retrieve information	.312	.162	.300	.049	.263	.361*	.069
Satisfied with OPAC	.347*	.273	.328*	.245	.433**	.723****	.212
User friendliness	.189	.109	.164	.206	.165	.386*	.106

Note: **n=18**

****** Correlation is significant at the 0.01 level (2-tailed).**

***** Correlation is significant at the 0.05 level (2-tailed).**

**** correlation is significant at the 0.10 level (2-tailed).**

*** correlation is significant at the 0.20 level (2-tailed).**

The above table shows that age has a negative correlation with flexibility aspect of the OPAC however a positive correlation with satisfaction of using the OPAC. We have seen in the Table 4.14 of this chapter that age and marital status has strong positive correlation, therefore, marital status has

also reflected the same pattern of correlation with flexibility and satisfied with the OPAC.

This means, with the increase of age, satisfaction of using the OPAC also improves. It has already been observed in the Table 4.14 that, with the increase of age, experience of the OPAC under study has also increased and in the Table 4.16 it is clearly noticeable that high positive correlation exists between experiences of the OPAC under study and satisfied with the OPAC. Therefore, it can be safely concluded that with more use of the OPAC, satisfaction of using it improves.

Frequency of present use of the OPAC has positive influences on the experience of the OPAC under study and the frequency at which the participants will be using the same, in future. It can also be derived that with more experience of the OPAC, users find it user-friendly and retrieve thorough, up-to-date information, quickly.

This table reveals that higher educational qualification helps the users to easily follow the instructions, options and commands. Educational qualification, however, has negative correlations with understanding the OPAC and satisfaction with the relevant terms, which can be attributed to the fact that the better-educated users wanted to comprehend the OPAC system more and have better vocabulary strength but the OPAC has failed to support in both aspects. Putting it in other words, the OPAC structure is

so complicated that lower-educated users are reluctant to understand and at the same time, is not supported with wide-ranged thesaurus.

It can also be concluded that, participants with higher professional status found the OPAC satisfactory, followed the instructions, options and commands easily and move easily within the OPAC system.

No significant relationship has been noticed, from the table, between the use of other OPAC system or systems and any of the OPAC search satisfaction variables. This particular situation is self-explanatory, as because the study was conducted to evaluate the search satisfaction of a particular OPAC, the experience of any other systems will, therefore, have no significant relation with the features of the OPAC under study.

It is also to notice, flexibility of the OPAC has negative correlations with all the background variables, which interpret that users have found the OPAC system as, not flexible enough, for their purpose.

It is, however, obvious from the above discussions that age is one of the major dominating factors of the OPAC search satisfaction. Therefore, it can be interpreted that the correlation between other background variables, namely 'qualification', 'profession', 'experience with the OPAC under study' and 'other OPAC/s used' and OPAC search satisfaction variables might have been influenced with the age factor and computed results may be misleading. To ascertain the real level of correlation, between the above-

mentioned variables, partial correlations was computed, the details of which is presented in the following section.

4.3.2 PARTIAL CORRELATIONS BETWEEN SOME BACKGROUND VARIABLES AND OPAC SEARCH SATISFACTION VARIABLES

To eliminate the influences of all other background variables, these were partialed out, except the variable under consideration. To compute the partial correlation between qualification and the dependent variables all other independent variables, namely, Age, Sex, Marital Status, Experience of OPAC under Study, Other OPAC/s used and Profession, were controlled. The similarly procedure was followed in case of other variables, too. The details of controlled variables are described on the table head. The computed results have been presented in the Table 4.17 (Partial correlations between some background variables and OPAC search satisfaction variables).

Table 4.17 Partial correlations between some background variables and OPAC search satisfaction variables [n=18, df=10]

Background Variable / Dependent Variable	Qualification	Profession	Experience of OPAC under study	Other OPAC/s used
	Controlling for: Age,Sex, Marital Status, Experience of OPAC under Study, Other OPAC/s used, Profession	Controlling for: Age, Sex, Marital Status,Qualification, Experience of OPAC under Study, Other OPAC/s used	Controlling for: Age, Sex, Marital Status, Other OPAC/s used, Profession, Qualification	Controlling for: Age, Sex, Marital Status, Profession, Qualification, Experience of OPAC under Study, Other OPAC/s used
	Degree of Freedom: 10	Degree of Freedom: 10	Degree of Freedom: 10	Degree of Freedom: 10
Ease of following Instructions, options and commands	.0513	.5978***	.4847*	.1211
Layout and presentation	-.2235	.4696*	.4765*	-.3619
Ease of movement	.1579	.5457**	.0640	-.4255*
Flexibility	.2029	.2891	-.0863	-.2470
Responsiveness	.1694	.4877*	.3070	-.2529
Suitability	.2039	.0484	.3510	-.4082*
Frequency of Present Use	-.3898	-.2184	.4162*	-.0655
Frequency at which OPAC will be used	.2467	.0863	.3665	-.3097
Understood the OPAC	-.1783	-.0704	.2141	-.0235
Satisfaction with the relevant terms	-.0530	.0245	.3685	-.1125
Thorough	.1368	-.3315	.4530*	-.4882*
Amount of information retrieved	.3900	.0676	.0301	.1351
Up-to-datedness of Information retrieved	.3276	.2603	.3933	-.5461**
Time taken to retrieve information	-.1486	.1616	.3026	-.0806
Satisfied with OPAC	.2267	.5755**	.7402****	-.2478
User friendliness	.1889*	.1383	.3033	-.1196

Note: n=18, df (degree of freedom)=10
**** Correlation is significant at the 0.01 level (2-tailed).
*** Correlation is significant at the 0.05 level (2-tailed).
** correlation is significant at the 0.10 level (2-tailed).
* correlation is significant at the 0.20 level (2-tailed).

The above table reveals some more new correlations and few cases correlations have dropped to insignificant level. Though qualification is partially correlated only with user friendliness, it can be observed that profession has partial correlation with some more variables than those were found in case of bivariate correlation calculations. It has been found that in addition to its correlation with ease of following instructions, ease of movement and satisfaction of using the OPAC; profession is, also, partially correlated with layout and presentation and responsiveness. This means that, improvement of professional status also helped the users to retrieve required information, more easily.

Experience of the OPAC under study has shown some new partial correlations with ease of following instructions, layout and presentation, which can be interpreted in way that more experience has helped the users to follow the instructions and layouts. At the same time, the negative bivariate correlation with flexibility has dropped to insignificant level along with the positive correlations with frequency at which the OPAC will be used in future, up-to-datedness of retrieved information and user friendliness. However high correlation between experience of the OPAC and satisfaction of using the OPAC, still exists.

It is interesting to notice that, use of other OPAC/s has now shown significant, though low level, negative partial correlations with ease of

movement, suitability, thoroughness and up-to-datedness of retrieved information. This signifies that the users who have used other OPAC system or systems, have negatively evaluated the OPAC under study and found that the within the present system, it is difficult to move around, it is not suitable for the purpose, the retrieved information are not thorough and up-to-dated.

We can now conclude that, though it was found, with the help of bivariate correlation calculations, that age was one of the most dominating variables in case of assessing the relationship between background variables and the dependent variables, however, with the partial correlation calculations, it was observed that, the same pattern of relationship exists even after the age variable was partialed out.

It can also be concluded that, with the increase of age, qualification, profession and experience of the OPAC, the users can follow the instructions, understand the layout and presentation, retrieve thorough information, be satisfied with the OPAC and found the system user friendly. At the same time, the users, those who have used any other OPAC system or systems, have evaluated the present system in a subdued manner.

4.4 CONCLUSION

Based on the correlation analysis of quantitative data of the OPAC usages, it can be concluded that, with the improvement of educational qualification, higher professional status, and most importantly, with more experience of the OPAC, the users found the system more satisfactory and user friendly, as well as, followed the instructions, better; understood the layout, easily; retrieved thorough information, quickly. Users, who have higher educational qualifications and higher professional status, use more online catalogues and opt for multiple libraries to fulfil their information needs.

The layout of the OPAC is one of the most important factors to become user-friendly. Better layout of it assists to retrieve required and up-to-dated information, quickly, as it eases to follow the instructions. Better layout also attracts the users to use it more frequently.

This study indicates that, users of the OPAC feel satisfied, not only when the layout is better, but also when it is user-friendly, responsive to their search, suitable for their purpose, quick to retrieve thoroughness and up-to-dated information.

CHAPTER 5

ANALYSIS – II: QUALITATIVE DATA

CHAPTER 5

ANALYSIS – II: QUALITATIVE DATA

5.0 INTRODUCTION

This chapter begins with a brief description of the steps followed while analysing verbal protocol data, followed by, the protocol analysis of the collected data. The chapter concludes with the findings of the verbal protocol data.

5.0.1 BRIEF OVERVIEW OF THE ANALYSIS

In the verbal protocol analysis, the participants are asked to "think out loud" or "think aloud" as they perform a search on the OPAC. The assumption is that, they are expressing the knowledge and reasoning behind the specific search performance. The verbalizations regarding the performance are termed verbal protocols or think-aloud protocols. Analysis of such protocols, termed as, verbal protocol analysis, leads to insights into the knowledge and skills being used. It has been observed by Ransdell (1995) that protocol analysis "gathers data with sufficient temporal density to test models of online, second-by-second behaviour".

A typical verbal protocol analysis process has been suggested by Bainbridge & Sanderson (1995). Figure–5.1 is the diagrammatic presentation of the process, in which, it is shown that how protocols are

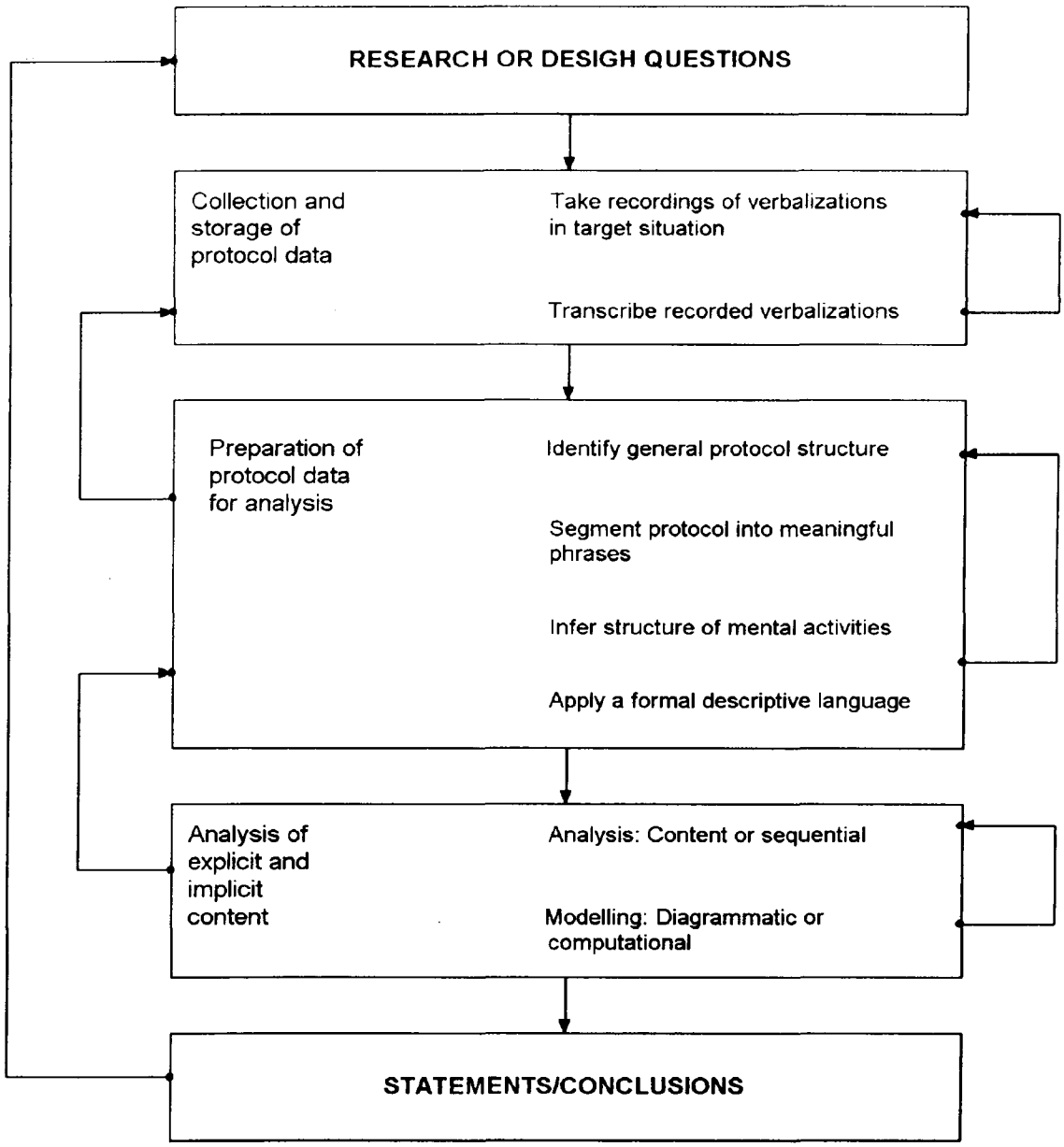


Figure – 5.1 Flow chart of the verbal protocol analysis process.
[Adopted from Bainbridge & Sanderson (1995)]

used to move from research or design questions through to conclusions, that answer, those questions. The diagram is divided into three stages, namely, collection and storage of protocol data, preparation of protocol data for analysis, and analysis of explicit and implicit contents of protocol. The

analyses of the verbal protocol data, of this study, have been done based on this model.

5.1 DATA PROCESSING AND ANALYSIS

The verbal protocols of the participants were audio recorded, as well as, notes were also taken, about the finger movements, expressions, for example, excitements, dissatisfaction, starting and ending time of the search etc., while the participants were performing the OPAC searches.

"Acknowledgment Tokens" were provided to the participants as and when it was necessary to remind them to keep talking. Boren and Ramey (2000) suggested that careful use of these token responses helps the participants to promote 'speakership'. However, proper care was taken so that minimum distractions would take place.

The following table (Table 5.1 search durations of the OPAC by the participants) shows the details of the total duration of search performed by the participants.

Table 5.1 search durations of the OPAC by the participants

Sl.No.	User Identification No.	Duration of Verbal Protocol
1.	USER – 01	20 Seconds
2.	USER – 02	1 Minute 01 Seconds
3.	USER – 03	56 Seconds
4.	USER – 04	1 Minute 12 Seconds
5.	USER – 05	2 Minute 39 Seconds
6.	USER – 06	43 Seconds
7.	USER – 07	1 Minute 24 Seconds
8.	USER – 08	2 Minute 43 Seconds
9.	USER – 09	1 Minute 32 Seconds
10.	USER – 10	1 Minute 17 Seconds
11.	USER – 11	1 Minute 15 Seconds
12.	USER – 12	1 Minute 09 Seconds
13.	USER – 13	3 Minute 12 Seconds
14.	USER – 14	1 Minute 34 Seconds
15.	USER – 15	2 Minute 35 Seconds
16.	USER – 16	1 Minute 49 Seconds
17.	USER – 17	2 Minute 49 Seconds
18.	USER – 18	1 Minute 05 Seconds

The audio-recorded protocols were converted into a type written transcriptions; the transcriptions are included in Appendix –VI. The transcriptions were subsequently segmented and encoded.

5.1.1 Segmenting the transcription

The next stage is to identify the meaningful units within the protocol that may suggest discrete mental process. Bainbridge and Sanderson (1995) suggested that, the segmentation of the text into phrases (which might loosely be described as minimum grammatical units) is done by natural language understanding. Segmentation involves, dividing the protocol into

units that can be encoded more or less independently. Here, cues for segmentation are by looking at the completion of the ideas, the completion of sentences, clauses, or pauses.

In analysing the verbal protocols, the knowledge that is relevant for analysis, are the knowledge required in using the OPAC. This is important because sometimes there are expressions in the protocol that are not relevant to use of the OPAC and those expressions were not analysed.

5.1.2 Encoding the segmented data

Each segment is then encoded. Time can be lost if an analyst commits prematurely to an encoding scheme and applies it to an entire data set without planning how the results will be analyzed (Fisher & Sanderson, 1996). Therefore, in this study the verbal protocol first undergone through a preliminary analysis using simple coding such as, 'Defining ', 'Planning', 'Monitoring' and 'Evaluating' so forth. After that an initial coding scheme based on the task directive coding scheme of Branch (2001) was used to identify the operators that would generate or instantiate the relevant knowledge in the verbal protocol. The final coding scheme for the users of the OPAC was derived from this initial coding scheme through refining and revising the conceptual operators, at the same time, that the analysis of the verbal protocol was carried out. Table 5.2 (Coding Scheme) gives the

result of this study with the following set of conceptual operators used by the OPAC users.

Table 5.2 Coding Scheme

CODE	SUB-CODES	OPERATORS	INITIALS*
Planning ⟶	a. Step		**PA**
	b. Procedure		**PB**
Defining ⟶	a. Document		**DA**
	b. Heading ⟶	1.Author	**DB1**
		2.Title	**DB2**
		3.Subject	**DB3**
	c. Data ⟶	1.Name of Author	**DC1**
		2.Title of Document	**DC2**
		3.Subject of Document	**DC3**
	d. Action		**DD**
Monitoring ⟶	a. Read		**MA**
	b. Identify		**MB**
	c. Examine ⟶	1. Compare-to-expected	**MC1**
		2. Determine-relevancy	**MC2**
		3. Identify-availability	**MC3**
Evaluating ⟶	a. Infer		**EA**
	b. Satisfy		**EB**
	c. Dissatisfy		**EC**
Indiscretion ⟶	a. Confusion		**IA**
Meta-reasoning ⟶	a. Comment		**MRA**

*Details of the INITIALS are described in Appendix-VIII

To start a search, the users of OPAC, plans for performing operations, through 'Step' and 'Procedure'. In other words, to start a search the users first plan what are the steps they will follow or which procedure will be followed to accomplish the job.

The above Coding Scheme reveals that the OPAC users 'Define' their task through the types of 'Document' or documents they are looking for. Then

they define under which access point of 'Heading' they will be looking for the document. This study has found the users to access through 'Author', 'Title' and 'Subject' options. Followed by which, the users define the 'Data' or the actual 'Name of Author' or 'Title of Document' or 'Subject of Document'. They also defined different 'Actions' involved in performing the search, for example, "pressing the Enter key".

After the results are retrieved by the OPAC, they start the monitoring operations by 'Reading', 'Identifying' and 'Examining'. 'Compare-to-expected' is used at the examining stage, and they also 'determine-relevancy' of the retrieved results. Which may be followed by 'identify-availability' of the documents in the library, means, whether the document is currently issued to any other library users or not.

The OPAC users goal, in this episode, is to interpret the significance of a given document by inference. For example, "well, this seems to be a related subject to me, because, it talks about introduction to information retrieval". They may feel satisfied or dissatisfied at this stage with the results of the search.

The 'Indiscretion' or confusion, however, may arise at any stage while performing the job. At the 'Meta-reasoning' stage the user make a general or specific comment about doing the search.

Along with the coding scheme, the initials of each code was also identified, which has helped to transfer the segmented data (the segmented data is available at Appendix-VII) from text file to the SPSS for Windows (ver.10.1.4), 2001 software package, to do the following analysis.

5.2 RESULTS

Total 617 segments were encoded from the 18 participants. Out the 617 segments, 24 were other comments, for example – "Finished the search", which were not relevant for the study, and removed. Total 'Acknowledgement Tokens' provided were 69. Also, after removing the acknowledgment tokens the actual number of protocol segments reduced to 524. The user wise breakups of the segments are described in the Table 5.3 (Number of Total Segments by participant).

Table 5.3 Number of Total Segments by participant.

Sl.No.	User Identification Number	Acknowledgement Token Provided	Segment / Code
1.	USER – 01	NIL	7
2.	USER – 02	2	21
3.	USER – 03	2	18
4.	USER – 04	5	37
5.	USER – 05	4	37
6.	USER – 06	14	26
7.	USER – 07	NIL	23
8.	USER – 08	5	44
9.	USER – 09	6	27
10.	USER – 10	13	28
11.	USER – 11	4	20
12.	USER – 12	2	22
13.	USER – 13	1	31
14.	USER – 14	NIL	29
15.	USER – 15	NIL	58
16.	USER – 16	1	19
17.	USER – 17	3	58
18.	USER – 18	7	19
	Total	**69**	**524**

The highest number of segments could be achieved from user number 15 and 17, whereas least number of segments could be achieved from the user number 01. It can also be observed that, no acknowledgement token was required to provide to the user number 01, 07,14 and 15. The average number of segments was 29 per participants. Figure 5.2 (No. of segments by participant)

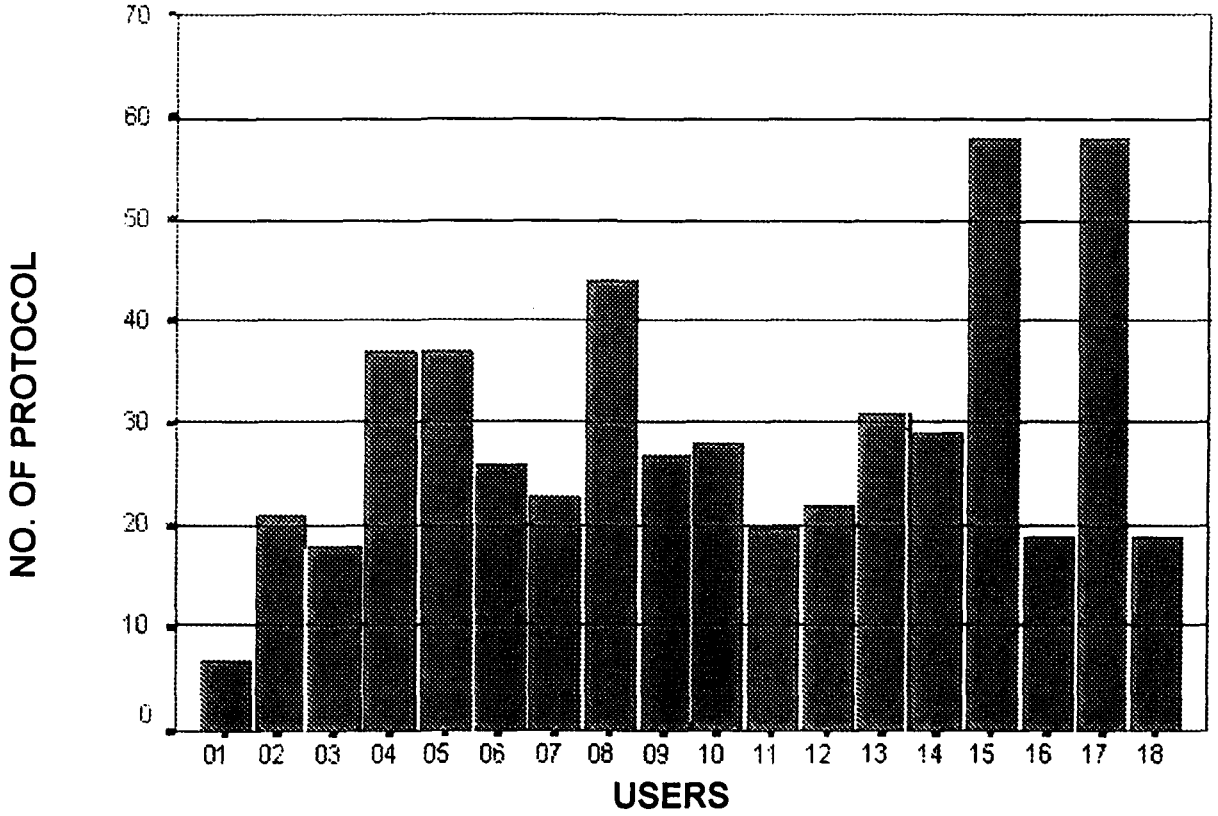


Figure 5.2: Number of Total Segments by participant

shows the differences in the number of statements by each participant.

Based on the coding scheme, as proposed above, the frequency distribution of the each conceptual operator was computed and presented in the Table 5.4 (Frequency distribution of conceptual operator).

Table 5.4 Frequency distribution of conceptual operator

Conceptual Operators	Frequency		Percentage
Planning		**69**	**13.17%**
Step	22		
Procedure	47		
Defining		**184**	**35.11%**
Document	11		
Heading	28		
Data	76		
Action	69		
Monitoring		**152**	**29.00%**
Read	60		
Identify	40		
Examine	52		
Evaluating		**67**	**12.79%**
Infer	11		
Satisfy	13		
Dissatisfy	43		
Indiscretion		**38**	**7.25%**
Confusion	38		
Meta-reasoning		**14**	**2.67%**
Comment	14		
Total Count: 524			

From the above table it can be seen that, a major part of the OPAC search activities is related to 'define' the search procedure and most of which is, defining the 'data' to be retrieved. Monitoring activity is also a major task to

perform the search. It is interesting to see that, total 43 times the participants expressed their dissatisfaction, whereas, only 13 times satisfaction were expressed, while performing the task. The participant wise break-ups of satisfaction and dissatisfaction is presented in Table 5.5 (Number of Satisfaction/Dissatisfaction expressed by participant)

Table 5.5 Number of Satisfaction/Dissatisfaction expressed by participant

USER I.D.	SATISFACTION	DISSATISFACTION
USER – 01	1	NIL
USER – 02	1	2
USER – 03	1	3
USER – 04	2	1
USER – 05	NIL	4
USER – 06	NIL	NIL
USER – 07	NIL	2
USER – 08	NIL	11
USER – 09	NIL	4
USER – 10	2	1
USER – 11	NIL	NIL
USER – 12	3	NIL
USER – 13	1	1
USER – 14	1	NIL
USER – 15	1	3
USER – 16	NIL	6
USER – 17	NIL	5
USER – 18	NIL	NIL
TOTAL	**13**	**43**

From the above table it can be observed that User no.06, 11 and 18 have not expressed their satisfaction or dissatisfaction. However, it has been observed, at the time of verbal protocol analysis, the purpose of the search of OPAC by the User no. 18, was just to verify, whether a couple of book is

still issued to him or not. Therefore, the expression of satisfaction or dissatisfaction did not arise. Total three users expressed satisfaction while searching. They are User No. 01, 12 and 14, of whom the second user expressed the satisfaction thrice. Rest all participants have expressed dissatisfaction at different time of their search, out of which six users, namely User No.05, 07, 08, 09, 16 and 17 have not expressed any satisfaction. The User no. 08 has expressed dissatisfaction eleven times. Total six participants have expressed dissatisfaction, along with satisfaction, namely User No. 02, 03, 04, 10, 13 ,15.

The Table-5.6 (Background variables and satisfaction / dissatisfaction) explained the relationship between the background variables and the satisfaction and dissatisfaction data revealed from the protocol analysis.

Table-5.6 - Background variables and satisfaction / dissatisfaction

USER	AGE	Qualification	Profession	Experience of the OPAC	Satisfaction	Dissatisfaction
USER-01	15-30	U.G.	U.G.	Less than 1 year	1	NIL
USER-02	15-30	U.G.	U.G.	Less than 1 year	1	2
USER-03	15-30	U.G.	U.G.	Less than 1 year	1	3
USER-04	15-30	P.G.	Others	Less than 1 year	2	1
USER-05	55-60	P.G.	Teacher/Lecturer/ Reader/Professor	2-3 years	NIL	4
USER-06	15-30	Graduation	U.G.	2-3 years	NIL	NIL
USER-07	30-35	P.G.	Others	Less than 1 year	NIL	2
USER-08	15-30	U.G.	U.G.	Less than 1 year	NIL	11
USER-09	35-40	M.Phil	Research Scholar	2-3 years	NIL	4
USER-10	15-30	U.G.	U.G.	Less than 1 year	2	1
USER-11	15-30	U.G.	U.G.	2-3 years	NIL	NIL
USER-12	35-40	P.G.	Others	Less than 1 year	3	NIL
USER-13	15-30	U.G.	U.G.	Less than 1 year	1	1
USER-14	30-35	Graduation	Others	1-2 years	1	NIL
USER-15	30-35	P.G.	Others	2-3 years	1	3
USER-16	Above 60	Graduation	Others	2-3 years	NIL	6
USER-17	55-60	Graduation	Others	2-3 years	NIL	5
USER-18	15-30	U.G.	U.G.	2-3 years	NIL	NIL

Legend: U.G. – Under Graduate Student; P.G.- Post Graduate.

From the above table, it can be observed that, out of the six participants, who have expressed only dissatisfaction, only one participant, namely, User-08 was undergraduate student, User-05 and 07 are Post Graduated, User-16 and 17 are Graduated and User-09 is M.Phil. degree holder. Out of these six participants four, namely User-05, 09, 16 and 17 have used the OPAC for more than 2 years. It has been observed that, three, out of these six participants, are above the age of 55 years, two are within the age group of 35-40 years and one is below 30 years.

On the other hand, out of the three users, who have expressed satisfaction, while using the OPAC, two have used the system for less than 1 year and only one have used it for 1-2 years. Two of them, are within the age group of 30 to 40 years, and one below 30 years. User-01, 14 and 12 have qualified Undergraduate, Graduate and Post graduate.

The Table-5.7 (Number of Statement coded for each participant) shows the range in the number of Think Aloud statements for each participant. As mentioned earlier, total 524 statements were coded with the help of coding scheme described in Table 5.2.

Table-5.7 – Number of Statement coded for each participant.

USER I.D.	Planning	Defining	Monitoring	Evaluating	Indiscretion	Meta-reasoning	TOTAL
USER – 01	1	5		1			7
USER – 02		12	1	4	4		21
USER – 03	3	4	5	3	3		18
USER – 04	8	10	12	4	3		37
USER – 05	6	11	11	4	3	2	37
USER – 06	4	14	6	1		1	26
USER – 07	3	9	5	2	3	1	23
USER – 08	6	16	8	13	1		44
USER – 09	5	6	6	6	4		27
USER – 10	2	12	8	4	2		28
USER – 11	3	10	6		1		20
USER – 12	3	8	7	3	1		22
USER – 13	3	13	11	2	2		31
USER – 14	4	11	10	1	2	1	29
USER – 15	2	13	34	6	1	2	58
USER – 16	1	3	4	6	4	1	19
USER – 17	13	19	16	6	2	2	58
USER – 18	2	8	2	1	2	4	19
TOTAL	**69**	**184**	**152**	**67**	**38**	**14**	**524**

The above table shows that, User-17 had to highest number of planning statements and User-15 had highest number of monitoring statements. User-01 had least number of statements and no monitoring statement. User-15 and 17 had highest number of statements, 58 each. Though, it can be observed that, User-01 and 06 had no indiscretion statement, rest all the participants had expressed confusion at different time during their search task.

The findings of Table 5.5 reveal that User-01, 12 and 14, expressed only satisfaction. However, except the User-01, other two participants had 'indiscretion' statements while searching the OPAC. User-02, 09 and 16 had expressed confusion four times, each.

The Diagram 5.1 (Cross-references between phases in verbal protocol analysis) shows that, after planning of the search, 43 times the participants have defined their search, then 41 times they have monitored the search results, and 27 times evaluated the results. It can be observed that, after evaluating 12 times and after monitoring 19 times, the participants have started defining their search, again.

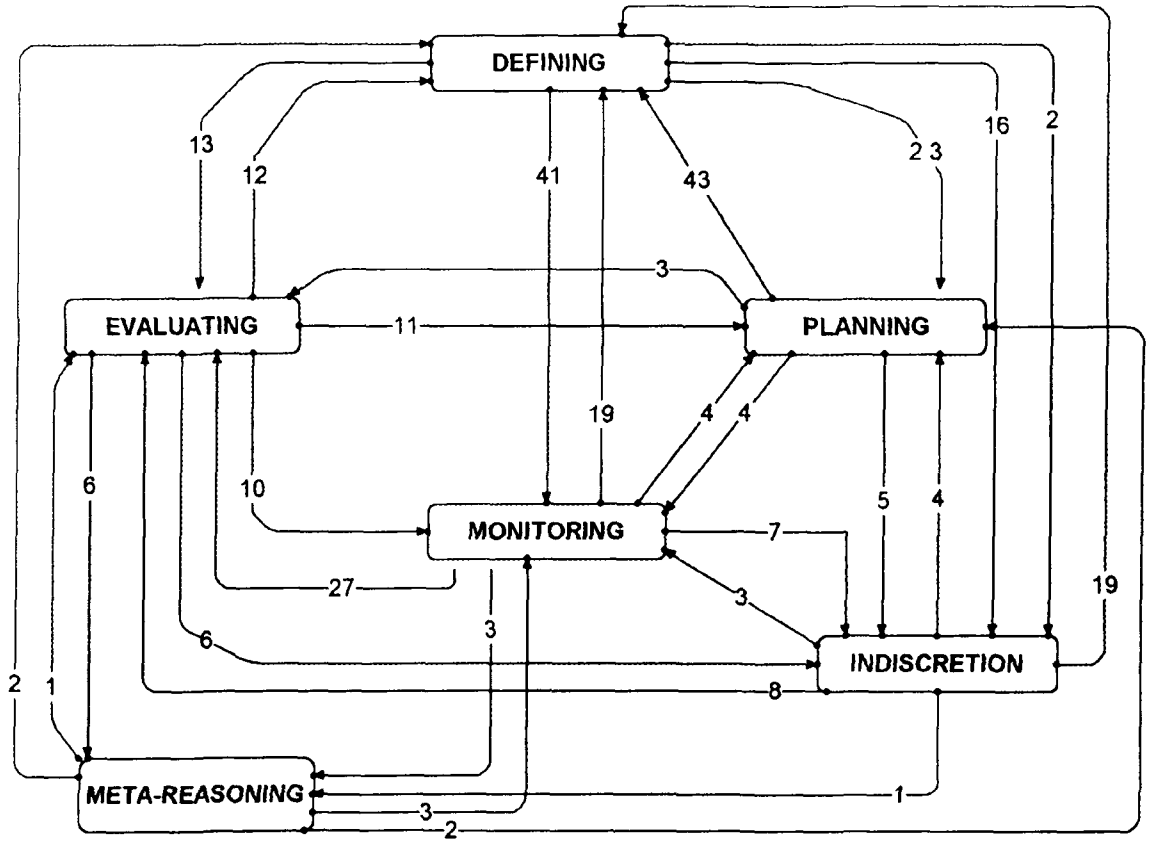


Diagram – 5.1 Cross-references between phases in verbal protocol analysis

The diagram has also revealed that, 7 times the participants were confused, and 19 times, after they felt confused, went back to the definitional statements. Similarly, 6 times they were confused while

evaluating. This diagram, therefore, substantiate the validity of the coding scheme proposed under Table 5.2. (Coding Scheme).

5.3 CONCLUSION

This chapter of analysis reveals that, those who have expressed satisfaction while using the OPAC system have not used the same for more that two years, whereas most of the participants who have expressed dissatisfaction have used the system for more that two years, as well as, most of them are Graduated and involved in different profession than studying at under-graduate level.

The analysis of the verbal protocol also resulted in the identification of coding scheme to analyse verbal protocol data. This simplified coding scheme is a representation of users' knowledge to use an Online Catalogue.

CHAPTER 6

COMPARISONS OF FINDINGS

CHAPTER 6

COMPARISONS OF FINDINGS

6.0 INTRODUCTION

To fulfil the objectives of the study and to test the hypotheses it was found necessary to compare the findings and results of both the research methods applied in this research. The two contrasting methods, applied in study, are Questionnaire Method, under the quantitative paradigm, and Verbal Protocol Method under the paradigm of qualitative research.

The findings of the questionnaire method has been analysed and presented in the Chapter – 4. The different background information of the participants has been also discussed in this chapter. The findings of the method has also been analysed against all of these background information. The similar guidelines has been maintained for the verbal protocol analysis also, and presented in the Chapter – 5.

6.1 COMPARISONS OF FINDINGS

In this chapter, the results of both the methods have been analysed against each influential background variable. The results and followed discussions of Table 4.16 (Correlations among Background Variables and OPAC search satisfaction variables) revealed that age, experience of OPAC under study, and professional status has high correlation with the

satisfaction and search performance, while using the OPAC. Therefore, these background variables have been selected to compare the results of 'satisfaction' data of the questionnaires and number of satisfaction / dissatisfaction and indiscretion protocols, collected by verbal protocol method.

6.1.1. AGE AND SATISFACTION OF USING THE OPAC

The Table 6.1 (Age and Comparison of the Satisfaction data collected by both the methods) has described below the differences of the outcomes of the methods.

Table 6.1 Age and Comparison of the Satisfaction data collected by both the methods

USER	AGE	SATISFIED (DATA COLLECTED BY QUESTIONNAIRE)	NO. OF SATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	NO. OF DISSATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	INDISCRETION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD
USER-01	15-30	To some extent	1	NIL	NIL
USER-02	15-30	To some extent	1	2	4
USER-03	15-30	To some extent	1	3	3
USER-04	15-30	To some extent	2	1	3
USER-05	55-60	To a very great extent	NIL	4	3
USER-06	15-30	To a great extent	NIL	NIL	NIL
USER-07	30-35	To some extent	NIL	2	3
USER-08	15-30	To some extent	NIL	11	1
USER-09	35-40	To a great extent	NIL	4	4
USER-10	15-30	To some extent	2	1	2
USER-11	15-30	To a great extent	NIL	NIL	1
USER-12	35-40	To some extent	3	NIL	1
USER-13	15-30	To a great extent	1	1	2
USER-14	30-35	To a great extent	1	NIL	2
USER-15	30-35	To a great extent	1	3	1
USER-16	Above 60	To a great extent	NIL	6	4
USER-17	55-60	To some extent	NIL	5	2
USER-18	15-30	To a great extent	NIL	NIL	2

The above table reveals a very interesting pattern of data. Before going into the details of the comparisons, it can be observed that out of 18 participants, 7 have responded to the item no. 15 of the questionnaire, asking "Are you satisfied with the OPAC" (please refer to Appendix-V), as, "To a great extent" another 7 opted for "To some extent" and one participant responded as "To a very great extent", and no one has responded as "To small extent" or "Not at all".

It can be observed that the User – 05, responded as "To a very great extent". However, the user have never expressed any satisfaction while performing the search task on the OPAC, rather expressed the dissatisfaction four times and thrice expressed confusion. It is to be noticed that the user belongs to the age group of 55-60.

In addition to User-05, User-16 and 17 belong to the age group of above 55 years. Item no. 15 was responded as "To a great extent" and "To some extent", by User-16 and 17, respectively. However, it is also to be observed that, none of these three participants had expressed satisfaction, and at same time they have expressed dissatisfaction and confusion, while performing the search.

There were total five participants, who belongs to the age group of 30 years and above, out of them User –09, 14 and 15 responded as "To a great extent". On the other hand, User-09 had no "satisfaction" protocol

and the rest two had one, each. However, all these participants were confused while searching the OPAC and User-09 and 15 had "dissatisfaction" protocols, too. Similarly the User –07, who also belongs to the same age group, responded to the item no.15 as "To some extent", had expressed dissatisfaction and confusion, rather than satisfaction.

It can also be found that, five out of all eight participants, who are above the age group of 30 years, had not expressed any satisfaction and had dissatisfaction and confusion while searching the OPAC.

Therefore, it can be concluded from this table that, though the Table 4.16 revealed that, there is positive correlation between age and satisfaction, which has not been articulated while actually doing the search.

6.1.2. EXPERIENCE OF THE OPAC AND SATISFACTION OF USING IT

The Table 6.2 (Experience of OPAC and Comparison of the Satisfaction data collected by both the methods) has described the findings pertaining to the number of years' experience of using the OPAC system under the study and their satisfaction variable. The results of both the methods have also been placed together to compare the findings.

Table 6.2 Experience of OPAC and Comparison of the Satisfaction data collected by both the methods

USER	EXPERIENCE OF THE OPAC	SATISFIED (DATA COLLECTED BY QUESTIONNAIRE)	NO. OF SATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	NO. OF DISSATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	NO. OF INDISCRETION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD
USER-01	Less than 1 yr	To some extent	1	NIL	NIL
USER-02	Less than 1 yr	To some extent	1	2	4
USER-03	Less than 1 yr	To some extent	1	3	3
USER-04	Less than 1 yr	To some extent	2	1	3
USER-05	2-3 yrs.	To a very great extent	NIL	4	3
USER-06	2-3 yrs.	To a great extent	NIL	NIL	NIL
USER-07	Less than 1 yr	To some extent	NIL	2	3
USER-08	Less than 1 yr	To some extent	NIL	11	1
USER-09	2-3 yrs.	To a great extent	NIL	4	4
USER-10	Less than 1 yr	To some extent	2	1	2
USER-11	2-3 yrs.	To a great extent	NIL	NIL	1
USER-12	Less than 1 yr	To some extent	3	NIL	1
USER-13	Less than 1 yr	To a great extent	1	1	2
USER-14	1-2 yrs.	To a great extent	1	NIL	2
USER-15	2-3 yrs.	To a great extent	1	3	1
USER-16	2-3 yrs.	To a great extent	NIL	6	4
USER-17	2-3 yrs.	To some extent	NIL	5	2
USER-18	2-3 yrs.	To a great extent	NIL	NIL	2

From the above table it can be observed that, total eight participants have used the LibSys OPAC of The British Council Library, Kolkata for 2 to 3 years and out of them, except the User-17, all have responded to the questionnaire that, they are satisfied with it "To a great extent". User-05 has even opted for "To a very great extent".

User-06 had not expressed satisfaction, dissatisfaction or confusion and can be considered that, the person had properly responded to the

questionnaire. Rest all seven participants have expressed confusion while using the OPAC, as the data revealed by verbal protocol analysis.

Four participants, namely, User-05, 09, 16 and 17, who have either responded as "To a great extent" or "To a very great extent", however, have never expressed their satisfaction and expressed dissatisfaction 4,4,6 and 5 times, respectively.

Therefore, it can be concluded, again, from this table that, though the correlation matrix of Table 4.16 showed the highest level of positive correlation between experience of using the OPAC and satisfaction, which means to say that, more use of the OPAC makes the users more satisfied, that has not been actually expressed while using the system.

6.1.3. PROFESSION AND SATISFACTION OF USING THE OPAC

The Table 6.3 (Profession and Comparison of the Satisfaction data collected by both the methods) presented the differences of the outcomes of the methods while considering Profession as a background variable.

Table 6.3 Profession and Comparison of the Satisfaction data collected by both the methods

USER	PROFESSION	SATISFIED (DATA COLLECTED BY QUESTIONNAIRE)	NO. OF SATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	NO. OF DISSATISFACTION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD	INDISCRETION PROTOCOLS COLLECTED BY VERBAL PROTOCOL METHOD
USER-01	U.G. Student	To some extent	1	NIL	NIL
USER-02	U.G. Student	To some extent	1	2	4
USER-03	U.G. Student	To some extent	1	3	3
USER-04	Others	To some extent	2	1	3
USER-05	Teacher/Lecturer/ Reader/Professor	To a very great extent	NIL	4	3
USER-06	U.G. Student	To a great extent	NIL	NIL	NIL
USER-07	Others	To some extent	NIL	2	3
USER-08	U.G. Student	To some extent	NIL	11	1
USER-09	Research Scholar	To a great extent	NIL	4	4
USER-10	U.G. Student	To some extent	2	1	2
USER-11	U.G. Student	To a great extent	NIL	NIL	1
USER-12	Others	To some extent	3	NIL	1
USER-13	U.G. Student	To a great extent	1	1	2
USER-14	Others	To a great extent	1	NIL	2
USER-15	Others	To a great extent	1	3	1
USER-16	Others	To a great extent	NIL	6	4
USER-17	Others	To some extent	NIL	5	2
USER-18	U.G. Student	To a great extent	NIL	NIL	2

From this table, it can be observed that, nine participants are involved in higher professional activities like, teaching, researching and different other jobs. Out of these nine participants, four have responded that the OPAC is "To some extent" satisfactory to them another four have opted for "To a great extent" and one has "To a very great extent" of satisfaction.

However, while comparing with the findings of the verbal protocol data it was found that, out of these nine participants, five have expressed their dissatisfaction and do not have any such protocol which can justify their

satisfaction, at any stage of the OPAC search process. It has been observed that, all these nine participants were confused, while performing their own search.

These findings has again helped to concluded that, though the computed correlation of Table 4.16 showed the high level of positive correlation between *professional status and satisfaction, the verbal protocol data has* revealed that, such relation does not exists.

6.2 TESTING OF HYPOTHESES

A total of nine background variables were identified and are listed in the section II of the questionnaires names as 'Personal Data'. These background variables 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.

In order to test the null hypothesis, H_o *"Conditions remaining the same, both qualitative and quantitative methods provide equally efficient tools to analyses and interpret the need of the users",* data were collected through the questionnaire method and verbal protocol method. Based on the questionnaire, the correlation, among the background variables and OPAC Usability Evaluation Variables, were computed and presented in the Table 4.16 (Correlations among Background Variables and OPAC search

satisfaction variables) and Table 4.17 (Partial correlations between some background variables and OPAC search satisfaction variables) and it was found that highest level of correlation (r=.723, significant at the 0.01 level [2-tailed]) and partial correlation (partial correlation=.7402 significant at the 0.01 level [2-tailed]) exist between the satisfaction of using the OPAC and the experience of using it.

The verbal protocol data, which has been collected at the time when participants were actually using the OPAC, were compared with the findings of the questionnaire data and presented in the Table 6.2 (Experience of OPAC and Comparison of the Satisfaction data collected by both the methods). It was found that out of eight participants, who have used the OPAC under study for 2 to 3 years, seven have expressed confusion, while using the system, and five participants have not expressed dissatisfaction and they made no protocol towards satisfaction.

In the similar way, the Table 4.16 and Table 4.17 revealed that positive correlation (r=.433, significant at the 0.10 level [2-tailed]) and partial correlation (partial correlation= .5755 significant at the 0.10 level [2-tailed]) also exist between profession and satisfaction of using the OPAC. The Table 6.3 (Profession and Comparison of the Satisfaction data collected by both the methods) has presented the comparisons of the findings of both

the methods and it was revealed that out of the nine participants, who have higher professional status, five have expressed their dissatisfaction and do not have any such protocol which can justify their satisfaction, at any stage of the OPAC search process. It has been observed that all these nine participants were confused, while performing their own search.

It was also observed from the Table 4.16 that, positive correlation exists between age and satisfaction of using the OPAC. The Table 6.1 (Age and Comparison of the Satisfaction data collected by both the methods) however, has revealed that, five out of all eight participants, who are above the age group of 30 years, had not expressed any satisfaction and had dissatisfaction and all these eight participants were confused while searching the OPAC.

It has been observed from the above analysis that, though both the methods were applied to the same group of users and under same condition, like on the same online catalogue system, same library, etc. the questionnaire method has could not reveal the actual satisfaction or dissatisfaction of the participants, which however was revealed by the verbal protocol method. This suggests that the verbal protocol method generates richer source of data than questionnaire method and could also focus on underlying thoughts of the users.

From the above discussions we conclude that Verbal Protocol Method (Qualitative Method) is more revealing about the actual satisfaction of individual users as compared to Questionnaire Method (Quantitative Method). Therefore, it will be safe to say that Verbal Protocol Method is an efficient tool to analyze and interpret the needs of the users as compare to Questionnaire Methods. However, in order to generalize the statement more studies need to be conducted.

6.3 CONCLUSION

From the above analysis it can be concluded that, the context and user-centred approach of the qualitative method, especially of the Verbal Protocol Method, has helped to analyse and interpret the satisfaction, dissatisfaction and confusions of the online catalogue users, more vividly. Though, it was observed from questionnaire data that, experience of OPAC has substantial influence on the users satisfaction, the verbal protocol data has revealed that, most of users have actually expressed their dissatisfactions and were confusions, while using the Online Catalogue.

CHAPTER 7

CONCLUSIONS

CHAPTER 7

CONCLUSIONS

7.0 INTRODUCTION

The present era have experienced an enormous production and availability of Library Automation Software. These software are always required to be supported with an Online Catalogue module and the latest trend in this field is that, these artifacts are also supporting the Web-OPAC facility, by which the library catalogue can be browsed over Internet.

Though most of developed countries have automated their libraries well back by early and mid 1980s, libraries in country like India, of course with few exceptions, have just joined in the automation movement. This particular scenario has ignited the software production houses to produce many new library automation software, especially in India. Slim++ (System for Library Information Management, a product of Algorhythms, Pune, India), SOUL (Software for University Libraries, developed by INFLIBNET, Ahmedabad, India), TLSS (Total Library Software Systems, developed by I.T. Solutions Pvt. Ltd., New Delhi, India) and LibSys (a product of LibSys Corporation, New Delhi, India), to name a few. Though LibSys is in the market for last one decade or so, they have recently added the Web-OPAC feature.

Consequently, techniques to investigate how the users of these OPACs search and satisfy themselves must be available to the librarians and information professionals, in order to ensure the implementation of these software, in their libraries. This research, summarized by this dissertation, has begun to address this need by extending the previous work accomplished in a number of disciplines, ranging from Ergonomics to Human Computer Interactions.

7.1 RESEARCH SUMMARY

Specifically, this dissertation has outlined how information collected by the users during the execution of OPAC search, whether they feel satisfied or dissatisfied or become confused.

To fulfill the objectives of the study and to test the hypotheses, two contrasting methods applied in the study are Questionnaire Method, under the quantitative paradigm, and Verbal Protocol Method under the paradigm of qualitative research. The finding of these two methods was analyzed separately and subsequently the findings of the both the methods were compared.

The inter-correlation analysis of quantitative data of the OPAC search satisfaction and the background variables revealed that, with the

improvement of educational qualification, higher professional status, and most importantly, with more experience of the OPAC, the users found the system more satisfactory and user friendly, as well as, followed the instructions, better; understood the layout, easily; retrieved thorough information, quickly. Users with higher educational qualifications and higher professional status, use more online catalogues and opt for multiple libraries to fulfil their information needs. It was also revealed that the users of the OPAC feel satisfied, not only when the layout is better, but also when it is user-friendly, responsive to their search, suitable for their purpose, quick to retrieve thoroughness and up-to-dated information.

However, while analyzing the qualitative data, it was observed that more detailed information about the searching process could be revealed with the help of Verbal Protocol Method.

While comparing the findings of both methods, it was found that the context and user-centred approach of the Verbal Protocol Method, has helped to analyze and interpret the satisfaction, dissatisfaction and confusions of the online catalogue users, more in detail. It was observed from questionnaire data that, experience of OPAC has substantial influence on the users satisfaction, the analysis of verbal protocol data, however, has indicated that, most of users have actually expressed their dissatisfactions while using the OPAC system.

This piece of work has reached to a conclusion that Verbal Protocol Method can be successfully used to assess the users' satisfaction while searching an OPAC system.

The main contribution, of this work, is the implementation of the verbal protocol method for analyzing the OPAC users' satisfaction. While implementing the methodology, this study has developed a scheme of coding (please refer to Table 5.2).

With the help of this scheme the verbal protocol data were analyzed and a generic model of Online Catalogue Searching Process Flow could be developed and presented below as a diagram (Diagram 7.1 Online Catalogue Searching Process Flow).

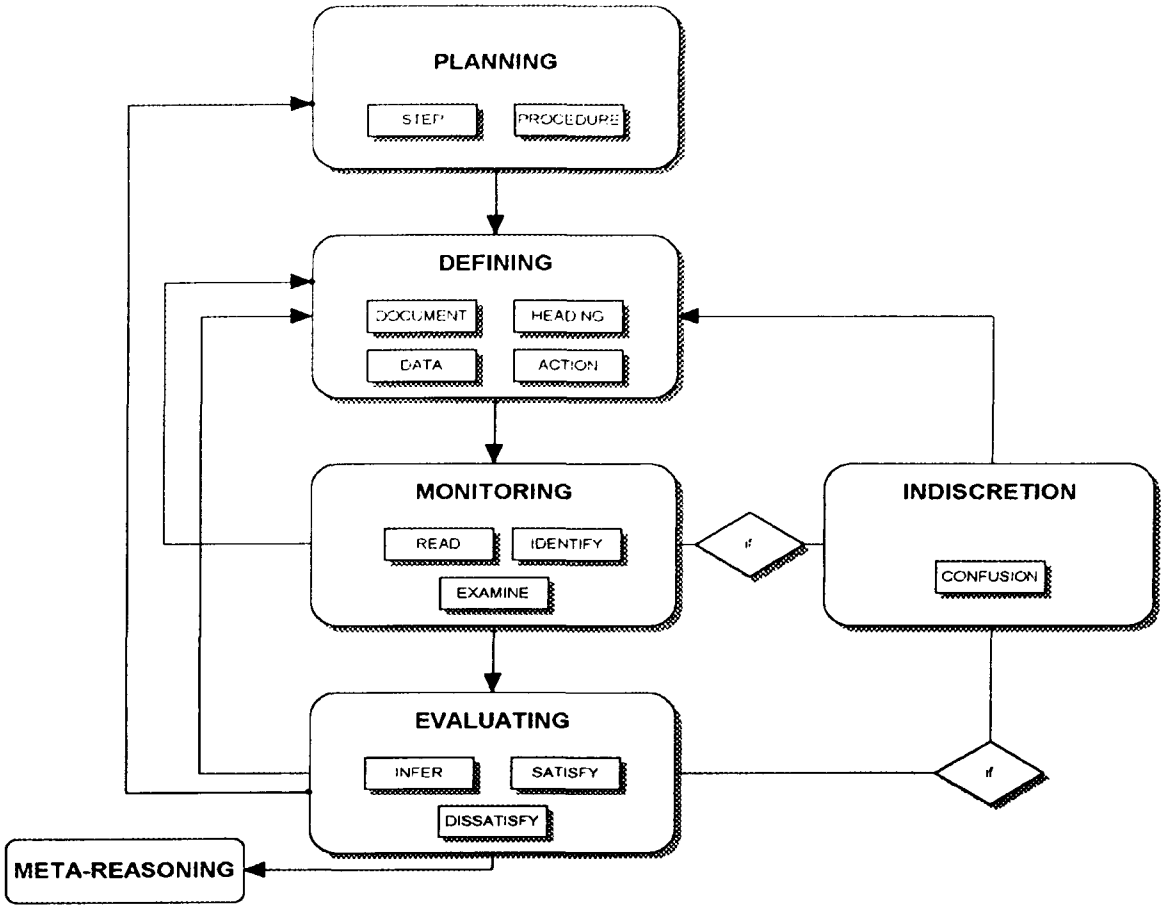
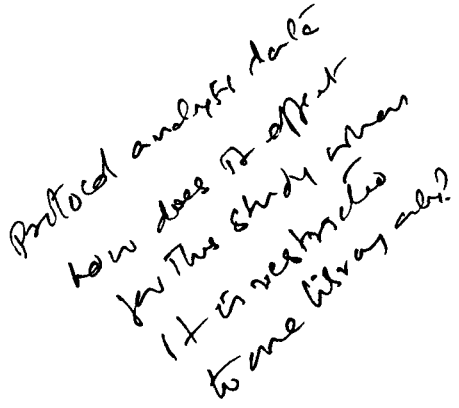


Diagram 7.1- Online Catalogue Searching Process Flow

This model explains how the online catalogue users conduct their searches. They start with a planning of a step or procedure, then define the type of document they are looking for under which access point, and what document, as well as, action involved in conducting the search. The results of the search then monitored by reading, identifying and examining. After monitoring they may go back to defining process again and conduct further search. However, generally after monitoring they try to evaluate by inferring and may evaluate the results as satisfactory or dissatisfactory.


Protocol analysis data
How does it affect
for This study when
It is restricted
to one library only?

After evaluation they may start another planning process or defining the next search. If they feel confused, at the stage of monitoring and evaluating, defining process starts again. This model can be used to analyze the verbal protocols data, to assess the users' satisfaction, while they conduct searches on an electronic information retrieval system to gather information.

7.2 DRAWBACKS

This study, however, has some drawbacks also. Three types of drawbacks were identified: infrastructure related, methodology related and environment related.

7.2.1 INFRASTRUCTURE RELATED DRAWBACKS

During the last one decade few specialized protocol analysis software have come into existence, like PAW (Protocol Analysis Workbench) developed by C. Fisher, and MacSHAPA by P. Sanderson. Both of these software works on Apple Macintosh environment, only. These are not easily available in the market, also. If any of these could be used, the analysis process would have save substantial amount of time. In absence of these, the time consuming manual analysis has been done. Though a special feature of SPSS for Windows ver.10.1.4, called "Read text data" has been used to lessen the burden to draw the bar-diagram.

11. If video recordings are taken, how / what the researcher would like to do?

Another infrastructure related problem was that, it would have been better if the verbal protocol data could be collected by the video recordings, instead of the audio recordings. However, it was beyond the means of this researcher to get that kind of data. To over come that, minuet observations were made, while the users are performing the search and a note book, for each step, was maintained.

7.2.2 METHODOLOGY RELATED DRAWBACKS

The main objective of this study was to assess the usability of qualitative research method, to be precise, of Verbal Protocol Method. Therefore, data were collected from 18 participants, which was good enough for this method, however it was felt that, for the statistical analysis of data collected by questionnaire method, the sample size was small.

Another methodology related problem is associated with the verbal protocol method, itself. The major disadvantage of the verbal protocol method is that, it is time-consuming. Another disadvantage is the likelihood that the method of study has some impact on the behaviour under observation.

7.2.3 ENVIRONMENT RELATED DRAWBACKS

It was felt at the research designing stage that the screens capture technique should be used, to see the movements of cursor and the OPAC screen. However, it was not possible to implement the same, as because

all the OPAC terminals of The British Council Library were hosted on dummy terminals. Therefore, screen capture software could not be loaded.

7.3 SUGGESTIONS AND FUTURE DIRECTIONS

The findings of this research have academic and practical values. The verbal protocol method, which is new to Library and Information Science, has been successfully used in the field of Ergonomics, Marine Navigation, Aircraft Traffic Controlling and Human Computer Interactions. This method helps to evaluate and assess the clients or users' need, satisfaction, problems, difficulties, etc. The library professionals are also trying to assess the same for quite a long time, by now. This method will help them to understand the library users, better.

This method offers great potential while designing library web pages, intranets and customized interfaces for various library databases.

This research suggests that further research should be conducted with the help of qualitative methods and especially with verbal protocol method, to find how people find and retrieve information on the Internet and even how do the library users locate a particular piece of information from a book, journal or other library material.

A series of research can also be conducted on different aspects related to electronic information retrieval systems, like Web-OPACs, in-house

databases, library automation software and its interface aspects and a generalized model of information searching process can be developed.

It is also suggested to have, at least one, centralized laboratory in India, for this purpose, which shall be well equipped with all necessary software and hardware infrastructure. If such arrangement and series of research can be done, it will not be difficult for the Library and Information Science professional to understand and satisfy their users.

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APPENDICES

APPENDIX – I

Letter of Request to British Council Division

To:
Dr. Indrani Bhattacharyya
Manager
The British Council Division
British Deputy High Commission
5, Shakespeare Sarani
Kolkata 700 071, India

Date : 15.10.2001

Sub: Data Collection for my Research Work.

Respected Madam,

I am a registered Ph.D. Scholar of North Eastern Hill University, Shillong and the name of the project is **"Use of Qualitative Research Method in Online Search: as assessment"**. As part of the project, I need to do a small experiment on the OPAC Search Behaviour of the Library Users.

We found that your library is one of the most well organised and automated libraries of Eastern India and therefore selected your library as most suitable for the purpose. I, therefore, humbly request you to allow me to conduct the experiment. If allowed, I would like to conduct the programme from 16.11.2001 to 30.11.2001.

The experiment will involve a small interview session while the library users are searching the OPAC and the proceedings will be audio-taped. The methodology will be used for this purpose is known as **Verbal Protocol**. A small Questionnaire will also be distributed amongst the interviewed users. The total size of the sample will be about 25 to 30 only.

Expecting your kind permission.
Thanking you,
Yours truly,
Tamal Kumar Guha

Note: Presently I am working as Assistant Librarian at IIT Guwahati. My postal address and other contact information are given below for your kind information.

APPENDIX – II

Initial acceptance of the proposal

From: Indrani.Bhattacharyya@in.britishcouncil.org

To: TAMTAMIN@YAHOO.COM

Subject: Your enquiry

Date: Tue, 20 Oct 2001 13:59:15 +0530

Dear Mr Guha

Thank you for your enquiry. We are considering your proposal and will get Back to you soon.

Incidentally I am Ms Bhattacharyya and not Dr Bhattacharyya as mentioned in your mail

Indrani Bhattacharyya(Ms)

APPENDIX – III

ACCEPTANCE LETTER OF THE PROPOSAL

From: Indrani.Bhattacharyya@in.britishcouncil.org

To: tamtamin@yahoo.com

CC: Monali.Paladhi@in.britishcouncil.org,
Aparna.Bhattacharya@in.britishcouncil.org

Subject: RE: Thank you

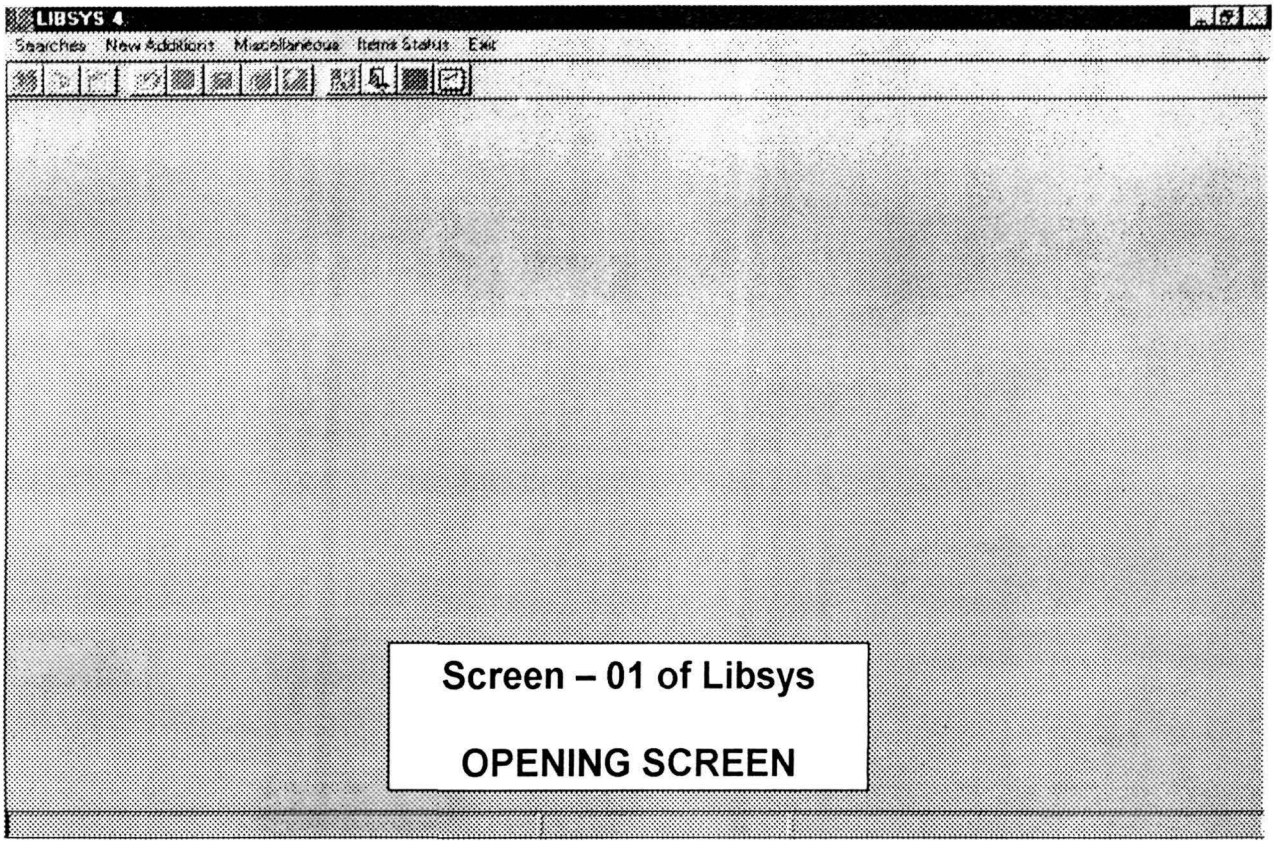
Date: Wed, 23 Oct 2001 14:31:38 +0530

Dear Mr Guha

We are pleased to inform you that our Director has agreed to your proposal. However please note that during the period of the survey our members should not be inconvenienced in any manner and they will be under no compulsion to respond to your enquiries. You are requested to contact us in early November before you actually come to the library and notify the exact duration of your stay in our premises. For security reasons you will be asked to produce valid photo-identification documents for entry to our premises. Do carry all necessary identification documents including your valid University Identity Card with you.

With best wishes
Indrani Bhattacharyya(Ms)

APPENDIX – IV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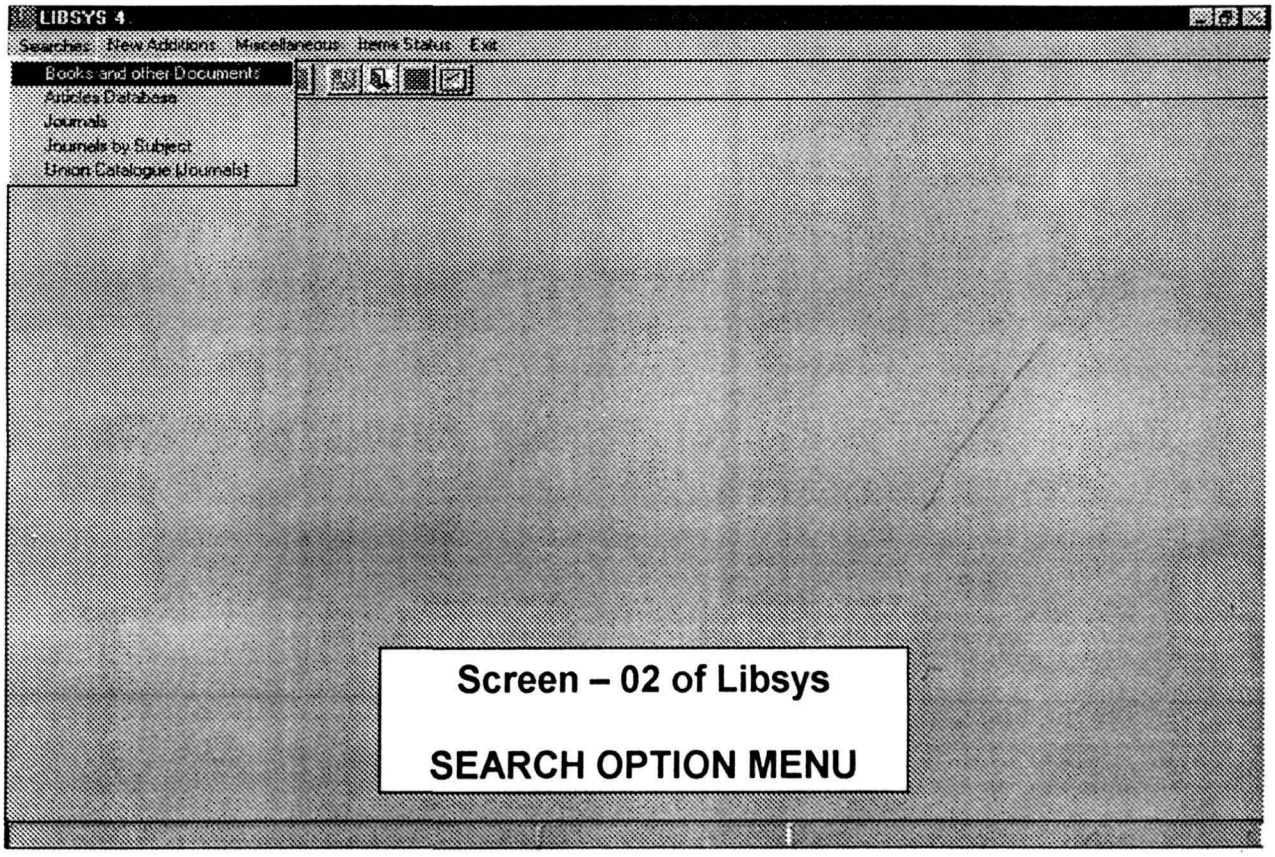
OPENING SCREEN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Searches New Additions Miscellaneous Items Status Exit
Books and other Documents
Articles Database
Journals
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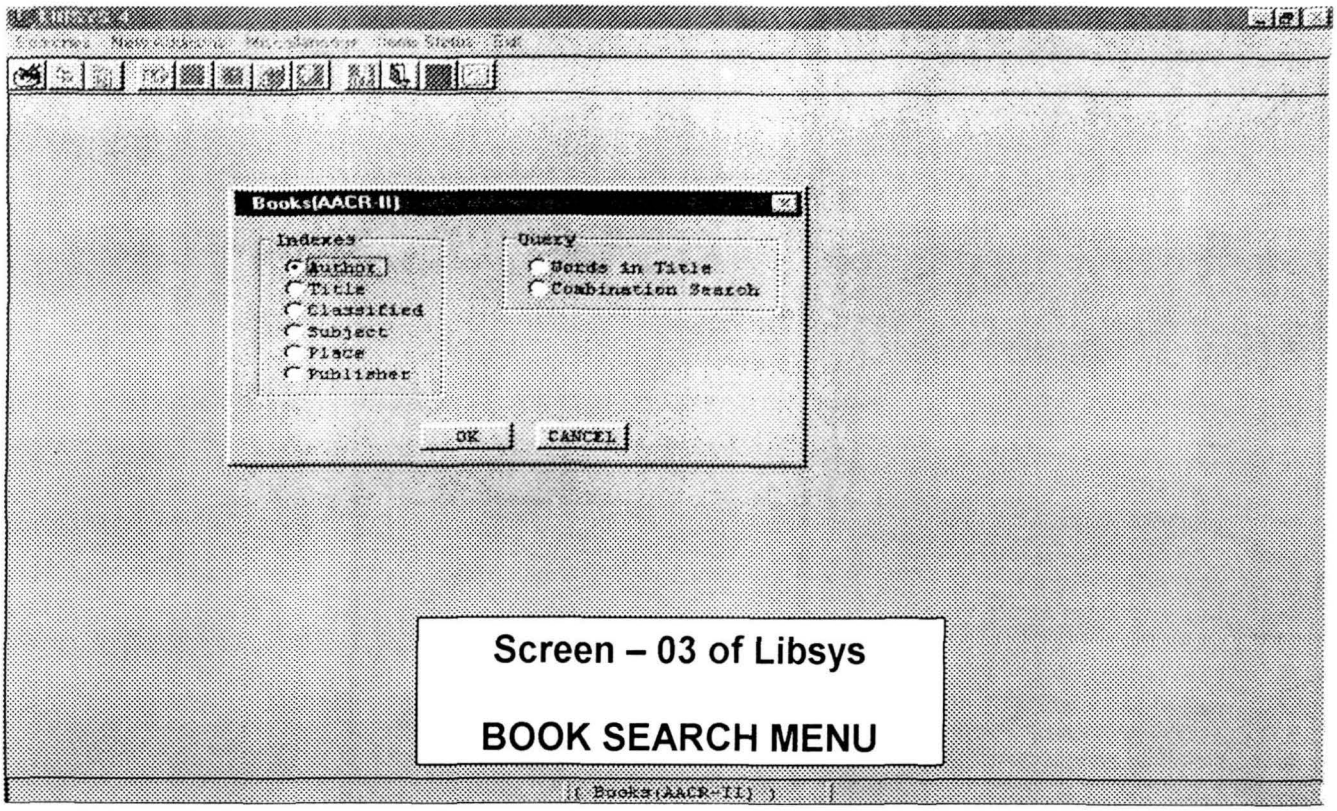
Union Catalogue (Journals)
Screen – 02 of Libsys
SEARCH OPTION MENU

APPENDIX – IV



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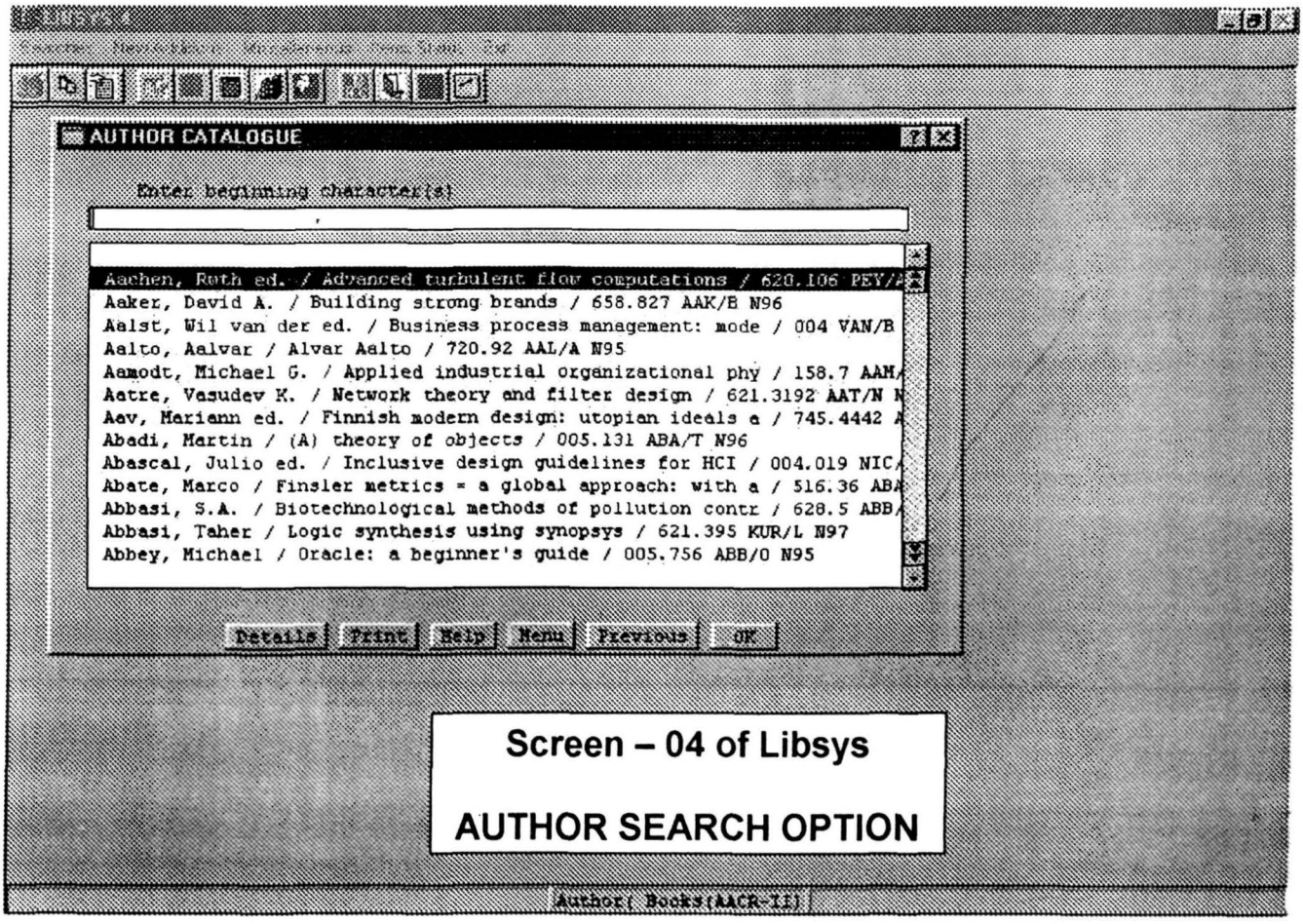
BOOK SEARCH MENU



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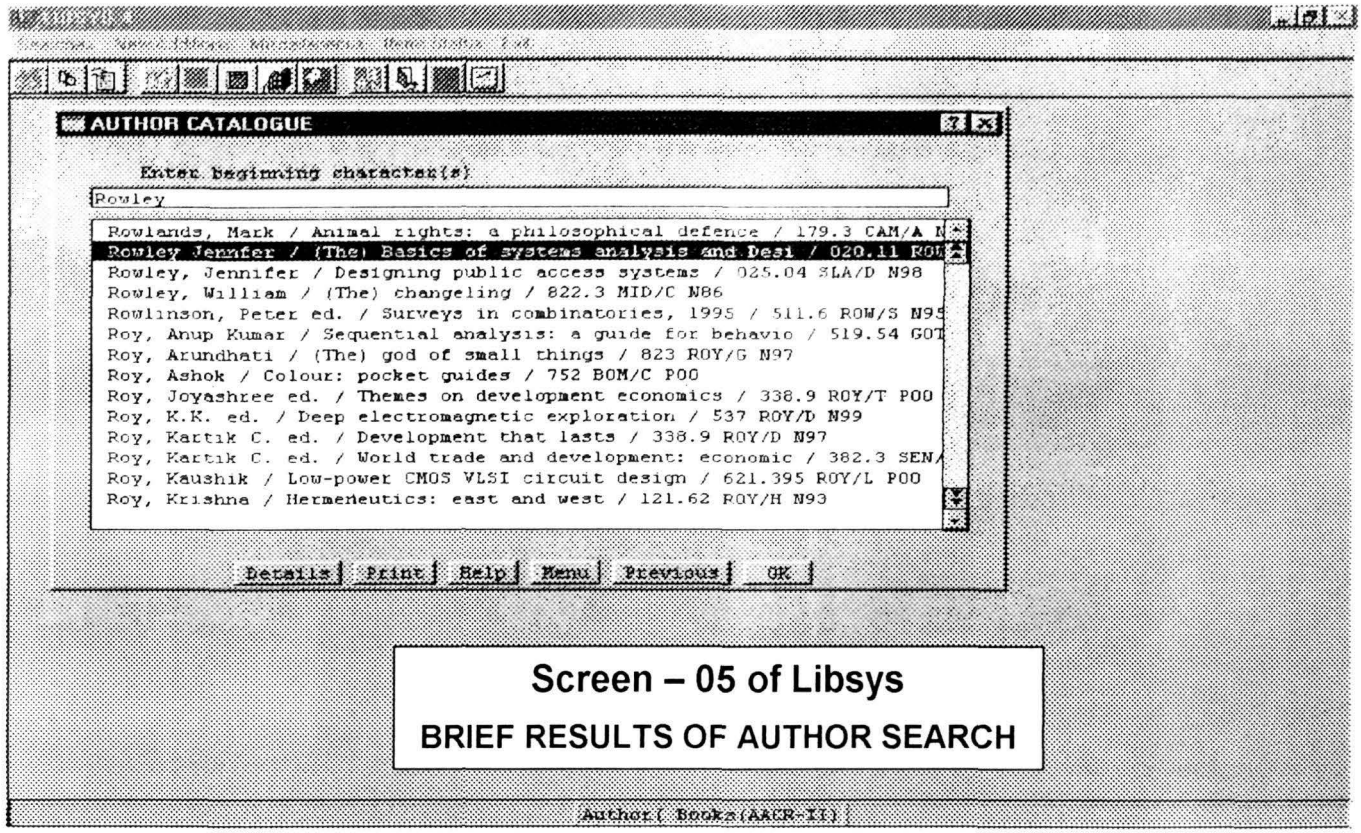
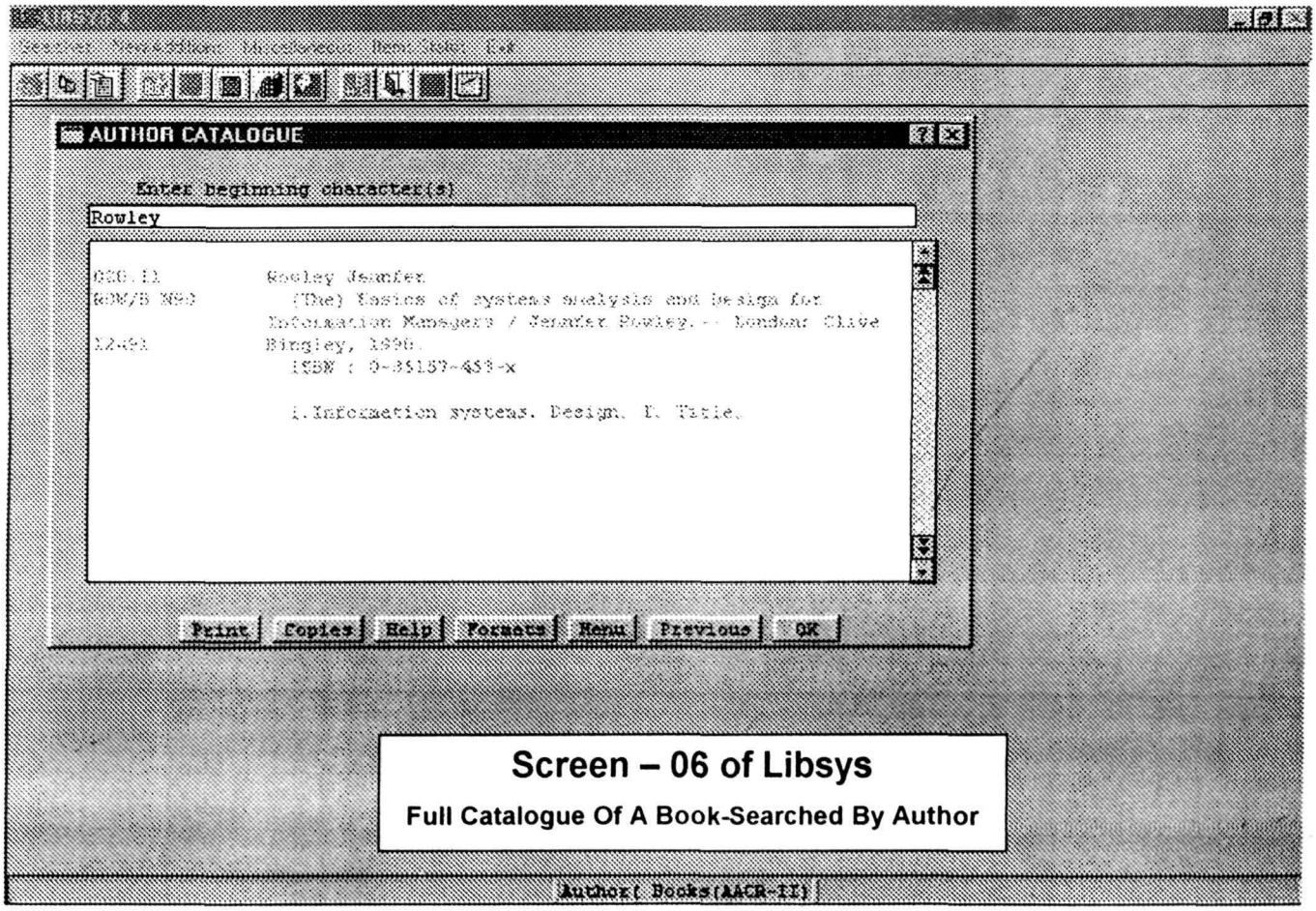
AUTHOR SEARCH OPTION

APPENDIX – IV



Screen – 05 of Libsys

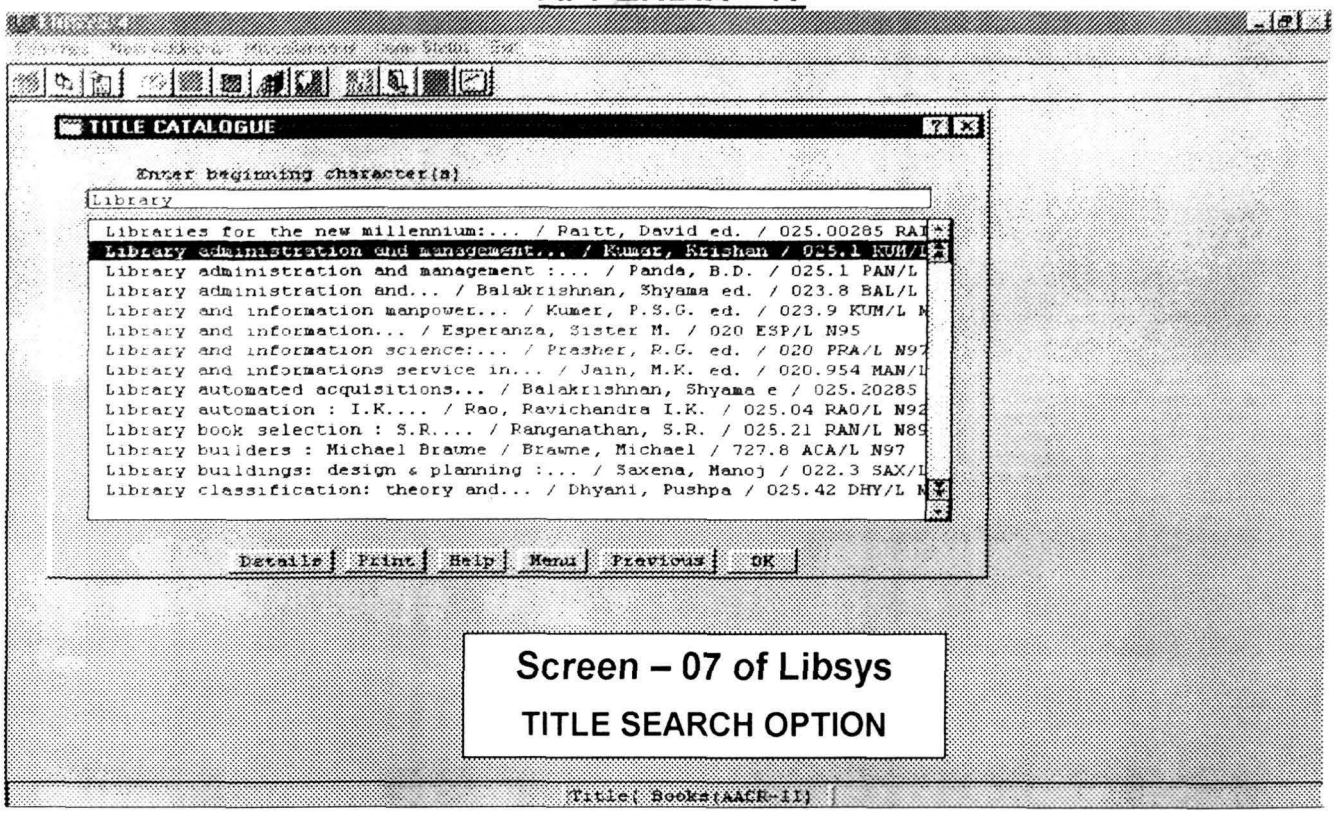
BRIEF RESULTS OF AUTHOR SEARCH



Screen – 06 of Libsys

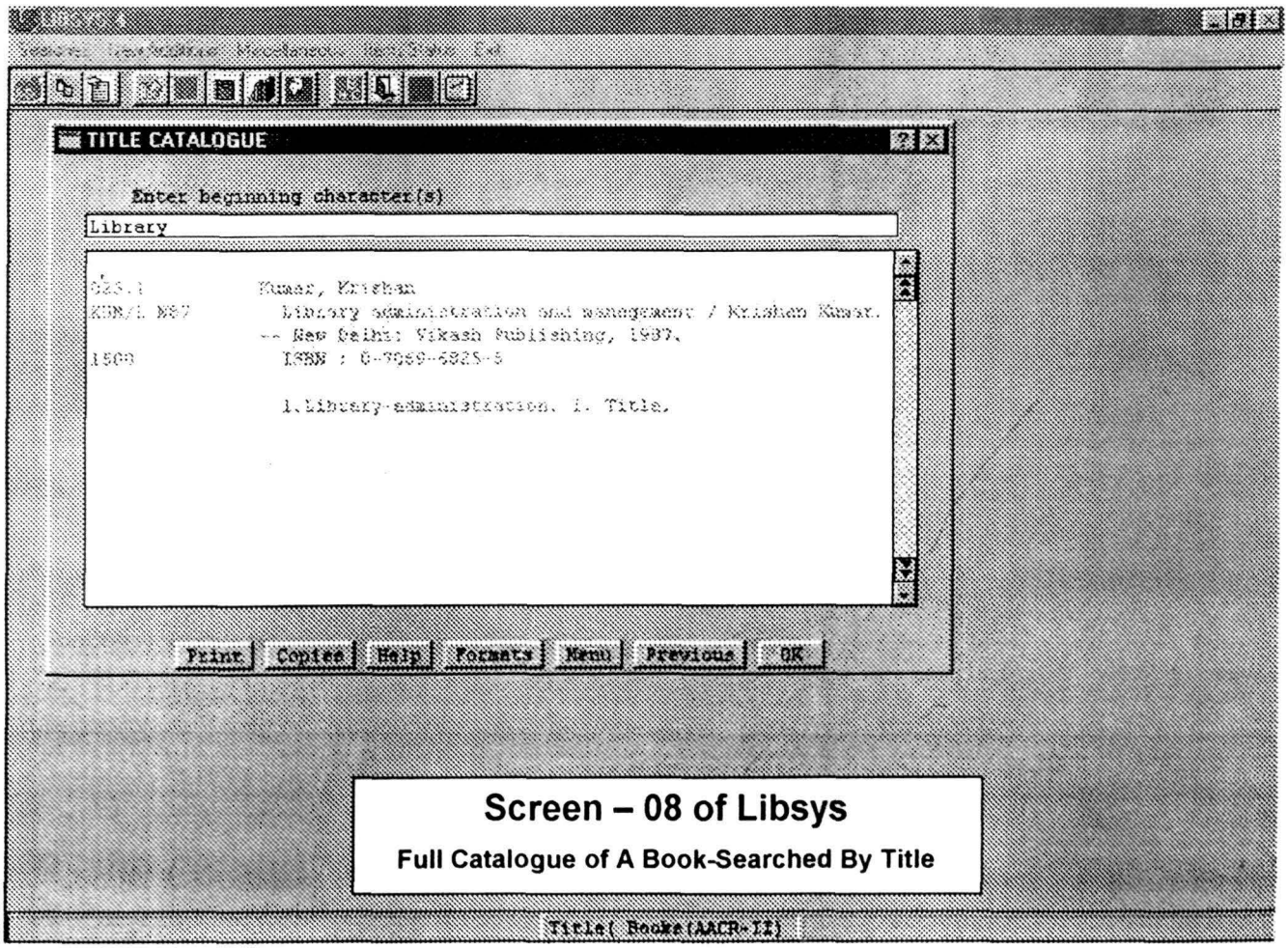
Full Catalogue Of A Book-Searched By Author

APPENDIX – IV



Screen – 07 of Libsys

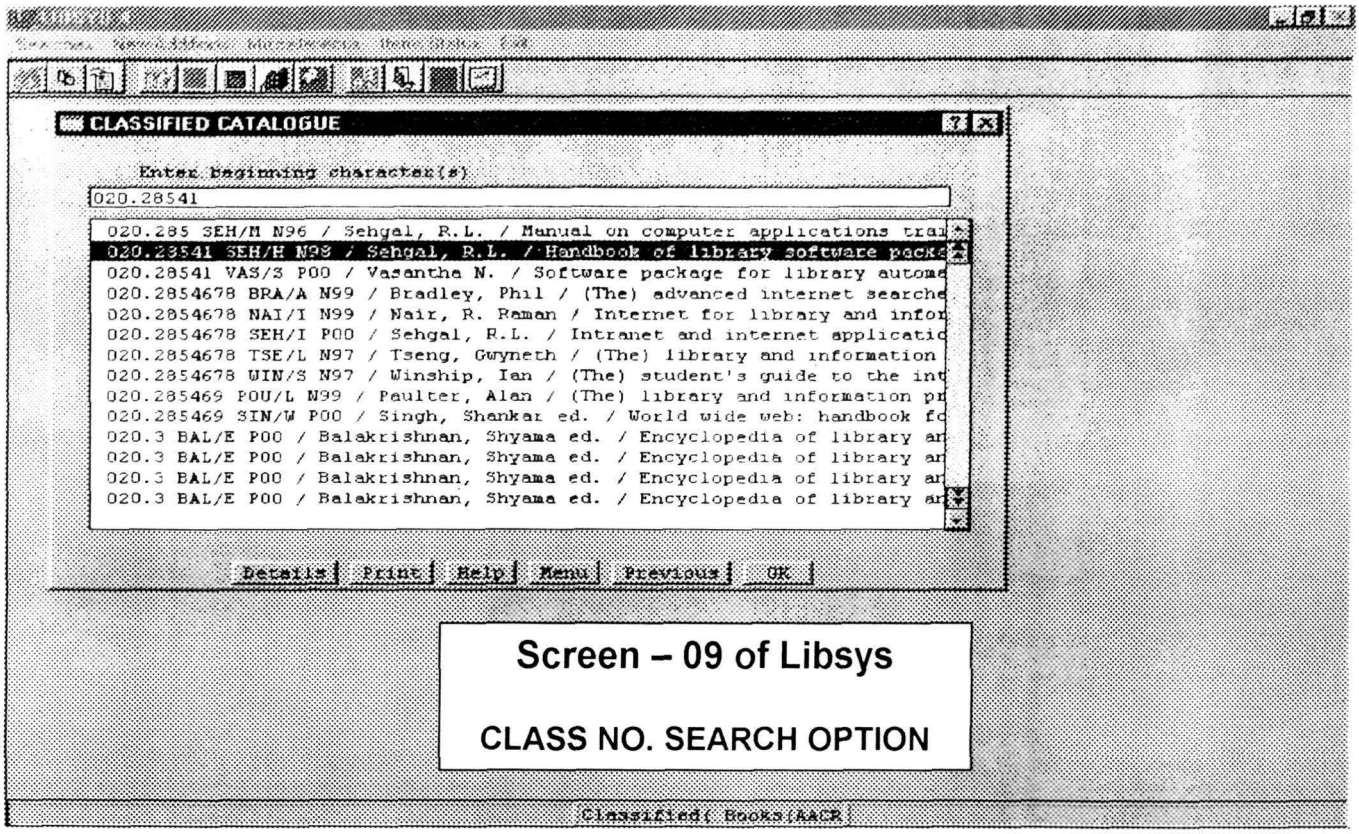
TITLE SEARCH OPTION



Screen – 08 of Libsys

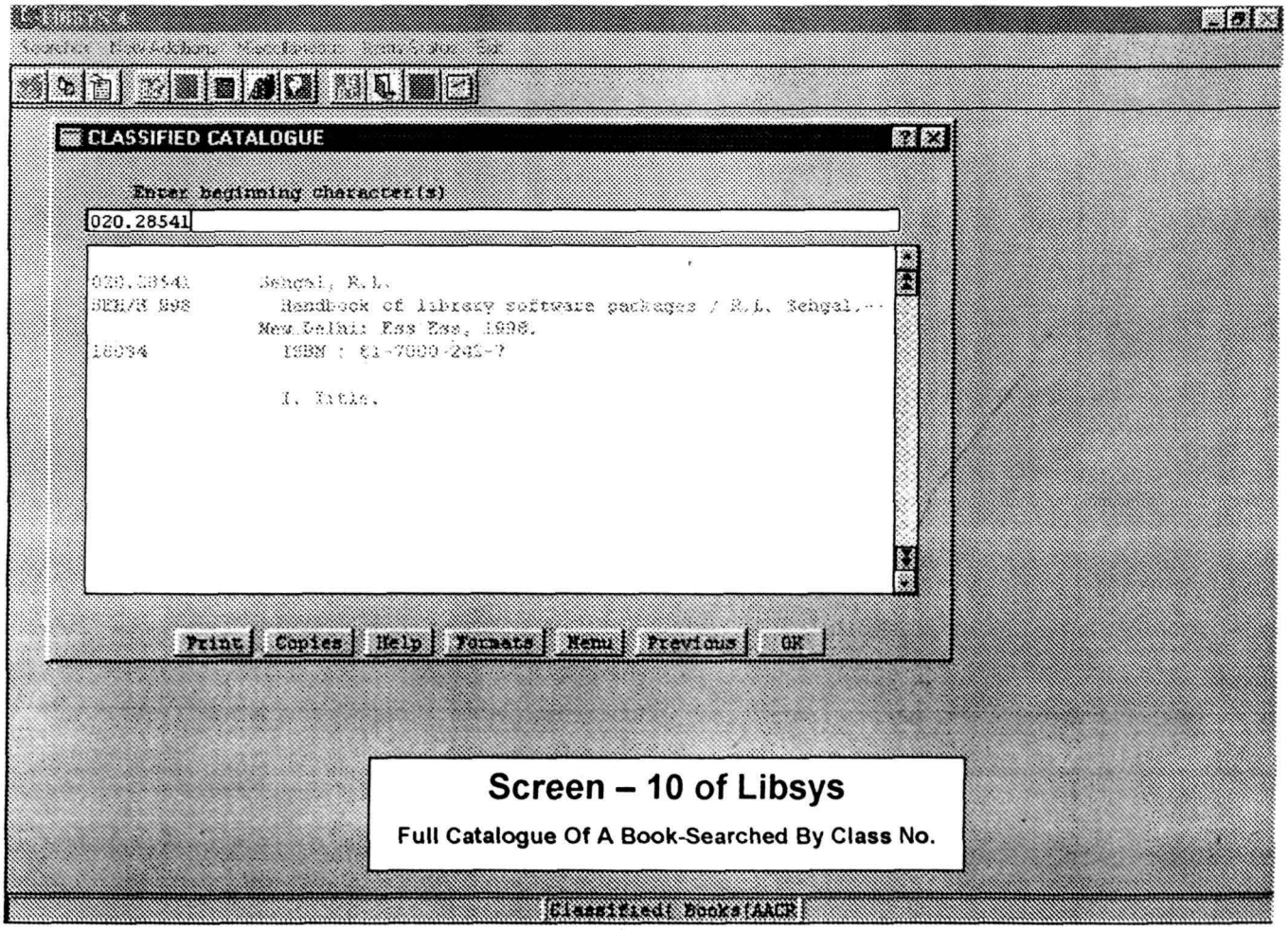
Full Catalogue of A Book-Searched By Title

APPENDIX – IV



Screen – 09 of Libsys

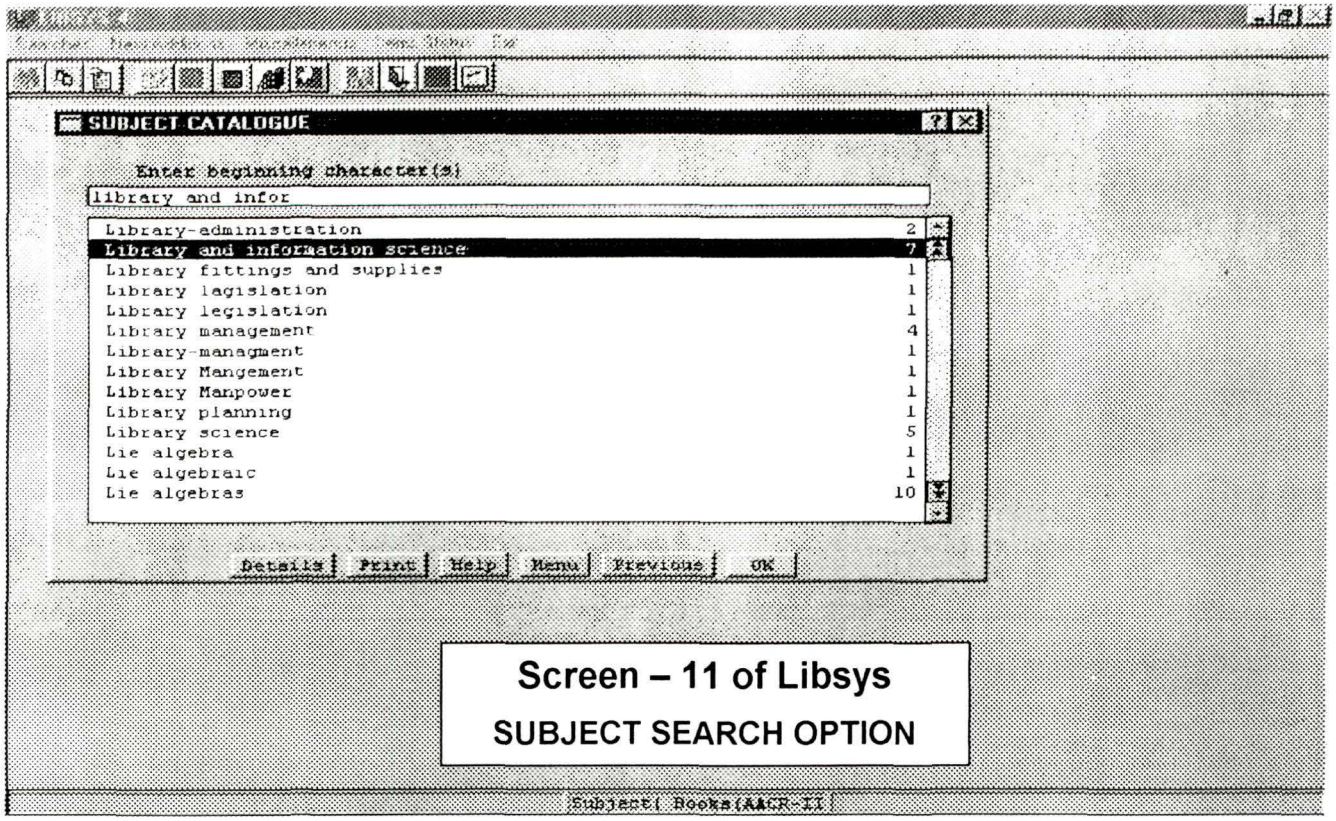
CLASS NO. SEARCH OPTION



Screen – 10 of Libsys

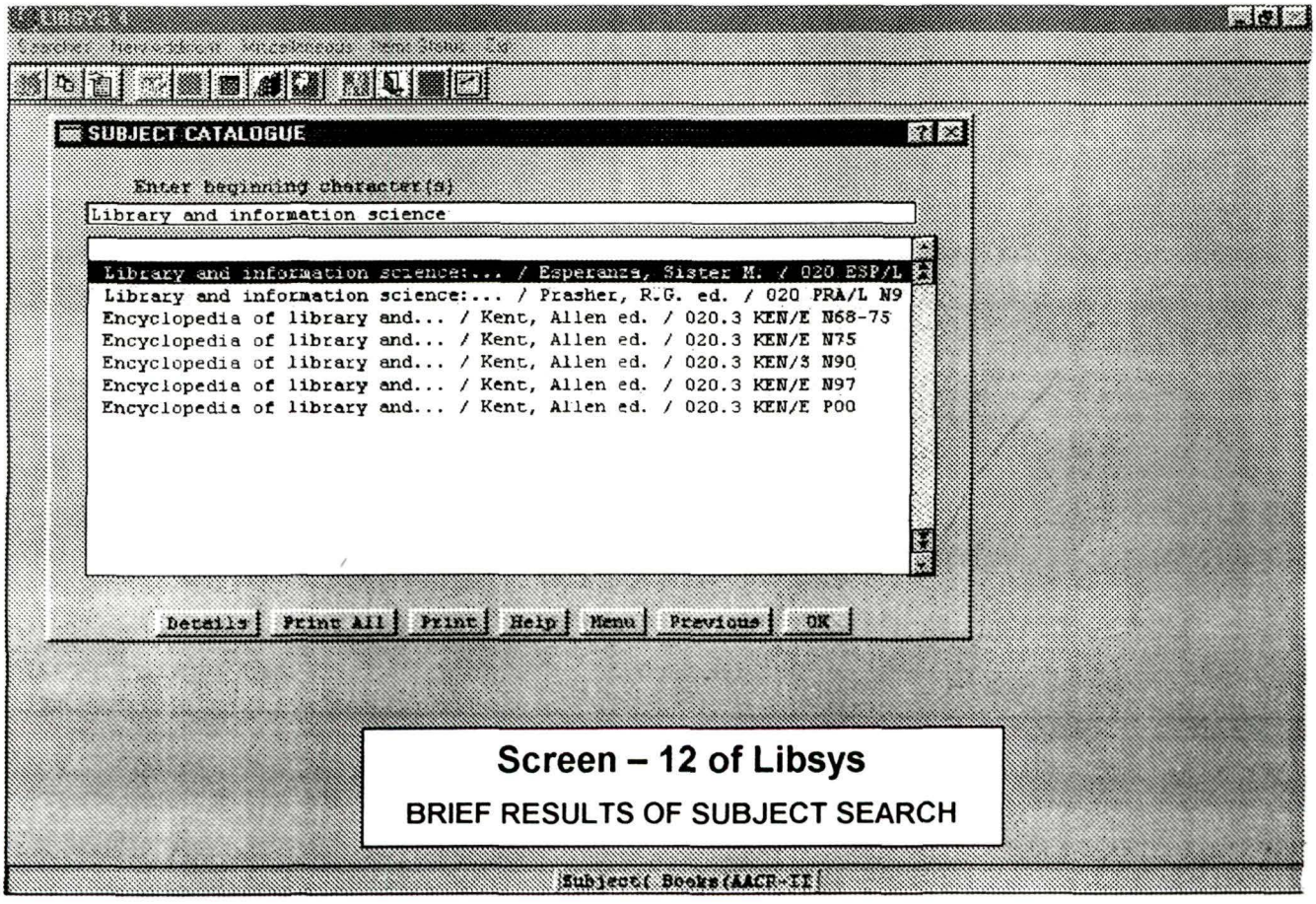
Full Catalogue Of A Book-Searched By Class No.

APPENDIX – IV



Screen – 11 of Libsys

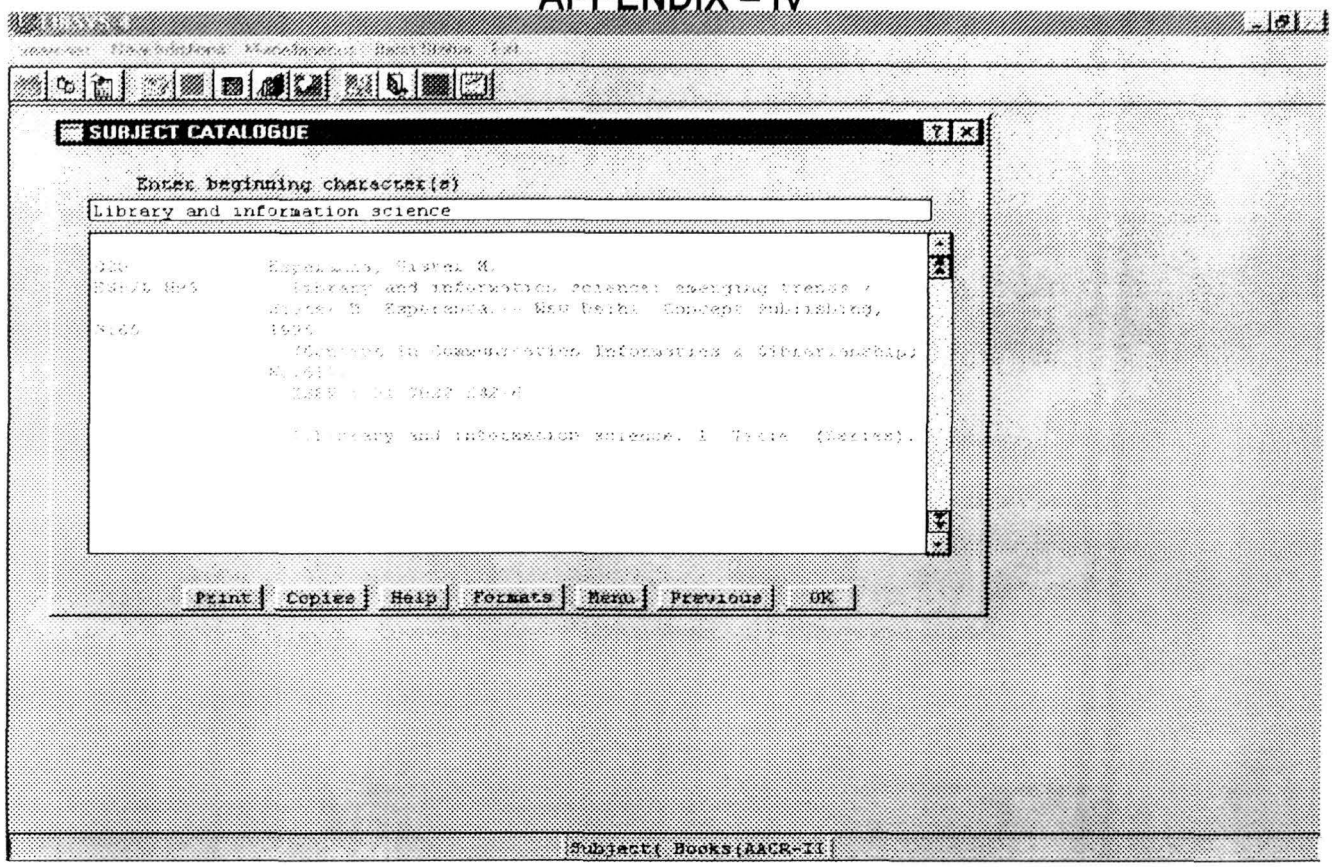
SUBJECT SEARCH OPTION



Screen – 12 of Libsys

BRIEF RESULTS OF SUBJECT SEARCH

APPENDIX – IV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Library and information science
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Formats
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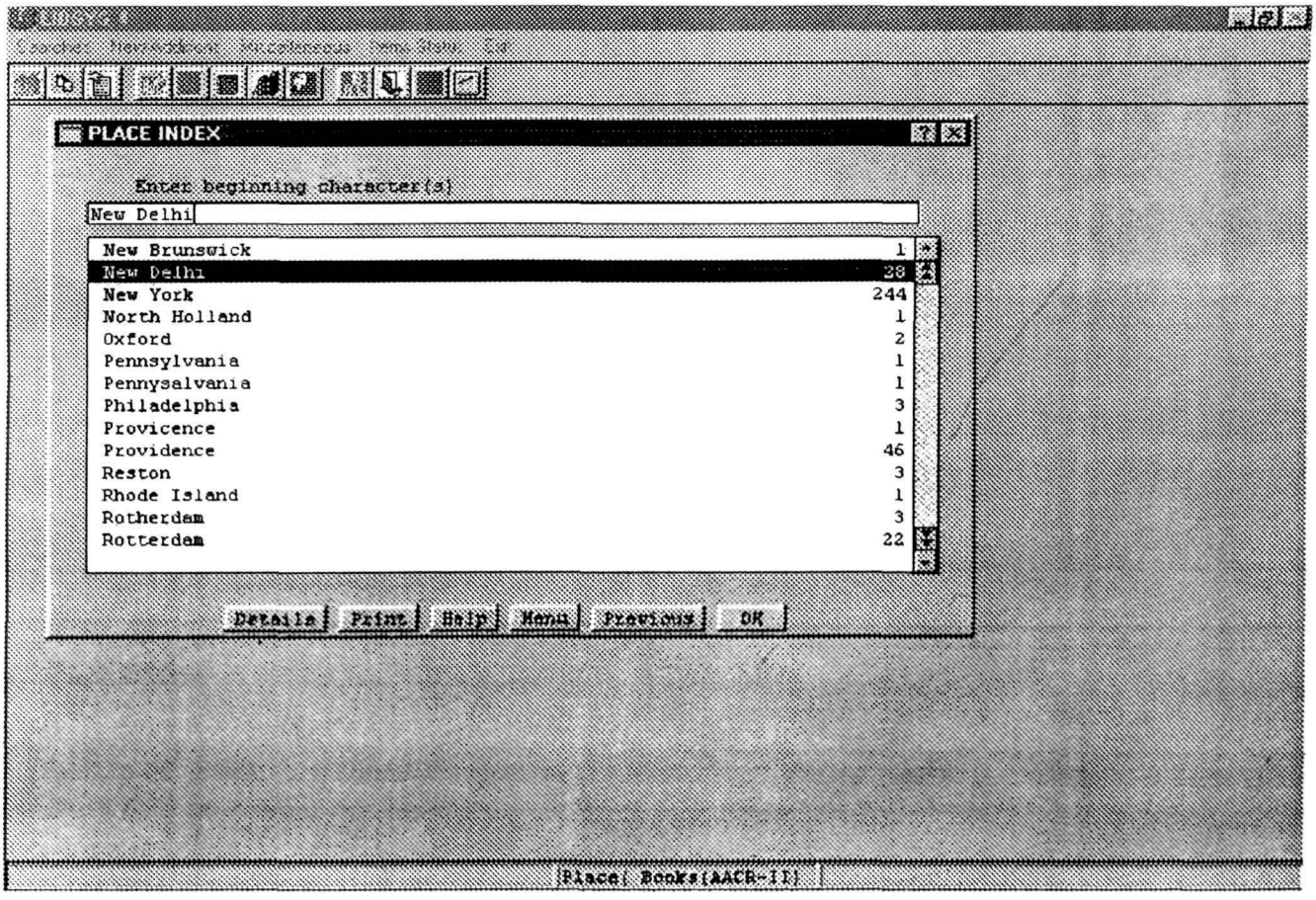
Subject(Books(AACR-II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New York 244
North Holland 1
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Pennsylvania 1
Pennysalvania 1
Philadelphia 3
Provicence 1
Providence 46
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Rotherdam 3
Rotterdam 22
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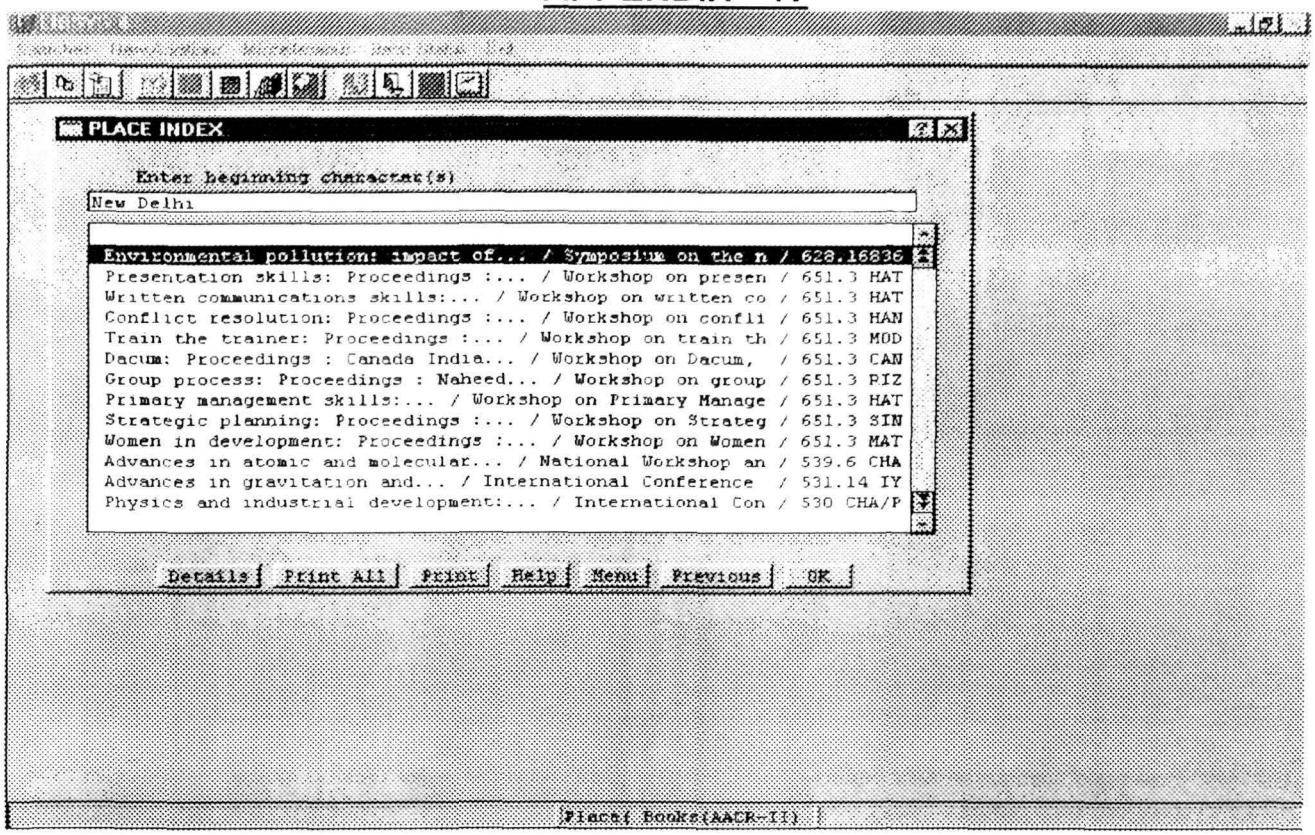
APPENDIX – IV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Environmental pollution: impact of... / Symposium on the n / 628.16836
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Conflict resolution: Proceedings :... / Workshop on confli / 651.3 HAN
Train the trainer: Proceedings :... / Workshop on train th / 651.3 MOD
Dacum: Proceedings : Canada India... / Workshop on Dacum, / 651.3 CAN
Group process: Proceedings : Naheed... / Workshop on group / 651.3 PIZ
Primary management skills:... / Workshop on Primary Manage / 651.3 HAT
Strategic planning: Proceedings :... / Workshop on Strateg / 651.3 SIN
Women in development: Proceedings :... / Workshop on Women / 651.3 MAT
Advances in atomic and molecular... / National Workshop an / 539.6 CHA
Advances in gravitation and... / International Conference / 531.14 IY
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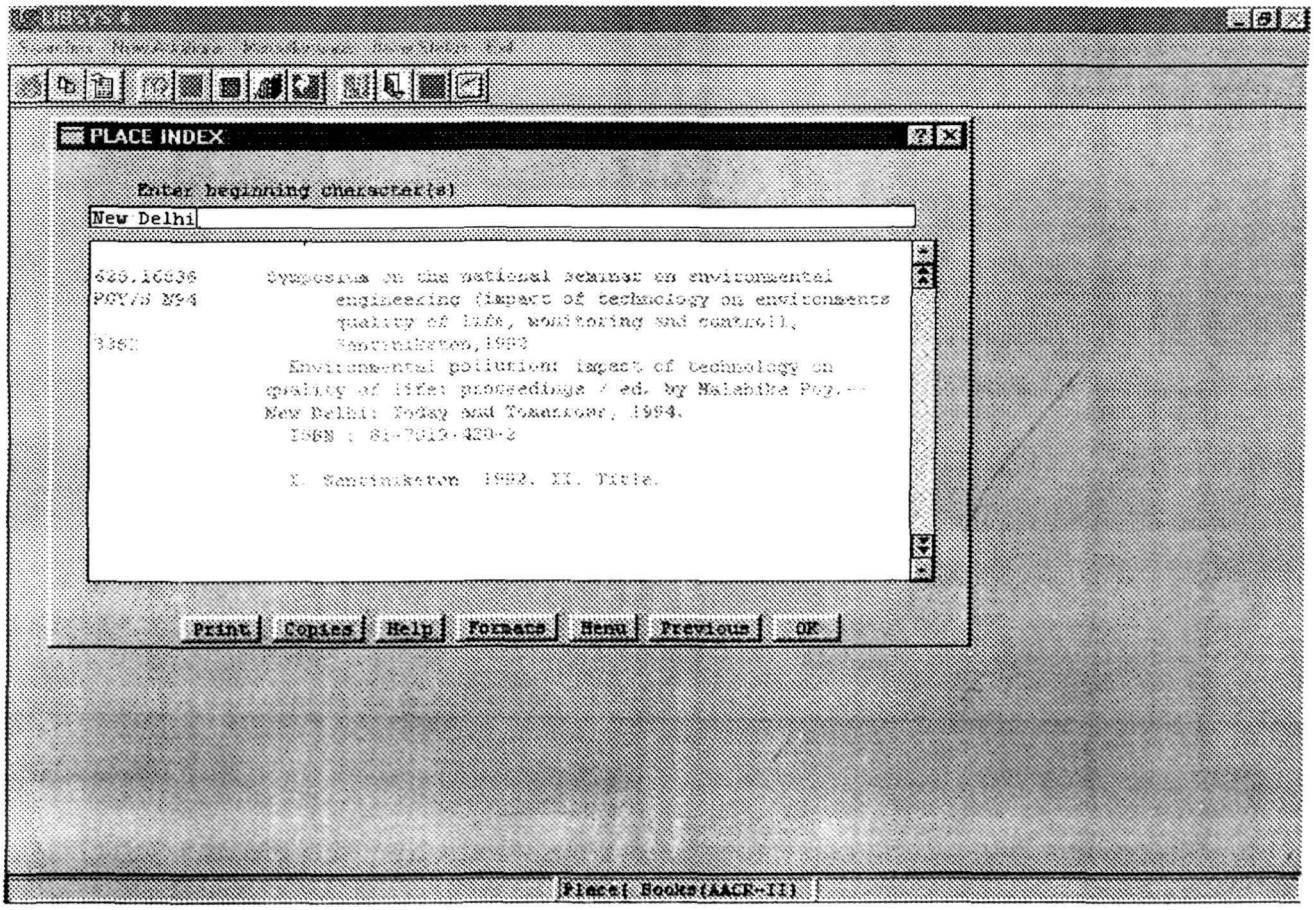
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628.16836 Symposium on the national seminar on environmental
P67/S 894 engineering (impact of technology on environments
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1st: Secunderabad, 1992
Environmental pollution: impact of technology on
quality of life: proceedings / ed. by Malabika Roy.--
New Delhi: Today and Tomorrow, 1994.
ISBN : 81-7019-420-2
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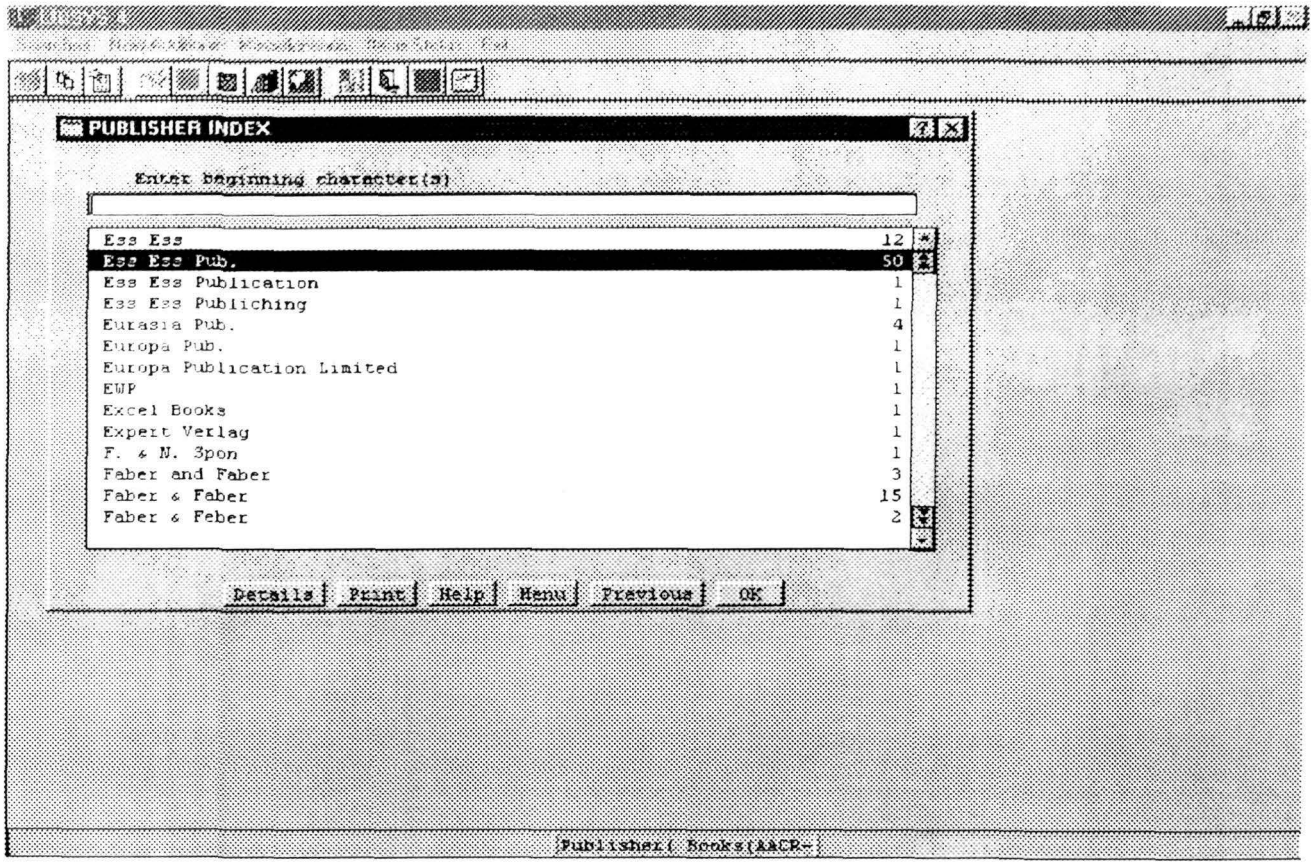
APPENDIX – IV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Ess Ess Publication 1
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Eurasia Pub. 4
Europa Pub. 1
Europa Publication Limited 1
EWP 1
Excel Books 1
Expert Verlag 1
F. & N. Spon 1
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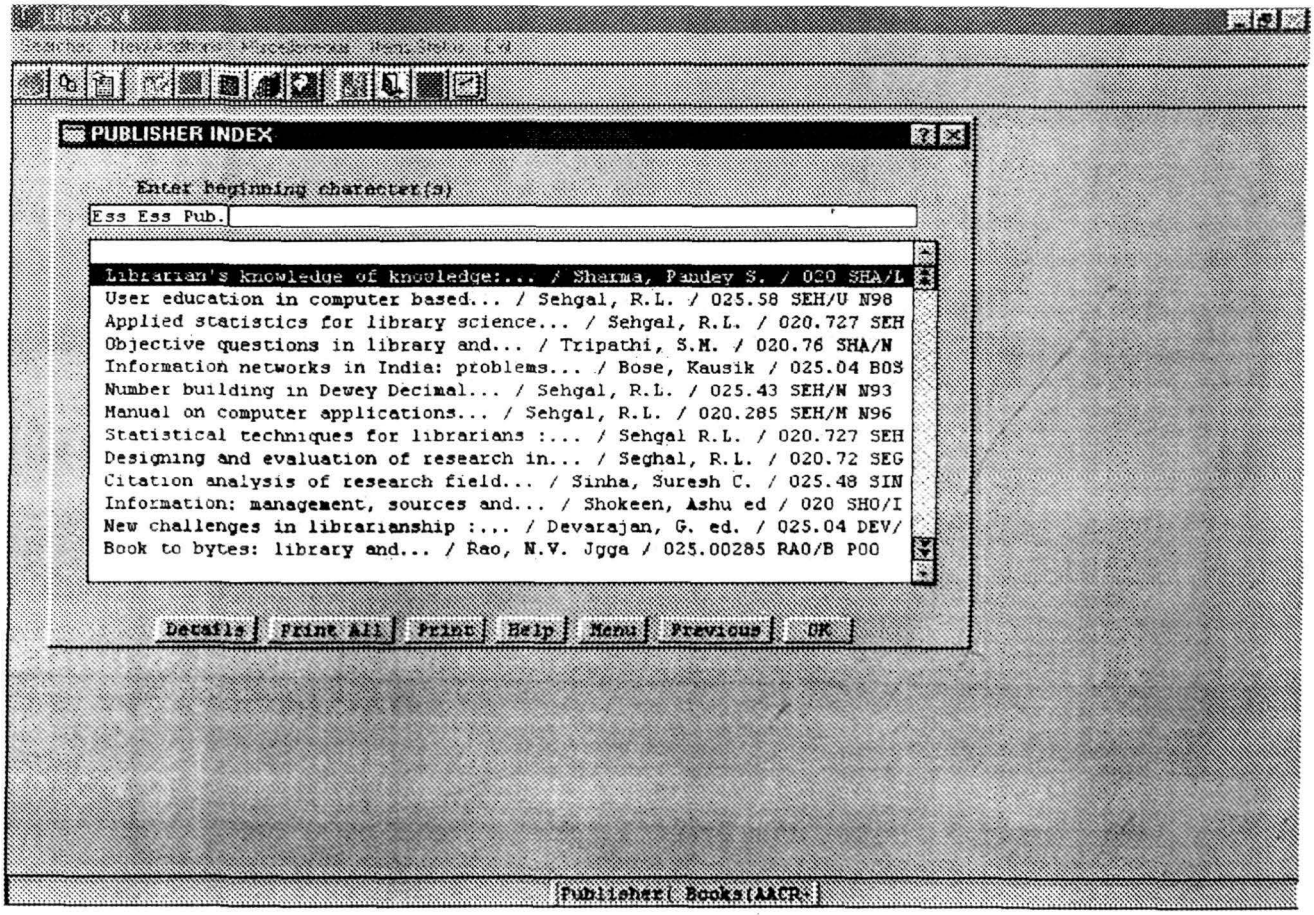
PUBLISHER INDEX
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Librarian's knowledge of knowledge:... / Sharma, Pandey S. / 020 SHA/L
User education in computer based... / Sehgal, R.L. / 025.58 SEH/U N98
Applied statistics for library science... / Sehgal, R.L. / 020.727 SEH
Objective questions in library and... / Tripathi, S.M. / 020.76 SHA/N
Information networks in India: problems... / Bose, Kausik / 025.04 BOS
Number building in Dewey Decimal... / Sehgal, R.L. / 025.43 SEH/N N93
Manual on computer applications... / Sehgal, R.L. / 020.285 SEH/M N96
Statistical techniques for librarians :... / Sehgal R.L. / 020.727 SEH
Designing and evaluation of research in... / Seghal, R.L. / 020.72 SEG
Citation analysis of research field... / Sinha, Suresh C. / 025.48 SIN
Information: management, sources and... / Shokeen, Ashu ed / 020 SHO/I
New challenges in librarianship :... / Devarajan, G. ed. / 025.04 DEV/
Book to bytes: library and... / Rao, N.V. Jgga / 025.00285 RAO/B P00
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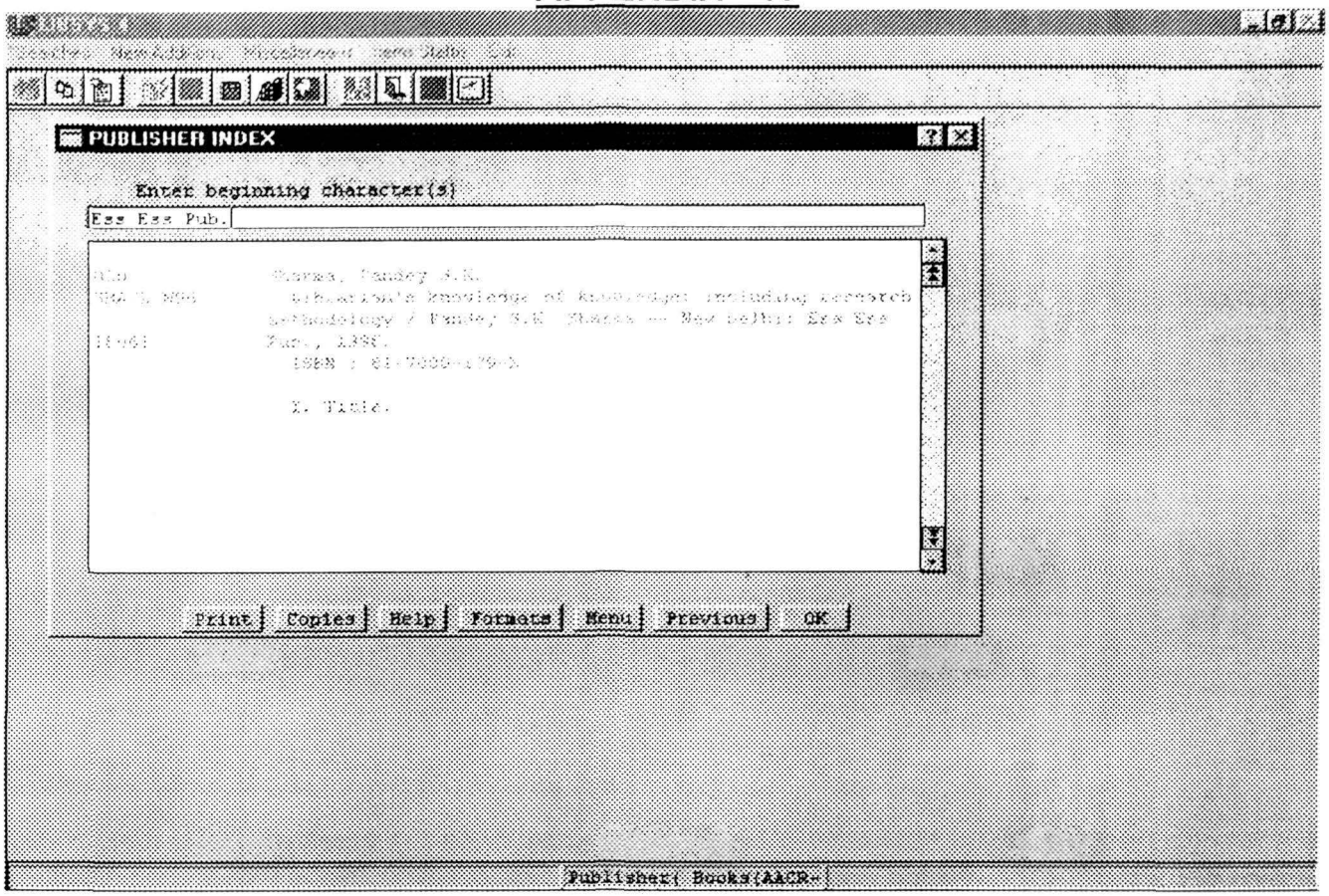
APPENDIX – IV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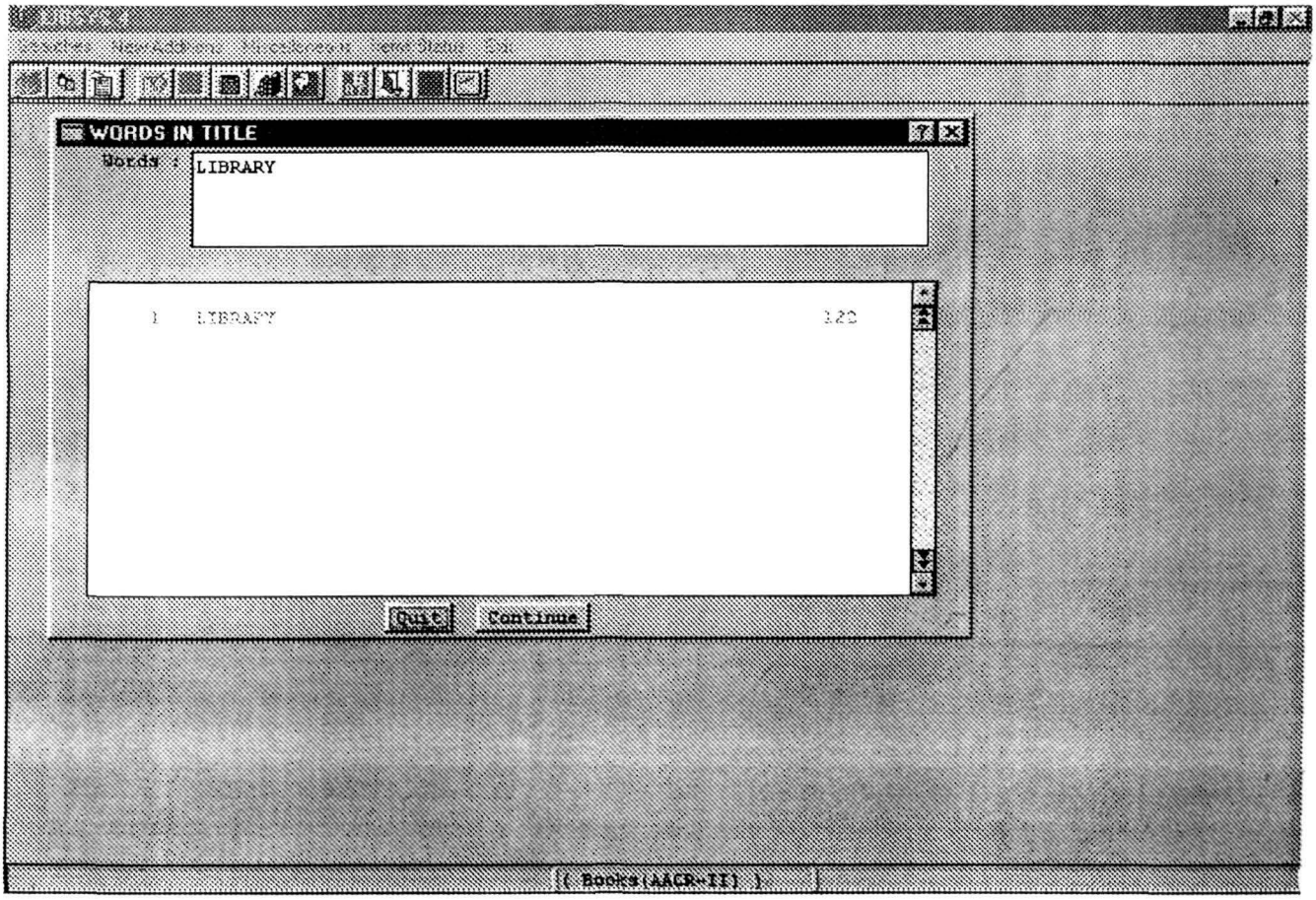
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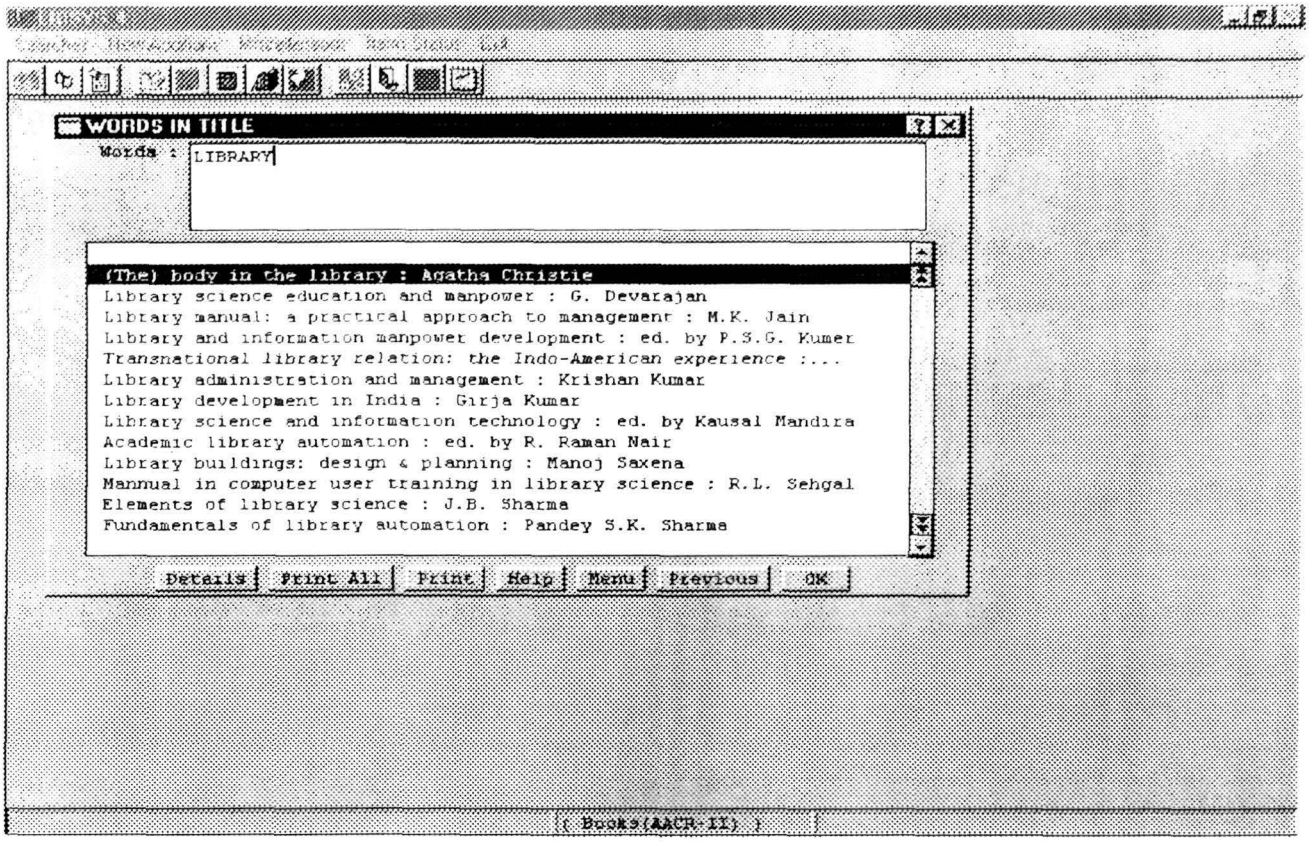
APPENDIX – IV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Library and information manpower development : ed. by P.S.G. Kumer
Transnational library relation: the Indo-American experience :...
Library administration and management : Krishan Kumar
Library development in India : Girja Kumar
Library science and information technology : ed. by Kausal Mandira
Academic library automation : ed. by R. Raman Nair
Library buildings: design & planning : Manoj Saxena
Mannual in computer user training in library science : R.L. Sehgal
Elements of library science : J.B. Sharma
Fundamentals of library automation : Pandey S.K. Sharma
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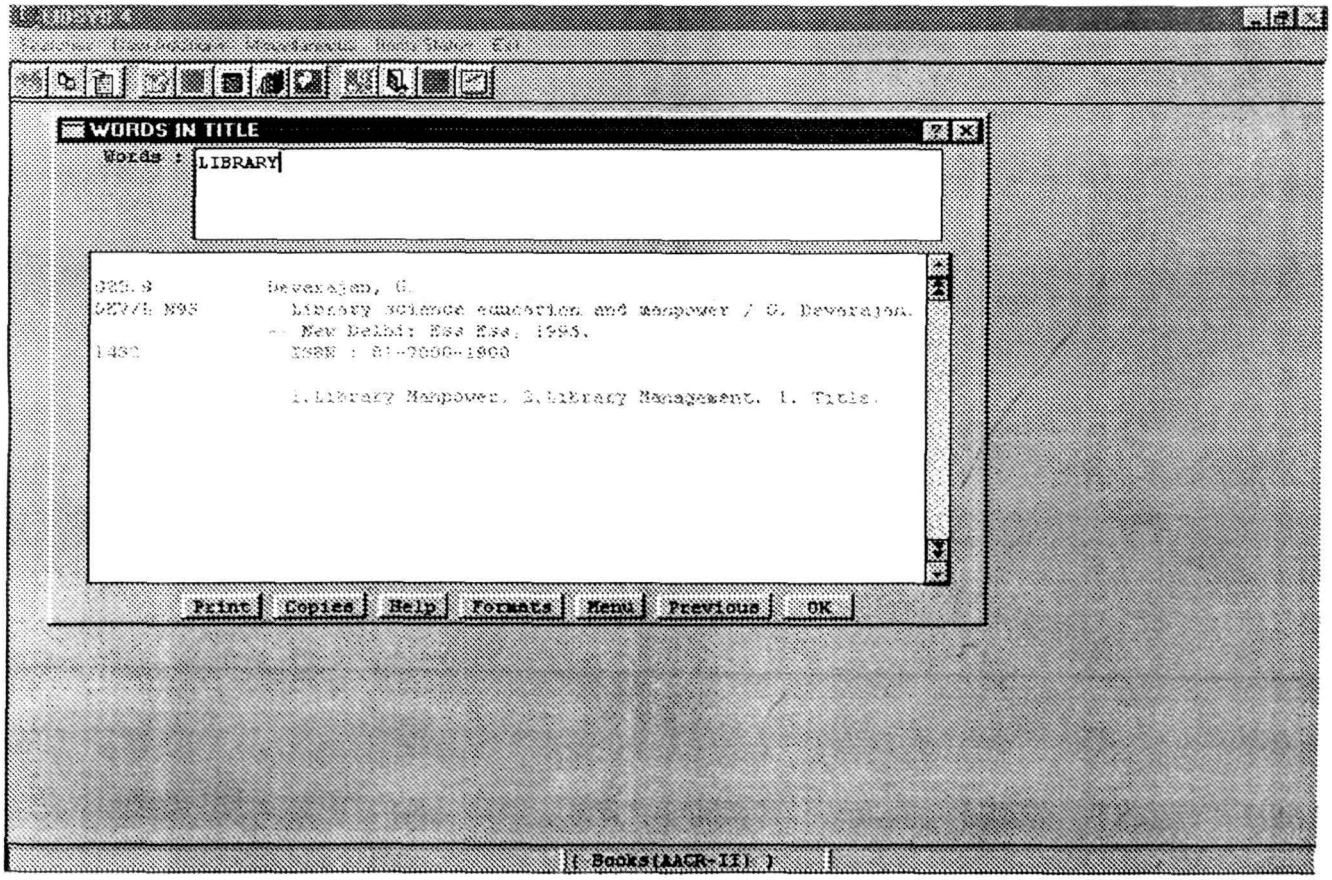
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New Delhi: Ess Ess, 1995.
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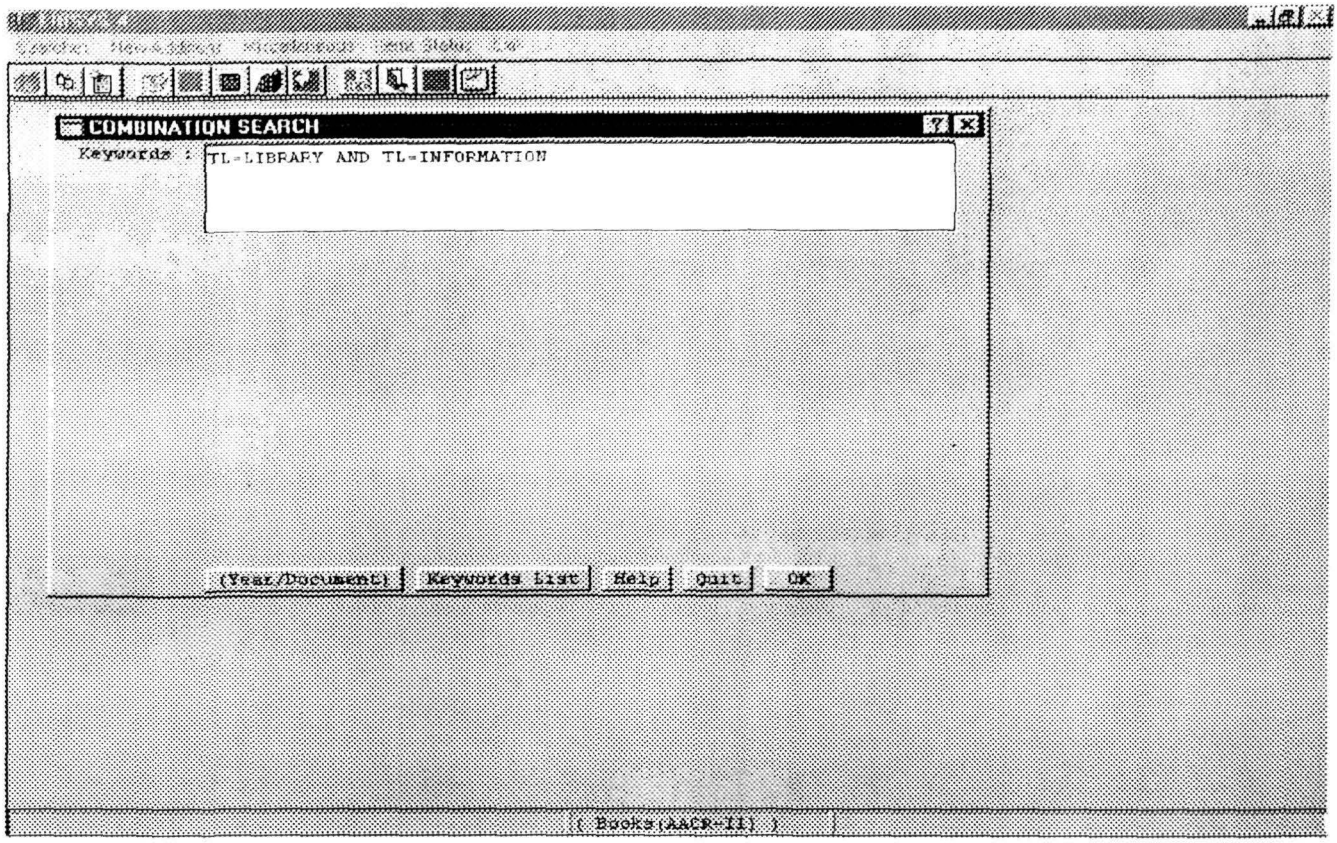
APPENDIX – IV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(Year/Document)
Keywords List
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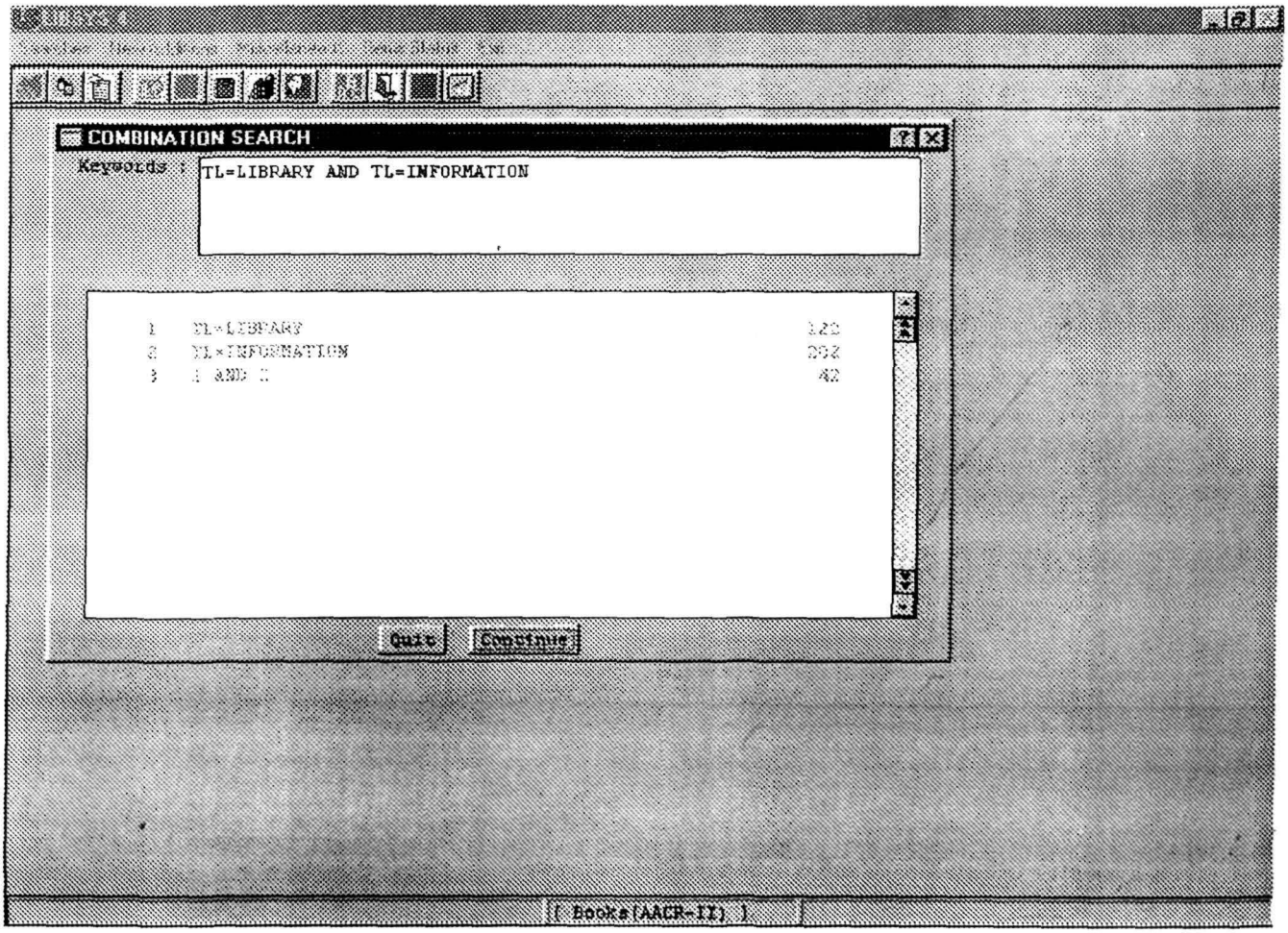
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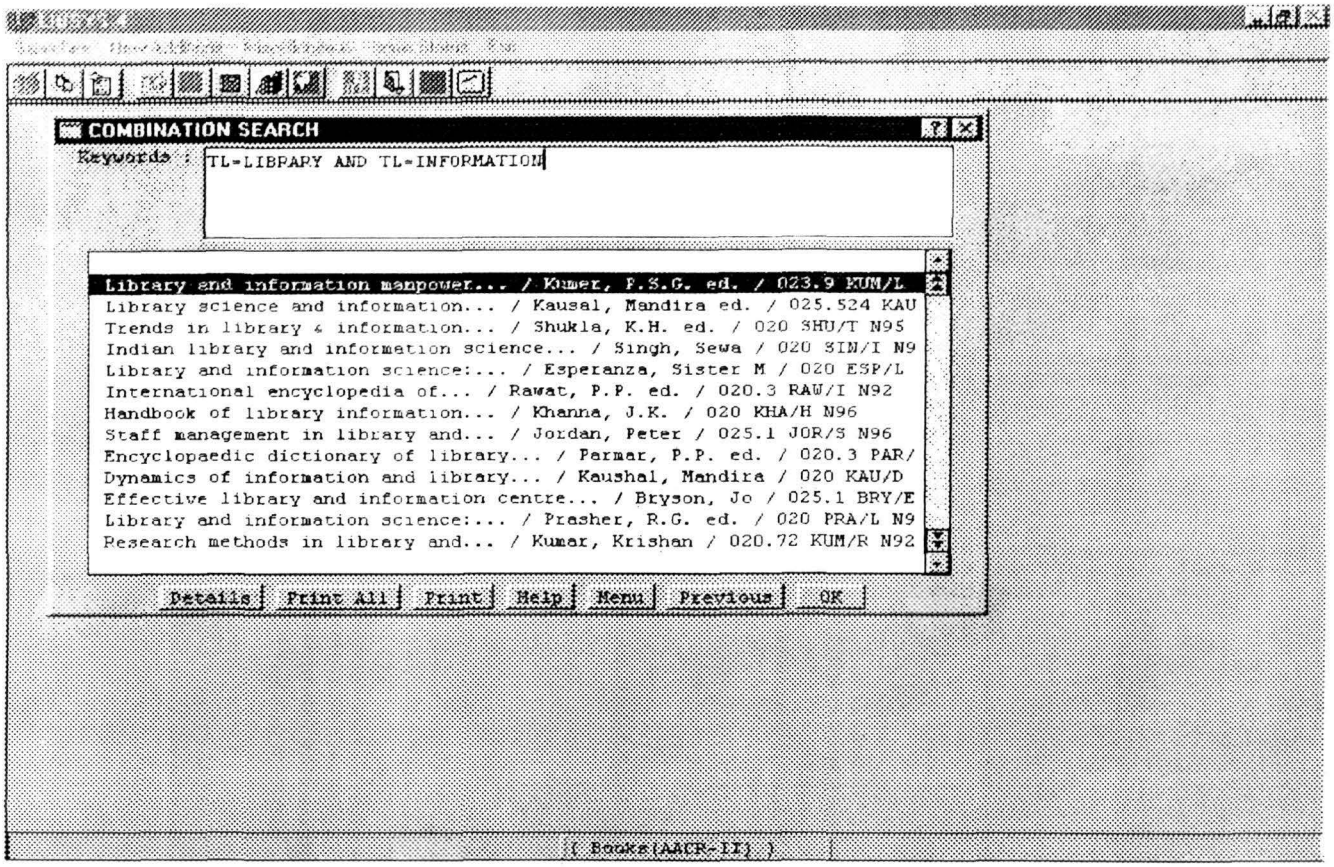
APPENDIX – IV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Library science and information... / Kausal, Mandira ed. / 025.524 KAU
Trends in library & information... / Shukla, K.H. ed. / 020 SHU/T N95
Indian library and information science... / Singh, Sewa / 020 SIN/I N9
Library and information science:... / Esperanza, Sister M / 020 ESP/L
International encyclopedia of... / Rawat, P.P. ed. / 020.3 RAW/I N92
Handbook of library information... / Khanna, J.K. / 020 KHA/H N96
Staff management in library and... / Jordan, Peter / 025.1 JOR/S N96
Encyclopaedic dictionary of library... / Parmar, P.P. ed. / 020.3 PAR/
Dynamics of information and library... / Kaushal, Mandira / 020 KAU/D
Effective library and information centre... / Bryson, Jo / 025.1 BRY/E
Library and information science:... / Prasher, R.G. ed. / 020 PRA/L N9
Research methods in library and... / Kumar, Krishan / 020.72 KUM/R N92
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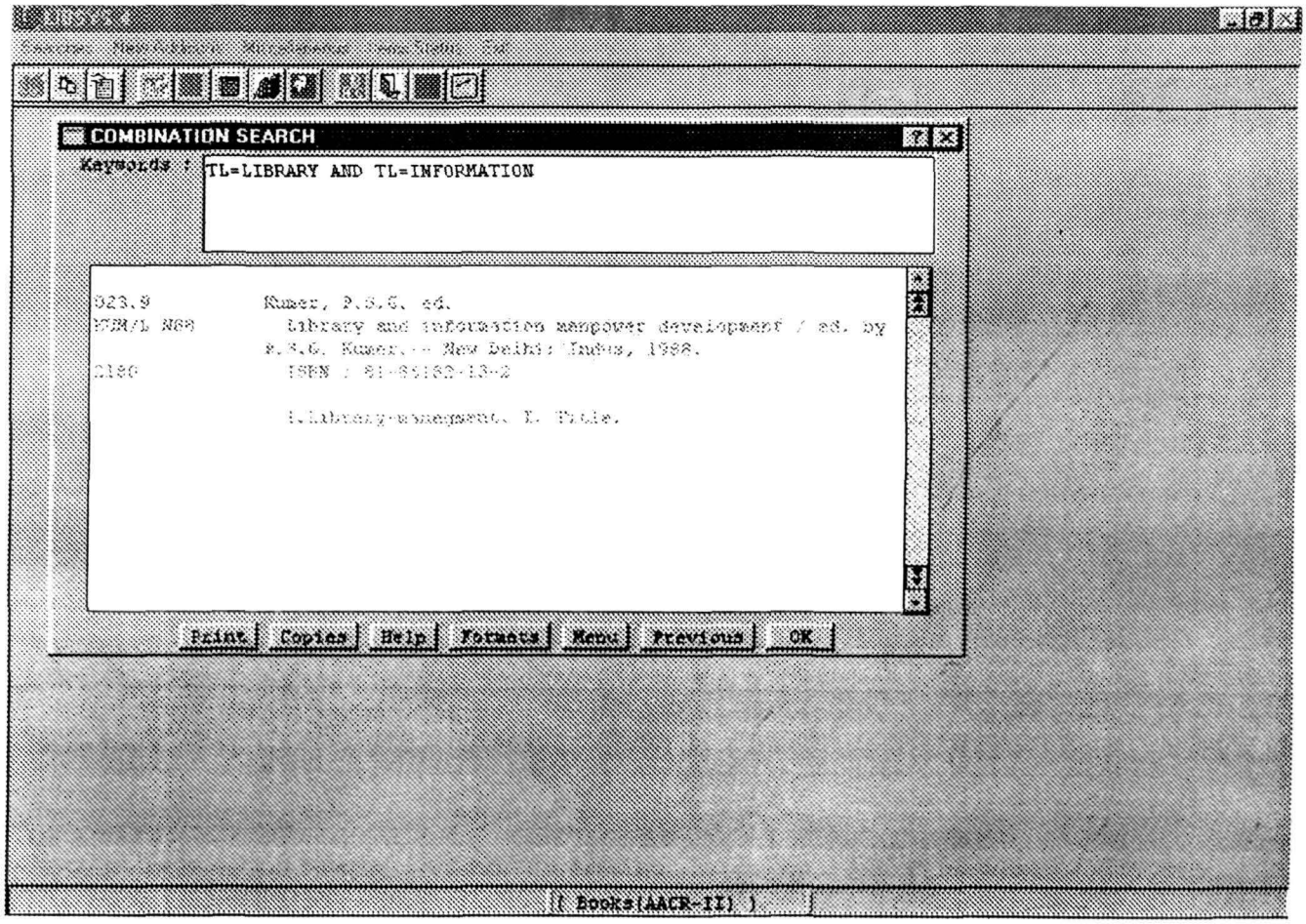
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P.S.G. Kumar.-- New Delhi: Indus, 1998.
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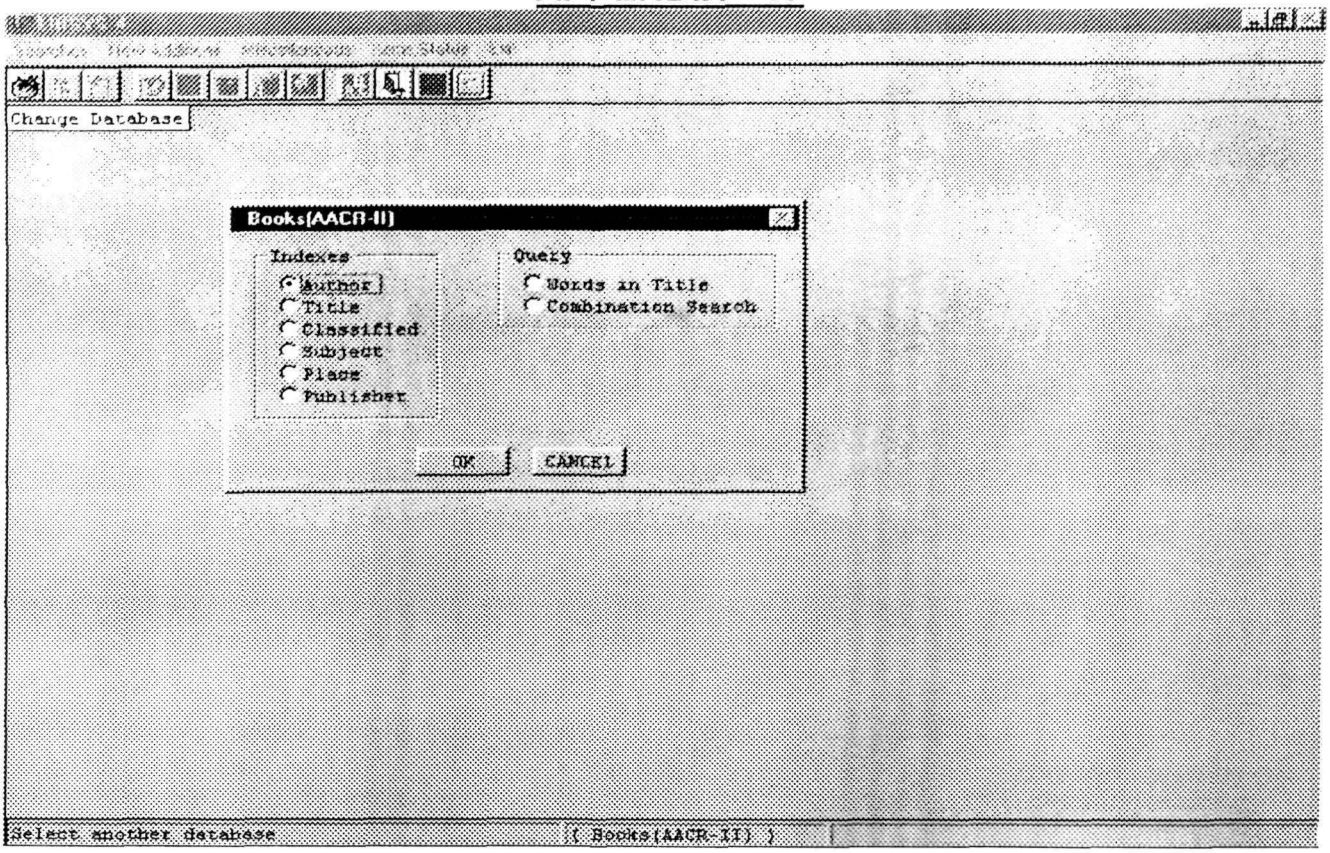
APPENDIX – IV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Combination Search
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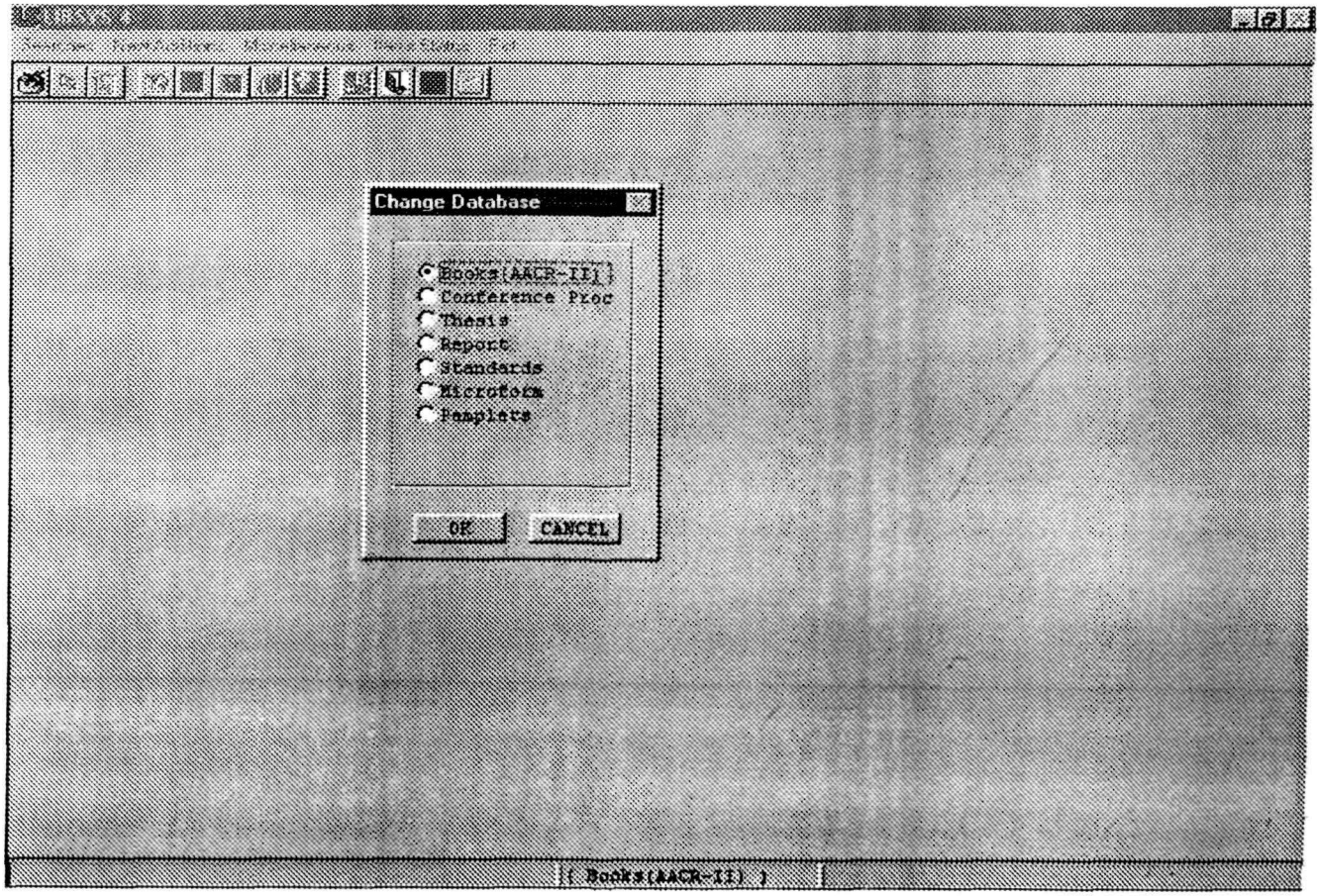
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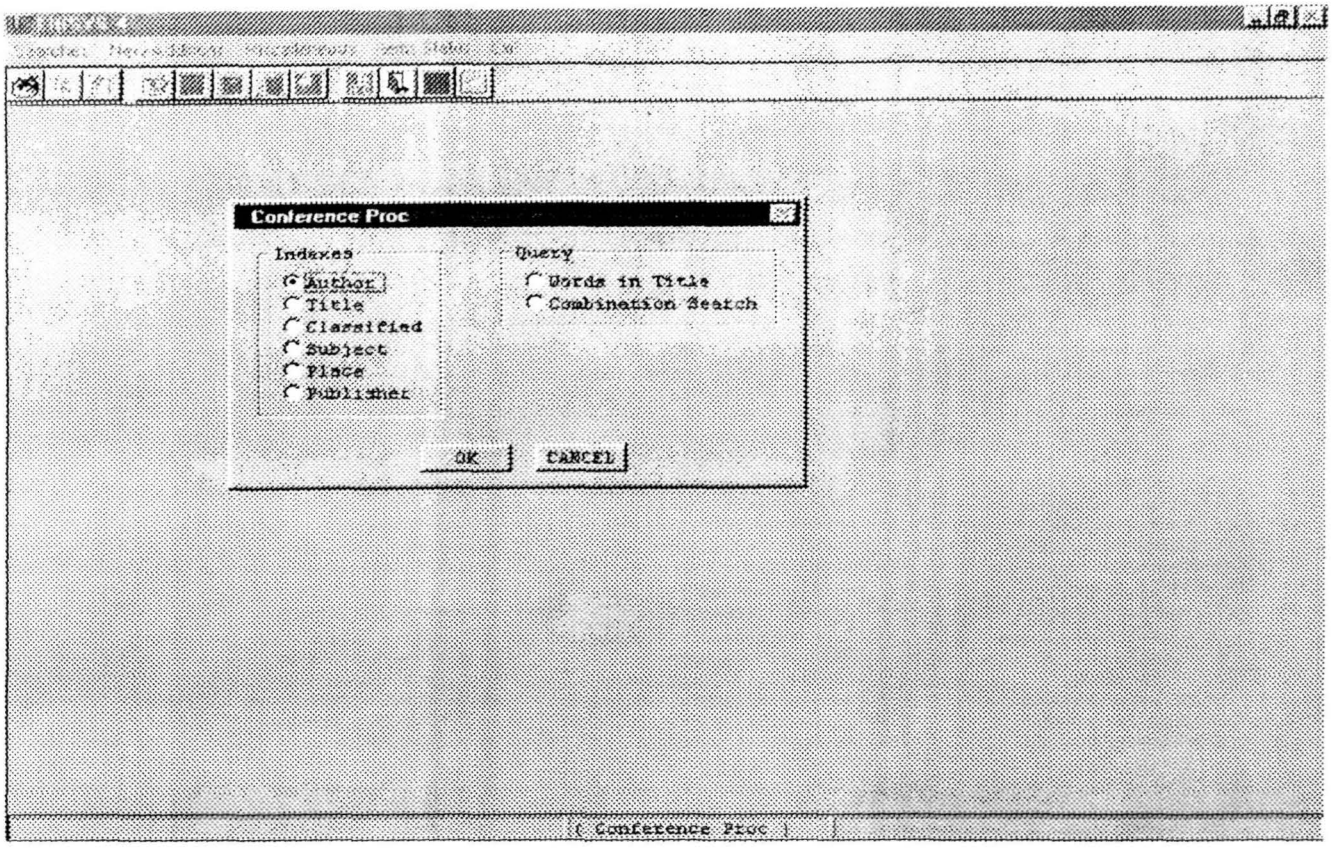
APPENDIX – IV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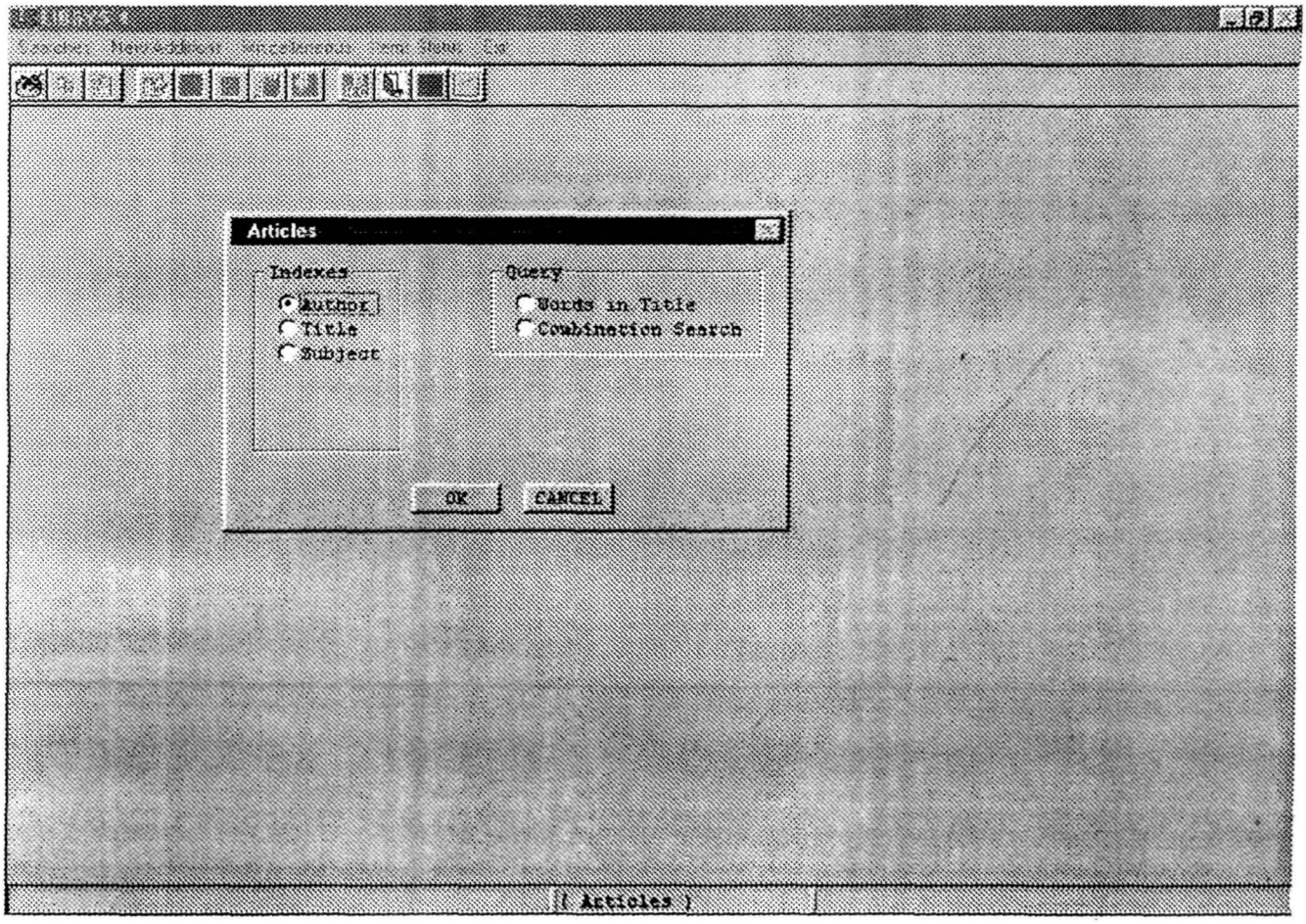
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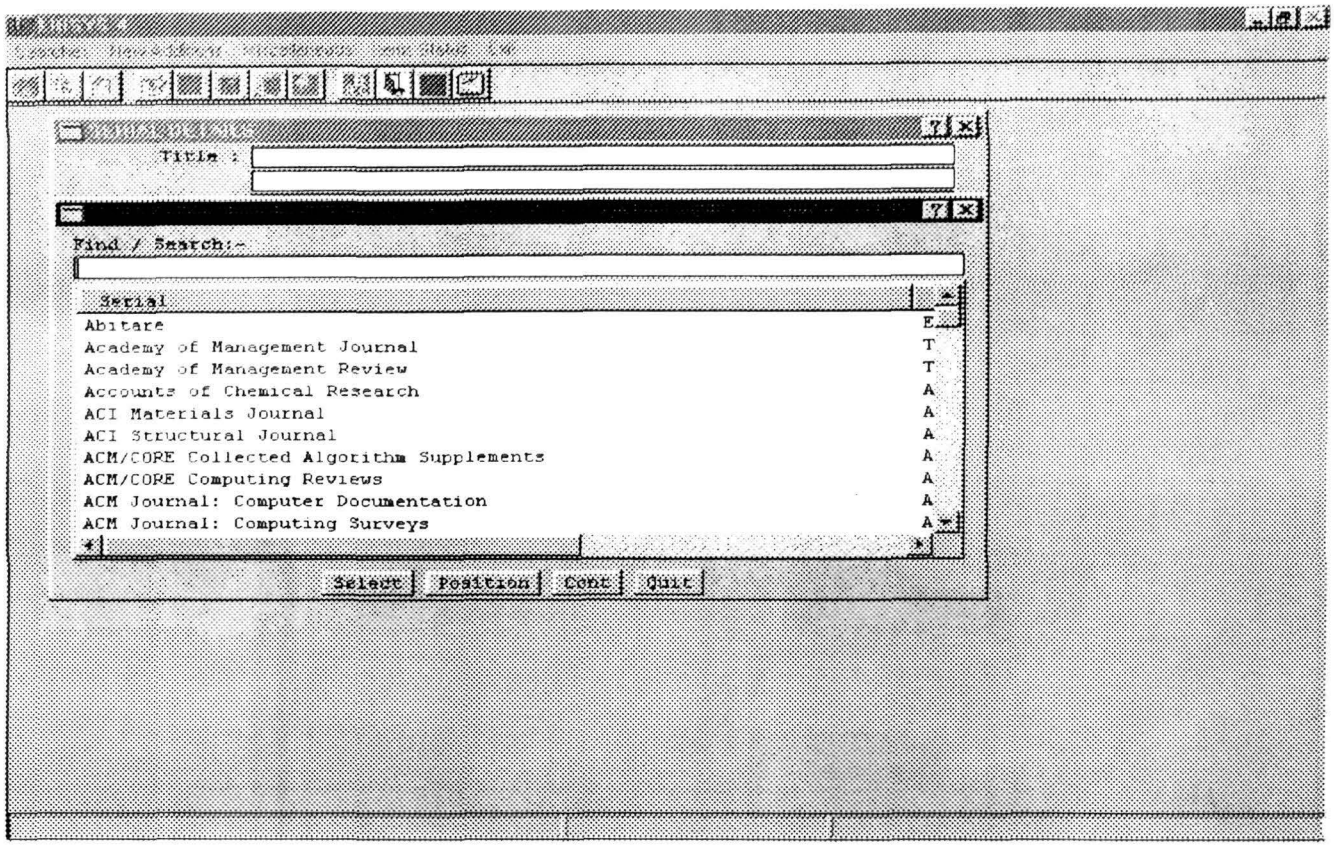
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Academy of Management Review
Accounts of Chemical Research
ACI Materials Journal
ACI Structural Journal
ACM/CORE Collected Algorithm Supplements
ACM/CORE Computing Reviews
ACM Journal: Computer Documentation
ACM Journal: Computing Surveys
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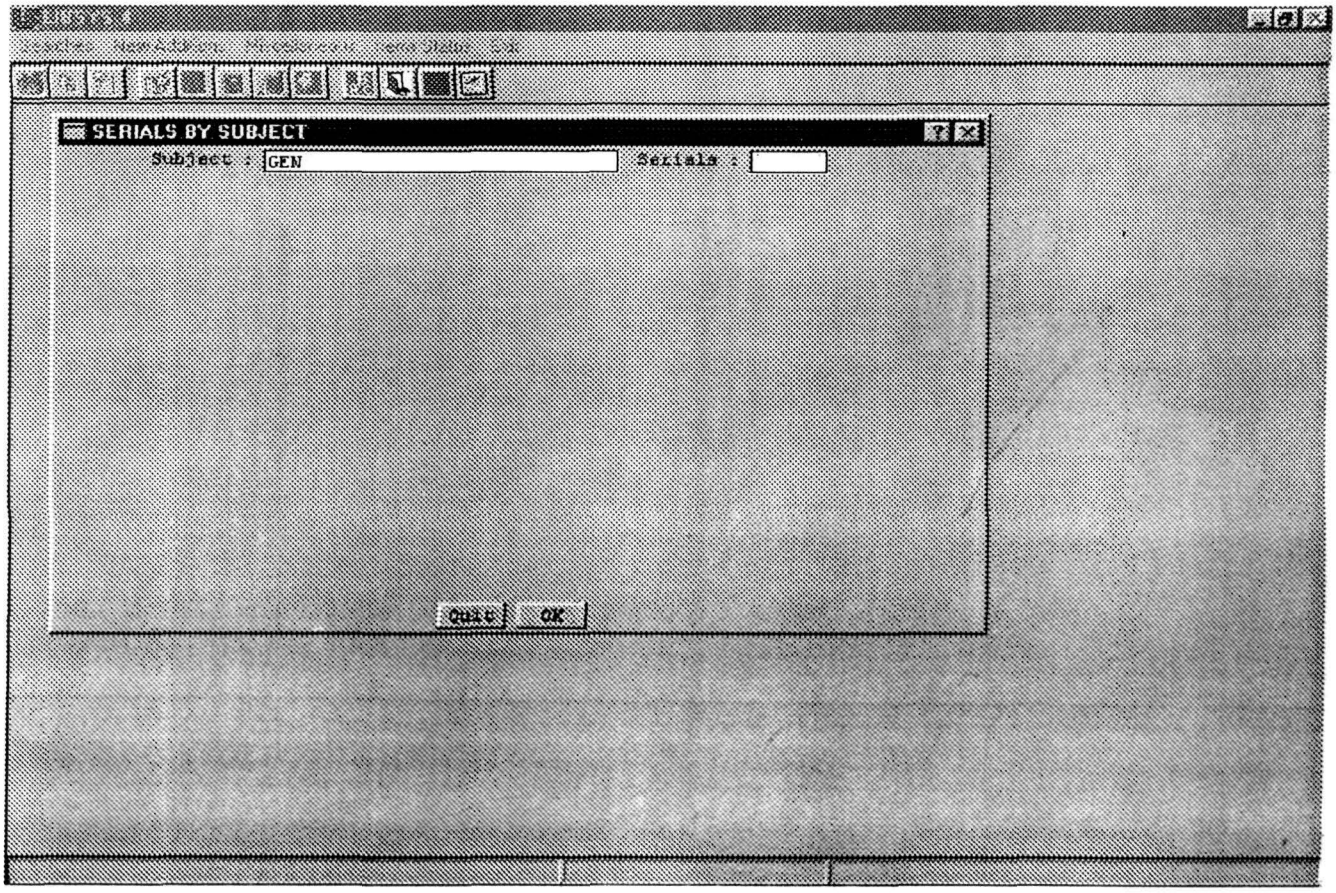
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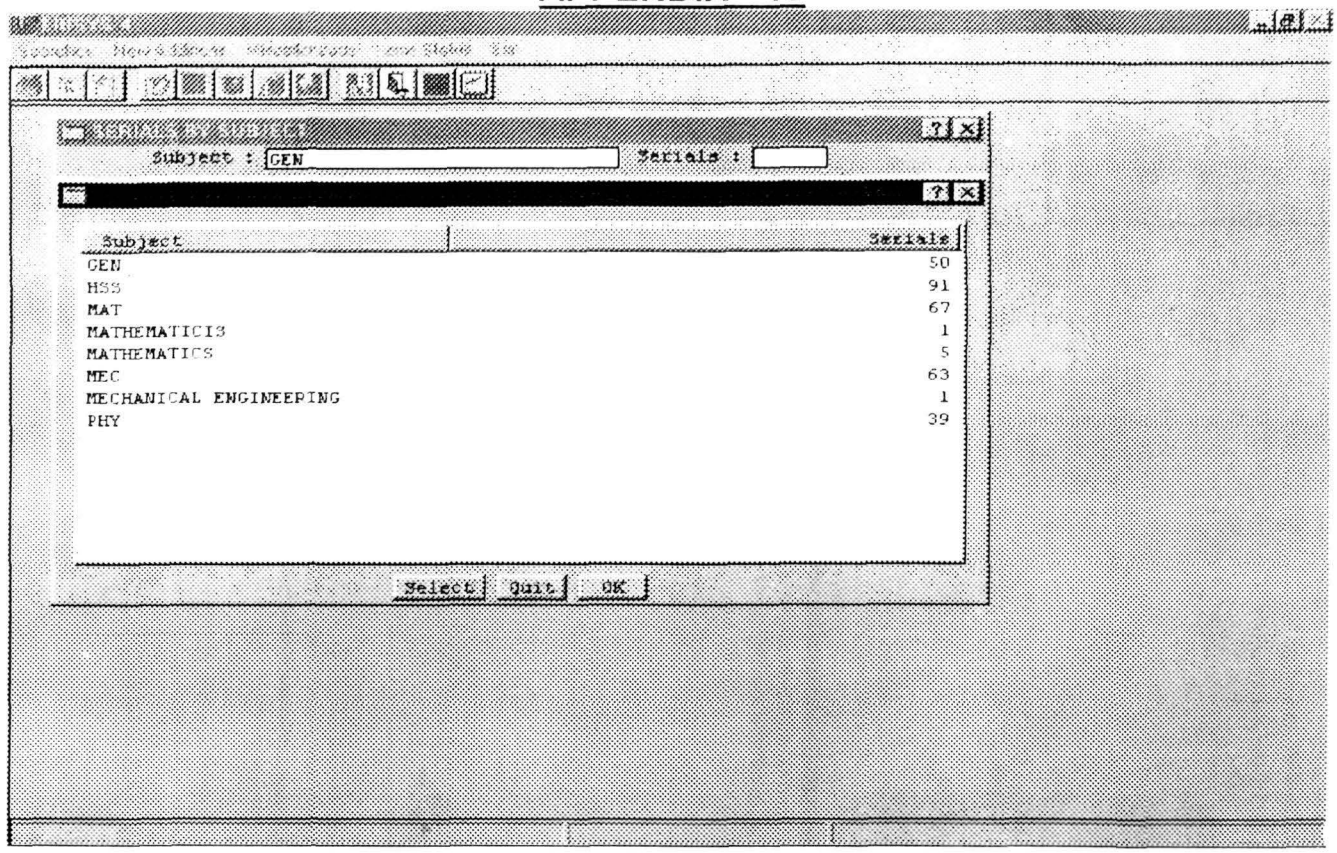
APPENDIX – IV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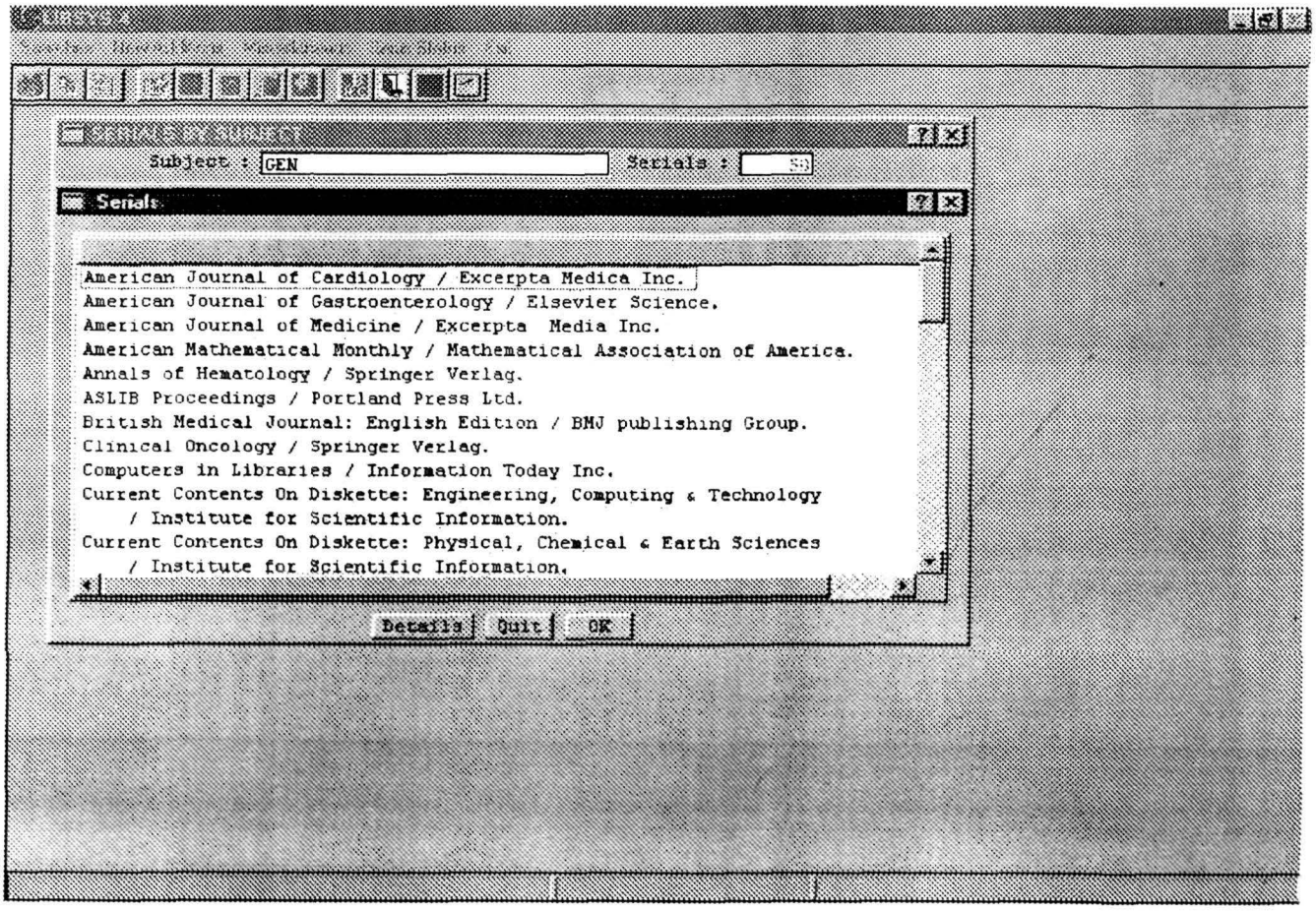
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Annals of Hematology / Springer Verlag.
ASLIB Proceedings / Portland Press Ltd.
British Medical Journal: English Edition / BMJ publishing Group.
Clinical Oncology / Springer Verlag.
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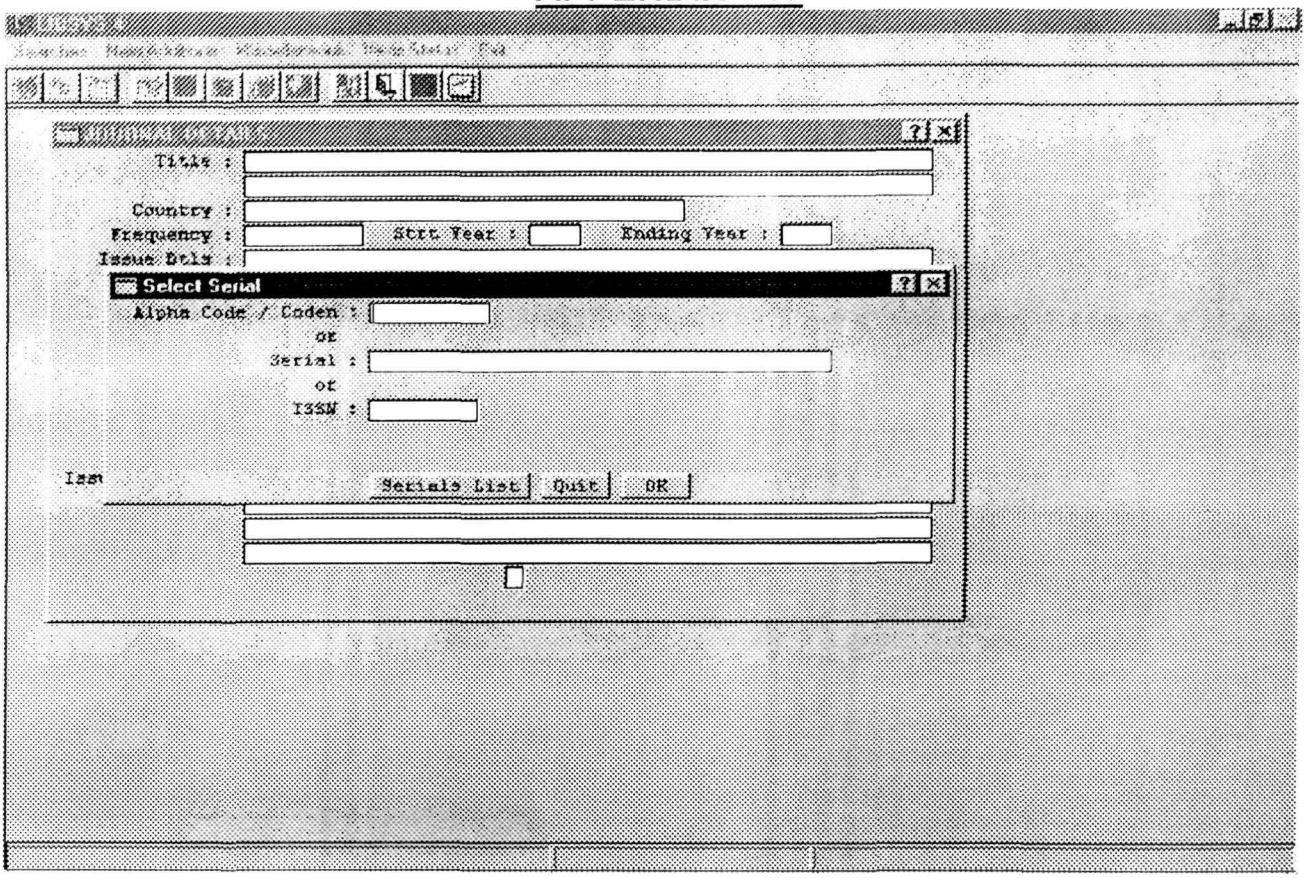
APPENDIX – IV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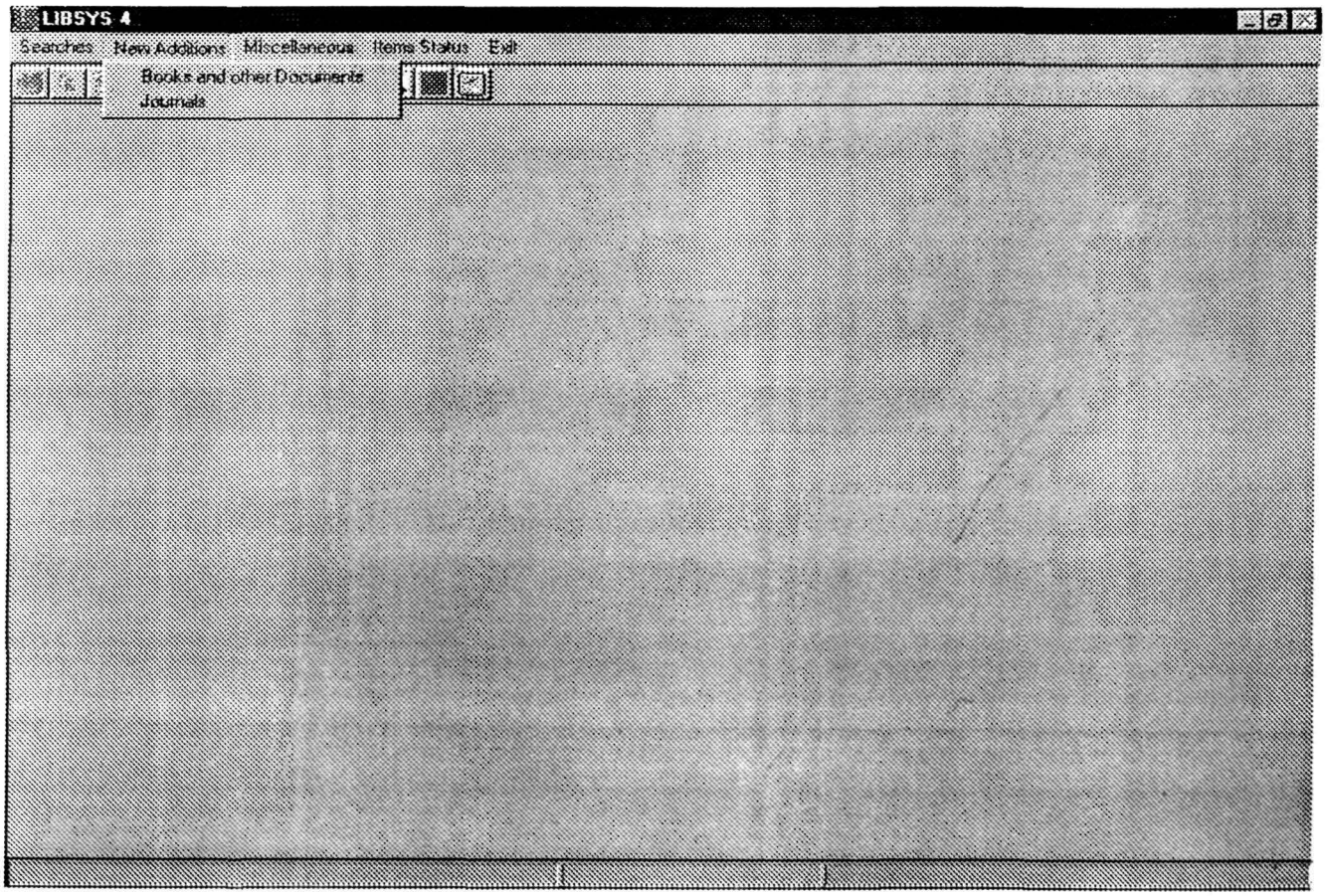
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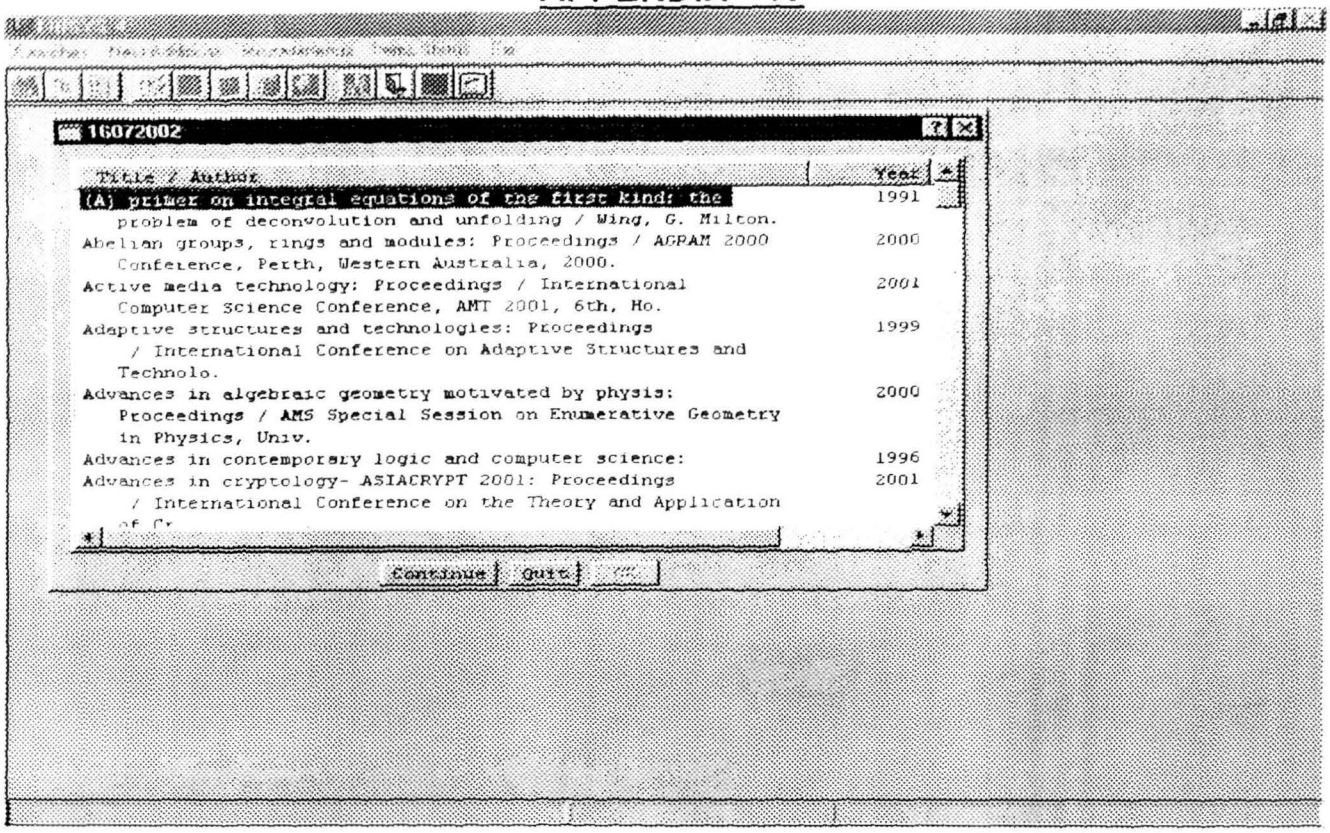
APPENDIX – IV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Active media technology: Proceedings / International Computer Science Conference, AMT 2001, 6th, Ho. 2001
Adaptive structures and technologies: Proceedings / International Conference on Adaptive Structures and Technolo. 1999
Advances in algebraic geometry motivated by physis: Proceedings / AMS Special Session on Enumerative Geometry in Physics, Univ. 2000
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Advances in cryptology- ASIACRYPT 2001: Proceedings / International Conference on the Theory and Application 2001
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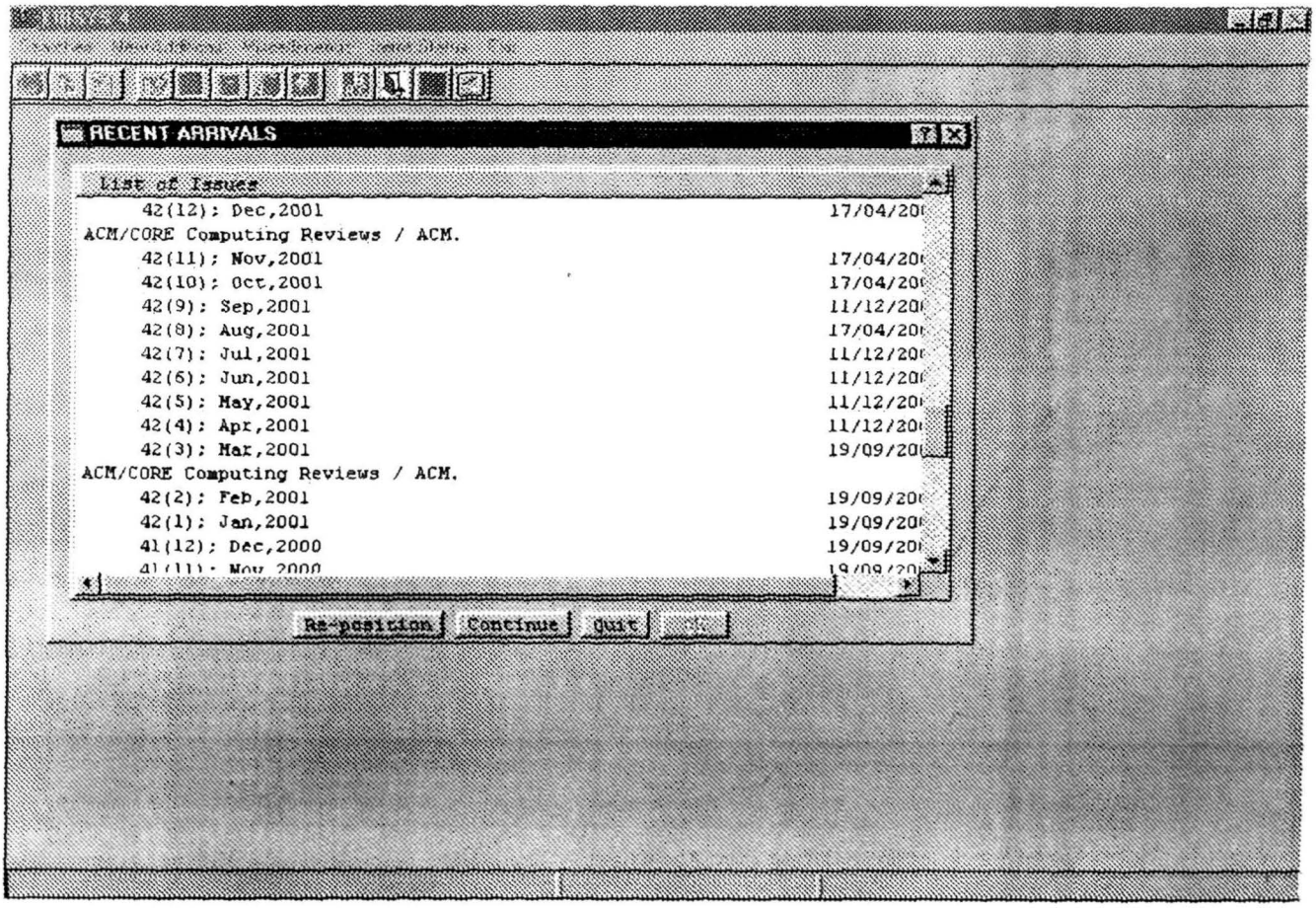
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42(9): Sep,2001 11/12/20
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ACM/CORE Computing Reviews / ACM.
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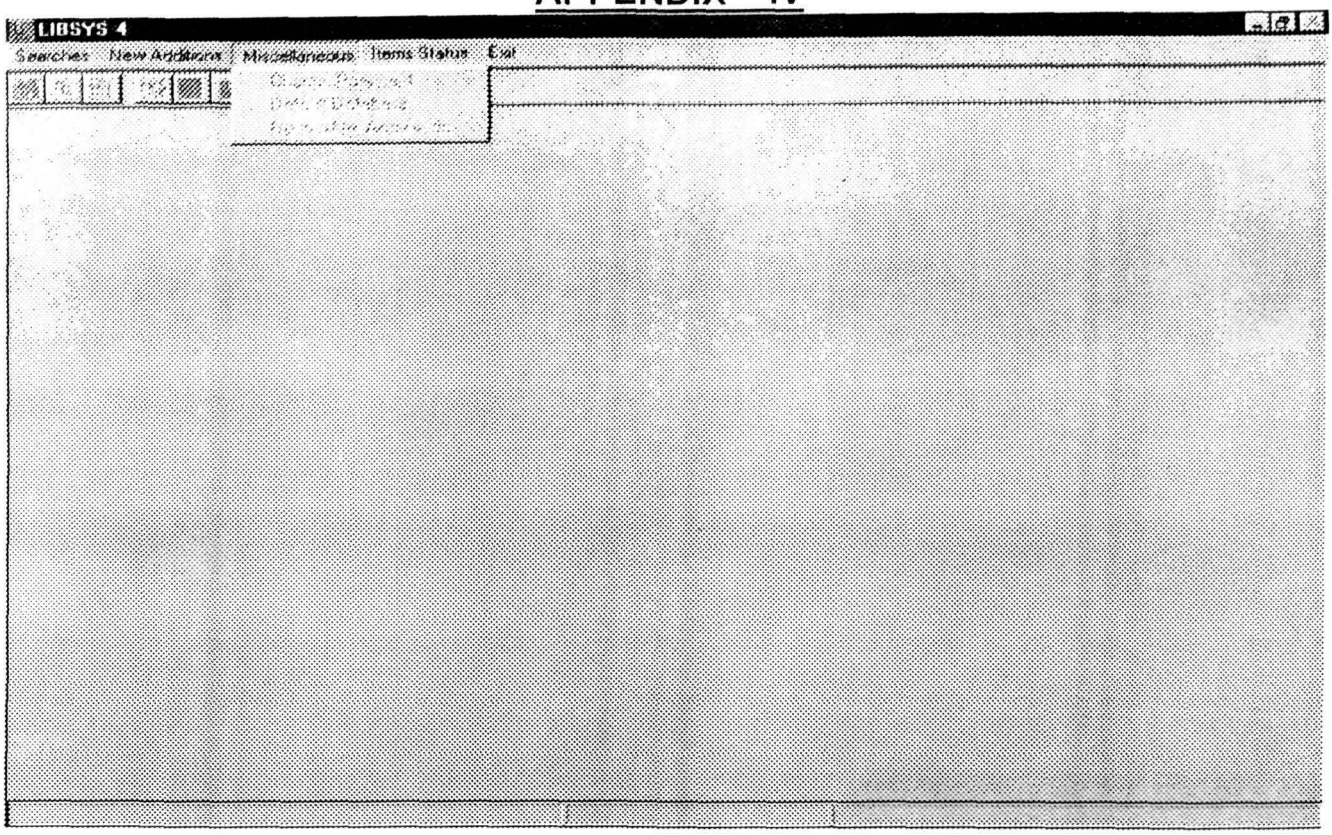
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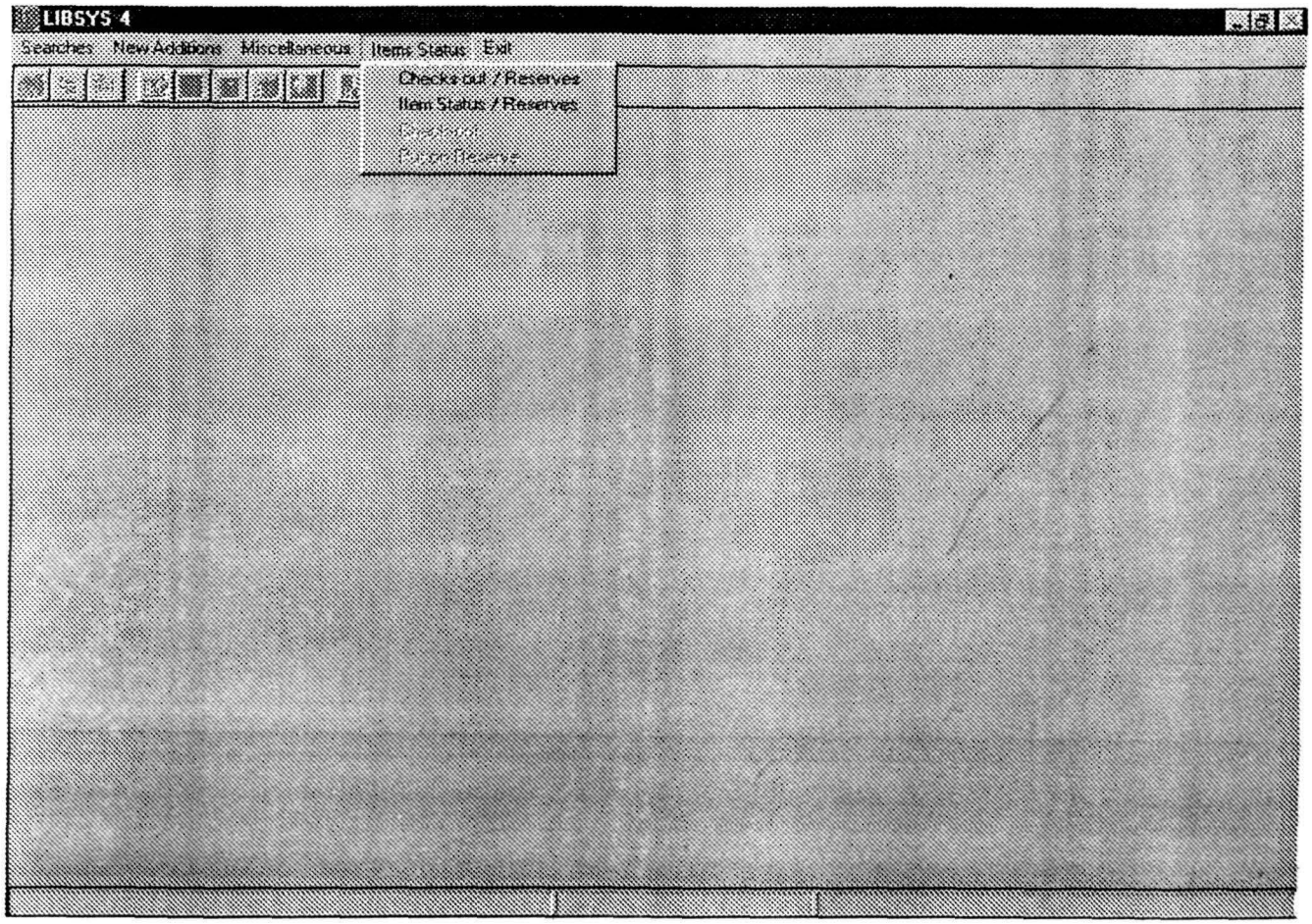
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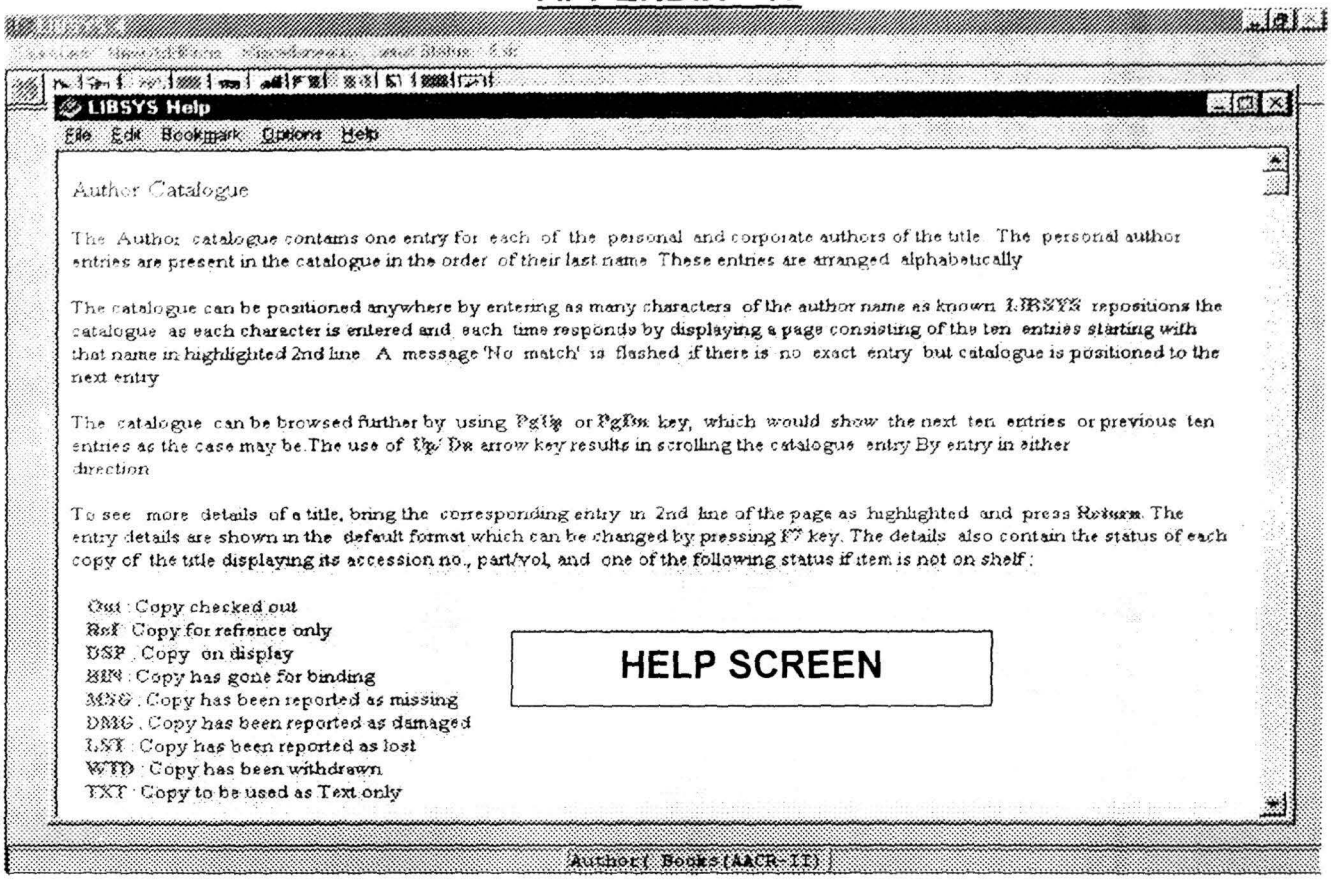
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Author Catalogue
The Author catalogue contains one entry for each of the personal and corporate authors of the title The personal author entries are present in the catalogue in the order of their last name These entries are arranged alphabetically
The catalogue can be positioned anywhere by entering as many characters of the author name as known LIBSYS repositions the catalogue as each character is entered and each time responds by displaying a page consisting of the ten entries starting with that name in highlighted 2nd line A message 'No match' is flashed if there is no exact entry but catalogue is positioned to the next entry
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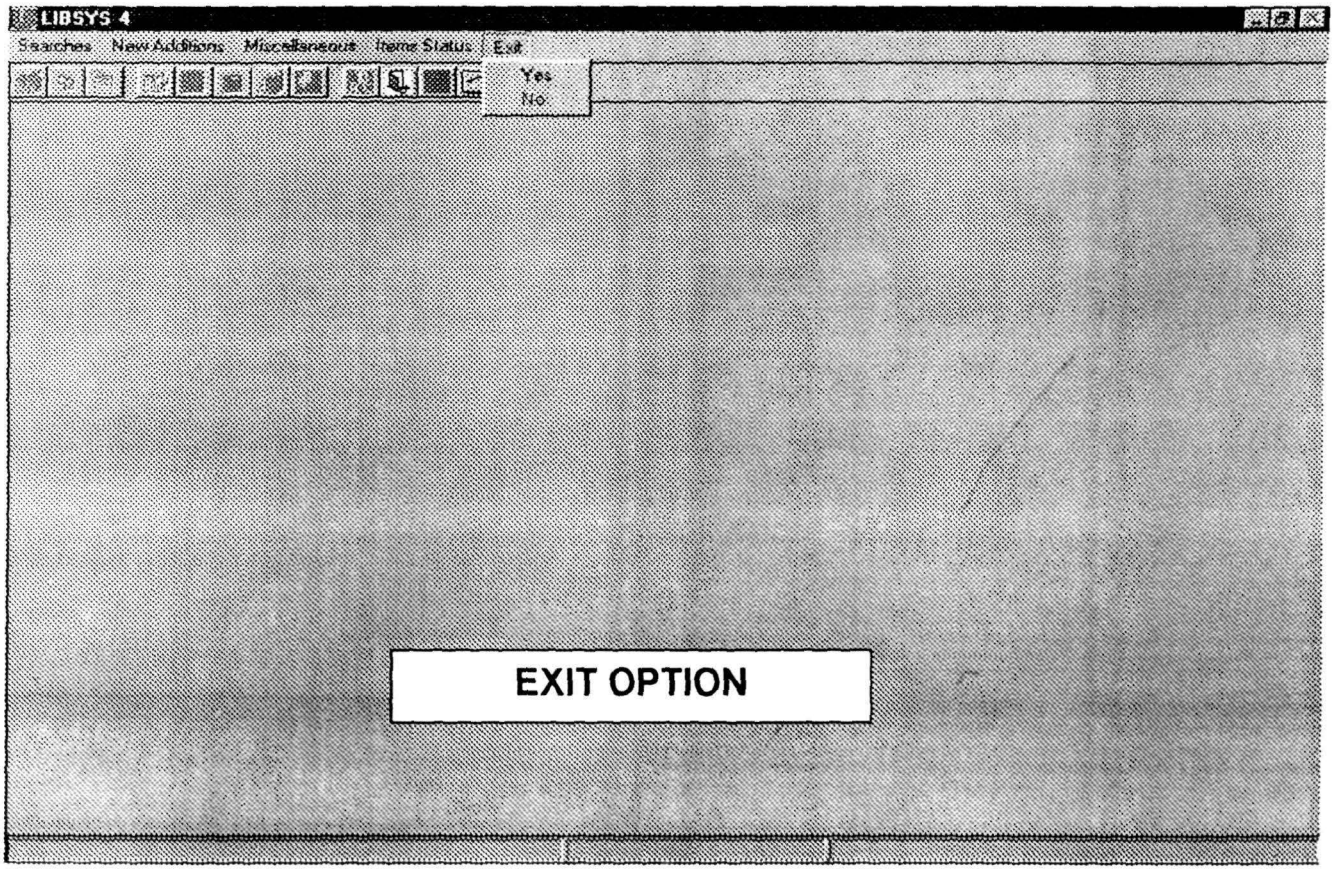
To see more details of a title, bring the corresponding entry in 2nd line of the page as highlighted and press Return. The entry details are shown in the default format which can be changed by pressing F7 key. The details also contain the status of each copy of the title displaying its accession no., part/vol, and one of the following status if item is not on shelf :
Out : Copy checked out
Ref : Copy for refrence only
DSP : Copy on display
BIN : Copy has gone for binding
MSG : Copy has been reported as missing
DMG : Copy has been reported as damaged
LST : Copy has been reported as lost
WTD : Copy has been withdrawn
TXT : Copy to be used as Text only
HELP SCREEN
Author(Books(AACR-II)


LIBSYS 4
Searches New Additions Miscellaneous Items Status Exit
Yes
No
EXIT OPTION

APPENDIX – V

Usability Assessment of Qualitative Methodology in OPAC Search

A SMALL DESCRIPTION OF THE RESEARCH PROJECT

Name & Address of the Researcher:	Name & Address of the Research Guide:
Tamal Kumar Guha C/O. Dr. (Mrs.) Veena Saraf, H.O.D. Department of Library & Information Science North Eastern Hill University Mayurbhanj Campus Nongthymmai, Shillong – 14 Meghalaya.	**Dr. (Mrs.) Veena Saraf** Head of the Department Department of Library & Information Science North Eastern Hill University Mayurbhanj Campus Nongthymmai, Shillong – 14 Meghalaya.

Dear Sir / Madam,

I am a Ph.D. Student in the Department of Library & Information Science, North Eastern Hill University, Shillong. Presently, I am working on the topic **"Usability assessment of Qualitative Methodology in OPAC Search"**.

As part of my work towards this degree, I am conducting a study to find out user's satisfactions, how a 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 brief interview and a small questionnaire will be handed over to you, which can be subsequently filled up.

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.

All replies, interview data and information will be strictly confidential and used for academic purpose only. You do not have to give your name or organisation if you do not wish to do so.

I would like to thank you for taking part in this survey.

Best wishes,

(Tamal Kumar Guha)

THANK YOU FOR THE KIND CO-OPERATION AND TAKING PART IN THIS SURVEY.

APPENDIX – V

Usability Assessment of Qualitative Methodology in OPAC Search

THE QUESTIONNAIRE

SECTION - I (OPAC RELATED DATA)

This section is meant to collect the data about the user's satisfactions, how a user faces problem and solve the same or ask for guidance while searching Online Library Catalogue (OPAC). Please read each of them and decide the answer. Please select your choice as given below and put a tick (✔) mark against each question.

1. Whether the instructions, options and commands for using the OPAC are easy to follow and use?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

2. Whether the layout and presentation of information in the OPAC are clear?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

3. Whether it is easy to move around different parts of the OPAC?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

4. Did the OPAC allow you sufficient flexibility to work in the way you wanted ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

5. Did you find the OPAC responsive to your searches ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

6. Do you consider the OPAC is suitable for the task of searching through your library catalogue ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

APPENDIX – V

Usability Assessment of Qualitative Methodology in OPAC Search

7. **At what frequency would you like to use the OPAC ?**
   - ❑ a. Very frequently
   - ❑ b. Frequently
   - ❑ c. Sometimes
   - ❑ d. Seldom
   - ❑ e. Not at all

8. **How often do you use the OPAC ?**
   - ❑ a. Very frequently
   - ❑ b. Frequently
   - ❑ c. Sometimes
   - ❑ d. Seldom
   - ❑ e. Not at all

9. **How much you have understood how to search the OPAC ?**
   - ❑ a. To a very great extent
   - ❑ b. To a great extent
   - ❑ c. To some extent
   - ❑ d. To small extent
   - ❑ e. Not at all

10. **Are you satisfied with using relevant terms and phrases to retrieve your required information ?**
   - ❑ a. To a very great extent
   - ❑ b. To a great extent
   - ❑ c. To some extent
   - ❑ d. To small extent
   - ❑ e. Not at all

11. **How thorough the information you retrieved for your purpose ?**
   - ❑ a. To a very great extent
   - ❑ b. To a great extent
   - ❑ c. To some extent
   - ❑ d. To small extent
   - ❑ e. Not at all

12. **Whether the amount of information you could retrieve was up to your satisfaction ?**
   - ❑ a. To a very great extent
   - ❑ b. To a great extent
   - ❑ c. To some extent
   - ❑ d. To small extent
   - ❑ e. Not at all

13. **Whether the information you retrieved was up-to-date ?**
   - ❑ a. To a very great extent
   - ❑ b. To a great extent
   - ❑ c. To some extent
   - ❑ d. To small extent
   - ❑ e. Not at all

APPENDIX – V

Usability Assessment of Qualitative Methodology in OPAC Search

14. Are you satisfied with the time taken by the OPAC to retrieve your information ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

15. Are you satisfied with the OPAC ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

16. Do you feel the OPAC is user-friendly (means, whether it provides proper online help) ?

- ❑ a. To a very great extent
- ❑ b. To a great extent
- ❑ c. To some extent
- ❑ d. To small extent
- ❑ e. Not at all

SECTION - II (PERSONAL DATA)

Please put a tick (✔) mark or as applicable to you:

YOUR PRESENT AGE (in years):

Below 15	18 – 30	30 – 35	35 – 40	40 – 45	45 – 50	50 – 55	55 – 60	Above 60

YOUR ARE A:

Male	Female

YOUR MARITAL STATUS :

Married	Unmarried	Single	Others

YOU ARE A:

- ❑ Teacher/Lecturer/Reader/Professor
- ❑ Academic Staff
- ❑ Non Teaching/Non Academic Staff
- ❑ Individual Researcher
- ❑ Librarian/Library Staff
- ❑ Journalist
- ❑ Related with Business
- ❑ Others (please specify) _____

If , Student:

- ❑ Undergraduate
- ❑ Postgraduate
- ❑ M.Phil Student
- ❑ Research Scholar
- ❑ Any other (Please State) _____

APPENDIX – V

Usability Assessment of Qualitative Methodology in OPAC Search

YOUR MOTHER TONGUE :

YOUR QUALIFICATION :

12th Standard	Graduation	Post Graduation	M. Phil	Ph.D.	D. Phil

YOUR AREA OF SPECIALISATION:

FOR HOW LONG YOU ARE USING THIS OPAC (in years):

- ❑ Less than 1 year
- ❑ 1-2 years
- ❑ 2-3 years
- ❑ 3-4 years
- ❑ 4-5 years
- ❑ more than 5 years
- ❑ Not known.

HAVE YOU USED ANY OTHER OPAC THAN THIS: ❑Yes ❑ No.

If Yes, where you have used it and how was/is

.....

.....

If Yes, for how many years you have used it : .....

Thank you once again for helping me to make this study meaningful

APPENDIX – VI

Verbal Protocol Transcription

USER – 01	Date: 16th Nov 2001	Session Started at: 12:05:37 p.m.	Ended at: 12:05:57 p.m.

I am searching for a book on Dracula under the title
(Typing while talking)
(Pressing the upper arrow and lower key to see the search result)
Okay I found it.
Eight twenty three (a little hesitation and rapidly looking twice to the screen) point eight.
Yeah
[Thank you.]

USER – 02	Date: 16th Nov 2001	Session Started at: 14:07:19 p.m.	Ended at: 14:08:20 p.m.

I am pressing the... key button for Author
[Okay]
and I am typing it... Jessy Liberty
i...e...e...r...t...y(Pressing the keys and uttering)
(Pressed the Enter Key Boldly)
I am not getting
Now I will go for the title not for the Author
[Okay]
(Rumbled a little)
(Thinking for a while)
I am pressing the... key for the title
Pressing Enter (pressed the Enter key boldly)
and I am typing... Code Java
(Started typing while taking)
(Checking on the monitor for a while)
Still I am not ... **YEAH** I got something
(Checking on the monitor by the Upper & Lower Key. It took several seconds)
Java ... Java ... (Murmuring)
I found
Finish it.

USER – 03	Date: 17st Nov 2001	Session Started at: 15:16:26 p.m.	Ended at: 15:17:22 p.m.

Searching for the Modern Short Stories
(Typing while talking)
on... a...a... literature
(Browsing the catalogue)
Modern short story (Murmuring)
Most of the books are out
um... um...(Browsing the catalogue)
I am going back to the catalogues
[Right]
um... searching through the authors
[Right]
(Started Typing)
Searching for Mansfield (while continuing the typing)
(Browsing the catalogue)

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 03 contd...)
Yeah... Captain Mansfield
(Browsing the catalogue)
It is out
This is again out.
mmuuch (Expressing slight dissatisfaction)
That's all
Finished the search

USER – 04	Date: 19st Nov 2001	Session Started at: 11:38:44a.m.	Ended at: 11:39:56a.m.

Okay.
I am writing Anthropology, okay (Pressed Enter key while talking)
[Right]
Let me see there (while hesitating) is any book on this subject or not
On title
[Okay]
(Started Typing)
Let me see
(browsed through the displayed screen)
but there is no book
of course (Murmuring)
all these all about ... **OKAY** I discovered, really.
And then ... really.
I HAVE GOT A BOOK .(with excitement)
Okay, let me do one thing
F4 (pressed the F4 key)
[Then]
Title... no, not title
This is the subject all about. If I write the subject it will come.
Okay, I am writing my subject, okay.
[Yes, Please]
(Started Typing)
It's my subject
Twenty-four (counted the number of hits)
And the books are ...
(browsed through the displayed screen)
This (identified a book)
There are other books also. Yeah lots of books.
Environmental Economics (reading the retrieved titles)
Introduction to ... (Murmuring and reading)
DICTIONARY OF ECONOMICS (reading the retrieved titles)
It is a very important book. Like to go into the details.
[So]
I press Enter (Pressed the Enter key)
Huh ... so this is the detail
Yeah
End of the Search

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

USER – 05	Date: 20th Nov 2001	Session Started at: 17:22:34 p.m.	Ended at: 17:25:13 p.m.

Now I am ... I was going to search for "Behaviour of Animals" ... and by David Attenborough. It's a very interesting book and I got one ... very few years ago and ... now I am searching that one, whether it is in the library now or not.
[Okay]
The title of the book is "Behaviour of Animals"
[Okay, Sir]
Um... behaviour ... animals that's a very nice book (while continuing the typing)
(Browsing through the displayed screen)
animals ... oh no (murmured)... by David Attenborough ... not here (while browsing)
Now I say ... not here now
I can use also Dadvi (correcting himself) David Attenborough. From the title David Attenborough, I can have that one.
From the Author (correcting himself)
[Okay Sir]
David Attenborough (started typing)
... b,o... (murmured while typing)
Is it Attenborough (asking himself while browsing through the searched results)
I am not getting
Attenborough first and David is second it may be of that one also.
(Started typing)
David Attenborough (while browsing through the searched results)
"The Life of Birds"
Five Nine Eight Point Two Nine Five Four (Reading the class number)
This is also very nice book.
(Reading the retrieved titles one by one)
"This Request Expeditions"
"The Trials of Life"
and there is also of David Attenborough "Life of Animals", "Life of Animals" also there.
But today I am not getting it this one.
[Okay Sir]
Thank you.

USER – 06	Date: 21st Nov 2001	Session Started at: 11:54:28 a.m.	Ended at: 11:55:11 a.m.

Sir, first of all I am searching for a book on Shashi Tharoor's "Riot"
[Right]
Click on 'Author' (Selected the 'Author' option)
[Right]
(Pressed the Enter key)
Now I type the name of the author, title of the author, rather.
[Hu]
Title is Tharoor
[Hu]
t,h,a,r,o,o,r (Pressing the keys and uttering)
[Hu]
I get a list of books available in this library
[Okay]

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 06 contd...)
Written by Shashi Tharoor
[Right]
There are two books available
[Right]
Now to get any of these books I click on them
(Pressed the Enter key to display the full catalogue of the first retrieved result)
[Hu]
Here it's written 'out' (while reading the catalogue)
It means it's not currently available in the library
[Right]
Now I can go for another book
[Hu]
For that I press F10, which is for previous screen
(Pressed the F10 key)
[Hu]
I go for another novel (selected the next title and pressed the Enter key)
[Hu, Hu]
which is "Riot"
[Hu, Hu]
It's recently released novel of Shashi Tharoor
Here I click (Pressed the Enter key to display the full catalogue)
It's also out.
Yeah.
End of the Search

USER – 07	Date: 21st Nov 2001	Session Started at: 15:29:16 p.m.	Ended at: 15:30:40 p.m.

I am searching for ... book title ... umm ... it is called ...
"The Selfish Gene" (while typing)
Yeah coming (Murmuring)
(Pressed the Enter key to see the full catalogue)
It's available.
So I note down the name and then now go and see.
Now I will go to ...go back box and search some IT books (Pressed the 'Back' option)
In IT books I am searching for ... title
Ohhh... that is books on windows...98 (while typing)
No it is Author, I am sorry
(went back to previous menu)
Windows 98 (while typing)
Few books I find ... (while browsing through the searched results)
Sorry ... issued ... issued ... so no books to search for actually.
So I go back.
Yes
End of the Search

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

USER – 08	Date: 21st Nov 2001	Session Started at: 18:04:52 p.m.	Ended at: 18:07:34p.m.

Look, I am, pressing this word
(Typed)
Humm... Embryology, under subject
And only three books... (while browsing)
It shows only three books (while browsing)
[Okay]
but... aa...and... and these books are very very less important
I go through words in title
Okay
[Hu]
Then, then I press Embryology
(Typed)
But look there are twelve books (while browsing)
Hu, twelve books (while browsing)
[Okay]
And this not in proper way
[Right]
Not only that ... humm ... not only that
And then I, I again
(Pressed Esc Key to go back previous menu)
... again it will back
And then ... aaa...aache... Gilbert, Okay
Author (Selected the Author option)
Gilbert... haa
[Hu Hu]
G,I,... huu (while typing)
(Pressed the Enter key)
Gilbert (while browsing)
Hu ... Hum...(while browsing)
"Developmental Biology", "Gilbert"
Developmental Biology or Embryology is a same, same matter
But this ... aaa... this name to book is not included in words in Title or Subject hum
So there are some problems
Okay Invertebrate
(Selected Subject option)
(Typed)
(Pressed enter)
Look, hi hi (laughing while reading the catalogue)
this a another problem
Invertebrate is a subject, hu, here only one book it shows
Okay
And I, I goes to words in title
Again press Invertebrate (typed)
There are seventeen books (while browsing)
What is the matter
What is the different, in Words In Title and in in Subjects, What is the different
It should not be any any different, but there is some difference
My time is up

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

USER – 09	Date: 22st Nov 2001	Session Started at: 16:13:39 p.m.	Ended at: 16:15:11 p.m.

I am searching for books
on ... GIS (while started typing)
[Hu]
and Remote Sensing
[Hu Hu]
okay. So... (Pressed the Enter key)
It will be under subject
[Hu Hu]
aaa... (while browsing through the searched results)
Geographical... Geography (while pressing the Upper Arrow Key and Lower Arrow Key to see the retrieved results)
Something else it's coming.
Therefore I change in modes. It's not coming under Geography
[Hu Hu]
(Looking at the screen)
So now
There is in classified let me see
[Hu Hu]
(Went back to main screen, selected the 'Classified' option of the OPAC and entered a classification number)
usss... it's not there ...
It's coming only under ... Author it's coming
[Hu Hu]
(Went back to main screen, selected the 'Author' option of the OPAC and entered an author's name)
David Martin (name of the author typed)
essss... it's David Martin
"Geographical Information System"
It's **OUT**
It's not there
I have completed

USER – 10	Date: 23st Nov 2001	Session Started at: 14:23:41 p.m.	Ended at: 14:24:58p.m.

Okay ahaa...
I am for books on Economics
[Right]
I am
I pressing the arrow keys to find out the particular books
[Right]
Subject (selected the 'Subject' option)
Now I pressing the Enter keys (pressed the Enter key)
[Right]
Beginning from the yeah... they need the ... they asking for the subject what I want
[haa]
I pressing the eb (after entering E)
[haa]

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 10 contd...)
I search
[haa]
searching for Economics books
[haa]
So I pressing E
[Right]
I pressed the key (Pressed the Enter key)
[Hu]
oo... (while browsing through the searched results)
Economics Five (counting the number of hits while browsing)
If find to Demand and Supply
(Pressed the Enter Key after selecting the hit)
o... Demand and Supply I have find book what I want
Econ... Demand and Supply (Pressed the Enter key to display the full catalogue)
[Yes]
There is only one book named aa.. author John Solmon and Solmon
[Hu Hu]
Yes aaa... Yes I find my book
[Hu]
and I aa... Yes it out of a...it is issued actually (while reading the catalogue)
[Hu]
I think I can't get this time
End of the Search

USER – 11	Date: 24st Nov 2001	Session Started at: 15:27:52 p.m.	Ended at: 15:29:07 p.m.

Searching a book on... Intellectual Property Law
[Hu]
and I searching on the Author right now
[Right]
The name of the author happens to be (Pressed Enter to start searching on Author field)
Bainbridge... happens to be Bainbridge (typed the author name and pressed the Enter key)
and I will just check it out, whether it is in or not (while browsing through the retrieved results by pressing Upper Arrow Key and Lower Arrow Key)
[Right]
These are fiction books, which have come out in the beginning (while browsing through the retrieved results)
I have to go on to the lower section (pressing the Lower Arrow Key)
It's there. Ha I think it is coming now
Intellectual Property (Pressed the Enter key to display the full catalogue)
Okay, it's out
(Checked all the full catalogues of Bainbridge's books by pressing the Upper Arrow Key and Lower Arrow Key)
Hum... seems all the Bainbridges are out. So I guess I have to check out (Pressed Esc key to return to main menu)
[Ha]
Finally subject so that I find some other author (selected the 'Subject' option and pressed the Enter key)

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 11 contd...)
So it is typing the subject name. It happens to be Intellectual Property (Typed and pressed the Enter key)
(Browsing through the retrieved results)
(Pressed the Enter key to display the full catalogue of a book)
There is **ONLY ONE BOOK**, which is in, and if my luck favours I just get it
I just end my search over here
[Okay, thank you]

USER – 12	Date: 26th Nov. 2001	Session Started at: 14:36:02 p.m.	Ended at: 14:37:11p.m.

Aa.. It's... I am looking for a novel by Anthony Trollop and I am doing also search.
So... I am clicking on the Author Catalogue (selected the 'Author' option and pressed the Enter key)
and I am typing in it's name Trollop (while typing)
and **AAH!** it's bringing up a whole list of Anthony Trollop's works (while browsing through the retrieved results)
So I scroll down (while browsing through the retrieved results by pressing Upper Arrow Key and Lower Arrow Key)
Scroll down more, aah..
[Hu]
and scroll up
[Hu]
and I find "Dr. Thrown"
and press Enter (pressed the Enter key)
and its gives me... the information at ... and this classification number and ...(while reading the catalogue)
but it doesn't seem to do its tell me whether it's on the shelf or ... out at the moment.
Okay, so... it should be on the shelf , then, which is what I wanted to know
So that's me finished.

USER – 13	Date: 27st Nov 2001	Session Started at: 17:19:29 p.m.	Ended at: 17:22:41 p.m.

Title of books (pointing to the 'Title' option of the OPAC and pressing the Enter key)
I entering the title. The title is "Applications in Physical Chemistry"
That is a, p, p, l, i, c, a, t , i, o, n, s in Physical p, h, y, s, i, c, c, a, l Chemistry c, h, m, i, s, t, r, y (while typing)
(Browsed through the retrieved results)
But I don't found, any books, this name.
I should entered in the author (pressed the Enter key, wrongly and reached to a full catalogue of a book)
[Okay]
title theke authore jete gele ki kore (in Bengali)
(meaning: How to go to the Author from Title ? Requested the researcher for assistance. Assistance provided to reach to the main menu, where by default 'Author' option gets selected)
Thanks
(Pressed the Enter key to reach the 'Author' field)
We entered into Author
Name of author
Levine Phil

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 13 contd...)
e, v, i, n, e (while typing)
Now I am to move downwards (Pressing Lower Arrow key)
I want to go upwards (Pressing Upper Arrow key)
The name of the book is "Physical Chemistry" writer is Era N. Levine (Reading one of the retrieved results)
Now I Enter (Pressed the Enter key to get the full catalogue)
The book is out (while browsing the catalogue)
Again I am back (pressed the Esc key to reach previous screen)
Again I go on
(Browsing through the retrieved records)
Name of the book "Quantum Chemistry" writer I. N. Levine (while browsing the catalogue)
Enter (Pressed the Enter key to get the full catalogue)
No this is not out (while browsing the catalogue)
I want to see, that there is another copy of named "Physical Chemistry" of I. N. Levine. So I
(checked the catalogue)
No, this is also out
So, both two the are out
So
I want to take "Quantum Chemistry", I.N. Levine
This book (pointing to the catalogue on the screen)
My search is over
[Thank you]

USER – 14	Date: 28st Nov 2001	Session Started at: 12:54:47 p.m.	Ended at: 12:56:21p.m.

Okay
I am just looking for a book here
Book is on literature
Written by Shakespeare
So what I have do is, I have to author (selected the author option after trying several keys)
And now... there is a key ... there is a ... some a ... some word is there Author
So I have to enter that one
(pressed Enter key)
Then what I have do is I have to pick...
There is a some thing scrollbar
Where I have to write Shakespeare
(Typed Shakespeare)
and I got some books, lot of books on ... written by Shakespeare (while browsing)
(pressed Down Arrow Key)
aaa... right now I just want to ...aa ... see
it's lot of Shakespeare like (while browsing)
... um... Mr. Nicholas Shakespeare is there
(pressed Down Arrow Key)
William Shakespeare is there
So in fact I was looking for a book which is written by **WILLIAM SHAKESPEARE**.
(pressed Down Arrow Key)
And that book name is "As he like it"
It is there (while browsing) ... it's there
I'm just ...a...put now clicking Enter Key (Pressed the Enter Key)

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 14 contd...)
And getting it
The book is ... oo... looks like the book is in the **SHELF**
And aa...you can saw I can this
These all, I can pick up the book for the Shelf
Yeah it's end the search
[Okay, thank you]

USER – 15	Date: 28st Nov 2001	Session Started at: 17:09:47 p.m.	Ended at: 17:12:22 p.m.

I am going to the Subject search
(selected the subject option)
Now, here I gave Information Tec ... I type Information Technology (typed)
(Pressed enter) Enter
(Pressed Down Arrow Key)
Now, here I find lot of ... Information Retrieval, Information Science, Services, Systems & Technology
And there are six numbers ... six books mentioned here
I clicked to see the list here (pressed Enter to see the brief details)
aa... these all ... Information Technology (reading)
This I.T. (reading)
It Infrastructure (reading)
YEAH
Now, I am interested in three books here
That is "Information Technology: the basics"
I am not able to see the complete this thing
(selected the title)
So I click on this to see the catalogue card (Pressed the Enter Key)
"Information Technology: the basics" by "Barbara Wilson" publishing's to Macmillan (reading)
opp... this is not the one which I am searching for
(pressed the Down Arrow Key and selected the next record)
"Information Technology and its applications"
(Pressed the Enter Key)
Yes
This is from "Terry Corbett" "the second edition" "Longman Publication"
This seems to be interesting this thing ... one...
I am just noted it down for picking it up and going through the thing
(Pressed Esc Key)
I am going back
(selected another subject heading by Up Arrow key)
and there is anything which is there in Information Retrieval
(Pressed the Enter Key)
"Organising knowledge: an introduction to" (browsing a brief record)
Well, I have to click on this to see the complete title
(Pressed the Enter Key)
"An introduction to Information Retrieval" by "Jennifer Rowley", "Second Edition" all sort
Well, this seems to be a related subject to me because it talks about introduction to information retrieval
I have just noted it down Rowley, J. (written on a paper)
For a further reference

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 15 contd...)
(Pressed Esc Key)
I Go back and see what is the second title, which is listed in information type here
"Finding government information in the Internet"
(Pressed Esc Key)
Well this I am not interested, here
I go back to the last subject which I am interested "Information Science"
There is one book mentioned here
(selected the record)
Click it (Pressed the Enter Key)
"Changing context of information"
I have to again click to see the complete title
(Pressed the Enter Key)
It's an introductory analysis by "Kirin McCray "
"London", "Library Association"
well this doesn't seem to be my interest
I am ending my search here

USER – 16	Date: 29st Nov 2001	Session Started at: 13:16:33p.m.	Ended at: 13:18:22 p.m.

I want a book on the head of aquarium
[Okay]
What is the system
How can I find here
(Selected subject option)
(Typing)
... a, c, q, ...(while typing)
(browsing the results)
...*nai* (Not there) ...(browsing the results)
...*nai* (Not there) ...(browsing the results)
...*nai* (Not there) ...(browsing the results)
no book on aquarium
(Pressed the Esc Key)
(Pressed the Esc Key)
(Pressed the Esc Key)
(Pressed the Esc Key- main menu reached on the third stroke- system gave an alarm beep)
(Pressed the Esc Key- main menu reached on the third stroke- system gave an alarm beep)
(Selected the Subject option)
(Pressed the Enter Key)
Or we can change into the fish aquarium ... if there any title
(Typed)
Eleven books are there, hopefully any fish
(Pressed the Enter Key on a retrieved brief title)
But whether it is in aquarium or not
Fish ... (browsing by Down Arrow Key)
No ... (browsing by Down Arrow Key)
(Murmuring and reading in a very low voice, while browsing by Down Arrow Key)
(End of the list reached by still pressed the Down Arrow key- system gave an alarm beep)
(Pressed the Enter Key on last record)
Nothing
I do not know whether in other matter I can get entry
um... I will be take the assistance of the Library person

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

USER – 17	Date: 30st Nov 2001	Session Started at: 14:07:35 p.m.	Ended at: 14:10:24 p.m.

(Started typing)
Thomas
... aaa...
(Typing)
D,y ...Tyaning (while typing)
Okay
So here I am getting Thomas Tyaning ...
Thomas Tyaning...Yeah ... under melcoid
Okay
I am looking for the book under the melodic (while browsing)
Eight twenty two point nine one two (reading)
By chances it is two places, okay
One is Eight twenty two point nine one two (while reading)
One is Eight twenty two point nine one two T, H, O (while noting)
And again it Eight twenty two point nine one two (while browsing)
Eight twenty two point nine one two (while noting)
Then ... again I am looking for a book ... on mathematics ...which is by Hogman
Okay
(pressed Space Bar several times)
Okay Ho...
(typed)
o... o... o...o ... it's not there at all (while browsing)
Somebody seems to taken it home
Hogman (while browsing other records)
(pressed Down Arrow key)
That's... (while browsing other records)
(pressed some other key – system gave an alarm beep)
End
Now I will try to find some anthology of poetry
[Right]
Okay
[Hu]
So anthology of poetry ... again I have to go back F10 (pressed twice – system gave an alarm beep)
Okay
My title, it's subject I have to go to, isn't it
(Selected subject option) So checked
(typed 'Poetry")
poetry ... (while browsing)
poetry ... umm...(while browsing)
poetry English (while browsing)
yeah these are the valued anthologies (while browsing)
noo... unfortunately ... it's not there (while browsing)
Let try if, I am not finding it, so let's try to do it in a different manner
(Press Esc Key)
umm... subject ... Enter (Pressed the Enter Key)
Anthology a, n, e, h antho...logy ...y anthology (while typing)
Anthology is yeah, wait anthologies Enter (Pressed the Enter Key)

1.Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2.Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VI

(USER – 17 contd...)
Yeah
(Murmuring while browsing)
Literature (while browsing)
Poetry (while browsing)
(Murmuring while browsing)
Only these...
No, I don't think I will be getting
Anyway, now I will try to find out the book myself,
[Okay]
Okay

USER – 18	Date: 30st Nov 2001	Session Started at: 18:06:27 p.m.	Ended at: 18:07:32p.m.

Aaa... "Opertating System" by Tanningo
[Hu]
aaa...
(Typing)
Tanningo (while typing)
Author (while typing)
[Okay]
(Continued typing)
(Pressed the Enter Key)
All these about (browsing the catalogue card)
And... basically I want to... umm... I have. Basically this is renewed to me, to my card
[Okay]
I want to renew it, this is to my card
[Okay]
I jua forget the serial number, that's why I want to renew it, so writing this serial number
Yeah, I have a books on Algebra
(Went back to pervious menu)
(Started typing Algebra on title field)
Title (Checking the title field)
[Okay]
(Pressed the Enter key twice to see the full catalogue)
Algebra (Checking the catalogue)
[Okay]
This is ... (Checking the catalogue)
It is also issued ... issued to me
[Okay]
And I want to renew it.

1. Italics texts inside the square brackets indicate- 'Acknowledgement Token'. For example: *[Okay]*
2. Normal texts inside the first brackets indicate a note of action, movement etc., collected at the time of search. For example: (Pressed the Enter Key)
3. Texts in bold indicates expression of excitement. For example: **AAH!**

APPENDIX – VII

Verbal Protocol Segments & Coded Data

ID : Transcription : CODE
U0101:I am searching:PB
U0102:for a book:DA
U0103:on Dracula:DC2
U0104:under the title:DB2
U0105:Okay I found it:EB
U0106:Eight twenty three:DC4
U0107:point eight:DC4
O1U01:Yeah:O
O2U01:[Thank you]:O
U0201:I am pressing the:DD
U0202:...:IA
U0203:key button for Author:DB1
T1U02:[Okay]:T
U0204:and I am typing it:DD
U0205:...:DB1
U0206:Jessy Liberty:DC1
U0207:i...e...e...r...t...y (Pressing the keys and uttering):DC1
U0208:I am not getting:EC
U0209:Now I will go for the title not for the Author:DB2
T2U02:[Okay]:T
U0210:I am pressing the:DD
U0211:...:IA
U0212:key for the title:DB2
U0213:Pressing Enter (pressed the Enter key boldly):DD
U0214:and I am typing:DD
U0215:...:IA
U0216:Code Java:DC2
U0217:Still I am not:EC
U0218:...:IA
U0219:YEAH I got something:EA
U0220:Java ... Java ... (Murmuring):MC1
U0221:I found:EB
O1U02:Finish it:O
U0301:Searching:PB
U0302:for the Modern Short Stories:DC3
U0303:on... a...a...:IA
U0304:literature:DC3
U0305:Modern short story (Murmuring):MC1
U0306:Most of the books are out:MC3
U0307:um... um...:IA
U0308:I am going back to the catalogues:PA

ID Legends: U - User; First two digits – the User No.; Next two digits- Segment No. For example, U1111 stands for the User No. 11 and the 11th Segment of the user's protocols.
T – Acknowledgement Token; First one or two digits – the Token No.; U – User; next two digits – User No. For example, T2U02 stands for the Second Acknowledgement Token provided to the User No. 02
O – Other statements; First one or two digits – the Other Statement No.; U – User; next two digits – User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

For detailed Transcriptions, please refer to Appendix – VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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T1U03:[Right]:T
U0309:um...:IA
U0310:searching:PB
U0311:through the authors:DB1
T2U03:[Right]:T
U0312:Searching for Mansfield:DC1
U0313:Yeah...:EB
U0314:Captain Mansfield:MC1
U0315:It is out:MC3
U0316:This is again out:MC3
U0317:mmuuch (Expressing dissatisfaction):EC
U0318:That's all:EC
O1U03:Finished the search:O
U0401:Okay:PA
U0402:I am writing:PA
U0403:Anthropology:DC3
U0404:okay:PA
T1U04:[Right]:T
U0405:Let me see there:PA
U0406:is any book:DA
U0407:on this subject or not:DC3
U0408:On title:DC2
T2U04:[Okay]:T
U0409:Let me see:PA
U0410:but there is no book course:EC
U0411:all these all about:MC1
U0412:....:IA
U0413:OKAY I discovered really:EB
U0414:And then really:IA
U0415:I HAVE GOT A BOOK (with excitement):EB
U0416:Okay, let me do one thing:PA
U0417:F4 (pressed the F4 key):DD
T3U04:[Then]:T
U0418:Title:DB2
U0419:... no, not title:IA
U0420:This is the subject all about:DB3
U0421:If I write the subject it will come:PA
U0422:Okay, I am writing my subject:DB3
U0423:okay:PA
T4U04:[Yes, Please]:T
U0424:It's my subject:DC3
U0425:Twenty-four (counted the number of hits):MA
U0426:And the books are ...:MA
U0427:This (identified a book):MB
U0428:There are other books also:MB

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For detailed Transcriptions, please refer to Appendix – VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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U0429:Yeah lots of books:MB
U0430:Environmental Economics:MC1
U0431:(reading the retrieved titles):MA
U0432:Introduction to ... (Murmuring and reading):MA
U0433:DICTIONARY OF ECONOMICS (reading the retrieved titles):MA
U0434:It is a very important book:EA
U0435:Like to go into the details:MC2
T5U04:[So]:T
U0436:I press Enter (Pressed the Enter key):DD
U0437:Huh ... so this is the detail:MA
O1U04:Yeah:O
U0501:Now I am:PB
U0502:...:IA
U0503:I was going to search:PB
U0504:for "Behaviour of Animals":DC2
U0505:...:IA
U0506:and by David Attenborough:DC1
U0507:It's a very interesting book and I got one ... very few years ago and ... :MRA
U0508:now I am searching that one:PB
U0509:whether it is in the library now or not:PB
T1U05:[Okay]:T
U0510:The title:DB2
U0511:of the book:DA
U0512:is "Behaviour of Animals":DC2
T2U05:[Okay, Sir]:T
U0513:Um... behaviour ... animals:DC2
U0514:that's a very nice book:MRA
U0515:animals ...:MA
U0516:oh no (murmured)...:EC
U0517:by David Attenborough ...:MA
U0518:not here:MC3
U0519:Now I say ... not here now:EC
U0520:I can use also Dadvi (correcting himself) David Attenborough:PB
U0521:From the title:DB2
U0522:David Attenborough:DC2
U0523:I can have that one:PB
U0524:From the Author (correcting himself):DB1
T3U05:[Okay Sir]:T
U0525:David Attenborough:DC1
U0526:(started typing) ... b,o... (murmured while typing):DD
U0527:Is it Attenborough (asking himself):IA
U0528:I am not getting:EC
U0529:Attenborough first and David is second it may be of that one also:DC1
U0530:David Attenborough (while browsing through the searched results):MA
U0531:"The Life of Birds":MA

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For detailed Transcriptions, please refer to Appendix VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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U0532:Five Nine Eight Point Two Nine Five Four (Reading the class number):MA
U0533:This is also very nice book:MC2
U0534:"This Request Expeditions":MA
U0535:"The Trials of Life":MA
U0536:and there is also of David Attenborough:MC1
U0537:"Life of Animals", "Life of Animals" also there:MC1
U0538:But today I am not getting it this one:EC
T4U05:[Okay Sir]:T
O1U05:Thank you:O
U0601:Sir, first of all I am searching:PB
U0602:for a book:DA
U0603:on Shashi Tharoor's:DC1
U0604:"Riot":DC2
T1U06:[Right]:T
U0605:Click on 'Author' (Selected the 'Author' option):DB1
T2U06:[Right]:T
U0606:Now I type:DD
U0607:the name of the author, title of the author, rather:DC1
T3U06:[Hu]:T
U0608:Title is Tharoor:DC1
T4U06:[Hu]:T
U0609:t,h,a,r,o,o,r (Pressing the keys and uttering):DD
T5U06:[Hu]:T
U0610:I get a list of books available in this library:MA
T6U06:[Okay]:T
U0611:Written by Shashi Tharoor:MB
T7U06:[Right]:T
U0612:There are two books available:MB
T8U06:[Right]:T
U0613:Now to get any of these books I click on them:DD
U0614:(Pressed the Enter key to display the full catalogue of the first retrieved result):DD
T9U06:[Hu]:T
U0615:Here it's written 'out' (while reading the catalogue):MC3
U0616:It means it's not currently available in the library:EA
T10U06:[Right]:T
U0617:Now I can go for another book:PB
T11U06:[Hu]:T
U0618:For that I press F10:DD
U0619:which is for previous screen (Pressed the F10 key):DD
T12U06:[Hu]:T
U0620:I go for another novel:PA
T13U06:[Hu, Hu]:T
U0621:which is "Riot":MB
T14U06:[Hu, Hu]:T
U0622:It's recently released novel of Shashi Tharoor:MRA

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O – Other statements; First one or two digits – the Other Statement No.; U – User; next two digits – User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

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U0623:Here I click (Pressed the Enter key to display the full catalogue):DD
U0624:It's also out:MC3
U0625:Yeah:PB
U0701:I am searching for:PB
U0702:... book title:DB2
U0703:... umm ...:IA
U0704:it is called ..."The Selfish Gene":DC2
U0705:Yeah coming (Murmuring):MA
U0706:It's available:MC3
U0707:So I note down the name and then now go and see:MRA
U0708:Now I will go to ...:PA
U0709:go back box:DD
U0710:and search:PB
U0711:some IT books:DC3
U0712:In IT books I am searching for ...:DC3
U0713:title:DC2
U0714:Ohhh... :IA
U0715:that is books on windows...98:DC2
U0716:No it is Author, I am sorry:IA
U0717:Windows 98 (while typing):DC2
U0718:Few books I find ... (while browsing through the searched results):MA
U0719:Sorry ...:EC
U0720:issued ...:MC3
U0721:issued ...:MC3
U0722:so no books to search for actually:EC
U0723:So I go back:DD
O1U07:Yes:O
U0801:Look, I am, pressing this word:DD
U0802:Humm... Embryology:DC3
U0803:under subject:DB3
U0804:And only three books...:MB
U0805:It shows only three books:EC
T1U08:[Okay]:T
U0806:but... aa...and... and these books are very very less important:EA
U0807:I go through words in title:DB2
U0808:Okay:PB
T2U08:[Hu]:T
U0809:Then:PA
U0810:then I press:DD
U0811:Embryology:DC3
U0812:But look there are twelve books:MB
U0813:Hu, twelve books (while browsing):MB
T3U08:[Okay]:T
U0814:And this not in proper way:EC
T4U08:[Right]:T

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For detailed Transcriptions, please refer to Appendix – VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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U0815:Not only that ... humm ... not only that:EC
U0816:And then I, I again:PA
U0817:(Pressed Esc Key to go back previous menu):DD
U0818:... again it will back:PA
U0819:And then ... aaa...aache...:PB
U0820:Gilbert, Okay:DC1
U0821:Author:DB1
U0822:Gilbert... haa:DC1
T5U09:[Hu Hu]:T
U0823:G,I,... huu (while typing):DD
U0824:(Pressed the Enter key):DD
U0825:Gilbert (while browsing):MA
U0826:Hu ... Hum...(while browsing):MA
U0827:"Developmental Biology":MB
U0828:"Gilbert":MB
U0829:Developmental Biology or Embryology is a same, same matter:EA
U0830:But this ... aaa...:IA
U0831:this name to book is not included in words in Title or Subject hum:EC
U0832:So there are some problems:EC
U0833:Okay Invertebrate:DC3
U0834:Look, hi hi (laughing while reading the catalogue):EC
U0835:this a another problem:EC
U0836:Invertebrate is a subject, hu:DC3
U0837:here only one book it shows, Okay:EC
U0838:And I, I goes to words in title:PB
U0839:Again press:DD
U0840:Invertebrate:DC3
U0841:There are seventeen books (while browsing):MB
U0842:What is the matter:EC
U0843:What is the different, in Words In Title and in in Subjects, What is the different:EC
U0844:It should not be any any different, but there is some difference:EC
O1U08:My time is up:O
U0901:I am searching:PB
U0902:for books:DA
U0903:on ...:IA
U0904:GIS:DC3
T1U09:[Hu]:T
U0905:and Remote Sensing:DC3
T2U09:[Hu Hu]:T
U0906:okay:PA
U0907:So...:IA
U0908:It will be under subject:DB3
T3U09:[Hu Hu]:T
U0909:aaa... (while browsing through the searched results):MA
U0910:Geographical...:MA

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T - Acknowledgement Token; First one or two digits - the Token No.; U - User; next two digits - User No. For example, T2U02 stands for the Second Acknowledgement Token provided to the User No. 02
O - Other statements; First one or two digits - the Other Statement No.; U - User; next two digits - User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

For detailed Transcriptions, please refer to Appendix - VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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U0911:Geography:MA
U0912:(pressing the Up Arrow Key):DD
U0913:Something else it's coming:EC
U0914:Therefore I change in modes:PB
U0915:It's not coming under Geography:EC
T4U09:[Hu Hu]:T
U0916:So now:IA
U0917:There is in classified:PB
U0918:let me see:PB
T5U09:[Hu Hu]:T
U0919:usss... it's not there ...:EC
U0920:It's coming only under:EA
U0921: ...:IA
U0922:Author it's coming:EA
T6U09:[Hu Hu]:T
U0923:David Martin:DC1
U0924:essss... it's David Martin:MB
U0925:"Geographical Information System":MC2
U0926:It's OUT:MC3
U0927:It's not there:EC
O1U09:I have completed:O
U1001:Okay ahaa...:PB
U1002:I am for books:DA
U1003:on Economics:DC3
T1U10:[Right]:T
U1004:I am:EA
U1005:I pressing the arrow keys to find out the particular books:DD
T2U10:[Right]:T
U1006:Subject:DB3
U1007:Now I pressing the Enter keys (pressed the Enter key):DD
T3U10:[Right]:T
U1008:Beginning from the yeah...:IA
U1009:they need the ...:IA
U1010:they asking for the subject what I want:DB3
T4U10:[haa]:T
U1011:I pressing the eb (after entering E):DD
T5U10:[haa]:T
U1012:I search :DD
T6U10:[haa]:T
U1013:searching for:PB
U1014:Economics books:DC3
T7U10:[haa]:T
U1015:So I pressing E:DD
T8U10:[Right]:T
U1016:I pressed the key (Pressed the Enter key):DD

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T - Acknowledgement Token; First one or two digits - the Token No.; U - User; next two digits - User No. For example, T2U02 stands for the Second Acknowledgement Token provided to the User No. 02
O - Other statements; First one or two digits - the Other Statement No.; U - User; next two digits - User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

For detailed Transcriptions, please refer to Appendix - VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

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T9U10:[Hu]:T
U1017:oo... (while browsing through the searched results):MA
U1018:Economics Five (counting the number of hits while browsing):MA
U1019:If find to Demand and Supply:MC1
U1020:o... Demand and Supply:MC2
U1021:I have find book what I want:EB
U1022:Econ... Demand and Supply:MC2
T10U10:[Yes]:T
U1023:here is only one book:MC3
U1024:named aa.. author John Solmon and Solmon:DC1
T11U10:[Hu Hu]:T
U1025:Yes aaa... Yes I find my book:EB
T12U10:[Hu]:T
U1026:and I aa...:MC3
U1027:Yes it out of a...it is issued actually (while reading the catalogue):MC3
T13U10:[Hu]:T
U1028:I think I can't get this time:EC
U1101:Searching a book on...:PB
U1102:Intellectual Property Law:DC3
T1U11:[Hu]:T
U1103:and I searching on the Author right now:DB1
T2U11:[Right]:T
U1104:The name of the author happens to be:IA
U1105:Bainbridge... happens to be Bainbridge:DC1
U1106:and I will just check it out, whether it is in or not:PA
T3U11:[Right]:T
U1107:These are fiction books, which have come out in the beginning(while browsing)
:MB
U1108:I have to go on to the lower section:DD
U1109:It's there:MB
U1110:Ha I think it is coming now:MB
U1111:Intellectual Property:DC3
U1112:Okay, it's out:MC3
U1113:Hum... seems all the Bainbridges are out:MC3
U1114:So I guess I have to check out:PB
U1115:(Pressed Esc key to return to main menu):DD
T4U11:[Ha]:T
U1116:Finally subject:DB3
U1117:so that I find some other author:DC1
U1118:So it is typing the subject name:DD
U1119:It happens to be Intellectual Property:DC3
U1120:There is ONLY ONE BOOK, which is in, and if my luck favours I just get it:MC3
O1U11:I just end my search over here:O
O2U11:Okay, thank you:O
U1201:Aa.. It's...:PB

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O - Other statements; First one or two digits - the Other Statement No.; U - User; next two digits - User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

For detailed Transcriptions, please refer to Appendix VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

APPENDIX – VII

U1202:I am looking for a novel:DC3
U1203:by Anthony Trollop:DC1
U1204:and I am doing also search:PB
U1205:So...:PA
U1206:I am clicking on the Author Catalogue(selected the 'Author' option):DB1
U1207:and I am typing in it's name Trollop (while typing):DD
U1208:and AAH!:EB
U1209:it's bringing up a whole list of Anthony Trollop's works:EB
U1210:So I scroll down:DD
U1211:Scroll down more:DD
U1212:aah...:MA
T1U12:[Hu]:T
U1213:and scroll up:DD
T2U12:[Hu]:T
U1214:and I find:MB
U1215:"Dr. Thrown":MC1
U1216:and press Enter (pressed the Enter key):DD
U1217:and its gives me...:MB
U1218:the information at ...:MB
U1219:and this classification number and ...(while reading the catalogue):MB
U1220:but it doesn't seem to do its tell me whether it's on the shelf or ... out at the moment:IA
U1221:Okay, so... it should be on the shelf, then:MC3
U1222:which is what I wanted to know:EB
O1U12:So that's me finished:O
U1301:Title of books (pointing to the 'Title' option):DB2
U1302:I entering the title:DD
U1303:The title is "Applications in Physical Chemistry":DC2
U1304:That is a,p,p,l,i,c,a,t,i,o,n,s in Physical p,h,y,s,i,c,c,a,l Chemistry c,h,m,i,s,t,r,y (while typing):DD
U1305:But I don't found, any books, this name:EC
U1306:I should entered in the author:PB
T1U13:[Okay]:T
U1307:title theke authore jete gele ki kore (How to go to the Author from Title? asked in Bengali):IA
O1U13:help provided:O
O2U13:Thanks:O
U1308:We entered into Author:DB1
U1309:Name of author:DC1
U1310:Levine Phil:DC1
U1311:e,v,i,n,e (while typing):DD
U1312:Now I am to move downwards (Pressed Down Arrow key):DD
U1313:I want to go upwards (Pressing Up Arrow key):DD
U1314:The name of the book is "Physical Chemistry":MB
U1315:writer is Era N. Levine (Reading one of the results):MB

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For detailed Transcriptions, please refer to Appendix VI. For details of Codes, please refer to Table- 5.2 (Coding Scheme).

APPENDIX – VII

U1316:Now I Enter (Pressed the Enter key to get the full catalogue):DD
U1317:The book is out (while browsing the catalogue):MC3
U1318:Again I am back:DD
U1319:Again I go on:PA
U1320:Name of the book "Quantum Chemistry":MB
U1321:writer I. N. Levine (while browsing the catalogue):MC1
U1322:Enter (Pressed the Enter key to get the full catalogue):DD
U1323:No this is not out (while browsing the catalogue):MC3
U1324:I want to see, that there is another copy:PB
U1325:of named "Physical Chemistry":MB
U1326:of I. N. Levine:MB
U1327:So I (checked the catalogue):MC3
U1328:No, this is also out:MC3
U1329:So, both two the are out:MC3
U1330:So:IA
U1331:I want to take "Quantum Chemistry", I.N. Levine:EB
O3U13:This book (pointing to the catalogue on the screen):O
O4U13:My search is over:O
O5U13:[Thank you]:O
U1401:Okay:PB
U1402:I am just looking for:PB
U1403:a book here:PB
U1404:Book is on literature:DC3
U1405:Written by Shakespeare:DC3
U1406:So what I have do is:PB
U1407:I have to go to author:DB1
U1408:And now... there is a key ... there is a ... some a ... some word is there Author:IA
U1409:So I have to enter that one (pressed Enter key):DD
U1410:Then what I have do is I have to pick...:DD
U1411:There is a some thing scrollbar:DD
U1412:Where I have to write Shakespeare:DD
U1413:and I got some books, lot of books on ...:MA
U1414:written by Shakespeare (while browsing):MB
U1415:aaa... right now I just want to...aa ... :IA
U1416:see it's lot of Shakespeare like (while browsing):MA
U1417:...um... Mr. Nicholas Shakespeare is there:MA
U1418:William Shakespeare is there:MB
U1419:So in fact I was looking for a book:DA
U1420:which is written by WILLIAM SHAKESPEARE:DC1
U1421:And that book name is "As he like it":DC2
U1422:It is there (while browsing):MB
U1423:... it's there:MC3
U1424:I'm just ...a...put now clicking Enter Key (Pressed the Enter Key):DD
U1425:And getting it:MB
U1426:The book is ...:MC1

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O – Other statements; First one or two digits – the Other Statement No.; U – User; next two digits – User No. For example, O1U02 stands for the First Other Statement generated by the User No. 02.

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APPENDIX – VII

U1427:oo... looks like the book is in the SHELF:MC3
U1428:And aa...you can saw I can this:EB
U1429:These all, I can pick up the book for the Shelf:MRA
O1U14:Yeah it's end the search:O
O2U14:[Okay, thank you]:O
U1501:I am going to:PB
U1502:the Subject:DB3
U1503:search:PB
U1504:Now, here I gave Information Tec... :DC3
U1505:I type Information Technology (typed):DD
U1506:(Pressed enter) Enter:DD
U1507:(Pressed Down Arrow Key):DD
U1508:Now, here I find lot of ...:MA
U1509:Information Retrieval:MB
U1510:Information Science:MB
U1511:Services:MB
U1512:Systems & Technology:MB
U1513:And there are six numbers ... six books mentioned here:MB
U1514:I clicked to see the list here (pressed Enter to see the brief details):MB
U1515:aa... these all ...:MA
U1516:Information Technology:MC1
U1517:This I.T.:MC1
U1518:It Infrastructure:MC1
U1519:YEAH:EB
U1520:Now, I am interested in three books here:MRA
U1521:That is "Information Technology- the basics":MC2
U1522:I am not able to see the complete this thing:IA
U1523:So I click on this to see the catalogue card (Pressed the Enter Key):DD
U1524:"Information Technology- the basics":MA
U1525:by "Barbara Wilson":MA
U1526:publishing's to Macmillan (reading):MA
U1527:opp... this is not the one which I am searching for:EC
U1528:"Information Technology and its applications":MA
U1529:Yes:MC1
U1530:This is from "Terry Corbett":MC2
U1531:"the second edition":MA
U1532:"Longman Publication" :MA
U1533:This seems to be interesting this thing ... one...:MC2
O1U15:I am just noted it down for picking it up and going through the thing:O
U1534:I am going back:DD
U1535:and there is anything which is there in Information Retrieval:MC1
U1536:"Organising knowledge- an introduction to" (browsing a brief record):MA
U1537:Well, I have to click on this to see the complete title (Pressed the Enter Key):DD
U1538:"An introduction to Information Retrieval":MA
U1539:by "Jennifer Rowley":MA

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APPENDIX – VII

U1540:"Second Edition" all sort:MA
U1541:Well, this seems to be a related subject to me:MC2
U1542:because it talks about introduction to information retrieval:EA
O2U15:I have just noted it down Rowley, J. (written on a paper) For a further reference:O
U1543:I Go back:DD
U1544:and see what is the second title:DD
U1545:which is listed in information type here:EA
U1546:"Finding government information in the Internet":MRA
U1547:Well this I am not interested, here:EC
U1548:I go back to the last subject:DD
U1549:which I am interested "Information Science":MB
U1550:There is one book mentioned here:MA
U1551:Click it (Pressed the Enter Key):DD
U1552:"Changing context of information":MA
U1553:I have to again click to see the complete title(Pressed the Enter Key):DD
U1554:It's an introductory analysis:MA
U1555:"Kirin McCray ":MA
U1556:"London":MA
U1557:"Library Association":MA
U1558:well this doesn't seem to be my interest:EC
O3U15:I am ending my search here:O
U1601:I want a book:DA
U1602:on the head of aquarium:DC3
T1U16:[Okay]:T
U1603:What is the system:IA
U1604:How can I find here:IA
U1605:... a, c, q, ...(while typing):DD
U1606:...nai (Not there) ...(browsing the results):EC
U1607:...nai (Not there) ...(browsing the results):EC
U1608:...nai (Not there) ...(browsing the results):EC
U1609:no book on aquarium:EC
U1610:Or we can change into the fish aquarium:PB
U1611:... if there any title:IA
U1612:Eleven books are there (while browsing):MA
U1613:hopefully any fish:MA
U1614:But whether it is in aquarium or not:MC1
U1615:Fish ...:MA
U1616:No ...:EC
U1617:Nothing:EC
U1618:I do not know whether in other matter I can get entry:IA
U1619:um... I will be take the assistance of the Library person:MRA
U1701:Thomas:DC1
U1702:.... aaa...:IA
U1703:D,y ...Tyaning (while typing):DC1
U1704:Okay:PB

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APPENDIX – VII

U1705:So here I am getting Thomas Tyaning ...:PB
U1706:Thomas Tyaning:DC1
U1707:...Yeah ...:PB
U1708:under melcoid:DC2
U1709:Okay:PB
U1710:I am looking for the book:DA
U1711: under the melcoid:DC2
U1712:Eight twenty two point nine one two (reading):MA
U1713:By chances it is two places, okay:EA
U1714:One is Eight twenty two point nine one two (while reading):MA
U1715:One is Eight twenty two point nine one two T, H, O (while noting):MA
U1716:And again it Eight twenty two point nine one two (while browsing):MA
O2U17:Eight twenty two point nine one two (while noting):O
U1717:Then ... again I am looking for:PB
U1718:a book ...:DA
U1719:on mathematics ...:DC3
U1720:which is by Hogman:DC1
U1721:Okay:PB
U1722:Okay Ho...:PA
U1723:o... o... o...o ...:DD
U1724:it's not there at all:EC
U1725:Somebody seems to taken it home:MRA
U1726:Hogman (while browsing other records):MA
U1727:That's... (while browsing other records):MA
U1728:End:EC
U1729:Now I will try to find:PB
U1730:some anthology of poetry:DC3
T1U17:[Right]:T
U1731:Okay:PB
T2U17:[Hu]:T
U1732:So anthology of poetry ...:DC3
U1733:again I have to go back F10 (pressed twice - system gave an alarm beep):DD
U1734:Okay:PA
U1735:My title:DC2
U1736:it's subject I have to go to:DC3
U1737:isn't it:IA
U1738:(Selected subject option) So checked:DD
U1739:poetry ... (while browsing):MA
U1740:poetry ... umm...(while browsing):MA
U1741:poetry English (while browsing):MA
U1742:yeah these are the valued anthologies (while browsing):MB
U1743:noo... unfortunately ... it's not there (while browsing):EC
U1744:Let try if I am not finding it:PB
U1745:so let's try to do it in a different manner:PB
U1746:umm... subject...:PA

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APPENDIX – VII

U1747:Enter (Pressed the Enter Key):DD
U1748:Anthology a, n, e, h antho...logy ...y anthology (while typing):DD
U1749:Anthology is yeah:MA
U1750:wait:MA
U1751:anthologies:MB
U1752:Enter (Pressed the Enter Key):DD
U1753:Yeah:MC1
U1754:Literature (while browsing):MB
U1755:Poetry (while browsing):MB
U1756:Only these...:EC
U1757:No, I don't think I will be getting:EC
U1758:Anyway, now I will try to find out the book myself:MRA
T3U17:[Okay]:T
O1U17:Okay:O
U1801:Aaa...:PB
U1802:"Opertating System":DC2
U1803:by Tanningo:DC1
T1U18:[Hu]:T
U1804:aaa...:PA
U1805:Tanningo (while typing):DC1
U1806:Author (while typing):DC1
T2U18:[Okay]:T
U1807:All these about (browsing the catalogue card):MA
U1808:And... basically I want to...:IA
U1809:umm... I have:IA
U1810:Basically this is renewed to me, to my card:EA
T3U18:[Okay]:T
U1811:I want to renew it, this is to my card:MRA
T4U18:[Okay]:T
U1812:I jua forget the serial number, that's why I want to renew it, so writing this serial number:MRA
U1813:Yeah, I have a books:DA
U1814:on Algebra:DC3
U1815:Title (Checking the title field):DB2
T5U18:[Okay]:T
U1816:Algebra:DC2
T5U18:[Okay]:T
U1817:This is ... (Checking the catalogue):MC1
U1818:It is also issued ... issued to me:MRA
T6U18:[Okay]:T
U1819:And I want to renew it:MRA

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APPENDIX – VIII

DETAILS OF THE INITIALS

INITIALS	DETAILS OF INITIALS	EXAMPLES
PA	Planning for a step,	I am writing
PB	Planning for a Procedure,	I go to words in title
DA	Defining a Document,	So in fact I was looking for a book
DB1	Defining Heading by Author,	key button for Author
DB2	Defining Heading by Title,	key for the title
DB3	Defining Heading by Subject,	asking for the subject what I want
DC1	Defining name of a Author,	on Shashi Tharoor's
DC2	Defining title of a document,	The title is "Applications in Physical Chemistry"
DC3	Defining title of a document,	Intellectual Property Law
DD	Defining a particular action,	Pressing Enter
MA	Monitoring the searched results by reading.	I get a list of books available in this library
MB	Identifying a document while monitoring.	yeah these are the valued anthologies
MC1	Comparing to expected results by examining while monitoring the searched results.	But whether it is in aquarium or not
MC2	Determining the relevancy of the searched results .	Well, this seems to be a related subject to me
MC3	Identifying the availability of a document in the library, that is, whether the document has already been issue or available in the shelf.	looks like the book is in the SHELF
EA	Inferring from the searched results while evaluating	It is a very important book
EB	Satisfied with the searched results while evaluating	OKAY I discovered really
EC	Dissatisfied with the searched results while evaluating	And this not in proper way
IA	Confused while searching	So now
MRA	Comments	It's recently released novel of Shashi Tharoor

PARTICULARS OF THE CANDIDATE

Name of Candidate	:	Tamal Kumar Guha
Degree	:	Doctor of Philosophy
Department	:	Library and Information Science
Title of Dissertation	:	Usability assessment of Qualitative Methodology in OPAC search
Date of Payment of Admission	:	9th March, 2000
Approval of Research Proposal	:	
1. BPGS	:	21.10.1997
2. School Board	:	28.10.1997
Registration No. & Date	:	289 of 28th October, 1997
Extension (If any)	:	nil

24/10/02

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