CHAPTER 3

REVIEW OF LITERATURE

Introduction
Early Work (Up-to 1960)
General Overview
Evaluation of the Collection
Measurement and Evaluation of Library Service
Evaluation of Technical Service
Evaluation of Reference Service
Evaluation of Catalogue/OPAC Use
Evaluation of the Use of Periodicals
Evaluation of Document Delivery Service
Evaluation of Inter Library Loan Service
Evaluation of Electronic Service
Indian Scenario
Summing up
References
3.0 Introduction

Both a survey and a review of related sources of literature on the subject of this research are always helpful and they are the first step of design of research and they also help in designing an appropriate methodology of study. The review of literature reveals assessing not only the length and breadth of the topic of research but also vastness and depth of the subject itself. This will enable us to identify the gaps in the research. The analysis of literature in the field of performance evaluation in library and information in general would give a generic idea of how far the conduct of such studies and their results emphasize the need for conducting such studies and to find out their application in the real life situations. Comparatively the literature on evaluation of library services in general has been in good measure, but the focus on university libraries, particularly in Indian context, lacks both in quantity and quality.

Considering all these benefits of the review of literature, an attempt has been made in this chapter to review briefly the important contributions and studies related to Cost Effectiveness, Cost Benefit Analysis, Performance Measurement and Evaluation of Library and Information Services for library effectiveness. In this context it is found desirable to bring out in brief the inner content of the terms like ‘cost-effectiveness, cost-benefit analysis, performance measurement and evaluation’ in relation to library and information services. This literature review involves the analysis of resources and services such as Collection, Technical Processing of Documents, Reference, Circulation, Document Delivery, Inter Library Loan, Periodicals, Catalogue/OPAC use study, and Electronic Information Services. Some of the major and the most important works reviewed include various articles, books, reports and manuals. Some of them deal with empirical studies of the individual libraries, while others deal with methodological and theoretical issues.
For the purpose of collection of relevant sources of information on the topic the LISA(CD-ROM version) was used as the source document in this context and the period covered for this purpose was 1972-2000. Further the review is presented here under appropriate headings that fall within the scope of this study. The information sources particularly periodical articles are reviewed and their contents are presented in chronological sequence under each headings and sub headings.

3.1 Early Work(Up-to 1960)

Pragmatic collection evaluation in American libraries may be traced back, at least, to Jewett's 1849 description of the results of the study comparing the citation in several lists of notable books with the holdings of major libraries of America to substantiate the Smithsonian library budget and to point out the inadequacy of the nation's library resources compared with those of many European countries. Jewett pointed out that most of the surveys on the progress of the disciplines such as Chemistry or Ethnology, or lists of references in standard histories of Chemistry or International Law-could have not been written in the United States. Jewett was remarkable not only for the sophistication of his evaluations, but also for his scholarly orientation. He said, "We wish books for use and not for the gratification of mere curiosity"(Jewett, 1849)\(^1\).

For nearly a century after Jewett(1849) measurement and evaluation took the shape of narrative descriptions of high points of the collection, in the form of a recitation of the holdings of significant editions of classic, medieval, renaissance, or "modern" authors. During 1930s and 1940s, studies of collection evaluation concentrated on methodologies intended to demonstrate the incapacity of library collections to serve the ends of study, principally the inadequacies of United State
library collections to support the study of foreign areas, languages, and peoples. The documentalists of the 1930's and 1940's applied the mathematics of stochastic processes to the circulation of books and information in the library systems. They began to shift the focus from the collection to the process going on within the collection and the interaction between the collection and its users.

In the post-war decades i.e., 1950s and 1960s, measurement and evaluation studies increasingly concentrated on the holdings of individual libraries in certain subject area studies or disciplines for which a weakness of one kind or another was perceived. These studies tended to be primarily qualitative, emphasizing the utility of collections to certain practical curricular ends which seek to demonstrate the inadequacy not only of existing collections, but also of the funds to support them.

Carnovsky's (1959) article shows that the evaluation of library services is a contemporary trend. Not a modern trend alone. However, he states that it is "an extremely complex question". He further writes that "in one instance we may wish to evaluate a single library – public, academic, research or special, in another, the whole network of libraries of various kinds in a given state or nation." He also reveals that "there are elements common to both spheres, but the differences are more than similarities". The two basic questions, put forth by him, "What is library for?" and "How good is the library?" contain a lot of material for research in the context of evaluation and providing user satisfying services.

During the 1960s, the direction of measurement and evaluation studies began to change. On the one hand the more traditional methodologies continued to be used, on the other there was a growing attention to the search for scientific or "scientistic" methodologies. A significant contribution made to this change was the growing
disciplinary self-consciousness of librarianship itself which, like the social sciences, sought to emulate, engage in many studies seeking to demonstrate that the art of librarianship was in fact a science, subject to discoverable and immutable laws of information and measurement which, once found would finally legitimize librarianship as a profession comparable to Medicine or Law. One may cite here Fussler and Simon (1961)³ and Clapp and Jordan (1965)⁴.

3.2 General Overview

Foreman and Baldwin (1976)⁵ evaluate local library services given to medical students in the ‘Rural Physician Associate Program’ (RPAP). The users, according to this study, state that “the local library resources are not adequate to support the program. From this user feedback, to fill-up the gap in service, the library services adopted an innovative approach to provide ‘computer-based bibliography’ and ‘document supply service’. It is important to note here that the statement “the positive evaluation by the students(users) was responsible for expanding the library services to meet their real needs.”

Goodal (1988),⁶ writing on performance measures in general, states that “the topics of current interest are both national and local levels”. The article also covers a historical account on performance measurement from 1960 to the present (i.e. 1988). Hence, this article besides presenting some suggestions on the topic, also serves as complementary to the present review. “Despite the plethora of literature on the topic there appears to be a notable lack of progress in applying it”. In conclusion the author suggests that the “future work must concentrate on output measure which are both appropriate to services being provided and easy to understand by all”. The author also
quotes some pioneering works on performance measurement done during 1960s and 1970s.

"Performance measure" was a key phrase in 1970s, emphasizes Van House (1989) in her article "Output Measures in Libraries". The author specifically states the "library measurement as a modern trend has been on the increase, and that is being used for management decision making. The main focus of the article is to trace the history of the user of performance measures in libraries and discusses some of the issues in the use of such measures for decision making and problem solving.

In contrast the article is on "Practical experience of performance measurement of a public library", the author Schmidt (1990) opines that the performance measurement involves, in relation to a program or a service, its appropriateness, effectiveness and efficiency. This is, actually, a case study on evaluation of two programs of a state public library.

The next paper is on evaluation of academic libraries, particularly the business school library. The article is by Schonberg and Line (1994), the latter being one of the prolific writers in library and information science. The article stresses the shift from using the "theoretical considerations in performance evaluation to practical measures taken from the normal working conditions." Because libraries sometime adopt highly valid but expensive indicators, and others have instituted their own measures, there is thus inconsistency in the performance indicators user for evaluation of academic libraries. Hence, the authors have tried to establish some standard set of measures from a pilot project that may be applied to all kinds of libraries throughout the country. It is said, according to the authors that "the pilot evaluation tested most of the proposed
indicators satisfactorily and indicated them as most promising." Hence, the paper is to be looked for the stated standard set of measurements.

The paper by Alemna(1999)\textsuperscript{10} "provides a review of various types and levels of evaluation of attempts to stimulate a debate on the pro and cons of these, in order to provide options for academic libraries." In the context of the present research the paper is very contextual in selecting the methods for evaluation, as they are deliberated and suggestive of best methodology that can be adopted for academic libraries. The author emphasizes the lack of actual evaluation of libraries, although the evaluation is considered very important.

Hill Linda, et.al.(2000)\textsuperscript{11} have undertaken the six Digital Library Projects funded by NSF, DARPA and NASA. They evaluated the Alexandria Digital Library Collection and Services, focused on information containing geo-references: Maps, images, data sets, text, and other information sources with links to geographic locations. They developed three different user interfaces and tested by user groups. Users feedback was collected through various formal and informal approaches.

Nitecki and Hernon(2000)\textsuperscript{12} conducted a questionnaire survey at the Yale University libraries to develop and test an approach for converting scores from the SERVQUAL measurement protocol, used for the assessment of quality service in profit and non-profit organizations. The survey involved 226 faculty members, students, university staff and others(45.2\% response rate). The final survey tool was found to produce results that were useful for local planning and decision making and it also differentiates between service quality and satisfaction.
3.3 Evaluation of the Collection

3.3.1 Material-Centered Approach

Various authors have discussed specific techniques used in both the collection centered and client-centered approaches. General overviews are provided by Bonn(1974), American Library Association(1979), Altman(1980), Christiansen et.al.(1983), Intner(1985).

In the past, many researchers have relied heavily on qualitative and quantitative methods of collection evaluation apparently believing that the subjective methods were the best to utilize their professional judgement. Betts and Hargrave(1982), however, argued convincingly and said that “traditional skills are insufficient without a quantitative context in which to exercise them. Indeed, the existence of such a context both increases the degree of skill required in selection and provides an objective means of evaluating past selection.”


3.3.1.1 The Impressionistic Method

The impressionistic method, described in detail by Hirsch(1959) and Robinson(1981) occurs when one or more individuals-subject specialists, librarians, or scholars-thoroughly examine and evaluate the collection. Academic libraries in particular have relied on the expertise of faculty members when conducting impressionistic studies of this sort.
The greatest advantage of an impressionistic evaluation is its versatility. Any segment of the collection can usually be evaluated quickly with this method (Williams, 1967). Bonn (1974) reviewed a number of impressionistic evaluations of library collections, including several studies where faculty members from various academic departments were asked to rate the quality of the collection in their own subject area.

Goldhor (1959, 1967, 1973, 1981) suggested a different approach to list checking, which he referred to as an 'inductive method'. It involves assessing the quality of a collection by taking a complete list of the library's holdings in a particular subject area, comparing the titles with a number of books reviewing tools and selecting bibliographies, both current and retrospective.

3.3.12 Evaluation Using Citation Analysis

Coale (1965) suggested the large research collections should be evaluated one subject area at a time, using lists of citation selected by the library staff. A growing number of studies shown that this assumption is valid. Sineath (1970) used citation of faculty publications from both the University of Michigan and the University of Illinois to test the adequacy of collections in both libraries. These types of citation analysis are most suitable for large academic and research libraries because they measure scholarly use. Popovich (1978) measured the adequacy of his university libraries research collection in business/management.

Several evaluators have used this evidence of 'use' to shift collection acquisition patterns after completing a citation analysis. Griscom (1983) used a citation analysis approach to determine the use of music periodicals and subsequently cut music serial subscriptions. Many authors have described how they select citations
for the initial list used to evaluate a collection. Gallagher (1981) later used a classic text as a basis of citation analysis in one subject area.

### 3.3.13 Evaluation Against Quantitative Standards

For many years, the library professionals have been evaluating its collections against national, international and regional standards set by library associations or by accrediting bodies of the institution of which the library is a part. Many authors have argued against determining a quality of collection solely by examining its size. Some representative and reasonable arguments have been made repeatedly to include the following:

- Two collections purchased with identical budgets can vary greatly in their quality, depending on the wisdom of the purchaser (Hirsch, 1959).  
- The possibility of locating a useful resource depends ultimately on the nature of the request as well as the collection (Krikelas, 1966).  
- The number of books or periodicals owned by the library conveys only the most general impressions of the overall strength or the weakness of a library (McInnis, 1971).  
- Collection quality depends on diversity as well as on size (Kister, 1972).  
- Collection adequacy should be judged by performance – the percentage of time the user finds the book he or she wants (Gore, 1976).  
- Research has verified that the larger the collection the greater the library's circulation (McGrath, 1976/77).  
- There may be no relationship between the number of items held and the ability of collection to meet its user needs (Robinson, 1981).
The general dissatisfaction with quantitative standards and formulas for collection development have led some groups like the Public Library Association to drop prescriptive standards. Rather, they encourage libraries to set their own standards after examining current measures of service, use or output (Van House et al. 1987).  

3.3.14 Classified Profile Approach

The classified profile approach has been used frequently in university libraries since its development. Burr (1979) showed that the classified profile approach could successfully be combined with an evaluation using collection standards. His main goal was to identify parts of the collection, which provided a support for the courses offered at each of the four major schools: arts and sciences, engineering, education and business administration. Burr then compared the number of volumes that supported each curricular area with those recommended in a modified reason, of the collection development formula specified in the standards of the Association of College and Research Libraries (ACRL). Loertscher (1985) described the value of the classified approach as follows:

To eat an elephant, it should be cut it into small pieces is a sound strategy for collection building. He cautions against building the collection as a whole. Create a collection that is tailored specifically for the institution it serves. During the last few years a variation of this approach, called collection mapping, has gained growing acceptance in the academic library field.

3.3.2 Use–Centered Approaches

All methods of collection evaluation use studies that have been both criticized and praised by librarians. How valuable an analysis of use will be to a library depends on purpose of the library – that is, on the needs of its users. These needs should be
reflected in its mission statement. Kent et. al.(1979)\textsuperscript{46} showed that many books at the University of Pittsburgh library had never been used. In times of rising costs, academic librarians need to pay more attention to providing what users want. Schad(1979)\textsuperscript{47} "admitted that instructional use of a research collection is characterized by the intensive use of a small body of current materials often required the purchase of multiple copies to meet the users’ demand.

3.3.21 Circulation Service

One basic assumption underlying evaluation of collection use is that the past use is a good predictor of the present and the future use. In their major study of circulation records, Fussler and Simon(1969)\textsuperscript{48} tried to determine whether they could accurately predict how often groups of books with defined characteristics were likely to be used in a research library. Fussler and Simon's primary finding, that the average item's past circulation could accurately predict its future use, has been verified in all types of library settings. For example, Eggers(1976)\textsuperscript{49} examined all books returned at a small library in Iowa and found that 93% had been circulated in the previous year.

There is growing evidence that the pattern of low overall use of individual titles exists in many academic libraries. Ettelt(1978)\textsuperscript{50} observed circulation in libraries for more than one year and discovered that more than 70% of the titles owned did not circulate. At the Washington State library 50% of the collection did not circulated during a 35 months period(Reed, 1979).\textsuperscript{51} Brooks(1984a, 1984b)\textsuperscript{52,53} worked with data from academic and public libraries and showed that the past circulation can forecast the future overall circulation for a library.

The learning services library at Liverpool John Moores University conducted a library performance measurement exercise based on library circulation data(Day and
Revol, 1995). The study aimed at producing a simple analysis of the use of new acquisitions utilizing management information from the automated system.

3.3.22 Current or Popularity of a Title or Author

Librarians have always purchased items appearing on bestseller lists or works by authors with a popular following because users have repeatedly asked for these materials. During the last two decades, some librarians have begun to purchase more multiple copies of these works to improve the likelihood of meeting user's demands. Simmons(1970) examined the circulation of books in a single semester at the university of British Columbia. He identified more than 2,000 books for which the level of demand seemed to justify the purchase of additional copies. A five-week study at the University of Tennessee at Knoxville pinpointed reasons why the items wanted were unavailable(Smith and Granade, 1978). Metz(1980) found that a substantial number of items owned by university libraries and sought by users were checked out to other users, suggesting that some multiple copies should be needed.

The subject of the item also affects its use(McGrath, 1972). Mostyn(1974) developed a formula to test, for each subject area, the following null hypothesis, the proportion of circulation observed in a subject area is equal to the proportion of circulation expected in that area. In a later study McGrath et.al.(1979) used this approach to determine to what extent graduate and undergraduate students borrow books out side their own disciplines.

Several authors discussed how to distinguish among overused, underused and average used classes. Trochim(1980) and Trochim et.al.(1980) suggested that the emulator should simply examine the raw differences between the percentage of holdings and the percentage of circulation of each class. Many studies have shown
that the ratio of journals to book use varies considerably from discipline to discipline (for example, Hodowance, 1980). The automated circulation system described by Nimoner (1980) allows relative use to be simultaneously cross analyzed by subject and department library location. The evaluator could then determine how much overlap needs to be there in these collections. Indeed, Bulick (1982) found so much overlap between the social sciences in a university library that he recommended not having separate departmental libraries for social science disciplines.

3.3.23 Identifying Core Collection of Materials

Trueshell (1966) identified core collection in libraries at Northwestern University, the University of Massachusetts, and Holyoke College. In each case, he found that 80% of the use was accounted for by approximately 20% of the collection. Enough evaluators have observed this same pattern over the years (Kantor, 1980, Hardesty, 1981, and Gold Blatt, 1986) that it has been termed the 80:20 rules. In applying the 80:20 rule to improve collection development efforts it is assumed that the specific rule derived for a given library is stable over period of time suggested this could be tested. Many evaluators have concentrated in defining core collection of serials (Goldblatt, 1986, Sridhar, 1986). This is because the high rate of inflation in the price of journals which has forced libraries to drop the least used titles.

Sharp (1992) evaluates the performance of student shelvers in Brigham Young University library and briefly reviews the literature on shelving tasks in order to provide background information addressing three areas such as (a) book collection arrangement; (b) shelver training methods; and (c) production standards. While all test results on data reveal no interaction among the variables, the data provides some
evidence which suggest that job standards and evaluation may be the interacting variables with accuracy as expressed.

3.4. Measurement and Evaluation of Library Services

3.4.1 Evaluation of Technical Services

Technical services can be evaluated theoretically from two viewpoints: (1) their internal efficiency and (2) their long-range effect on the public services of the library. A reasonable range of work has been done on the internal efficiency of technical services, particularly in the last 20 years and is covered in the literature.

3.4.11 Time and Cost Factors

In measuring the efficiency of an operation, cost and productivity factors are of a paramount importance. Applied to library technical services, the measurement of efficiency must consider the time and cost of processing an item from the time it is ordered to the time it reaches the shelves and the productivity of the staff. It is clear that processing costs are directly related to processing time and a few investigators have recorded the times involved in various operations (Voos, 1964).73

Wessel (1968)74 discusses a number of techniques that might be applied profitably to the evaluation of library technical services. One analytical technique described by Wessel et al. (1968)75 is called SCORE (Service Components Reliability and Efficiency Analysis). Its objective is to determine the success probability of a particular operation or service and its mean cost. A second analytical technique called SCOUT (Service Components Utility Analysis) is designed to determine whether a library is allocating its resources to the best advantage in terms of services provided to users. Wessel's third technique, called CORE (Correlation, Regression, and Effectiveness Analysis) is used to identify libraries that, within a particular group of
institutions, deviate much from the norm, from the standpoint of the cost or time involved in a particular operation. GAME (Group Attainment and Methods Analysis) is a technique which analyzes an operation systematically to identity unnecessary steps and to develop standards for the time that is spent on each step.

Tuttle (1969)\textsuperscript{76} discusses the need for standardization in his two papers. Tuttle points out that 'these studies have not been standardized and their results systematized to produce useful units of measure for comparison purposes'. A useful bibliography of time, cost, and management studies of technical processing has been compiled by Dougherty and Leonard (1970).\textsuperscript{77} Spencer (1971)\textsuperscript{78} has described an approach to the measurement of unit costs in libraries. She uses a random alarm device to sample the working time of personnel, thereby deriving unit costs for interlibrary loans and photocopying services.

3.4.12 Efficiency of Operations

Although some libraries have put a great deal of effort into streamlining their technical services, with the objective of increasing efficiency and reducing costs, it is likely that considerable improvements can be made in many institutions. Martyn (1969),\textsuperscript{79} referring to an investigation reported by Butterworth (1969).\textsuperscript{80} He has writing about two British University libraries said, there is no reason to suppose that similar examples of inefficiency do not exit on the American library scene and very little has been done to evaluate the operations of technical service sections to determine the effect these operations will have on the public services provided by the library.

The article by Schmidt (1989)\textsuperscript{81} focuses on collection evaluation in respect of "precision, quality and client-centered objective". The author emphasizes the fact that "the collection evaluation is useful for cooperation if properly documented."
The paper by Cameron(1989)\textsuperscript{82} has almost taken a hint from the article by Schmidt, as the former deals with “evaluation of collection in the context of inter-institutional collection”. The paper states, from the point of view of both library professionals and administrator of an academic institution, that the evaluation of collection is not only important but also inevitable. In the course of growing trends of “accountability and flexibility” in the academic library context the collection planning contextually is important, in cooperative ventures.

Brown and Forsyth(1999)\textsuperscript{83} conducted a survey of 291 academic librarians and they addressed the question of how libraries choose approval plan of vendors. Traditional services, including expertise in managing approval plans, e.g., profiling and acquisition service, customer service, and discount rate, along with corporate reputation and business practices, retained their core status. Evaluators found that vendor performance was rated highest in corporate reputation, approval plan management and in electronic financial transactions.

3.4.2 Evaluation of Reference Service

The measurement and evaluation of reference service has been discussed in the professional literature for many years. A useful statement of the scope of reference service, which distinguishes between the direct and indirect services, was prepared by the Committee on Reference Standards and Statistics of the American Library Association’s Reference Service Division and reported by Shores(1961).\textsuperscript{84} The direct service involves personal given assistance to users by the library staff, and which includes answering questions of a factual type, conducting literature searches, and instructing and guiding patrons in their use of library resources. The indirect services,
on the other hand, are concerned with the preparation of tools (e.g., catalogues and bibliographies) to improve access to the collections.

Jestes and Laird (1968) at the University of California conducted a useful study of time considerations in reference work. The object was to determine what proportion of the total time spent by a librarian at the reference desk was directly spent with library users or in answering their questions. There were 1,60,298 telephone questions answered by the T.R.S. staff. Another 20,900 telephone questions were referred to central library subject departments, taking the total question handled to 1,81,198. Only 484 fall into the above categories.

Palmour and Gray (1972) presented the results of a cost analysis associated with answering reference questions at seven major libraries in Illinois. Daily logs were used to record time spent in answering queries. Costs were derived by relating time spent to average salary rates for reference staff at the seven libraries. Thoreen (1973) reports on two surveys of reference requests handled by the Bay Area Reference Center (BARC) one conducted during a one-month period in 1972 and the other during a one-week period in 1973. Of 263 requests handled during the earlier period, 58% were answered totally satisfactorily; 20%, partially satisfactorily, 8%, with negative success; 12% were unanswered.

A bibliography lists more than 100 studies, or overviews of studies, that discuss reference evaluation (Von Seggern, 1987). Such evaluation is being actively encouraged by library associations which, in some cases, are even issuing detailed standards and policies regarding reference services, sample evaluation forms and the like (for example, Association of Research Libraries, 1987).
3.4.21 Obtrusive Testing of Effectiveness

Crawford (1994)\textsuperscript{90} investigates the potential of conjoint analysis as a technique for evaluating reference services in academic libraries. The analysis involved 6 dimensions of reference service: Definitiveness of answer, waiting times, service time, number of items given to users, hours of service and cost of service.

Dewdney and Ross (1994)\textsuperscript{91} report the experiences of 77 library students at Westerns Ontario University who visited libraries of their choice and asked a question of personal interest. When asked if they would return to the same librarian with another question, only 59.7% expressed their willingness. Both willingness to return and overall satisfaction were significantly related to the librarian's behaviour and quality of the reference answer.

McCarthy and Marrie (1995)\textsuperscript{92} conducted the study between August 1993 to November 1993 at Educational Resources Centre, University of Melbourne. The sample included 184 respondents and special emphasis was put on levels of satisfaction with the service and to a range of variables, which might alter satisfaction. Overall satisfaction with the reference service was found to be very high, but there were statistically significant differences between some variables indicating satisfaction.

In 1995 Lancaster\textsuperscript{93} reported the results of evaluation of 2 expert systems designed for use in library reference services: The systems are Reference Expert(RE), developed by Houston University and Source Finder(SF), developed by Illinois University, Urbana-Champaign. The test group consisted of 60 graduate students. Results indicated that there was no significant difference between the RE and SF students in the confidence they expressed regarding the understanding of their test questions and no significant correlation was found between confidence in
understanding question and success. Overall results indicated that current expert systems for the selection of reference sources could not perform as well as experienced subject-oriented reference librarians.

Parker (1996) presents the findings of a Wisconsin, Ohio reference evaluation program conducted at the Joyner library, East Carolina University comparing the results with those achieved by using other methods of evaluation. He discusses the implications for documents reference service.

Mendelsohn (1997) describes the result of a qualitative study of the concept of quality as it applies to reference service in an academic library. The study explicates the dimensions of quality service and points to the interconnectedness and interdependence of these dimensions. Time and morale were found to provide the essential environment content for quality service.

In the same year Nassar (1997) used the Brandeis model of reference service - the salient features of Brandeis model are two tiers of staff; the first tier of non-professional workers and the second tier of professional librarians and the separate, yet interconnected, working environments. He finds that although the model might be suited to a large university library, it is not an efficient use of professional resources when the non-professionals are often unevenly trained work study students of varying skills or interests or where the volume of reference questions are rather ‘directional’ ones which do not justify a two-tired model.

Graves (1998) conducted a study at Illinois University of Chicago Library of the Health Sciences where a new service is now being offered based on that analysis. An information desk staffed by 25 library technical assistants was established. A
combination of evaluation methodologies both quantitative and qualitative, were used to determine the overall staff performance. The results confirm the value of the information desk and support the decision to continue this service model.

3.4.22 Unobtrusive Observation of Reference Performance

The most important work on unobtrusive evaluation to date is represented by two studies conducted in New Jersey. The investigators, Crowley and Childers (1971), reported the results of their separate surveys in a single publication.

King and Berry (1973) describe a pilot study of the telephone information service at the University of Minnesota libraries. Volunteers asked questions to several divisions of the library in order to determine (a) factual accuracy of responses (b) amount of 'negotiation' between librarian and questioner and (c) 'attitude' of the librarian.

Cheryl and Alan (1991) report an unobtrusive study of the ability of a professional librarian to deal with factual questions conducted at the Milner Library, Illinois State University. Librarians were evaluated on the accuracy of the responses they had given and on their responsiveness and helpfulness as judged by the student proxies.

3.4.23 Observation and Analysis of Reference Procedures

Closely related to the evaluation of reference performance are the observation, and analysis of how the reference librarian functions. This can be accomplished by observing the reference librarian in action, obtrusively, unobtrusively, or by retrospective analysis of records accumulated during reference activities. Excellent
examples of studies of reference activities through analysis of records of previous inquiries are provided by Mote and Angel(1962),\textsuperscript{101} Sabell et.al.(1962).\textsuperscript{102}

A detail analysis of search procedures, used by reference librarians was conducted by Carlson(1964)\textsuperscript{103} for Hughes Dynamics Inc. Carlson identified that the human search behaviour was in general quite regular: 'Most of the flow charts can be applied to different searches by the same librarian and also to searches made by different librarians. Further Carlson pointed out that the reference librarian 'has no consistent way of improving the quality of his search, because there is rarely any feedback from the user.

3.4.3 Evaluation of Catalogue/OPAC Use

The first step in a catalogue use study is to look at many people who use the catalogue, for how long, and at what times. These types of data have immediate value in planning schedules of reference assistance in the catalogue area and they also aid in making decisions on such matters as how many terminals are needed to meet peak-demand, simultaneous access capacity in an online catalogue.

Some typical studies of this type were conducted by Sage et.al.(1981),\textsuperscript{104} Tolle et.al.(1983),\textsuperscript{105} Taylor(1987, 1988).\textsuperscript{106-107} Sage and his associates and they observed catalogue use in a university library for six weeks. The card catalogue area was roped off to allow patrons easy access through a single entrance and exit point and to simplify the counting of arrivals. Observers recorded the number of arrivals and departures during each of 234 randomly selected 10 minute observation period and the length of each patron's use of the catalogue. Tolle et.al. and Taylor used queuing models to predict the number of terminals that would be needed to achieve various levels of service for online catalogues. Taylor's model enables evaluators to compare the
number of terminals required for 16 different levels of service, based on the number of
minutes a patron will have to wait for a machine.

In cases where the number of physical access points to the catalogue is limited,
evaluators should consider recording the number of people who must wait to use the
catalogue and how long they have to wait. When Pawley(1982) did this she found
that 89% of the patrons at the University of Guelph had to wait for an available
catalogue terminals. 35% waited one to two minutes; 38%, three to five minutes; and
16% six minutes or more. In a number of studies of online catalogues, patrons
themselves suggested the purchase of more terminals to meet their demand(for example
Mathews, Lawrence, and Ferguson, 1983).

One of the strengths of automated catalogues is that they can collect some types
of data automatically, including information volume and length of use, saving the
evaluator considerable effort. Unfortunately, online systems do not necessarily
differentiate a search conducted by one patron from the one conducted by another. As
a result the evaluator ends up with figures on the total number of uses of the catalogue
but not the total number of users. This has prompted some evaluators to collect data on
volume of use by manual surveys of individual patrons(Borgman, 1983). The
problem could be solved if the software was reprogrammed is such a way that each
patron would be required to log on and off, as in the MELVYL system at the University
of California(Larson and Graham, 1983).

3.4.31 Measuring the Effectiveness of Catalogue Use

A comprehensive review by Palmer(1972) suggest that, on the average, users
are able to find entries for 70-80% of the items or subject sought in the catalogue.
However, the range extends from 15% to 94% implying that some libraries are doing a
much better job than others in developing and maintaining effective catalogues. Today most evaluators use one of four techniques to evaluate the effectiveness of catalogue use.

1) To survey library users
2) To conduct controlled experiments
3) To analyse transactions that are automatically recorded by online catalogues
4) To use focus group interviews to identify the problems that users have with catalogues.

3.4.31.1 Surveys

Seymour and Schofield (1973) interacted with the catalogue users at Cambridge University to complete catalogue query slips, available in the catalogue area, when they were unable to find a known item in the catalogue. Follow-up interviews enabled evaluators to estimate the proportion of patrons completing the slips. Of the 446 patrons interviewed, 110 (25%) reported at least partial failure; of these, 311 completed query slips, a co-operation rate of only 28%.

The evaluator asked users whether the desired items were found or not. It may be necessary to accompany users to the stacks to determine the success of their searches, because as many as one-third of those who use the catalogue make their final selection at the shelves rather than directly from catalogue entries (Miura et al. 1980).

Surveying library users by questionnaire or interview is normally the most common method to obtain information on the effectiveness of catalogue use and this can be done inexpensively. Investigators conducted many surveys - Pease and Gouke (1982), Markey (1986). Although most surveys concentrate on evaluating the effectiveness of use in a particular library, studies have also been conducted
involving a number of different libraries. For example, the Council on Library Resources (CLR) collected information on user use of online catalogues in 29 different public and academic libraries (Ferguson et al. 1982)\textsuperscript{117}

3.4.3.1.2 Controlled Experiments in Catalogue Use

Siegel et al. (1983, 1984)\textsuperscript{118-119} set up a pair of controlled experiments to study the use of two proposed automated catalogues at the National Library of Medicine. In one experiment, staffs were given 14 paired search queries and they were asked to search for the materials in both catalogues. In the second experiment, randomly selected patrons conducted self-initiated searches of their own choosing in both catalogues. Library staff used results of the evaluation to choose the system that yielded more successful search results.

In another experiment, Pejtersen and Austin (1983)\textsuperscript{120} tested a catalogue designed to help users to select fiction. The entries indexed novels by subject matter and genre, setting, author's intention and accessibility. Aanonson (1987),\textsuperscript{121} compared results of keyword searches in six different online catalogues. One assumption made in this study is that patrons behave the same when they are actually using library catalogues as when they are participating in controlled tests.

3.4.3.1.3 Analysis of Transaction Logs

On-line catalogues have made it possible to monitor many aspects of catalogue use through the study of transaction logs. Penniman and Dominick (1980)\textsuperscript{122} comprehensively reviewed the types of data that should be collected in a transaction log. At a minimum, these elements should include the date and time of the transaction, the length of the transaction, the types of searches performed, the total number of operations performed by each patron, the number of matches or retrievals obtained after
each input access point, and the type and number of errors made. Studies using transaction logs have been reported by Tolle (1983), Dickson (1984), Freiburger and Simmons (1984).

### 3.4.3.1.4 Focus Group Interviews

Ferguson et al. (1982) reported the focus group interview that questioned the library staff about online catalogues. Staff members made pointed observations about patrons' fear and non-use of the catalogues, the difficulties the patrons had in using the catalogues, and the perceived impact of the catalogues on the library, the staff, and patrons; they also offered specific suggestions for improvement. This technique, however, is well suited to determining whether users understand the capabilities of current catalogues and to ascertaining what they would like to see changed. Moreover, the technique often unearths points that are brought out through questionnaires or interviews, which may explain why its popularity with librarians continues to increase (Markey, 1983).

### 3.4.4 Evaluation of the Use of Periodicals

In the field of Sociology, Baughman (1974) claimed that the citation studies could be used to predict 'readership'. Satrario (1978), however, found differences between Baughman's list of most cited journals in sociology and a list that 526 Sociologists, associated with institutions, claimed to be 'most read', citation data underestimates the use of popular journals and regional journals in Sociology. The author argued that the most cited journals list includes some journals from related disciplines that do not appear among the list of titles most read.
Broude (1978) combined no fewer than seven separate criteria into his "De-
selection Model" they are as follows:

<table>
<thead>
<tr>
<th>Points allocated</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Subscription Cost</td>
<td>13</td>
</tr>
<tr>
<td>2. Average Annual Use</td>
<td>29</td>
</tr>
<tr>
<td>3. Impact Factor</td>
<td>6</td>
</tr>
<tr>
<td>4. Number of Indexing/Abstracting Services</td>
<td>12</td>
</tr>
<tr>
<td>5. Availability in Another Local Library</td>
<td>6</td>
</tr>
<tr>
<td>6. Reputation of Publisher</td>
<td>4</td>
</tr>
<tr>
<td>7. Curriculum Relatedness</td>
<td>30</td>
</tr>
</tbody>
</table>

For two of these 'criteria' the point scale would be reversed, with the highest score for the lowest costs and the lowest level of local availability.

Flynn (1979) recommends that 'expected cost per use' should be the criterion applied in periodical acquisition decisions. However, the only guidance he gives on how one should establish estimated use is that it be based on the 'worth' of journal. Curriculum relatedness is a little more concrete.

Wiberly (1982), using the field of social work, compared the rankings of journals derived from the 'national' citation data with the ranking derived from the 'local' citation data. The national data were drawn from two leading journals and one specialized encyclopaedia. The local data were the bibliographic references within publications of the faculty of a prominent social work.

Two other studies deserve attention here. Stankus and Rice (1982) ranked journals by use data from an academic library (State University of New York at Albany) and compared this ranking with the one based on citation counts and another based on impact factors. They found marked differences from one subject field to another. In Biochemistry, excellent correlation throughout the lists was found, while in Geosciences poor correlation had occurred.
Bennion and Karschamroon (1984)\textsuperscript{134} compared the ranking of Physics journals by perceived usefulness (based on a survey of 167 Physicists) with ranking derived from multiple regression models incorporating several bibliometrics values such as number of items published, citations received, impact fact, and ratio of citations made to citations received. Further they stressed the point that the multivariate models are said to predict usefulness more than any single bibliometric predictor can do. The best single predictor was determined to be the number of subscribers to the journal. Another journal selection model that takes into account multiple criteria is presented by Oluic-Vukovic and Pradic (1990).\textsuperscript{135}

Wise (1993)\textsuperscript{136} describes a reference periodicals evaluation at Appalachian State University and the impact of the subsequent cancellations on the quality of reference service. He discusses the emerging paradigm of access over ownership and implication for library collections and services.

The American Library Association’s Serials Acquisitions Committee (Alsbury, 1996)\textsuperscript{137} was preparing a guide for performance evaluation of serials vendors, and an overview of the evolution of the guide was given. Vendor evaluation was then discussed from the perspective of a librarian and a vendor. The librarian outlined the reasons for performing an evaluation and stated that vendor evaluation should be incorporated into routine workflow by formulating stated objectives for performance and establishing a means to track out and analyse those objectives.

University librarians continue to face the difficult task of determining which periodicals remain crucial for their collections during times of static financial resources and escalating periodicals costs. One evaluation tool (Kreider, 1999),\textsuperscript{138} Journal Citation Report (JCR), has recently become available on CD-ROM, making it easier for
librarians to use its citation data as input for ranking periodicals. The results of a study explore the correlation between the global citation data available from JCR and the local citation data generated specifically from British Columbia University for 20 subject fields in sciences and social sciences. The significant correlation obtained in this study suggests that large research-orientated university libraries could consider substituting global citation data for location citation data when evaluating all their periodicals with certain cautions.

### 3.4.5 Evaluation of Document Delivery Service

The most extensive investigation of the document delivery service of libraries was undertaken by the Institute for the Advancement of Medical Communications (IAMC) for the National Library of Medicine. The Document Delivery Test (DDT), used by IAMC in its investigation, is a simple, effective method to measure the ability of a library to supply documents. It has been reported by Orr et al. (1968), Pizer and Cain (1968), Orr and Schless (1972).

Urquhart and Schofield (1971) describe a survey method designed to measure availability of materials, in which library users record details of books that are not available at the time they are needed. The Library Management Research Unit of Cambridge University Library developed the method, which has been applied to four university libraries in the UK. One of the most important results of this survey was the ability to identify specific titles that caused multiple failures. Books sought unsuccessfully on more than one occasion accounted for 46% of total failures during the first survey period and for 60% during the second.

Buckland (1972) uses the term satisfaction level when referring to the question of whether or not a reader can find a particular book on the shelves when he
wants it. Clearly, the larger the collection of titles held, the more demands it is likely to satisfy. But other factors may influence the satisfaction level and in this connection Buckland identifies three ‘critical’ ones. They are (1) the number of copies held (2) the frequency with which a book is sought (i.e., its popularity) (3) the length of time it is off the shelf when being used.

Dougherty (1973)\textsuperscript{144} has described an innovative document delivery test introduced at the University of Colorado. In the event of no response to a telephone call from a member of the faculty, the university library staff will retrieve an item from the stacks, check it out and deliver it to the office of the requester. The goal is one-day delivery during the first year operation, 69\% of all items requested were delivered in one working day; 12\% were delivered later (an overall success rate of 81\%); 5\% were requests for non-circulating items; 8\% were not owned by library, but were requested on inter-library loan; 2\% were on order, but not yet received; and 4\% were missing items.

Mavor and Vaughan (1974)\textsuperscript{145} revealed that the Hamline University Library was able to supply approximately 43\% - 51\% of the materials needed by faculty and students to support the work of 30 courses. These figures were based on a sample of approximately 2,000 documents. Behm and Hansen (1997)\textsuperscript{146} describe the use of document delivery services for the supply of articles from journals not in the library’s holdings, carried out by library and information services at the Southern Illinois University at Edwardsville (SIUE). All respondents were satisfied with the speed of delivery for all three suppliers, although at the beginning of the project some delays were experienced.
Document delivery from UnCover to faculty and students at Colorado State University was analyzed in terms of patron use of journals and its impact on budget and staff (Beam, 1997). Results from several years' data indicated that subsidized unmediated delivery was cost effective when compared to the purchase of additional serial subscriptions. Patron use of UnCover followed some predictable, and some surprising patterns.

Leung (1998) gave an overview on the selection of overseas document delivery vendors. He conducts a study at Chinese University of Hong Kong. The library provides centralized, charging back inter-library loan services. Overseas document delivery vendors are essential to the interlending section in satisfying the information needs of its users. Leung's 9 considerations are: cost and pricing structure, repose and efficiency, fill rate, specialty, in-house collection, royalty, method of payment and means of request transmission. Based on these 9 considerations, the inter-lending section selects a few overseas document delivery vendors that are able satisfy nearly 90% of photocopy requests in 14 days. Such a performance matches that of the local sources.

Boyle and Davies (1999) had undertaken a study at Liverpool University to investigate and evaluate the existing and future document supply services. Reference is made to related literature, the background of the pilot projects, and the criteria utilized for the inclusion of services. They conclude that, in their current form, document delivery services cannot be seen as a panacea for resolving the holdings versus access debate.

Boyle (1999) made investigations at Liverpool University Library, UK into the efficiency and economic implications of document delivery services. Evaluation
and analysis looked at both qualitative and quantitative aspects of the services, both established and new services were reviewed.

### 3.4.51 Evaluation of Inter Library Loan Services

A study of costs is presented in a book by Palmour et.al.(1972), Rouse et.al.(1975). They have variables affecting costs and have described a mathematical model of an inter-library loan network suitable for use in analytical, simulation and evaluation activities.

In an effort to improve the services provided by the library, South Africa University Library(UNISA) introduced performance measurement and goal setting as a means of evaluating its inter-library loans. The study reports the rationale behind the evaluation and the actual performance attained, as well as the factors contributing towards their improvement(Willemse, 1993).

Bjarno(1994) describes, the development of a technique to measure the cost and performance of inter library loans services in Danish academic libraries and to use a relational database management system to analyze collected data. Bjarno further describes a model that enables one to record both the costs of the tasks performed and the performance – such as the speed of delivery, fill rate and so on. The model has been developed in co-operation with some Danish university libraries.

A study was conducted by the Association of Research Libraries(ARL), on the performance of inter-loan operations in North American Research and Academic Libraries. The inter library loan/document delivery performance measures study collected data in fill rate, turn around time, user satisfaction and costs with the aim of identifying effective inter-loan operations(Jackson, 1997).
Henderson(2000)\textsuperscript{156} reports results of a study of Collection Failure Quotient (CFQ), and of the evaluation of the performance of libraries statistics, calculated and published from Association of Research Libraries (ARL) statistics for 80 Canadian and the US university libraries from 1974 to 1988. He concludes that if the measure of library service is that users obtain what they seek when they seek it, the CFQ is a true indicator of failure. Its most appropriate uses are to measure changes over a period of time and to compare these with peer libraries. It is also used to evaluate library performance and to make decisions about the effective balance of resource allocations.

3.4.6 Evaluation of Electronic Services

Obst(1995)\textsuperscript{157} found that e-mail and the Internet were the services mostly used by students mainly for private purposes. His pioneering work is more concerned with assessing university campus networks rather than the evaluation of electronic information services. But the repertoire of techniques they recommend is relevant and surprisingly traditional.

Doran(1995)\textsuperscript{158} contends that it is effective to "contrast the reality of the Internet with perceptions that the patron already holds" to help library users understand when to turn to the Internet for information. Although he takes a negative stance("The Internet is not fast."), the overall tone of the article is positive, and provides some good points for students to consider.

When users learn to evaluate information on the Internet to determine whether the resources available online meet their needs, they should be informed that traditional print or offline material may meet their requirements in ways Internet resources may not. They should realize what the Internet is not in order to realize what it can offer.
them. Teaching critical evaluation of Internet sites and information is best conducted when students have "real" projects to do. An evaluation lesson can become a natural extension of term papers or WebQuests (Dodge, 1995), which require users to use web resources in addition to print resources. When the library media specialist and the academic teacher work together, the student will be assisted by both the subject specialist (the teacher who knows the content) and information specialist (the library media specialist who knows how to find the information).

Tate and Alexander's (1996) article presents a college level bibliographic instruction lesson plan dealing with the evaluation of web-sites. The article also outlines the concept of evaluating different types of web pages with different sets of criteria. Criteria and examples are given for an advocacy page, a business/marketing page, an informational page, a news page, and a marketing page. More of their work may be found on the web at http://www.widener.edu/ following the library link.

Schrock (1996) outlines a lesson plan for teaching critical evaluation of web sites in the library media center. She starts by outlining the critical evaluation criteria and then goes on editing a credible page into six different versions, some of which contain an incorrect knowledge. The students work in groups to evaluate the printed copies of the site. The article includes a series of evaluation guides for each level of students.

Barron and Ivers (1996) present a research model for incorporating relevant and meaningful Internet activities in the K-12 classroom. This article deals with the information-gathering process and with the process of sorting, shifting, and evaluation of what is found. Based mainly on Eisenberg and Berkowitz's "Big Six" Model, the basic and advanced research processes for online searching are succinctly outlined. The
evaluation section explains that the student may need to repeat the cycle again if an adequate answer to their information problem is not found.

In an article targeted towards school library media specialists and their use of the Internet to support curriculum, Everhart(1997)\textsuperscript{163} outlines nine categories one should become familiar with when evaluating web sites. She draws her criteria from other evaluation sources on the Internet, some of which are discussed in the article, and she also discusses evaluation from a school-based perspective (i.e., "Information is presented in short enough segments so it can be printed out without backing up the system for other users.")

Using a common sense approach, Symons(1997)\textsuperscript{164} offers some practical tips to help librarians find Internet sites that are worthwhile. She suggests looking at the home pages of other schools and libraries to see what other teaching professionals have found worthy of adding to their sites. This article also includes criteria for evaluation of sites, and suggests that librarians rate some sites and share the results of these ratings with other professionals via the web and professional journals.

Hill et.al.(1997)\textsuperscript{165} used multiple methods to obtain a feedback regarding the Alexandria Digital Library(ADL) at the University of California, Santa Barbara. The study adopted several methods to evaluate users' views including online surveys, ethnographic studies, focus groups, and user comments. The goal of this study was not to compare the value of the system with its costs, but rather to incorporate user feedback in the ongoing design and implementation of the ADL.

A survey of web use by undergraduate academic library students at the University of Sunderland(McKeever, 1998)\textsuperscript{166} was undertaken in May 1997. This
showed that most of the respondents experienced difficulties in navigating the web that its potential use value was great by diminished. There was a conspicuous lack of awareness about the information gateways; 81% of respondents encountered problems frequently or occasionally. Students customarily sought help from other students.

Talbot et al. (1998)\textsuperscript{167} employed a Likert type survey to evaluate patron satisfaction with various electronic library services at the University of California, San Diego. This survey was conducted in response to a comprehensive change in the philosophy of the management of library.

Ray and Day (1998)\textsuperscript{168} report that most students do use electronic services but they still like to use electronic sources alongside print resources. Beattie and McCallum (1998)\textsuperscript{169} report the emergence of the electronic publishing promotion project in Canada. Wilson (1998)\textsuperscript{170} says that we are at the beginning of a very rapid revolution in scholarly communication, which has barely begun to make impact upon many disciplines although it has had a readily discernible impact on others. Hampson and Pinfield (1999)\textsuperscript{171} puts a greater emphasis print materials in arts and humanities, where serendipity is important and more electronic journals are available in the science. In most subjects there was an 80:20 split in favour of print, but the ratio was in favour of electronic information in business and only just in favour of print in Physics (Nankivell, 1999).\textsuperscript{172}

A study at Glasgow Caledonian University confirmed these findings. A mixture of qualitative methods was used (Crawford, 1999)\textsuperscript{173} consisting of 47 semi-structured interviews and three independently facilitated focus groups. Some of the conclusions drawn from the study were as follows:
The distinctive mission of the library’s Electronic Information Floor (EIF) of the library was not clear to users who simply viewed it as a collection of computers located in the library.

Much of the use was unsophisticated and centered on e-mail, the Internet and word processing. Electronic information services were less used.

There was a good deal of non-curricular use centering on using e-mail and the Internet for recreational purposes.

Levels of IT skills were low especially among non-traditional students.

Traditional reference services, where librarians give the users the right or wrong answers to their questions, has slowly begun to change. With the emergence of electronic resources, digitalization, World Wide Web (WWW) resources, and full text databases, many students need more consultation on where to get started than on which option is correct. Librarians at Arizona university libraries strive to help students gain user sufficiency and information literacy. When at the reference desk, they tend to teach rather than do the work for the students. As the libraries were customers centered, it was decided to conduct an evaluation of reference services. The evaluation involved the use of a combination of surveys, focus groups, and unobtrusive observation worksheets with a small sample of students. The results were very meaningful (Norlin, 2000).174

3.5 Indian Scenario

White Carl(1965)\textsuperscript{179} conducted a survey of the University of Delhi library. He was responsible for the total evaluation of the Delhi university library system. To judge the general progress of the university library, he made comparisons between the data available and the ones collected with the help of questionnaire with those in other libraries in the country, examined the institutions records to determine the pattern of their growth, used norms and methods and prepared a comparative analysis to measure the financial support the library received. He checked the standard bibliographies to assess the strengths and weaknesses of the collections and sent out the questionnaire to the users, he also conducted interviews with teachers, students to measure user satisfaction with the library services they get from the library system in the light of their study and research. All this was done with reference to the standards and educational commitments of the university. Planning unit of the University of Delhi published this report in 1965. He made suggestions to improve the quality of library services. This report is a guideline for evaluation process of the university libraries in India.

Krishan Kumar(1981)\textsuperscript{180} mentions the objectives and functions of a college library. He describes a changing philosophy of education. He enumerates services which should be provided by the college library. He discusses the concept which should be provided by the college library. He discusses the concept of evaluation and brings out the need for evaluation of the library services. He discusses the fact as to who should do evaluation and mentions the methods available for evaluation. He describes in detail the use of the library survey as a suitable method involving the use of questionnaire, interview and observation techniques. He enumerates the statistics to be maintained for different services to supplement the data obtained through a library
survey. He considers the evaluation of library service not as an end in itself but as a means to improve services.

Kumar (1981) argues that the mission of college libraries in India is to shoulder the responsibilities of a torch bearer. He suggests that these libraries should encompass new areas of services such as audio-visual aids, extension services, assistance to schools, and archival cells. He indicates the ways in which libraries can pay a special attention to the needs of students of depressed classes.

A study measuring the users' satisfaction over important services offered by the central library, Sambalpur University, was undertaken by Rout (1982). The services evaluated covered the document acquisition policy, documentation service, and the delegated search offered by the library. He developed a model leading to the measurement of user satisfaction over the services offered by the library.

Mujumdar (1986) discusses the need for measuring the effectiveness of the library. In this context he defines the concepts of cost-benefit analysis, cost effectiveness, and examines various criteria for measuring effectiveness. He mentions different models to increase effectiveness. While discussing measurement and effectiveness of reference service, he defines reference, examines its scope and lists various factors which are essential to provide reference service. In conclusion he says that the present techniques of measurement based on cost and time are not sufficient and users' satisfaction is an important indicator of the measurement.

Suriya and Kalavathi (1988) conducted a study in leading university libraries of Tamil Nadu to evaluate the services offered to the faculty members. Since the universities have assumed a significant role in research and development, they felt a
necessity to assess the capacity of a library in contributing to the needs and requirements of the faculty involved in teaching and research of the university concerned.

Shukla (1990) describe the planning of library services with regard to educational, social and economic aspects of our country. In the past he investigated (in 1974) the reading habits and the level of education in a few selected areas of Orissa and gave a very sorrowful results, which focused the good reading habits of the whole country. The conclusion so obtained is a total failure yielding only 2% of the total population who continued self-education. It is therefore well be perceived that lack of library facilities. He used simple evaluation technique for analysis of the data.

Seva Singh (1991) wrote a paper on "Information Services in University Libraries". In this paper he tried to give a brief account of library services provided by university libraries in India. He suggested that the university library would have to gear up to provide the following services effectively and efficiently;

1. Acquisition, processing and organization of all kinds of reading materials;
2. Circulation service under which all kinds of reading material may be sent out to users;
3. Provision of regular reference service to answering users' queries, giving them education etc.
4. Provision of information services such as indexing and abstracting services, bibliographical services, current awareness services etc.

He suggested that from the point of view of the library personnel, strong steps should be taken for their professional development. He also suggested that in order to improve the information services in future, changes in the course contents of library and information science schools should be made accordingly. He also made it clear...
that to improve standards for library practices and performances need to be updated from time to time by organizing workshops for scholars and researchers.

Utility analysis, its importance and need for a study in an academic library set up is discussed by Meera (1991)\(^\text{187}\) with special reference to Indian Statistical Institute, Bangalore Centre Library. She describes that the benefit or the effectiveness of the system is measured in terms of research publications of the users of the library and evaluation against the cost-structure of the system.

Mohammad Sabir Husain (1991)\(^\text{188}\) explained the need of extension service in university libraries in his paper "Dimensions of extension service in university libraries". He has identified the following activities that the extension service in Indian universities should carry out.

1. Personal assistance to readers.
2. Exhibitions and book display on important events.
3. Lectures and talks by experts on various disciplines.
4. Use of mass media of communication should be extensively exploited.
5. Branch library/extension library centres in case of scattered campus of the university.
6. Literary and cultural functions like Mushairs, Kavi - Sammelans etc., should be arranged by the university libraries.

Rout (1992)\(^\text{189}\) conducted a survey in university libraries in Orissa and West Bengal on evaluation and measurement of library services. In his book "Operational Management of University libraries in India", an attempt has been made to analyse inadequate library environments persisting in many states of India and measures different suggestions in different situations. Evaluation and measurement are the essential components of scientific management. He attempted to quality of library services and measures the satisfaction of users through some statistical methods. The library management techniques have been adapted to these static situation-developing
concepts steady - Status design, Dynamic design, Control system design and other related parameters.

Livingston and Raju (1992)\(^{190}\) report the results of a questionnaire survey of library and information resources for agriculture in the district of Guntur, in Andhra Pradesh, India. They point out the inadequacies of library facilities, proposed effective utilization of information resources through library co-operation and networking to support research and education programmes.

Sadasivamurthy, Yadav and Siddamallaiah (1993)\(^{191}\) stated that regular evaluation is important for the development of the library and information system. User evaluation is particularly valuable as the user brings a different, and often more objective, view of the system to the evaluation process. Familiarity with the needs and problems of users can provide a basis for the requirement of a system. They describe how user evaluation can be integrated into the routine day-to-day activities of the library services through a system based on good communication and understanding the relation between users and library staff.

Shukla (1994)\(^{192}\) had undertaken a study on evaluation of abstracting services in the field of Biological Sciences. The study covers overlap, time lag, indexing and Indian contribution. The study compares eight international and two Indian abstracting services in the field of energy. During the period of 1982-86, a total of 9206 records were selected as a sample form and ten databases under examination. Stratified random sampling was employed in this study and the important findings are;

1. The total overlap at journal level was found to be 48.6% the total overlap at conference level was found to be 30.6% but the subject coverage was not satisfactory in all cases.
2. It was found that Bio-energy literature conforms to Bradford's law of scattering.

3. It was observed that over 81% and Area(10%) in the field of biomass are published in English.

This study is useful for collection development in university libraries and for subscribing to international databases.

**Janak Raj(1994)** states that the evaluation of one is not dependent on the other. So each has to be studied separately and then they should be synthesized in some way to present a composite picture of the effectiveness of the library. He further explained that even in the financial limitations, a lot many steps could taken to improve the effectiveness of a library by increasing accessibility and exposure.

**Choudhry(1994)** has undertaken a study to make an assessment of the attitude of teachers with regards to the use pattern of the existing resources and utilization of services of the three university libraries in Orissa i.e., Utkal University, Berhampur University and Sambalpur University. Attitudes of the faculties reflect the extent to which the efforts of the university libraries are successful in developing the resources planning and designing the services to meet their academic and scholarly pursuits. He observed that most of the respondents 87(55.06%) are of the opinion that the collection of reading materials is only 'partially adequate' for teaching and research purpose. Also 53(33.54%) respondents view that the collection is totally 'inadequate', while 16(10.02%) faculty members hold the opinion that the book collection is adequate.

An evaluative study was made by **Dash(1998)** on the quality of the periodical service of Smt. Hansa Mehta Library of the Maharaja Sayajirao University of Baroda, by taking a sample of 53 respondents with a structured questionnaire. The study was
limited to Chemistry periodicals. Significant findings of the study are: that the periodicals are used for research and for guiding research scholars; that the degree of benefits received from the service is low that there is no significant relationship between the use of a periodical and its cost and that the quality of the periodical service is relatively poor. He makes suggestions for improving the periodical service in the library.

The changing scenario (Meera, 1998)\textsuperscript{196} which regards library and information systems as profit making organizations has resulted in subjecting them to review and control measures quite unlike any other organization. She examines the role of performance measures in quality improvement programmes in libraries. She attempts to identify and enumerate performance indicators and units of measurement for different library operations. She also considers library management tools applicable to these operations leading to the improvement of performance quality.

Singh (1999)\textsuperscript{197} evaluated the collection development and reader’s services provided by IIT library, Bombay. He mentioned briefly the establishment of IIT, Bombay and its library. He designed two questionnaires for data collection (one each for the librarian and the users). Further he discussed the acquisition, use and adequacy of library collection. Singh examined user awareness of the various library services and their usefulness. Finally he provided the users and librarians’ suggestions about the collection and services.

Scientometric based performance analysis at the institutional as well as country level is gradually gaining significance in science policy making. Research output, in any form, of an institution to a large extent, reflects the level of its research and development activity. Pandalai (2000)\textsuperscript{198} and others conducted a study to assess the
performance analysis of individual scientists as well as institutions based on this form of output. They came to conclusion that the advent of Science Citation Index (SCI), such studies have gained popularity. The compilation of the data and the analysis thereof has automated at CSIR laboratories and they describe the various steps involved in automation.

3.6 Summing up

The studies cited above clearly direct the vast amount of work in all the aspects of the research topic. Though the work in India is in the formative stage, it is hoped that it will take an objective shape to come out with scientific investigation yielding substantial results.

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