COST BENEFIT ANALYSIS OF PERIODICALS COLLECTION IN CENTRAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A COMPARATIVE STUDY

ABSTRACT
OF THE
THESIS

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ABSTRACT

In the present scenario, all types of libraries are facing problems due to explosion of literature, escalation of prices, growing demands of users and shrinking budget etc. To overcome these problems, librarians have to adopt to different ways and means. In this era of decreasing financial resources and increasing demands for accountability, libraries all over the world are facing the challenge of representing and quantifying their value to their funders and stakeholders.

In the context of Academic libraries, especially librarians must prove their value to the institution in order to secure the financial resources necessary to serve the university and research community. As Financial Authorities weigh competing priorities and allocate limited resources, they need concrete evidence of how the library supports the institution’s strategic goals. In addition, they need evidences that help them weigh the value of new discretions. As the library administrators make budgeting decisions, librarians are asked to prioritize their products and services to focus on those entities that are most effective in serving the institutional mission with increasing financial challenges. In this economic crisis, librarians with the help of management tools such as Cost-benefit analysis can prove the value or worth as well as justify the expenditure of library’s collections and services.

Cost-Benefit Analysis is an important aspect of management and helps in decision making. To study the feasibility of any system, to evaluate it or to choose one system out of several alternatives the decision making authorities have to make a Cost-Benefit Analysis. In this process, total cost involved in terms of equipments, materials and manpower have to be taken into account including the value of all the benefits i.e. expenditure in terms of money, efforts and time involved have to be calculated. If the value of benefits is more as compared to the cost involved, the system is suitable and if the results are reverse to this, the system is a misfit. It is, therefore essential to use cost-benefit analysis in the libraries instead of blindly following other techniques.

Due to exponential growth of knowledge and information, libraries are trying their best to acquire all the documents available worldwide. But lack of funds leads the librarians to a situation in which he/she has to take decisions judiciously as to which documents should be purchased and which not to be purchased. It is the
responsibility of the librarian to convince the higher authorities and prove the value of library’s collection and services. For this purpose cost-benefit analysis method is appropriate. In this scenario to prove the economic value of library, librarian’s responsibility increases. But with the help of various types of CBA study librarians can prove the worth of the library collections and services.

The periodicals are not only the chief medium for disseminating current information but also serve as an important part of a library collection. These are helpful in fulfilling both the objectives of teaching and research within an organisation. Periodicals such as Journals are very expensive to subscribe therefore librarians must take decisions judiciously as to which journals to subscribe and which not to. University and Research libraries usually spend more than 70 percent of their total budgets on the subscription of periodicals only, Periodicals, a source of current information have become indispensable these days because the results of research being done in different parts of the world are communicated through them (Ravat & Kumar, 2002).

Therefore, the investigator decided to conduct a study to identify the Cost and Benefits of Periodicals Collection in Central University Libraries of U.P. especially Aligarh Muslim University (AMU) and Banaras Hindu University (BHU).

STATEMENT OF THE RESEARCH PROBLEM

A clear and defined statement of the problem is needed to achieve the goals and objectives of the study. The problem selected for the present study is “Cost Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study”. The problem has been selected by the investigator to understand the different embedded costs and benefits derived from the Periodicals subscribed by the Central University Libraries, so that it can make further improvements in the subscription/renewal/cancellation of Periodicals depending upon the results and suggestions.

NEED AND SIGNIFICANCE OF THE STUDY

Periodicals especially Journals are the most expensive resources subscribed in the University Libraries. Therefore there is a need for extra care in deciding or selecting the journals titles at the time of subscribing them. During the times of current economic constraints, Cost-Benefit Analysis method is used by the investigator to assess the value of Journals collection. Financial Authorities allocate limited resources and they need concrete evidence of how the Journals support
Abstract

research needs of the Research community in the University with increased financial challenges. The investigator using the study of Cost-Benefit analysis tries to prove the value or worth, as well as justify the expenditure on Journals collection in select Central University Libraries. Moreover, so far no research work has been conducted on the Cost-benefit analysis of Journals Collection in India.

The research study undertaken here attempts to assess the Cost and Benefit of Journals collection in the central libraries of AMU and BHU which will be useful in comparing the benefit of Journals with the cost of Journals and to check the extent of benefit that outweigh cost in libraries under study.

In addition, the study will be useful for Librarians, Library administrators or Funding authorities and Researchers who directly or indirectly are engaged or are interested in planning for subscribing to these Journals. The comparative study will show the present status of both the Universities.

In an era of decreasing budget and increasing demands for accountability on the part of library professionals. The present study will be helpful for demonstrating and quantifying the Journals’ economic value to their funders and to other stakeholders. In addition, the study is also helpful for checking the cost per use of E-Journals/Databases subscribed under UGC-Infonet Digital Library Consortium in the libraries under study. The study also serves as a source of input during the time of subscription/renewal/cancellation of journals for decision making regarding the E-journals/Databases that are having less use resulting in high cost and high use resulting in less cost in the libraries under study. Cost-Benefit Analysis of Journals will help in decision making at the time of subscription of Journals, since Journals are considered to be a very important information resource in University libraries and is used in research, teaching and updating the knowledge of Faculty Members and Research Scholars of the University. It will prove to be an useful study which may be implemented by other libraries too, to carry out an assessment of journals and to increase usage at low cost.

Maulana Azad Library and Sayaji Rao Gaekwad Library are the Central Libraries of AMU and BHU respectively. The present study is limited to the two Universities which are reputed and well established institutions of higher learning in the state of Uttar Pradesh. Sayaji Rao Gaekwad Library was established in 1941, whereas Maulana Azad Library was established in 1960 to cater the needs of the Students, Research scholars and Faculty Members of the University.
SCOPE AND LIMITATIONS OF THE STUDY

Scope of the Study

The work entitled “Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” is an attempt to assess the Cost and Benefit of Journals Collection in AMU and BHU. The two selected Central University Libraries are subscribing to different types of Periodicals such as Journals, Newspapers and Magazines etc., but the present study undertakes the Cost-Benefit Analysis of Journals in AMU and BHU. For the present study Periodicals refer to scholarly journals as it is the general understanding prevalent in the academia and has been used as such for analysis and interpretation.

Usually Journals are subscribed annually in the University libraries, therefore the investigator tried to assess the Cost-Benefit Analysis of Journals for the current year 2014-15, comparing the benefit of Journals with the cost of Journals and to check the extent of benefit that outweigh cost.

The study seeks to measure the benefit of Journals into monetary term i.e. in Rupees (the official currency of India) by using Contingent Valuation Method. Further an attempt has been made to compare these benefit with the cost of Journals, in order to check the extent to which benefit outweigh Cost in both the selected libraries. The study further investigates the use, benefits, importance of Journals and satisfaction levels of users with regard to existing Journals collection available in the surveyed libraries.

The investigator identifies E-journals/Databases which were common in both the surveyed libraries under UGC-Infonet Digital Library Consortium to calculate the cost per use for E-journals/Databases for the current year 2014, as both the central libraries do not maintain any record of usage statistics for Print Journals.

Moreover, the literature review reveals that no attempt has been made so far, to study the Cost-Benefit Analysis of Journals Collection in University Libraries in India. Taking this fact into consideration, the present study has attempted to give a new dimension by studying the Cost-Benefit Analysis of Journals Collection in two Central University libraries of Uttar Pradesh that are having a rich collection of Journals.

In conclusion, the study has laid down some significant points in the form of suggestions derived from analysis of the collected data which in turn will help to
improve the quality of Journals collection and also to enhance the use of these services in AMU, BHU and similarly in other Universities in the country.

LIMITATIONS OF THE STUDY

Following are the major limitations of the study.
1. There are four Central Universities in Uttar Pradesh but being a comparative study, it covers the two central libraries of oldest and well established Central Universities of Uttar Pradesh i.e. Aligarh Muslim University (Maulana Azad Library) and Banaras Hindu University (Sayaji Rao Gaekwad Library).
2. The present study focuses only the Journals, as the major portion of the Periodicals Section in the University Libraries constitutes of Journals and major amount of the budget is also spent on Journals, so newspapers, magazines and other forms of Periodicals have been excluded from the present investigation.
3. For the Cost-benefit Analysis of Journals was the users comprised of Faculty Members and Research Scholars in both the Universities.

OBJECTIVES OF THE STUDY

Journals are the costliest items subscribed in the libraries, therefore it is the responsibility of the librarians to understand the benefit of Journals and compare the cost of Journals with the benefit of Journals at different intervals. The investigator decided to study the Cost-benefit Analysis of Journals subscribed in the central libraries of AMU (Maulana Azad Library) and BHU (Sayaji Rao Gaekwad Library) in the state of Uttar Pradesh for the year 2014-15.

The objectives of the study include:
1. To assess the library budget as well as the expenditure (cost) involved in maintaining the Journals Collection in libraries under study.
2. To examine the Journals Collection in Central Libraries of AMU and BHU.
3. To ascertain the use and importance of Journals Collection for Faculty Members and Research Scholars in libraries under study.
4. To assess the benefits of Journals to Faculty Members and Research Scholars in libraries under study.
5. To measure the benefit of Journals into monetary term in the libraries under study.
6. To compare the benefit of Journals with the cost of Journals, to check the extent of benefit that outweigh cost in libraries under study.
7. To calculate the Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection in libraries under study.

8. To assess the satisfaction level of the users with the Journals collection in the libraries under study.

9. To find the use and Cost per Use of E-journals/Databases subscribed in the libraries under study.

**HYPOTHESES**

The study attempts to test the following hypotheses formulated on the basis of literature review and findings from the earlier researches, related to the present study.

1. There exists higher Cost than Benefit of Journals collection in the libraries under study.

2. The Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection is higher in BHU than in AMU.

3. There are significant differences in the total number of articles read in a month in AMU and BHU.

4. There are significant differences in the time spent in searching articles per week in AMU and BHU.

5. There is a significant difference in the satisfaction level with the use of Journals collection among the users of AMU and BHU.

**RESEARCH METHODOLOGY**

Research Methodology has its own importance in scientific investigation, because objectivity in any research investigation cannot be obtained unless it is carried out in a very systematic and planned manner. Scientific investigation involves careful and proper adoption of research design, use of standard tools and tests, identifying adequate sample by using appropriate sampling techniques, sound procedures for collecting data and careful tabulation of data and use of appropriate statistical techniques for analyzing the data.

The investigator has chosen survey method as the research method to determine the extent to which selected University Libraries are providing Journals resources to their users (Research Scholars and Faculty Members) and their actual usage by the users of concerned Universities. Survey research is characterized by selection of samples from large populations to obtain empirical knowledge of contemporary nature. This knowledge allows generalizations to be made about
characteristics, opinions, beliefs, attitudes, and so on, of the entire population being
studied. The following research processes are undertaken for the present study:

**Document/Literature Review**

The investigator collected data from various printed and electronic resources such as annual reports, unprocessed internal data and websites of the University Libraries, whenever required. Primary Sources of information such as Journal articles, Theses, Dissertations etc. and Secondary sources of information such as Dictionaries, Text books both in print and electronic form as per the need of the study were also consulted.

Prior to the launch of the study, a survey of related literature was undertaken. The purpose of this exercise was to understand the existing trends, outcomes and drawbacks, so as to arrive at the right perspective. The research topic is partitioned into various sections and a thorough search is made for related materials in various journals, books, seminar/conference proceedings etc. and a bibliography is prepared for the most relevant and related research based articles. A detailed and in-depth study of these articles is presented in Chapter-2.

**Data Collection Methods**

Several techniques are adopted for collecting relevant and authentic data. Though there are a number of data collection techniques available such as questionnaire, schedule, interview, observation, document review, psychological test, socio-metric techniques etc. Being empirical in nature, the study is conducted through a survey using questionnaire. The investigator visited both the Central University Libraries under study and approached the Librarians and users (Research Scholars and Faculty Members) of concerned Libraries to collect necessary data.

**Questionnaire Method**

Questionnaire is the heart of survey operation. For the present study, the investigator designed two questionnaires one for the librarians and another questionnaire for the users (Research Scholars and Faculty Members) of both the libraries. After which, a pilot study was conducted to check the feasibility and objectivity of the prepared questionnaires, samples were selected and the questionnaires were administered for data collection.

**(i) Questionnaire Design**

The investigator designed a questionnaire to gather necessary data for the present study. In order to produce a reliable questionnaire the investigator had made
efforts to conduct a thorough search and review of all the literature related to the topic. Enough care was taken to develop the kind of questions that will accurately measure the research needs of the investigator. Individual statements on the questionnaires were formulated based on the selected literature reviews and the research objectives of the study.

The questionnaire designed for the Librarians of the Surveyed Libraries, consisted of a number of questions in definite order and format. The questionnaire covers information about total number of Journals subscribed, budget, Expenditures and Cost of Journals and various aspects of use of Journals. The questionnaire designed for users is also based on structured pattern and a definite format. The aspects covered in the user’s questionnaire include frequency of use of journals, purpose of using journals, use of journals for academic purposes, number of articles read, time spent in browsing/searching articles, satisfaction of users, reasons for consulting Journals in libraries and willingness to pay to access articles per month.

The detailed questionnaire administered among the Librarians of both the Universities is provided in Appendix-I and questionnaire for users has been appended as Appendix-II. The detailed profiles of the Central Libraries under study are enlisted in Appendix-III. The investigator has also made use of the usage statistics of E-journals/Databases gathered from both the surveyed libraries. The usage statistics of E-journals/Databases subscribed under UGC-Infonet Digital Library Consortium and Price list of articles are given in Appendix-IV and Appendix-V respectively.

(ii) Pilot Study

The purpose of pilot study was to test the validity of the questionnaire, both as a data collection instrument and statistical measurement device. The questionnaire was prepared with utmost care to ensure that it was easily understood by the users and eliminating any probability of misunderstanding, confusion and biasness. Pilot study was conducted for both the questionnaires prepared for Librarians and Users by administering it in the libraries during the peak hours in the month of April, 2015. The ‘Questionnaire for Librarians’ of the University libraries was administered to the Librarians of AMU and BHU combined by an informal interview. The questionnaire for users was distributed to twenty users in each of these University Libraries. The respondents were asked to note any difficulties faced while filling-up the questionnaire. The feedback and responses provided by the respondents was collected and their suggestions for change were noted.
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As a result of the pre-test it was decided to add a few more structured questions. Some questions were added while some irrelevant questions were removed. After editing the questionnaire, investigator checked for the modifications and after finalization resulting questionnaires were used to fulfill the objectives of the study and to elicit more reliable data, the questionnaires were administered personally to ensure better and speedier response rate.

(iii) Population and Selection of Sample

The present study was conducted among Librarians and users (Research Scholars and Faculty Members) of two Central University Libraries of Uttar Pradesh. All items under consideration in any field of enquiry constitute a universe or population. A complete enumeration of all items in the population is known as a census enquiry. It can be presumed that in such an enquiry, when all the items are covered, no element of chance is left and highest accuracy is obtained (Kothari, 1992). Here census method is adopted for Librarians, because the population is single in both the Universities.

As far as the selection of respondents among the users (Research Scholars and Faculty Members) is concerned, it was not feasible to collect large quantities of data by taking responses from each and every unit of the population. Sufficiently accurate results are obtained by studying only a part of the total population. The investigator used the purposive sampling technique for data collection. For sampling, the universe was first divided into two groups based on their academic status, viz., Research Scholars and Faculty Members. The total population of Research Scholars was 2123 and Faculty Members’ was 1209 in Aligarh Muslim University (AMU), whereas the total population of Research Scholars was 5037 and Faculty Members’ was 1218 in Banaras Hindu University (BHU) during the period of the study. A number of questionnaires were distributed to the sample population selected through convenience sampling until each quota had been filled for the required number of respondents.

(iv) Administration of Questionnaires

The investigator visited both the University Libraries under study in the month of May 2015 and met the Librarian in person. The investigator discussed the questions in detail with both of them, and got the questionnaire filled. The response rate of librarians was 100% as the questionnaire from AMU and BHU were collected personally.
As mentioned above, a total of 440 and 770 questionnaires were distributed among the users (Research Scholars and Faculty Members) of AMU and BHU respectively. Out of the total administered questionnaires, a total of 356 (221+135) filled-in questionnaires were received from AMU and 654 (510+144) from BHU. Of the total questionnaires received, 24 questionnaires from AMU and 29 from BHU were rejected due to incomplete responses. Finally, 332 (212+120) filled-in questionnaires from AMU and 625 (503+122) from BHU were considered and used for data analysis, which constituted 10% of the total population in each categories giving a proper representation in the sample selected. The total response rate of users in AMU and BHU as depicted in the above table is found to be 75.45% and 81.16% respectively.

PROBLEMS IN DATA COLLECTION AND THEIR SOLUTIONS

The present study entitled Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study is required to measure the Cost and Benefit of using Periodicals into monetary term. Cost is easily measured into monetary term but benefit of journals were neither available into monetary term nor usage statistics of the Print journals were available. To overcome this problem a survey of users (Research Scholars and Faculty Members) was conducted and Contingent Valuation Method (CVM) was used for measuring the benefit of Journals into monetary unit i.e. in Rupees. Whereas Usage Statistics of E-
journals/Databases subscribed under UGC-Infonet Digital Library Consortium were provided by the librarians of the central libraries under study.

**ANALYSIS AND INTERPRETATION OF DATA**

The data collected from the surveyed libraries using questionnaires were scrutinized by comparing answers to one question with answers to related questions so as to check its consistency and compatibility. In this way all the filled-up questionnaires were made more or less uniform for the purpose of statistical analysis. The responses were coded and categorization was done by reducing data into homogeneous groups for getting meaningful relationships. Using a self designed coding sheet, statistical counting was done for each response.

Finally the data was organized, analysed, compared, consolidated, tabulated and interpreted by using statistical techniques, tables, percentages and graphs. The software package MINITAB was used to verify the validity of the results. In the light of the above data, useful findings and conclusions have been derived.

**STANDARDS FOLLOWED FOR BIBLIOGRAPHIC REFERENCES**

The investigator has followed American Psychological Association Formatting and Style Guide (APA, 6th ed., 2010) for providing the bibliographical references. Some examples are given as under.

**MAJOR FINDINGS**

**PART-A**

**LIBRARIANS’ PERSPECTIVE**

For the present study the investigator calculated the cost of Journals from the analysis of librarians’ responses of the Central Libraries under study.

**COST ANALYSIS OF JOURNALS FROM LIBRARIAN’S RESPONSES**

**Library Budget**

1. The findings of the study reveals that BHU library got a higher library budget i.e. ₹6,89,63,625 than the central library of AMU, ₹2,38,75,000 in the year 2014-15. On an average library budget in AMU was ₹2,27,81,800 whereas BHU library got a higher average budget ₹5,50,58,354 (Table-5.1, Figure-5.1).

2. It was observed that there was no growth in the budgetary allocation in AMU except for the year 2013-14 and 2014-15. Whereas a fluctuating growth pattern (increasing/ decreasing) of budget was discernible in BHU library. BHU library had an average annual growth of 11.83% in the library budget allocation whereas
AMU library had only 1.83% average annual growth in the budget allocation (Table-5.2, Figure-5.2).

**Expenditure or Amount Spent on Journals**

3. It is further studied that on an average BHU library spent more amount on journals (₹2,08,33,977) than the central library of AMU (₹1,66,000,00) (Table-5.3, Figure-5.3). For the AMU library, the present budget was found to be insufficient for developing a good journals collection and to meet Researchers needs, an additional amount of ₹40,00,000 was required for Print journals and ₹60,00,000 was required for E-journals as stated by the authorities in charge of the library. In BHU library, the amount spent on subscribing journals is by and large adequate to meet the routine requirements of the Researchers.

**Journals Collection**

4. Central library of BHU was subscribing to more number of journals than the Central library of AMU. On an average BHU library subscribed to 2603 journals (print and e-journals) during the years 2010-14, whereas the central library of AMU subscribed to 741 print journals and one online database (LISA). It is found that a trend of decreasing number of Print journals and increasing number of E-journals is seen in BHU for the years 2010 to 2014. The Pearson correlation between Print Journals and Electronic Journals in BHU was worked out to be –0.946 indicating high degree of negative correlation i.e. the number of print journals is decreasing while the number of E-journals is increasing, considering the correlation, was tested to be highly significant at p < 0.015 (Table-5.4, Figure-5.4).

**Manpower Cost**

5. Total annual salary of staff of Periodicals Section in Maulana Azad Library (AMU) was ₹47,92,920 during the financial year 2014-15. However, total annual salary of staff of Periodicals Section in Sayaji Rao Gaekwad Library (BHU) was ₹41,53,248 during financial year 2014-15. Thus, it is clear from the analysis that the manpower cost of Periodicals Section is higher in AMU than the manpower cost of Periodicals Section in BHU during the financial year 2014-15 (Table-5.6).

**Total Cost of Journals**

6. Total cost of Journals collection in the central library (Maulana Azad library) of AMU was ₹2,08,00,920 in the financial year 2014-15. Whereas the total cost of
Journals collection in the central library (Sayaji Rao Gaekwad Library) of BHU was ₹1,75,59,600 (Table-5.7).

**Preference for E-Journals**

7. Librarians of both the libraries preferred E-Journals as they are easy to order, easy to maintain, multiple use, no space problem and no problem of theft and mutilation are the reasons for acquiring E-journals as unveiled by the librarians of the select libraries (Table-5.10).

**Impact of E-Journals**

8. Librarians of both the Universities agreed that time of staff members as well as users were saved due to use of E-journals (Table-5.11).

9. Regarding the impact of E-journals on the use of Print Journals, librarians of both Universities agreed that usage of Print Journals decreased with the use of E-journals. Besides this, the quality of research and number of research publications had also increased (Table-5.12).

10. There is a heavy impact on users after the introduction of E-journals due to various advantages such as time saving, currency of knowledge and availability of information on the desktop. The number of users visiting the libraries has decreased as they are accessing E-journals from their respective departments, computer centre and hostels.

**Methods for Promoting the Use of E-Journals**

11. Regarding methods to promote the use of E-journals, both the libraries have adopted provisions for Training programs and library web page links to E-Journal Publishers/Vendors. BHU library also circulates database specific user guide (hardcopy) and subject list of E-journals on library web pages. But both the libraries do not use E-mail alerts to notify new E-journals nor provide general online guidance/tutorials on library use (Table-5.13).

**Problems of E-Journals**

12. ‘Slow connectivity’ and ‘lack of ICT Knowledge’ are the major problems faced by the users while accessing to E-journals as stated by the librarian of the AMU library. Whereas, librarian of BHU claimed that lack of maintenance was the major problem while providing access to them (Table-5.14).
PART-B

USERS’ PERSPECTIVE

For the present study the investigator calculated the cost of Journals utilizing the data collected from the analysis of responses received from the librarians of the Central Libraries under study and Benefit of Journals were calculated from the analysis of responses received from the users (Research Scholars and Faculty Members) of central libraries of the Universities under study.

BENEFIT ANALYSIS OF JOURNALS FROM USERS’ RESPONSES

During the present study there were 2123 Research Scholars and 1209 Faculty Members in Aligarh Muslim University (AMU), whereas there were 5037 Research Scholars and 1218 Faculty Members in Banaras Hindu University (BHU). Thus it was observed that there were more Research Scholars in BHU as compared to AMU and the numbers of Faculty Members were almost same in both the Universities.

Usage of Journals Collection

13. Majority of the respondents 34.33% from AMU and 45.60% from BHU used journals daily, followed by twice in a week and twice in a month. Moreover, a small percentage from both the Universities used the journals occasionally (Table-5.15, Figure-5.5).

14. Majority of the Research Scholars (84.43%) in AMU and 83.30% in BHU used journals for research work followed by finding relevant information in the area of specialization, updating their knowledge, writing articles and presentation/project purposes (Table-5.16(a), Figure-5.6(a)).

Majority of the Faculty Members (72.5%) in AMU and 90.16% in BHU used journals for finding relevant information in the area of specialization followed by, updating their knowledge, research work, writing articles and teaching work. A low percentage (25.83%) of the users in AMU and 29.50% of the Faculty Members in BHU made use of journals for the purpose of presentation/project (Table-5.16(b), Figure-5.6(b)).

15. Majority of the Faculty Members 95.83% in AMU and 98.36% in BHU used journals for writing articles in journals/conference proceeding. On the other hand majority of the Research Scholars 93.86% in AMU and 93.83% of the Research Scholars in BHU used journals for writing their thesis and dissertations (Table-5.17(a&b), Figure-5.7(a&b)).
16. A good number of respondents (42.16%) from AMU and 43.68% from BHU read around 10-20 articles per month. In AMU, a lesser percentage of 2.71% users read more than 40 articles per month and 2.08% of the users read more than 40 articles per month in BHU (Table-5.18, Figure-5.8).

17. The users of BHU Central library spent more time in browsing/searching articles in a week than the users of AMU Central library (Table-5.19, Figure-5.9).

**Benefits of Using E-Journals**

18. Majority of the users 91.86% in AMU and 92.48% in BHU opined that they had access to current and up-to-dated information using E-journals along with the ability to expedite their research process, provided easier and speedier access to information, getting access to a wider range of information and help to improve professional competence (Table-5.20, Figure-5.10).

19. Majority of the users 52.40% in AMU and 51.2% in BHU stated that E-journals had a direct impact on their research publications as they agreed that their research publications had increased after the use of E-journals (Table-5.21, Figure-5.11).

**Importance of Journals**

20. Majority of the users in AMU (61.14%) and 55.68% in BHU strongly agreed to the statement that journals were important for research work (Table-5.22, Figure-5.12).

**Satisfaction Regarding the Use of Journals**

21. With respect to the satisfaction level regarding the use of journals, majority of the users 67.52% in BHU were satisfied, whereas in AMU 53.01% of the users were satisfied. It revealed that BHU users were more satisfied with the use of journals than the users of AMU (Table-5.23, Figure-5.13).

**Total Benefit of Journals**

22. Majority of the users (61.14%) in AMU and 66.56% of the users in BHU stated a common reason for consulting journals in the library as ‘very expensive to purchase’. One cannot afford to subscribe individually, therefore library is the best place for consulting journals (Table-5.24).

23. Total benefit of Journals based on Annual WTP was ₹7,44,84,000 in AMU and ₹12,72,06,000 in BHU. It shows that benefit of Journals in BHU is more than AMU because of the larger number of users (Table-5.26).
Cost-Benefit Analysis of Journals

24. Cost-Benefit Ratio (1:7.2) and Return On Investment (624%) is much higher in BHU library as compared to Cost-Benefit Ratio (1:2.5) and Return On Investment (258%) in AMU library (Table-5.27).

Productivity or Research Output

25. During the year 2013-14, in AMU a total 2074 Research Papers/Articles were published and 159 Books were published by Faculty Members. Total 321 M. Phil./Ph.D. Degrees were awarded and a total number of 210 Research Projects were carried out. Whereas in BHU during the same year (2013-14) a total of 2669 Research Papers/Articles were published and 175 Books were published. Total 714 M.Phil./Ph.D. Degrees were awarded and a total number of 402 Research Projects were carried out. Hence the Productivity or Research Output of BHU was more than AMU in the year 2013-14 (Table-5.28).

PART-C

ANALYSIS OF USAGE STATISTICS OF JOURNALS

The usage statistics of E-Journals/Databases subscribed through Consortium (UGC-Infonet Digital Library Consortium) was provided by the libraries of both the Universities under study and the analysis of usage statistics was done and findings are presented in the following paragraphs.

Use of E-Journals/Databases

26. On an average the downloaded articles 11,75,890 were quite high in BHU as compared to downloaded articles in AMU (3,89,472) during the period 2012-2014. The articles downloaded in BHU were almost three times more than in AMU. It shows that the usage of E-Journals/Databases is more in BHU than in AMU (Table-5.29).

27. In AMU, the usage of E-Journals/Databases had increased from 3,29,706 to 4,30,476 full-text downloads during the period 2012-2014. In BHU also the usage of E-Journals/Databases had increased from 9,13,698 to 13,43,598 full-text articles were downloaded during the period 2012-2014. It shows the increasing trend of using E-Journals/Databases (Table-5.29, Figure-5.15).

28. During the period 2012-2014 in AMU, the five most used E-Journals/Databases included Science Direct (43.54%), followed by Springer Link (11.79%), JSTOR (10.11%), Wiley-Blackwell (7.97%) and American Chemical Society (6.86%).
The five least used E-Journals/Databases included American Institute of Physics (0.45%), Project Muse (0.37%), Portland Press (0.17%), Euclid (0.03%) and SIAM (0.03%) (Table-5.29.1, Figure-5.16).

29. In BHU, during the same period (2012-2014) the five most used E-Journals/Databases included Science Direct (52.44%), followed by Springer Link (10.84%), American Chemical Society (7.88%), Wiley-Blackwell (7.14%) and JSTOR (4.95%). The five least used E-Journals/Databases included Cambridge University Press (0.37%), Project Muse (0.23%), Portland Press (0.10%), SIAM (0.06%) and Euclid (0.02%). In both the universities, Science Direct and Springer Link were among the most highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases during the period 2012-2014 (Table-5.29.2, Figure-5.17).

30. A Comparative study of the average use of top five E-Journals/Databases in select Universities during the period 2012-2014 shows that, Science Direct was highly used in AMU (43.54%) and (52.44%) in BHU, followed by Springer Link (11.79%) in AMU and (10.84%) in BHU, JSTOR (10.11%) in AMU and (4.95%) in BHU, Wiley-Blackwell (7.97%) in AMU and (7.14%) in BHU, American Chemical Society (6.86%) in AMU and (7.88%) in BHU (Table-5.29.3, Figure-5.18).

**Cost per Use of E-Journals/Databases**

31. In AMU, JSTOR had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014. It indicates that the journals provided by JSTOR were used more and thus was cheaper in terms of cost (₹6.43 or $0.10) whereas SIAM (₹865.15 or $13.94) was expensive as it is costlier in terms of use as its usage is less (Table-5.30, Figure-5.19).

32. In BHU, Royal Society of Chemistry had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014. It shows that the journals provided by Royal Society of Chemistry were used more and thus was cheaper in terms of cost (₹2.51 or $0.04) whereas SIAM was expensive (₹213.38 or $3.43) as it was costlier in terms of use as its usage was very less (Table-5.30, Figure-5.20).
RECOMMENDATIONS

In the light of the analysis of data, findings and the opinions received from the librarians and users, the following recommendations are made in order to increase the benefits of Journals.

1. More funds should be made available to the Central library (Maulana Azad Library) of AMU to develop the Journals collections like that of BHU library.
2. The budget allocated to both the libraries should be with the escalating cost of Journals every year.
3. The requirements of users may be fulfilled by adopting a sound collection development policy that may be supplemented by ILL.
4. Maulana Azad Library should subscribe to E-Journals/Databases besides the E-Journals/Databases subscribed under UGC-Infonet Digital Library Consortium, to meet the current information requirements of the Research Scholars and Faculty Members.
5. Both the libraries should maintain statistics for recording the use of Print journals.
6. Both the libraries should subscribe to more number of E-Journals/Databases as they have many advantages.
7. Both the libraries should send E-mail alerts or sms alerts to notify the arrival of new journals to Research Scholars and Faculty Members for increasing the usage.
8. Both the libraries should increase their subscription to more number of consortium for providing maximum benefits of best collection at least cost.
9. Both the libraries should cancel the subscription of the E-Journals/Databases like Portland Press, SIAM and Euclid because they are among the least used E-Journals/Databases, as well as they prove to be expensive as Cost per Use was calculated to be high in the current year 2014.

CONCLUSION

The present study compared the Cost-benefit analysis of Journals collection in the central libraries of AMU and BHU for the current year (2014-15). Findings revealed that BHU library had larger budget and was subscribing to more journals than the AMU library. Findings revealed that benefits of Journals in BHU are more than AMU because of greater usage subsequent to the larger number of users resulting in a higher Cost-Benefit Ratio and Return On Investment.
The analysis of usage statistics revealed that the articles downloaded in BHU were almost three times more than in AMU. It indicates that the usage of E-Journals/Databases was more in BHU than AMU which further is reflected in the Productivity or Research Output of BHU which is higher that of AMU. The study revealed that in AMU, Science Direct, Springer Link and JSTOR were highly used E-Journals/Databases as compared to Portland Press, Euclid and SIAM which were among the least used E-Journals/Databases. In AMU, the Cost per Use of JSTOR was very low (€6.43 or $0.10) whereas SIAM had high Cost per Use (€865.15 or $13.94).

In BHU, Science Direct, Springer Link and American Chemical Society were among the highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases. The Cost per Use of the journals provided by Royal Society of Chemistry was low (€2.51 or $0.04) whereas the Cost per Use of SIAM was high (€213.38 or $3.43).

Both the libraries preferred E-Journals/Databases because of several benefits and cost-effectiveness of E-Journals/Databases. Journals are very important information sources used by Research scholars and Faculty members. Majority of users in both the universities used journals for their research and writing articles. The users of BHU read more number of articles and spent much time than the users of AMU. As a result, users of BHU library were more satisfied with the use of journals than the users of AMU library.

**IMPLICATIONS OF THE STUDY**

1. The library authorities as well as the Funding Agencies should improve the journals collection in libraries by increasing the budget allocation for the central library of AMU, so as to provide better access to information sources and services for Research Scholars and Faculty Members.

2. The study may help the librarians to prove the economic value or worth as well as justify the expenditure of journals collection in this era of decreasing financial resources and increasing demands for accountability.

3. The Cost per Use of E-Journals/Databases presented in the study will guide the librarians to evaluate the performance of each E-journal/Database.

4. The study will be helpful for librarians to provide an insight of highly used E-journals/Databases at low cost and less used E-journals/Databases at high cost by guiding them at the time of subscription or renewal of journals.
RECOMMENDATIONS FOR FURTHER RESEARCH

During the period of the research study, the investigator realized that the following similar studies may be carried out in other areas and on other types of collections in libraries.

1. A similar study may be undertaken to assess the economic value of collections such as Books, E-books, Magazines, Newspapers, Audiovisual materials etc. available in libraries.

2. A similar study can also be conducted to estimate the economic value of services provided by libraries such as circulation service, information services, technical services, reference service and newspaper clipping service etc.

3. Another similar study may be undertaken for measuring the economic value of different types of libraries.

4. A comparative study is also suggested between the libraries of reputed universities and Institutions such as JNU, DU, IITs and IIMs.

ORGANIZATION OF THESIS

The study is organized into six chapters.

CHAPTER-1 INTRODUCTION

CHAPTER-2 REVIEW OF RELATED LITERATURE

CHAPTER-3 AN INTRODUCTION TO PERIODICALS

CHAPTER-4 COST-BENEFIT ANALYSIS IN LIBRARIES

CHAPTER-5 DATA ANALYSIS AND INTERPRETATION

CHAPTER-6 FINDING, SUGGESTIONS AND CONCLUSION
COST BENEFIT ANALYSIS OF PERIODICALS COLLECTION IN CENTRAL UNIVERSITY LIBRARIES IN UTTAR PRADESH: A COMPARATIVE STUDY

THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

Doctor of Philosophy

In

Library & Information Science

BY

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UNDER THE SUPERVISION OF

DR. SUDHARMA HARIDASAN
Associate Professor

DEPARTMENT OF LIBRARY & INFORMATION SCIENCE
ALIGARH MUSLIM UNIVERSITY
ALIGARH-202002 (INDIA)
2016
Dedicated
To
The Memory of my Father
Saeed Ahmad
This is to certify that Ms. Saba Naasen Bano has completed her thesis entitled “Cost Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” for the award of the degree of Doctor of Philosophy in Library and Information Science. She has conducted the work under my supervision.

It is further certified that this work has not been submitted in any University or Institution for the award of any other degree or diploma. I deem it fit for submission.

(Dr. Sudhama Haridasan)
I hereby declare that the thesis entitled “Cost Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” submitted for the award of the degree of Doctor of Philosophy in Library and Information Science is based on my research work and the thesis has not formed the basis for the award of any other degree or diploma.

Place: Saba Nasreen Bano
Date: En. No. CC-4859
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Chapter 1

Introduction
CHAPTER - 1

INTRODUCTION

“A library has been rightly enabled with the functions of collecting, preserving, preparing and disseminating knowledge with a certain aim-the aim being the fulfillment of the purpose of the parent body” (Mittal, 1963). The general aim of libraries is the provision of reading facilities to the public so that their personality is enlightened. These aims and purposes differ to some extent in different kinds of libraries. In public libraries, the aim of the library is to provide inspiration, recreation and information to the readers so that they can become ideal citizens and that they may be able to perform their duties properly. In case of academic libraries, the libraries have to provide the reading materials particularly in accordance with the curricula of various disciplines to help the students to grasp knowledge for examination purposes, besides their general mental development. These aims can be fulfilled only if all relevant reading materials including books, periodicals, etc are made available to the readers.

In the present scenario, all types of libraries are facing problems due to explosion of literature, escalation of prices, growing demands of users and shrinking budget etc. To overcome these problems, librarians have to adopt to different ways and means. In this era of decreasing financial resources and increasing demands for accountability, libraries all over the world are facing the challenge of representing and quantifying their value to their funders and stakeholders.

In the context of academic libraries, librarians must prove their value to the institution in order to secure the financial resources necessary to serve the university and research community. As Financial Authorities weigh competing priorities and allocate limited resources, they need concrete evidence of how the library supports the institution’s strategic goals. In addition, they need evidences that help them weigh the value of new discretions. As the library administrators make budgeting decisions, librarians are asked to prioritize their products and services to focus on those entities that are most effective in serving the institutional mission with increasing financial challenges. In this economic crisis, librarians with the help of management tools such as Cost-benefit analysis can prove the value or worth as well as justify the expenditure of library’s collections and services.
Cost-Benefit Analysis is an important aspect of management and helps in decision making. To study the feasibility of any system, to evaluate it or to choose one system out of several alternatives the decision making authorities have to make a Cost-Benefit Analysis. In this process, total cost involved in terms of equipments, materials and manpower have to be taken into account including the value of all the benefits i.e. expenditure in terms of money, efforts and time involved have to be calculated. If the value of benefits is more as compared to the cost involved, the system is suitable and if the results are reverse to this, the system is a misfit. It is, therefore essential to use cost-benefit analysis in the libraries instead of blindly following other techniques.

Due to exponential growth of knowledge and information, libraries are trying their best to acquire all the documents available worldwide. But lack of funds leads the librarians to a situation in which he/she has to take decisions judiciously as to which documents should be purchased and which not to be purchased. It is the responsibility of the librarian to convince the higher authorities and prove the value of library’s collection and services. For this purpose cost-benefit analysis method is appropriate. In this scenario to prove the economic value of library, librarian’s responsibility increases. But with the help of various types of CBA study librarians can prove the worth of the library collections and services.

The periodicals are not only the chief medium for disseminating current information but also serve as an important part of a library collection. These are helpful in fulfilling both the objectives of teaching and research within an organization. Periodicals such as Journals are very expensive to subscribe therefore librarians must take decisions judiciously as to which journals to subscribe and which not to. University and Research libraries usually spend more than 70 percent of their total budgets on the subscription of periodicals only, Periodicals, a source of current information have become indispensable these days because the results of research being done in different parts of the world are communicated through them (Ravat & Kumar, 2002).

Therefore, the investigator decided to conduct a study to identify the Cost and Benefits of Periodicals Collection in Central University Libraries of U.P. especially Aligarh Muslim University (AMU) and Banaras Hindu University (BHU).
1.1. STATEMENT OF THE RESEARCH PROBLEM

A clear and defined statement of the problem is needed to achieve the goals and objectives of the study. The problem selected for the present study is “Cost Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study”. The problem has been selected by the investigator to understand the different embedded costs and benefits derived from the Periodicals subscribed by the Central University Libraries, so that it can make further improvements in the subscription/renewal/cancellation of Periodicals depending upon the results and suggestions.

1.2. TERMS USED IN STATEMENT OF THE RESEARCH PROBLEM

The terms, Cost-Benefit, Cost-Benefit Analysis, Periodicals, Periodicals Collection, Central University, Library, Uttar Pradesh, Comparative and Study are defined separately as follows:

Cost-Benefit

According to Oxford Advanced Learner’s Dictionary of Current English the term “Cost-Benefit” is defined as “The relationship between the cost of doing something and the value of the benefit that results from it” (“Cost-benefit”, 2010).

According to Collins English Dictionary & Thesaurus the term “Cost-Benefit” is defined as “denoting or relating to a method of assessing a project that takes into account its costs and its benefits to society as well as the revenue it generates” (“Cost-benefit”, 2000).

Cost/Benefit Analysis

According to dictionary of Economics and Commerce the term “Cost/Benefit Analysis” is defined as “A technique for the evaluation of an existing situation whereby the social cost is considered in relation to the benefit it confers on the community” (“Cost/Benefit Analysis”, 1974).

Cost-benefit analysis

According to Encyclopedia of Economics “Cost-benefit analysis is a generic term applied to any systematic, quantitative appraisal of a public project to determine whether, or to what extent, that project is worthwhile. Essentially, a cost-benefit analysis attempts to determine whether the benefits of a public project justify the costs” (“Cost-benefit analysis”, 1982).
Periodicals

*Glossary of Library & Information Science* defines “A periodical is a serial published indefinitely at regular or stated intervals, generally more frequently than once a year. Each issue is numbered and / or dated consecutively and contains articles, stories or other writings. Journals, Magazines, Newspapers and Periodicals publication in a continuous series, with a consecutive number and no predetermined end, as distinct from a single work in several parts” (“Periodical”, 2004).

Periodicals Collection

According to *Harrod’s Librarians’ Glossary and Reference Book*, “Periodicals Collection” is defined as “A library collection of periodicals, newspapers, and other serials whether bound, unbound, or in microform; usually kept as a collection and separate from other library materials” (“Periodicals Collection”, 2005).

Central University

The Indian Universities are basically of two types- Residential (campus) and Residential-cum-affiliating. The Residential type of universities are generally confined to a single campus and have provisions for both postgraduate and undergraduate programmes and also have a strong emphasis on research such as Aligarh Muslim University and Banaras Hindu University.

A Central University in India is established by the Government of India, normally by an Act of the Parliament. The Government of India is responsible for allocating and distributing financial resources required by the University Grants Commission (UGC) for establishment of Central Universities in India (AIU, 2014).

Library

*A.L.A. Glossary of Library and Information Science* has defined “library” as, “a collection of materials organized to provide physical, bibliographical, and intellectual access to a target group, with a staff that is trained to provide services and programmes related to the information needs of the target group” (“Library”, 1983).

Uttar Pradesh

According to *Manorama Year Book (2015)* “Uttar Pradesh (U.P.) is the most populous state of India. It has 2.94 lakh sq. km. which is about nine percent of the country’s total area. Tibet and Nepal bound Uttar Pradesh in the north, Himachal Pradesh in the northwest, Haryana in the west” (“Uttar Pradesh”, 2015).
Comparative

According to *Cambridge Advanced Learner’s Dictionary* the term “comparative” is defined as “the form of an adjective or adverb that expresses a difference in amount, in number, in degree or quality; comparing different things” (“Comparative”, 2005).

Study

*The Concise Oxford English Dictionary* defines “Study” as “the act of considering or examining something in detail”. It also means applying the mind to learning and understanding a subject in order to discover new information (“Study”, 2004).

1.3. NEED AND SIGNIFICANCE OF THE STUDY

Periodicals especially Journals are the most expensive resources subscribed in the University Libraries. Therefore there is a need for extra care in deciding or selecting the journals titles at the time of subscribing them. During the times of current economic constraints, Cost-Benefit Analysis method is used by the investigator to assess the value of Journals collection. Financial Authorities allocate limited resources and they need concrete evidence of how the Journals support research needs of the Research community in the University with increased financial challenges. The investigator using the study of Cost-Benefit analysis tries to prove the value or worth, as well as justify the expenditure on Journals collection in select Central University Libraries. Moreover, so far no research work has been conducted on the Cost-benefit analysis of Journals Collection in India.

The research study undertaken here attempts to assess the Cost and Benefit of Journals collection in the central libraries of AMU and BHU which will be useful in comparing the benefit of Journals with the cost of Journals and to check the extent of benefit that outweigh cost in libraries under study.

In addition, the study will be useful for Librarians, Library administrators or Funding authorities and Researchers who directly or indirectly are engaged or are interested in planning for subscribing to these Journals. The comparative study will show the present status of both the Universities.

In an era of decreasing budget and increasing demands for accountability on the part of library professionals. The present study will be helpful for demonstrating and quantifying the Journals’ economic value to their funders and to other stakeholders. In addition, the study is also helpful for checking the cost per use of E-
Journals/Databases subscribed under UGC-Infonet Digital Library Consortium in the libraries under study. The study also serves as a source of input during the time of subscription/renewal/cancellation of journals for decision making regarding the E-journals/Databases that are having less use resulting in high cost and high use resulting in less cost in the libraries under study. Cost-Benefit Analysis of Journals will help in decision making at the time of subscription of Journals, since Journals are considered to be a very important information resource in University libraries and is used in research, teaching and updating the knowledge of Faculty Members and Research Scholars of the University. It will prove to be an useful study which may be implemented by other libraries too, to carry out an assessment of journals and to increase usage at low cost.

Maulana Azad Library and Sayaji Rao Gaekwad Library are the Central Libraries of AMU and BHU respectively. The present study is limited to the two Universities which are reputed and well established institutions of higher learning in the state of Uttar Pradesh. Sayaji Rao Gaekwad Library was established in 1941, whereas Maulana Azad Library was established in 1960 to cater the needs of the Students, Research scholars and Faculty Members of the University.

1.4. SCOPE AND LIMITATIONS OF THE STUDY

1.4.1. Scope of the Study

The work entitled “Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” is an attempt to assess the Cost and Benefit of Journals Collection in AMU and BHU. The two selected Central University Libraries are subscribing to different types of Periodicals such as Journals, Newspapers and Magazines etc, but the present study undertakes the Cost-Benefit Analysis of Journals in AMU and BHU. For the present study Periodicals refer to scholarly journals as it is the general understanding prevalent in the academia and has been used as such for analysis and interpretation.

Usually Journals are subscribed annually in the University libraries, therefore the investigator tried to assess the Cost-Benefit Analysis of Journals for the current year 2014-15, comparing the benefit of Journals with the cost of Journals and to check the extent of benefit that outweigh cost.

The study seeks to measure the benefit of Journals into monetary term i.e. in Rupees (the official currency of India) by using Contingent Valuation Method. Further an attempt has been made to compare these benefit with the cost of Journals,
in order to check the extent to which benefit outweigh Cost in both the selected libraries. The study further investigates the use, benefits, importance of Journals and satisfaction levels of users with regard to existing Journals collection available in the surveyed libraries.

The investigator identifies E-journals/Databases which were common in both the surveyed libraries under UGC-Infonet Digital Library Consortium to calculate the cost per use for E-journals/Databases for the current year 2014, as both the central libraries do not maintain any record of usage statistics for Print Journals.

Moreover, the literature review reveals that no attempt has been made so far, to study the Cost-Benefit Analysis of Journals Collection in University Libraries in India. Taking this fact into consideration, the present study has attempted to give a new dimension by studying the Cost-Benefit Analysis of Journals Collection in two Central University libraries of Uttar Pradesh that are having a rich collection of Journals.

In conclusion, the study has laid down some significant points in the form of suggestions derived from analysis of the collected data which in turn will help to improve the quality of Journals collection and also to enhance the use of these services in AMU, BHU and similarly in other Universities in the country.

1.4.2. Limitations of the Study

Following are the major limitations of the study.

1. There are four Central Universities in Uttar Pradesh but being a comparative study, it covers the two central libraries of oldest and well established Central Universities of Uttar Pradesh i.e. Aligarh Muslim University (Maulana Azad Library) and Banaras Hindu University (Sayaji Rao Gaekwad Library).

2. The present study focuses only the Journals, as the major portion of the Periodicals Section in the University Libraries constitutes of Journals and major amount of the budget is also spent on Journals, so newspapers, magazines and other forms of Periodicals have been excluded from the present investigation.

3. For the Cost-benefit Analysis of Journals was the users comprised of Faculty Members and Research Scholars in both the Universities.

1.5. Objectives of the Study

Journals are the costliest items subscribed in the libraries, therefore it is the responsibility of the librarians to understand the benefit of Journals and compare the cost of Journals with the benefit of Journals at different intervals. The investigator
decided to study the Cost-benefit Analysis of Journals subscribed in the central libraries of AMU (Maulana Azad Library) and BHU (Sayaji Rao Gaekwad Library) in the state of Uttar Pradesh for the year 2014-15.

The objectives of the study include:
1. To assess the library budget as well as the expenditure (cost) involved in maintaining the Journals Collection in libraries under study.
2. To examine the Journals Collection in Central Libraries of AMU and BHU.
3. To ascertain the use and importance of Journals Collection for Faculty Members and Research Scholars in libraries under study.
4. To assess the benefits of Journals to Faculty Members and Research Scholars in libraries under study.
5. To measure the benefit of Journals into monetary term in the libraries under study.
6. To compare the benefit of Journals with the cost of Journals, to check the extent of benefit that outweigh cost in libraries under study.
7. To calculate the Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection in libraries under study.
8. To assess the satisfaction level of the users with the Journals collection in the libraries under study.
9. To find the use and Cost per Use of E-journals/Databases subscribed in the libraries under study.

1.6. **HYPOTHESES**

The study attempts to test the following hypotheses formulated on the basis of literature review and findings from the earlier researches, related to the present study.

1. There exists higher Cost than Benefit of Journals collection in the libraries under study.
2. The Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection is higher in BHU than in AMU.
3. There are significant differences in the total number of articles read in a month in AMU and BHU.
4. There are significant differences in the time spent in searching articles per week in AMU and BHU.
5. There is a significant difference in the satisfaction level with the use of Journals collection among the users of AMU and BHU.
1.7. RESEARCH METHODOLOGY

Research Methodology has its own importance in scientific investigation, because objectivity in any research investigation cannot be obtained unless it is carried out in a very systematic and planned manner. Scientific investigation involves careful and proper adoption of research design, use of standard tools and tests, identifying adequate sample by using appropriate sampling techniques, sound procedures for collecting data and careful tabulation of data and use of appropriate statistical techniques for analyzing the data.

The investigator has chosen survey method as the research method to determine the extent to which selected University Libraries are providing Journals resources to their users (Research Scholars and Faculty Members) and their actual usage by the users of concerned Universities. Survey research is characterized by selection of samples from large populations to obtain empirical knowledge of contemporary nature. This knowledge allows generalizations to be made about characteristics, opinions, beliefs, attitudes, and so on, of the entire population being studied. The following research processes are undertaken for the present study:

1.7.1. Document/Literature Review

The investigator collected data from various printed and electronic resources such as annual reports, unprocessed internal data and websites of the University Libraries, whenever required. Primary Sources of information such as Journal articles, Theses, Dissertations etc. and Secondary sources of information such as Dictionaries, Text books both in print and electronic form as per the need of the study were also consulted.

Prior to the launch of the study, a survey of related literature was undertaken. The purpose of this exercise was to understand the existing trends, outcomes and drawbacks, so as to arrive at the right perspective. The research topic is partitioned into various sections and a thorough search is made for related materials in various journals, books, seminar/conference proceedings etc. and a bibliography is prepared for the most relevant and related research based articles. A detailed and in-depth study of these articles is presented in Chapter-2.

1.7.2. Data Collection Methods

Several techniques are adopted for collecting relevant and authentic data. Though there are a number of data collection techniques available such as questionnaire, schedule, interview, observation, document review, psychological test,
socio-metric techniques etc. Being empirical in nature, the study is conducted through a survey using questionnaire. The investigator visited both the Central University Libraries under study and approached the Librarians and users (Research Scholars and Faculty Members) of concerned Libraries to collect necessary data.

1.7.2.1. Questionnaire Method

Questionnaire is the heart of survey operation. For the present study, the investigator designed two questionnaires one for the librarians and another questionnaire for the users (Research Scholars and Faculty Members) of both the libraries. After which, a pilot study was conducted to check the feasibility and objectivity of the prepared questionnaires, samples were selected and the questionnaires were administered for data collection.

(i) Questionnaire Design

The investigator designed a questionnaire to gather necessary data for the present study. In order to produce a reliable questionnaire the investigator had made efforts to conduct a thorough search and review of all the literature related to the topic. Enough care was taken to develop the kind of questions that will accurately measure the research needs of the investigator. Individual statements on the questionnaires were formulated based on the selected literature reviews and the research objectives of the study.

The questionnaire designed for the Librarians of the Surveyed Libraries, consisted of a number of questions in definite order and format. The questionnaire covers information about total number of Journals subscribed, budget, Expenditures and Cost of Journals and various aspects of use of Journals. The questionnaire designed for users is also based on structured pattern and a definite format. The aspects covered in the user’s questionnaire include frequency of use of journals, purpose of using journals, use of journals for academic purposes, number of articles read, time spent in browsing/searching articles, satisfaction of users, reasons for consulting Journals in libraries and willingness to pay to access articles per month.

The detailed questionnaire administered among the Librarians of both the Universities is provided in Appendix-I and questionnaire for users has been appended as Appendix-II. The detailed profiles of the Central Libraries under study are enlisted in Appendix-III. The investigator has also made use of the usage statistics of E-journals/Databases gathered from both the surveyed libraries. The usage statistics of
E-journals/Databases subscribed under UGC-Infonet Digital Library Consortium and Price list of articles are given in Appendix-IV and Appendix-V respectively.

(ii) Pilot Study

The purpose of pilot study was to test the validity of the questionnaire, both as a data collection instrument and statistical measurement device. The questionnaire was prepared with utmost care to ensure that it was easily understood by the users and eliminating any probability of misunderstanding, confusion and biasness. Pilot study was conducted for both the questionnaires prepared for Librarians and Users by administering it in the libraries during the peak hours in the month of April, 2015. The ‘Questionnaire for Librarians’ of the University libraries was administered to the Librarians of AMU and BHU combined by an informal interview. The questionnaire for users was distributed to twenty users in each of these University Libraries. The respondents were asked to note any difficulties faced while filling-up the questionnaire. The feedback and responses provided by the respondents was collected and their suggestions for change were noted.

As a result of the pre-test it was decided to add a few more structured questions. Some questions were added while some irrelevant questions were removed. After editing the questionnaire, investigator checked for the modifications and after finalization resulting questionnaires were used to fulfill the objectives of the study and to elicit more reliable data, the questionnaires were administered personally to ensure better and speedier response rate.

(iii) Population and Selection of Sample

The present study was conducted among Librarians and users (Research Scholars and Faculty Members) of two Central University Libraries of Uttar Pradesh. All items under consideration in any field of enquiry constitute a universe or population. A complete enumeration of all items in the population is known as a census enquiry. It can be presumed that in such an enquiry, when all the items are covered, no element of chance is left and highest accuracy is obtained (Kothari, 1992). Here census method is adopted for Librarians, because the population is single in both the Universities.

As far as the selection of respondents among the users (Research Scholars and Faculty Members) is concerned, it was not feasible to collect large quantities of data by taking responses from each and every unit of the population. Sufficiently accurate results are obtained by studying only a part of the total population. The investigator
used the purposive sampling technique for data collection. For sampling, the universe was first divided into two groups based on their academic status, viz., Research Scholars and Faculty Members. The total population of Research Scholars was 2123 and Faculty Members’ was 1209 in Aligarh Muslim University (AMU), whereas the total population of Research Scholars was 5037 and Faculty Members’ was 1218 in Banaras Hindu University (BHU) during the period of the study. A number of questionnaires were distributed to the sample population selected through convenience sampling until each quota had been filled for the required number of respondents.

(iv) Administration of Questionnaires

The investigator visited both the University Libraries under study in the month of May 2015 and met the Librarian in person. The investigator discussed the questions in detail with both of them, and got the questionnaire filled. The response rate of librarians was 100% as the questionnaire from AMU and BHU were collected personally.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Responses</th>
<th>Number of Respondents</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>RS</td>
<td>FM</td>
</tr>
<tr>
<td>1.</td>
<td>Questionnaires Administered</td>
<td></td>
<td>270</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(12.71)</td>
<td>(14.06)</td>
</tr>
<tr>
<td>2.</td>
<td>Questionnaires Received</td>
<td></td>
<td>221</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(81.85)</td>
<td>(79.41)</td>
</tr>
<tr>
<td>3.</td>
<td>Questionnaires Analyzed</td>
<td></td>
<td>212</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(78.51)</td>
<td>(70.58)</td>
</tr>
</tbody>
</table>

* RS= Research Scholars, FM= Faculty Members
(Figures within the parenthesis represent %)

As mentioned above, a total of 440 and 770 questionnaires were distributed among the users (Research Scholars and Faculty Members) of AMU and BHU respectively. Out of the total administered questionnaires, a total of 356 (221+135) filled-in questionnaires were received from AMU and 654 (510+144) from BHU. Of the total questionnaires received, 24 questionnaires from AMU and 29 from BHU
were rejected due to incomplete responses. Finally, 332 (212+120) filled-in questionnaires from AMU and 625 (503+122) from BHU were considered and used for data analysis, which constituted 10% of the total population in each categories giving a proper representation in the sample selected. The total response rate of users in AMU and BHU as depicted in the above table is found to be 75.45% and 81.16% respectively.

1.8. PROBLEMS IN DATA COLLECTION AND THEIR SOLUTIONS

The present study entitled Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study is required to measure the Cost and Benefit of using Periodicals into monetary term. Cost is easily measured into monetary term but benefit of journals were neither available into monetary term nor usage statistics of the Print journals were available. To overcome this problem a survey of users (Research Scholars and Faculty Members) was conducted and Contingent Valuation Method (CVM) was used for measuring the benefit of Journals into monetary unit i.e. in Rupees. Whereas Usage Statistics of E-journals/Databases subscribed under UGC-Infonet Digital Library Consortium were provided by the librarians of the central libraries under study.

1.9. ANALYSIS AND INTERPRETATION OF DATA

The data collected from the surveyed libraries using questionnaires were scrutinized by comparing answers to one question with answers to related questions so as to check its consistency and compatibility. In this way all the filled-up questionnaires were made more or less uniform for the purpose of statistical analysis. The responses were coded and categorization was done by reducing data into homogeneous groups for getting meaningful relationships. Using a self designed coding sheet, statistical counting was done for each response.

Finally the data was organized, analysed, compared, consolidated, tabulated and interpreted by using statistical techniques, tables, percentages and graphs. The software package MINITAB was used to verify the validity of the results. In the light of the above data, useful findings and conclusions have been derived.

1.10. STANDARDS FOLLOWED FOR BIBLIOGRAPHIC REFERENCES

The investigator has followed American Psychological Association Formatting and Style Guide (APA, 6th ed., 2010) for providing the bibliographical references. Some examples are given as under.
(i) Book, one Author

(ii) Book, two Authors

(iii) Journal Article

(iv) Article from an Online Journal


(v) Websites

1.11. ORGANIZATION OF THESIS
The study is organized into six chapters.

CHAPTER-1 INTRODUCTION
The chapter briefs the whole study undertaken, beginning with the basic concept of Cost-benefit Analysis and background of the research. It includes statement of the problem, definitions of terms, need and significance of the study, scope and limitations of the study, objectives of the study and hypotheses. Further the chapter describes about the research methodology used, methods of data analysis and interpretation of data and standards followed for bibliographical references.

CHAPTER-2 REVIEW OF RELATED LITERATURE
Prior to launching the study, a survey of the related literature was undertaken. The purpose of this exercise was to understand the already existing trends, findings and problems so as to arrive at the right perspective. The research topic was divided
into various sections and a search was made for related research material in various sources i.e. journals, reports, seminar/conference proceedings etc.

**CHAPTER-3 AN INTRODUCTION TO PERIODICALS**

This chapter describes about Periodicals and its related terms. Further, historical perspective of scholarly journals, their types, problems, acquisition of printed periodicals have been discussed. Various selection aids and tools are outlined. An attempt has been made to discuss the E-journals, its characteristics, types, difference between Print journals and E-journals. The important E-journal providers, major library consortium in India such as UGC-Infonet Digital Library Consortium has also been discussed.

**CHAPTER-4 COST-BENEFIT ANALYSIS IN LIBRARIES**

This chapter includes a detailed description of Cost-Benefit Analysis and how it differs from Cost Effective Analysis (CEA). It deals with the theory and principles of CBA. This chapter covers the different methods/procedures for conducting CBA, difficulties and limitations of CBA in libraries. Further a detailed description of applications of CBA in libraries is provided.

**CHAPTER-5 DATA ANALYSIS AND INTERPRETATION**

The chapter deals with the analysis and interpretation of data collected through questionnaires. This chapter has been divided into three parts. Part-A consists of analysis of Librarians’ responses, Part-B deals with analysis of user’s responses and Part-C deals with analysis of Usage Statistics. The data is tabulated and different statistical tools are used to come to the conclusion of the study.

**CHAPTER-6 MAJOR FINDINGS, RECOMMENDATIONS AND CONCLUSION**

This chapter covers findings, tenability of hypothesis, recommendations, suggestions and conclusion of the study. Implications of the study and recommendations for further research are also provided at the end of this chapter.

The end part of the thesis contains Bibliography and Appendices. The questionnaire administered to the librarians and the questionnaire administered to the users is provided in Appendix-I and Appendix-II respectively. Profiles of Central Libraries studied, Usage statistics of E-journals/Databases used in the study and List of Price per Article are also provided in Appendix-III, Appendix-IV and Appendix-V respectively.
REFERENCES


Chapter 2
Review of Related Literature
CHAPTER - 2

REVIEW OF RELATED LITERATURE

This chapter presents review of related literature on Cost-benefit Analysis of E-journals as well as Print journals using CBA techniques in Academic libraries, Public libraries, Special libraries and National libraries. The purpose of this chapter is to understand the research that has been conducted in the related areas of research.

There are not many studies on the topic of Cost-benefit Analysis of Periodicals Collection in Academic Libraries. However, an attempt has been made to review a reasonable amount of literature both from Books and Periodicals, published in India and abroad on the topic Cost-benefit Analysis of Journals Collection. A few studies have been conducted on this topic in India while most of the studies that were conducted on CBA are from USA especially in public libraries. The investigator has conducted a thorough search for literature and has reviewed only those studies, which are directly or indirectly related to the present study. The literature reviewed indicates a comprehensive view of the Cost benefit Analysis of Periodicals Collection or all types of libraries has observed an escalation of prices in the journals as well as inadequacy of funds.

Review of related literature is an organized presentation of what has been published on the topic. The purpose of this review is to convey to the readers the present status of the concept and research on the topic available for study.

2.1. COST-BENEFIT ANALYSIS OF JOURNALS

Libraries are experiencing pressure to justify budget expenditures to their funding authorities or to higher authorities. Now a days University Libraries are subscribing a large number of Journals at a very high cost especially in the field of Science and Engineering. Librarians have been adopting Return On Investment (ROI) and Cost Benefit Analysis (CBA) techniques for the last few decades to provide quantitative proof of the value of services and resources. Scholarly journals are very expensive but essential for research and teaching purposes.

King and Tenopir (2013) conducted a study among the faculty members at five U.S. Universities, the survey was based on a critical incident method by asking questions concerning the last journal article read. The emphasis of this study was to demonstrate the relationship of purpose of reading scholarly journals (research,
teaching, current awareness) lead to the information seeking patterns used by them
(how they identified articles that are read, where they obtained them) that shows
certain aspects of use (how much is read, age of articles read, format of the articles)
which is further related to the positive outcomes or value of reading (increased
productivity, improved research, or teaching, saving readers’ time or money), which
provides as return components of the ROI of academic library journal collections. The
findings of this study revealed that articles were read for the purpose of research,
found by searching and obtained from the library collections have the highest value to
faculty. The faculty opined that the articles provided by the library save the effort on
the part of the faculty which can be quantified using contingent valuation. The Return
On Investment (ROI) for library collections can be calculated by measuring all library
costs and establishing monetary returns to faculty members through contingent
valuation. Library journal collections are estimated to have an ROI between 3.3 and
3.6 to 1. They calculated the benefits in terms of money in the context of Academic
Library Journals.

Another very interesting study reported by Bodycomb and Baglivo (2012)
using an automated tool to calculate return on investment (ROI) and cost benefit ratio
(CBR) for library collection of books and journals in the Health Sciences and Human
Services Library (HS/HSL) of the University of Maryland in 2009. The tool was
developed by the National Network of Libraries of Medicine (NN/LM). Authors
described the process used to compile the statistics for the calculator, using data from
the 2008 and 2011 financial year. The library had 8,500 print and online journal
subscriptions, 174,000 print and online books, 96 databases and 6,797 users (faculty
and students). To complete the calculator for ROI and CBR the library supplied
statistics dealing with user’s average annual salary, library salary budget, number of
journal articles read, per article price from vendor, user’s time saved per article,
journal budget, staff time devoted to journal collection as well as for books. Once all
required metrics were entered the instrument automatically calculated benefit and cost
in a quantitative measure along with ROI and CBR values. 30$ was taken as per
article price from a vendor and 20 minutes were used as user time saved for
borrowing journals. Print usage for journal articles was compiled from reshelving
activity, with one volume shelved equivalent to one article read. Electronic article use
was calculated using number of successful full-text article requests from COUNTER
compliant vendors. CBR was calculated as 21.2: 1, and ROI 2,017% for the fiscal
year 2008. For the year 2011 CBR was 23.3: 1, and ROI was 2,234%. The library staff also calculated manually ROI and CBR with the help of ROI formula, and related values were obtained. Although this study presented the use of automatic calculator in obtaining ROI and CBR values, even then this study was helpful for the present study.

A cost benefit analysis was conducted by Pan, Wiersma and Fong (2011) for providing proof of value and to demonstrate that their collection development efforts supported university requirements. This paper revealed the results of a pilot study that analyzed the extent to which use of online library resources contributed to faculty teaching and research outcomes. The study included both quantitative and qualitative methodologies, including citation analysis and faculty interviews. For citation study they limited the scope to articles and book chapters published 2009 onwards and focused on journal articles cited in the reference lists. With the journal titles, they determined the source of full-text access and calculated the percentage of reference from journals and citations from online library resources. During the interviews researchers asked 4 questions about use of library resources. This pilot study focused on calculating CBA and ROI for electronic journal access as maximum amount of the library budgets were allocated for electronic resources. The findings revealed that at Denver, the CBA was high with $2.00 in 2009, and then dropped in the year 2010. The total CBA during the study period was nearly $1.50. The overall CBA for the Boulder study was $2.17 and ranged from $1.68 in 2009 to $2.37 in 2010. ROI used the same values as CBA however ROI was calculated in percentages showing the return or increase in value as dollars spent to achieve a benefit. The generic formula of ROI is benefits minus costs divided by costs and multiplied by 100. Denver’s ROI was over 90% in 2009, dropped to 13% in 2010, for an overall ROI of nearly 50%. Boulder’s overall ROI was 117%. The model was unable to account for differences in research needs according to discipline. This pilot study created and tested a model that can be used to calculate ROI and CBA in any academic library. This pilot study produced valuable comparative data for a multi-campus university system. This study is useful for the present work particularly in understanding the methodologies used for calculating CBA and ROI of the journals.

Similar study was conducted by Tenopir, King, Mays, Wu and Baer (2010) for examining the value and ROI of e-journal collections in the grants process in eight universities from eight countries. The findings revealed that library provides access to
scholarly journals and they help in faculty productivity. Therefore faculty members value and use electronic resources for doing their research, grant and publishing activities. The study indicated that a majority of faculty members responded that citations were essential, very important, or important to grant proposals (90.4%). Faculty members read many articles for each one they cite. Faculty members who are grant active and non active reported reading on average about 24 articles for each one they cite. Faculty reported that spending an average of 5.66 hours finding and accessing articles or books per week. More time spent on an activity, the more value it has. All respondents also reported that they spent a good deal of time each week reading work related articles. They spent about 12 hours a week reading for work.

The study of Tenopir (2010) highlighted Return on Investment (ROI) as one method of measuring the value of a library’s e-journal collection. An international study designed to test ROI formula which was developed as a case study at the University of Illinois. It was found that depending on the mission and subject emphasis of the institution, ROI of the value of e-journals to grants income varies. Faculty members reported that e-journals have transformed the way they do research, including making them more productive and competitive.

Duran and Rangel (2007) conducted a study on cost-benefit analysis of e-journals subscribed by the National University of Mexico (UNAM) using the statistical reports as well as the subscription costs. Downloaded articles and subscription costs from six different publishers (American Chemical Society, Emerald, Elsevier, Nature, Springer and Wiley) are analyzed for the year 2005-2006. Data was analyzed considering both the subscription type (print plus electronic or only electronic) and use level (high, low or null). In order to calculate the cost-benefit of the collections the Lancaster’s model on acquisition cost is used. In general, the e-journals subscribed with the six publishers mentioned above results beneficial for UNAM. Three of the collections are highly beneficial since they show high levels of use. Two of them show some titles with low or null use generating a deficit in the subscription cost and finally, one collection revealed that 95% of their titles were poorly used. The authors recommended that some initiatives must be analyzed in order to improve the use of this particular collection.

Another landmark study of Pan and Fong (2010) reported the cost-benefits and the return on investment of consortium including five separately managed libraries in the University of Colorado (CU) System. To express the benefits of shared collection
development outweighing the costs, the CU libraries conducted a return on investment (ROI) analysis of their combined budget. CU libraries purchased or renewed range from a single journal title to a large publisher package. The average cost was $83,590.26 and the median cost $10,494.00 during july2009 - june2010. The CBA value of the benefit is based on the total consortia cost to access the shared CU e-resources divided by the individual library’s monetary contribution for those materials. Auraria has access to about 60 CU deals, the value of the benefit to purchase these e-resources is 6,940,215.51 and its share of the cost is $851,043.76. For every US dollar Auraria spends, they receive $8.15 in consortium purchased e-resources. By comparison for every US dollar Boulder spends, they receive $1.56 because they pay $4,693,822.83 to access over eighty e-resources having a combined value of $7,316,937.08. The CU libraries determined their ROI by subtracting the individual library contribution from the system price by dividing each library’s portion and then multiplying by one hundred. The ROI for consortia purchasing is 715% for Auraria and 56% for Boulder. Since this study deals with CBA and ROI of consortium, therefore it is helpful for the present research work.

In the same year one more study on Consortia was reported by Emrani, Moradi-Salari and Jamali (2010). They reported the analysis of COUNTER-compliant usage data of Elsevier ScienceDirect journals for the period of 2004-2009 by Consiran, an Iranian national consortium of 58 institutions. The aim of this study was to develop a license model for subscription purchases. The results showed journal use followed the "80/20 rule" or Pareto principle. The conclusion was that, for a cost-benefit license model, institutions should be grouped into three or four categories based on their subject fields and amount of use. They also covered the problems of usage data and highlighted the need for implementing a system to locally collect and analyze usage data rather than relying on the usage data provided by vendors and publishers.

Similar study was conducted by Scigliano (2002) entitled “Consortium Purchases: Case study for a Cost-Benefit Analysis” of Ontario Council of University Libraries (OCUL), which had 19 member academic libraries in Ontario, Canada and had 300,000 users. The author analyzed some of the costs and benefits of consortium purchase associated with the links represented by OCUL institutions and their users. For determining costs and benefits, the data collection for the study started in Feb, 2002. The 14 OCUL subscribers were asked to supply details from records of
payments for all Annual Reviews, both print and electronic, on subscription in the preceding subscription year (2001). These were compared to costs and subscriptions for AR Online for 2002. They were also asked to provide access to their online use statistics for AR Online. From the use data, cost per use and rate of use for each institution were estimated for the year 2002. AR Online use statistics for the 14 sites for the January to March 2002 total 20,212 full-text articles, and the projected use for all 12 months is 44,915 full-text articles. The average cost per use is CA$1.62 (CA$72,962.54 ÷ 44,915). The cost per use averaged over the 14 institutions is CA$ 4.45. Users of member libraries gain in terms of content by the access to AR Online and increasing online series from 167 to 406 and users save time when resources are available electronically via the campus network because most e-resources are accessed outside of the library. By acquiring AR Online, the faculty member saves approx. 15 minutes per article. To get the value of time saved, consider the average salary for a faculty member in Ontario Universities which is CA$ 85,271 and the cost for 1 minute of labor is CA$ 0.78 making 15 minutes labor equivalent to CA$ 11.70. This amount when multiplied by the projected number of uses over a year results in a relative measure of the total value of users time saved in one year. This study resulted the projected value of time saved for OCUL users using AR Online in 2002 is over half a million dollars. And in the case of student the value of student time is set at CA$ 7.85 per hour and per minute is CA$ 0.13 per minute and saving is CA$ 11,677.90. These studies are very useful for present thesis. This study is very helpful in quantifying the value of time saved of faculty members and students.

Another related study to the present research was conducted by Shahrzadi (2006) stating that electronic journals are the rich scientific resources that take time, budget and manpower in academic libraries every year. This research studies electronic journals from two approaches: number of usage to determine the place of electronic journals among the users, and cost per use to recognize cost-benefit collections. Data collection was carried out through questionnaire from Latin journals acquisition department in 15 universities of Tehran city. In 2003 about $702840 spent for 68330 electronic journal titles. The average cost per use for Science Direct, ProQuest, ACS, IOP, Ovid, EBSCO and Emerald has been $0.24, $0.88, $1.11, $1.21, $1.66, $2.02 and $4.4 respectively. The result of the study revealed that Science Direct had the highest cost-benefit ratio. Since, this study has used cost per use
methodology for obtaining CBA of electronic journals and therefore very helpful for the present research work.

Linn (2009) highlighted the fact that there is a need of understanding the concept of CBA by library managers for better utilization of it. The author explained why ROI should be used instead of other types of CBA, because there are different ways to calculate ROI, thus one can select the formula that best suites the situation. Author also pointed out some errors and positive aspects of the study conducted by Scigliano in the year 2002. She used CBA to analyze some of the costs and benefits of subscribing to an electronic resource through a purchase by consortium. The positive aspect of the article was that it provided a good example of how this can be done regarding the value of the time that the patrons saved using online subscriptions instead of having to go to the library to read the paper version. The author determined the value of their customer’s time by how much they earned per hour at work. Thus for the professors she used the dollar amount that the average faculty member earned per hour and used the students average pay rate on campus as the value of their time. One could then multiply the appropriate number with the amount of time a type of patron saved to come up with the value of the time saved by using electronic resources for that class of client. This is the best method to derive their customer’s benefits from a CBA formula.

Another important study for evaluating e-journals in terms of the quality, cost benefit and usefulness conducted by Suseela (2011) discussed the application of usage statistics for assessing the use of e-journals in the Indira Gandhi Memorial library (IGM) of University of Hyderabad. The main purpose of this study was to examine the application of usage statistics during subscriptions/renewals i.e. the selection of databases, upgrading the versions, increasing licenses, cancellation of subscriptions of e-databases and provides direction to library management regarding the utilization of the log data that reflects the true value of E-journals/Databases, whereas taking decisions during their selection/renewal in university libraries. She covered also many methods to measure the usefulness of journals such as citation analysis, table count, slips method, direct observation, photocopy requests, interlibrary loan requests, document delivery requests, data from circulation section, conducting surveys and use of log files (usage reports) or vendor reports. She also elaborated the origin, standardization of usage reports and the importance of COUNTER (Counting Online Usage of Networked Electronic Resources) statistics in establishing the usefulness of
the e-journals. The use of various electronic databases by the academic community of University of Hyderabad is referred to according to these statistics/reports, mentioning the way in which it is helpful to university library in assessing their actual usage. IGM was getting online access to 9 bibliographic databases, more than 5000 online journals through 19 full text databases. The statistics provided by the Inflibnet centre indicated that university is ranked 2nd as per usage of Infonet databases in the year 2006 and 3rd in 2007. IGM Library had upgraded EBSCO, Sciencedirect databases to higher versions and increased user licenses for Scifinder database due to its stable usage. The other 3 search databases such as biological Abstracts, J-gate and Ingenta were discontinued by the consortium due to very low usage.

Based on usage statistics a study of EBSCO online journals databases in IGM Library, University of Hyderabad conducted by NagiReddy and Suseela (2006). The findings of the study revealed that the usage of EBSCO Host had increased from 2,979 to 3,042 as per full text downloads, according to abstracts from 458 to 11,049, from 467 to 2,808 searches and from 841 to 6,424 sessions during the period 2001-2004. The usage is found more during 2001-2002 and further declined due to the availability of many other databases.

In the same year another similar study conducted by Prem Chand et al. (2006) to assess the evaluation of usage of UGC Infonet Digital Library Consortium in North East Universities. The usage pattern of 17 databases in 9 universities of North Eastern States of India for the year 2005 showed that ACS, Springer Link, AIP/APS databases were ranked first to third. Tezpur University was the highest in usage and secured 28th position in 100 member universities of the consortium. The usage data given by Infonet e-journals consortium for 9 to 11 databases for the year 2004 reflected that North Bengal University was the highest among 5 North Eastern universities with 13,151 articles downloads, while Gawhati University had recorded the lowest usage of only three downloads from 9 databases. Biological Abstracts and ACS were extensively used databases.

White and Crawford (1998) applied Cost-Benefit Analysis method for investigating the cost-effectiveness of an electronic database full-image ABI/Inform BPO, acquired by the Heindel Library in 1994. It had 400 business journals and magazines on a series of CD-ROMs. The reason of purchasing database was to increase access to business journals and to reduce ILL traffic. Library analyzed ILL requests for 1993 (the full year prior to BPO) and 1995 (the full year after BPO), in
1993 the library made 4,764 ILL requests, of which 922 (19.4%) were from titles indexed in ABI/INFORM. In 1995 the library made 3,946 ILL requests of which 464 (11.8%) were titles from ABI/INFORM. Thus the data show that acquiring BPO cut the library’s interlibrary loans for ABI/INFORM titles by about 50%. Association of Research libraries (ARL) estimated that the average transaction cost for an ILL was $18.62. Using this figure as a standard measure, in 1993 the cost to acquires articles indexed in ABI/INFORM through ILL was $17,168. In 1995, this figure declined to $8,640 a saving of $8,528. Another finding of this study was that libraries also paid less for copyright compliance for ABI/INFORM titles. In 1993, copyright payments were $847.45 for 135 articles compared to $285.65for 33 articles in 1995, resulted in a saving of $563. ILL costs and copyright saving constituted a total ILL saving of $9,091. The cost of the journals acquired through BPO considered a potential cost saving, i.e. the cost of subscribing to the paper copies versus the cost of accessing the articles through BPO for which ILL requests had been made.

The work of Hawbaker and Wagner (1996) compared the costs and benefits of periodical ownership against online access of a full-text periodical database in academic library. A full-text database allows the library to offer more than twice as many journals as it does currently for a 15% increase in expenditures. For purpose of this study, IAC’s printed Business Index publications list dated July 1994 and IAC’s printed Business ASAP publications list dated Sept. 1994 were compared with the UOP’s (University of Pacific) printed periodical collection. If library were to subscribe at 1994 prices to printed version of all 917 Business Index publications, the cost would be approximately $173,000. However, only 407 titles or 44% of those in Business Index are available full text in Business ASAP. If a library were to subscribe to these 407 Business ASAP titles in printed form, it would cost approximately $34,000 (1994 subscription rates). The study revealed that Business Index and Business ASAP can be purchased for a UOP price of $19,500 ($4,900 for Business Index and $14,600for the full text Business ASAP), a savings of about 43% ($14,500/$34,000) was realized from electronic access over printed ownership of the 407 titles.

Another study of e-journals by Kaur (2011) examined the impact of e-journals on Indian University Libraries in terms of resources, staffing, space, technical services and equipment. The study revealed that number of print journals has decreased in 66% libraries after access to e-journals, 86% libraries installed more nodes to provide
access to e-journals, 76% provided access to departmental libraries through LAN and 58% developed library gateway/portal to establish single window for accessing e-journals. About 30% of the libraries reported that they require more staff for negotiating contracts and maintaining e-journal records. A total of 31% decrease in shelving and circulation staff was reported. On an average each library saved about 27% cost of space maintenance for print journals. The study also revealed that due to access of e-journals 37% libraries reported that much time has been saved in cataloguing and maintaining print titles. More than 60% of the libraries showed an increase in the capital cost on campus network, computer hardware, and software maintenance. 59% of the libraries had an increase and 23% a decrease in the number of library visitors. The use of print journals decreased in 45% libraries while the use of e-journals increased in 86% libraries. 63% libraries showed a reduction by 33.4% on an average in the amount of photocopying. 67% libraries showed a reduction in bound journals reshelving. This study provides some insight related to the impact of e-journals in Indian University libraries thus useful to present research.

Williams, Nicholas and Rowlands (2010) reviewed the literature related to the use of e-journals and main aim was to examine the use and impact of the availability of e-journals on research scholars and faculties from UK. Most of the papers used in literature review were identified using Web of Knowledge, EBSCO, and LISA from March 2009 to February 2010. The results of this study showed that the huge rise in availability and taking of e-journals. Authors pointed out that access to e-literature was mainly by keyword searching, or general academic gateways and search engines (Google) all used above publishers platforms, alerts and other ways to find literature. The value of e-journals has been shown to be high, both in terms of gaining new insights, helping with teaching and in measuring of Contingent valuation. Another finding of this study was the barriers to e-journal use included non-purchase of titles by the library and years or volumes not available electronically. The review concluded that it is now unimaginable for researchers to work without the convenience and comprehensiveness that e-journals provide them.

Another similar study was conducted by Montgomery (2000) to examine the impact of e-journals on library operations, staffing, infrastructure and cost in Drexel University Library. In the year 2000 renewals Drexel’s journal collection consisted of 800 print only subscriptions and 5000 e-journals. A very change in staff workload was the most immediate impact on library operations. The objective was to develop a
framework for assessing the shifts in personnel and costs that could be used for planning and budgeting at Drexel and provided guidance to other academic libraries. The study revealed that due to the access of e-journals, cost of computer network infrastructure, staffing increased and requirement for space and technical services for print journals decreased. The study also revealed that bound journal reshelving was reduced by 40%, photocopying decreased by 20% and reference questions by 8%. For managing or developing electronic resources means negotiating, review contracts and interact with consortia for purchasing, library created a new position of an Electronic Resources Manager.

A case study of a pediatric hospital system to cut the journal costs while increasing value for patrons at Children’s Healthcare of Atlanta was conducted by Kate Daniels (2010). This case study examined both types of journals (Print and electronic), using online statistics, 25,134 articles were read by employees and medical staff in 2008. It would cost $25.00, if the articles were to be acquired by individuals directly from the publisher. The value of these articles was very high $628,350. With $227,377 spent on both print and electronic journals in 2008, the savings realized from owning the journal collection was $373,595. The library received $2.76 in benefit for every dollar spent on online journals. Using the same numbers, the cost per article was $9.04 in the year 2008, lower than the publishers cost or even the inter library loan cost. Using statistics from the year 2006, the library was also able to calculate the cost per article had decreased from $10.22 in 2006 to $9.04 in 2008 due to the increase in usage. Therefore journal collection saved the institution $75,000 in 2008. At an average interlibrary loan cost of $12 and with 25,000 articed read, the library’s cost of $9 per article saved the system $3 per article. The author also explained that if the organization did not have librarians to obtain interlibrary loans, it would cost at least $25 per article to order from an outside source. Funding 3 librarians and a journal collection actually saved approximately $400,000 in 2008. These findings had a huge impact on higher authorities and they were very much impressed. Kate Daniels also surveyed library users (physicians and nurses) online for measuring the worth of journals collection. The author divided journal titles and users according to their specialty. The results of the survey showed that 28 titles which were less used were not renewed, and 26 titles were moved to online only or an online plus print subscription. The savings from these changes
amounted to a little over $19,000 and library purchased a few new titles. This study is very relevant and helpful for the present study.

Payne and Burke (1997) described a method which was used to evaluate the cost effectiveness of three different ways of supplying electronic articles in an academic library. The methods considered were subscribing to a periodical title (ownership), individual article supply by two electronic document delivery services, Articles First of OCLC First Search and Uncover, and traditional article supply by British Library Document Supply Centre. The operational costs of alternatives were obtained by taking management accounting approach and examined in relation to the provision of services within the library of St. Patrick’s College, Maynooth, Ireland. The cost per use of owning a periodical title is calculated based on the operational costs of the Periodicals Department of the library. Its subscription price and a lifetime use determined by examination of the current requests for articles made through the Inter-Library Loans Department. The cost per use for the other services are also calculated based on their operational costs and Document delivery charges.

Steve Black (1997) described a method for analyzing the cost-effectiveness of journal collections of an Arts College. He explained the criteria for analyzing the cost-effectiveness of a journal collection and how it could be measured. It was based on measurements of journal use, journal subscription prices, and course enrollment by academic department. The author analysed each journal’s price per use and each department’s subscription expenditure per enrollment, enrollment per subscription, and rate of journal use per enrollment. Use data were collected for 1,022 journals. Titles that had ceased or had been canceled were extracted from the use counts and excluded from the cost efficiency analysis. Total 951 titles were remained only for analysis. Zero uses were recorded for 81 of these 951 journals (8.5%). The author calculated data on the use of journals and the subscription price per use in each department and also sorted by department enrollment divided by department subscriptions, which indicated the enrollment rate per journal in each department. It showed the criteria of cost-effectiveness of enrollment per subscription and number of uses per enrollment. The subscription prices per use in special education ($1.21) was relatively low, enrollment per subscription (78.9) was above the median, and the rate of use (1.6 uses per enrollment) was relatively high. It suggested that the collection in this department was cost-effective. Although use is affected by factors other than enrollment such as available indexing and nature of assignments given in each
department’s courses. That library did not have electronic citation databases might lower the rate of use in these departments. The library had no subscriptions to electronic journals in 1996. A list of 81 titles which recorded zero use journals were considered for shifting to store. The zero use and shelf space data were applied in 1997 to move some journals to storage and to shift all the journals to allow for 5 years growth for each title. The collection and analysis of shelf space, use, price and enrollment data provided valuable insights regarding the journal collection.

Milne and Tiffany (1991) stated that many libraries were thinking necessary to cancel some of the periodicals in their collections, because of rising subscription costs and inadequate budgets. In selecting titles for cancellation, librarians had used a variety of criteria such as subject relevance, quality of the published material, subscription prices, and the amount of use they received. The cost-effectiveness of periodicals is another important factor that many libraries would find useful when deciding which to cancel. They used cost per use method in evaluating the cost-effectiveness of periodicals in the library at the Memorial University of Newfoundland.

Sridhar (1988) examined in-house use and lent out use of two latest issues of 485 current journals subscribed to by the Indian Space Research Organisation (ISRO) Satellite Centre (ISAC) Library were monitored and recorded over three months from the date of their arrival and display in the library. For the purpose of applying CBA to journals, the use data of this study had been extracted in the case of about 6% of the titles. The actual sample was picked by selecting every 15th title from the list of current journals arranged alphabetically by title. Thus this study was limited to a sample of 33 titles. The main purpose of this study was to see how effective the CBA of journals is in a special library. The subscription cost of the sample journals in rupees for the year 1983 and their periodicity had been noted to determine cost per issue. The sample journals were analysed and compared for their cost per use. The average use per issue of a journal during the first three months of its arrival and display in the ISAC Library was 7.5. The average subscription cost of an issue of a journal in the sample was Rs. 153.75 and the average cost per use of a single issue over the 3 months was Rs. 20.63. 2 journals were not used during the sample use study, their cost per use was not worked out and excluded from the CBA. 28 heavily used journals used more than 30 times during the use study recommended for additional copies subscription. Among 33 titles, ignoring 2 titles that were unused, 31
titles presented in increasing order of their cost per use and decreasing order of use and increasing order of cost are also indicated in table. It showed that rank order of these journals by cost per use and by use alone were highly correlated (the Spearman Rank order correlation was 0.70 at the 0.005 significance level). The highest cost per use of Rs. 448.58 was scored by the Journal of Engineering Physics. CBA was helpful in furthering the findings of the use study by grouping the journals of a library in to 4 profiles such as Low cost and low use journals, High cost and low use journals, High cost and high use journals and Low cost and high use journals, these were the ideal journals from a CBA point view for any library. CBA provided a hint of journal retention or cancellation.

Bravo and Diez (2011) analyzed the preferences and models of consumption of the Academic communities of five Spanish Universities regarding the use of journals distributed by Emerald, Science Direct, Springer Link, and Wiley. The main objectives of this study were to analyze the concentration and scattering of use of the electronic journals for which subscriptions were held, to enquire the preferences of the 5 Universities evaluating the differences in the use made of electronic contents, relevance of the four packages of e-journals that were most widely used, to investigate the value for money of subscriptions to electronic contents and determined the strengths and weaknesses of the model of subscriptions to fixed packages or the Big Deal. Data for Overall Downloads of Articles Segregated by Institution and Ratios of Articles per Students and Academic Staff. The overall total for downloads at the universities investigated showed constant growth from 2002 onwards. As to the providers investigated throughout the decade Science Direct was the distributor preferred by all five universities studied. Its percentage of downloads were over 80% of the total for the year 2009 in four of these institutions. The comparative figures showed that per student and per academic staff member usage of e-journals in the two largest universities was lower than was the case in the smaller institutions. The study revealed that there is a relationship between the degree programs offered and the use of certain content of the Emerald package at the University of Burgos.

Bucknall (2009) compared three models of journal access i.e. direct subscriptions, pay per view, and big deals during 2003-2005 at University of North Carolina at Greensboro (UNCG), USA. In the year 2002, library faced a $150,000 scarcity in serials budget. With the initiative of pay-per-view, gave access to nearly all the titles which were decided for cutting. Now the library was able to provide access
to nearly 2000 titles through pay-per-view (PPV). With the help of this new model, library was committed to pay for 100% of the cost of every PPV article accessed by students, faculty and staff. Library had shifted from a subscription model to usage based pricing model. The study recommended that it was cost-effective to subscribe high priced journals that were rarely used or out-of scope titles in PPV model. These titles can be moved to PPV. The third model of accessing journals, Big deal proved to be even more cost-effective than PPV. Author demonstrated it by analyzing a title example “the American Journal of Medical Genetics” compared access costs across the three models. The subscription cost was $9,333.00, PPV cost was 64(actual uses×$10.00)=$640.00 and consortium cost was only $11.00 for 221 uses. Therefore the Big deal access model was most cost effective. The findings of this study showed that the UNCG observed significantly improved cost/benefit ratios over PPV, due to higher usage and lower costs through the big deal. The study also revealed that the direct subscription model is suitable for some heavily used core titles. PPV and Big Deals models offered content at a very reasonable cost on per title and per/use basis, while Big deal proved to be the best model for most titles due to its cost savings and ease of end user access.

A comparative cost-benefit analysis of the two systems of subscription to periodicals i.e. direct subscriptions or the agency system was conducted by Joseph (1983). This study was based on the practice of Calicut University Library, which used direct subscription and Kerala University Library used an agent. Author estimated the cost per operation and arrived at the average cost involved per title under both systems. The study revealed comparative efficiency was assessed by the time-lag in the receipt of periodicals and the completion of volumes. The comparative study concluded that the direct subscription system is more efficient and economical.

McDonald (2007) examined the relationship between use of print journals, use of online journals and online journal discovery tools with local journal citations. The dataset includes 1,521 journals that were owned by the California Institute of Technology (Caltech) library. Use of journals were collected from 1997 to 2004 and included variables such as local print journal use, local use of online as measured by the library, local use of online as reported by publisher, local citations and articles published by the university’s authors, as reported by ISI. The earliest year of online journal use reported was in 1997. The journals were also assembled into 9 broad subject categories such as astronomy, biology, chemistry, computer science,
engineering, general science, geology, mathematics and physics. The regression results indicated that print journal use was a significant interpreter of local journal citations prior to the adoption of online journals. Publisher provided and locally recorded online journal use measures were also significant forecasters of local citations. Online availability of a journal was found to increase local citations.

Oliver Obst (2003) examined the print and online usage for 270 journals, both versions of which were available. Print usage was investigated annually since 1997 using the reshelving and error copies method. Online usage statistics were conveyed by 5 publishers. The purpose of this study was to investigate the relationship of usage and cost of print and online titles. After the introduction of online journals, print journal usage decreased by 22.3 and 30.2% respectively in two years. Journals published both in print and online lost 30.4% of their print usage within 2 years. The total loss of usage of print-only titles in the same period was somewhat higher, at 45.8%. The average correlation between online and print usage is 0.60 and 0.67 respectively. Users accessed the online versions ten times as compared to the print versions. Each usage of a print article cost 2.79-50.82€, each usage of an online article 0.31-15.10€, depending on the publisher. On an average, the usage of an online article was 5.4 times cheaper. Print titles not available online undergo a greater decline in usage compared with that were available in both versions. The findings of the study showed that what is read or purchased is decided by ease of access and user friendliness.

De Groote and Dorsch (2003) examined the use of biomedical journals in the library of the Health Sciences, Peoria, University of Illinois (Chicago). A survey was designed to assess online journal use, print journal use, database use, computer literacy levels, and other library user characteristics etc. On November 2000 questionnaire was sent through campus mail to all 471 faculty, residents and students of the Colleges of Medicine and Nursing at the Peoria campus. 41% (188) questionnaire were returned and data from the returned surveys were analyzed using SPSS, in which 98% students, faculty and residents reported that they were having convenient access to a computer connected to the Internet. While 53% of the users reported that they searched MEDLINE at least once a week and 6% never searched MEDLINE. Other databases indicated much lower usage: 29% never searched MD Consult, 73% never searched CINAHL, 73% never searched Current Contents, 75% never searched PsycINFO, 74% never searched Web of Science, 82.4% never
searched International Pharmaceuticals Abstracts, and 56% never searched the evidence based medicine (EBM) databases. Overall 71% of respondents reported a preference for online over print journals. Users preferred online resources to print and many chose to access these online resources remotely. The main reasons for selecting online resources were convenience and full-text availability. The results of this study indicated that databases without links to full text and online journal collections without links from bibliographic databases had lower use. These findings of the study had implication for collection development, promotion of library resources and end user training.

King et al. (2003) presented an article on outline of library economic metrics including service input, and output, performance, usage, effectiveness, outcomes, impact, and cost benefit comparison of electronic and print journal collections and collection services. This study was based on a cost finding study at Drexel University where the library had converted fully in to an electronic journal collection. Those data were matched with readership surveys of scientists at Drexel University of Tennessee, Oak Ridge National Laboratory and members of the American Astronomical Society which described changing information-seeking patterns and use of library electronic and print collections. They provided an approach to assessing the economics of e-journals in libraries. The approach involved a framework of input, output, performance, usage, effectiveness, cost-effectiveness, and outcome metrics of library services. In this article they used as an example of these metrics, the library electronic collection services compared with print collection services. Such comparisons were considered a “benefit” if favorable and a “cost” or loss,” if unfavorable. It showed that electronic collection and services yield benefits in requiring lower prices per title, less time of staff, and savings in space, thus these resources can be reallocated in to additional or better services to users. Users benefit in flexibility of access, saving substantial time in searching, locating and obtaining the articles, availability of new and useful features and broadening the number of journals they use. Thus it showed that library electronic collections are highly beneficial to publishers, libraries, readers, and their organizations.

The remarkable study of Sweeney (2002) focused on cost benefit comparison of print and electronic journals in the Davis library, University of California. The study discussed use and cost trends among print and electronic titles and demonstrated a cost model that provides an idea of relative costs of print and electronic journals.
The purpose of this study was to compare use, cost and value data between a set of journals owned in print format over a specific time period, with a set of journals owned in both print and electronic formats. The primary goal was to identify characteristics of use, cost, citation patterns etc. of print only and hybrid print/electronic environments. Cost and use of print journals data was collected for the time period 1998-2000, use of e-journals for 2000, citation data for the years 1993 and 1999 and Abstracting & Indexing coverage information for 2000. Use data for print titles has taken from DRA circulation module, cost information from acquisition program. Impact factors and immediacy indexes came from ISI Journal Citation Reports. A&I coverage data was extracted from the JAKE database as will be full-text/aggregator availability. Electronic journal use data was provided from the vendors. Approximately 1100 titles were taken for the study, in which 623 titles were available in print and electronic formats and 584 titles in print only. Total print use for all 1100 titles in this study declined from 1998-2000 and total print use of titles owned in print format only was about half that of total print use for titles also available online. While online use of journals continues to increase exponentially, in the year 1998 &1999 around 110,000 articles were viewed or downloaded for the 623 titles in this study. In contrast, total print use of these titles, as measured by circulation or re-shelving transactions was 50,000. Average cost per print use for print only titles is about half that of titles also available online ($24 vs. $56 in 1999). Print journals generate costs in stacks, processing, binding and periodical desk, where e-journals do not. The differences between electronic and print average cost per use amount to $24 per use for print titles and $11 per use for electronic.

Duy and Vaughan (2006) conducted a study for measuring quality and usefulness of library journal titles, used citation and print journal use data. This study examined relationships among different measurements and established that electronic usage correlate with print usage and that local citation data were applicable indication of total journal usage but Impact Factors were not as applicable. They emphasized on the relatively new electronic journal usage data and local citation data which were better measurement of local use than the more global impact factor. Data were collected at Concordia University Libraries and focused on a particular discipline such as Chemistry and Biochemistry and journal titles available in these subjects were used for the study. Print usage data were gathered through shelving studies. A total of 20 print journal titles from two different publishers were used. Titles used were those
that Concordia Libraries had a current print subscription to at the start of the data collection period (June 2000-May 2001), and for which continuous electronic usage data were available. The time period of electronic usage data gathered from October 2000-September 2003 and Print shelving data were gathered for the period of June 2000-September 2003. Electronic usage data for the journals were collected via the electronic journal publisher’s password-protected website. All sets of data were analyzed using SPSS software and Correlation analysis used to address research questions. The results showed significant correlations between electronic journal usage data and shelving data for print journal titles for both publishers. The study found that there was no relationship between the journal impact factor and electronic usage data.

Biswas, Chatterjee and Sen (2003) conducted a study entitled “cost-benefit analysis of subscribing Indian Periodicals: a case study of BCKV Central library, Kalyani, West Bengal”. They took a sample of 700 users and 25 Indian periodicals subscribed continuously from 1992 to 2001 at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Kalyani, West Bengal. In this study cost was measured in terms of the money spent for subscribing Indian journals and benefits were measured in terms of use frequency of the journals by different users and savings achieved through different methods of subscription. The 25 journals that were selected for the study were used by 30% to 75% of the users. It stated that a saving of around 25% can be achieved if the journals are subscribed for 3 years at a time. The objectives of this case study were, to examine the cost for Indian periodicals subscription, to measure the use frequency of a journal by the students, teachers and research scholars, to examine price hike of periodicals, to identify the alternate ways to reduce the cost factor and to evaluate the journal selection policy. A survey was conducted in September 2002 to find out the information needs of the users. This study revealed that the use frequency of journals was not directly related with cost, selection and renewal of subscription of journals should be considered after recognizing the use frequency as well as users need.

King, Tenopir, Montgomery and Aerni (2003) conducted a study to examine the patterns of journal use by faculty at three different Universities in USA i.e. University of Tennessee was in a transitional phase when the survey was done (2000), University of Pittsburgh had acquired a large electronic collection (2003), and Drexel University had migrated to nearly all electronic journals (2002). Journal use was
measured by asking the question “In the past month (30 days) approximately how many articles have you read? Reading is defined as going beyond the table of contents, title and abstract to the body of the article. The survey revealed that faculty use of personal print subscriptions remains significant, electronic personal subscriptions were used rarely by faculty. Electronic journal use was very high when available in library collections. 25 years trend of reading by university scientists showed substantial increases in average amount of reading with nearly all of this increase coming from library collections. Scientists appeared to be more advanced in their use of electronic journals than other faculty.

Montgomery and King (2002) compared library and user related costs of Print and Electronic Journal Collections. The purpose of this study was to perform a comparative analysis for Drexel University library and to develop a model for use by other libraries. They computed all overhead and fixed costs, including allocating staff benefits and institutional overhead. Costs in the broad areas of space, systems, services, supplies and staff were collected and then allocated to print journals, bound journals, electronic journals. Library staff kept log sheets of their time (in minutes) spent on journal related activities. For obtaining use indicators Drexel had maintained title-by-title re-shelving counts of both current and bound journals for four years. And for electronic full-text titles received use data from publishers and vendors. The library also conducted a readership survey which provided amount of reading from 3 types of collections as well as amount of reading from other sources such as personal subscriptions, articles provided by colleagues, and external websites and archives. Faculty stated 190 readings per year from scholarly articles, graduate students had 270 readings, most of which are from library sources. This survey showed that the library’s electronic collection is widely accepted and extensively used.

Vaughan (2001) highlighted the methods for journal collection evaluation in Academic Science Libraries. This study attempted to compare the main three methods used in most science libraries; reshelving data, citation analysis and the ISI impact factor rankings. Using the Spearman correlation coefficient $\rho$, it was found that reshelving and citation analyses generate the most similar ranked lists of journals. It was suggested that librarians should combine results from both methods in order to capture a more complete picture of journal value.

Chen, Wrynn and Rieke (2001) examined the rates of print journal subscription, price increases as the type of available electronic access. The types of
access included: electronic priced separately from the print, combining print with ‘‘free online’’ access, and aggregated, as electronic access purchased as part of a collection. The percentage of print price increase was compared to each other and for titles available only in print. The authors analyzed the percentage print price increase of 300 journals for five years. The titles were grouped according to type of available electronic access. The median and mean percentage of print price increase was calculated and plotted for all titles within each group. Using both the median and the mean to look at the percentage print price increase over five years, it was apparent that print prices for journals with electronic access exceeded journals that did not offer an electronic option. Electronic priced separately had an average 3% to 5% higher than print only titles using both measures. Combination of print with ‘‘free online’’ access had higher increases from 1996 to 1999, but, in 2000, their percentage increase was about the same as print only titles. The rate of price increase for aggregated titles consistently went down over the past five years. Journals with no electronic option showed the lowest percentage rates of print price increase. The findings revealed that the increase of print prices for their sample of titles was higher, if a type of electronic access was offered. Aggregated collections presently represent the electronic option whose percentage price increase for print price was lowest. However, the irregular fluctuations in rates of subscription prices revealed that the pricing of journals with electronic access is still growing. More study is suggested to notice if the trends observed in this study are continued over a longer time period.

Reddy (1996) worked out the amount that can be saved by subscribing/renewing Periodicals for more than one year. In the process, some amount was lost in the form of interest on the amount that is paid. Additionally total amount to be paid as extra over the previous year due to hike in subscription rates is indicated. For the study, about 250 Periodicals received by NICMAP library, both Indian and foreign have been scanned for the subscription details and analysed the collected data. Out of 250 Periodicals only 19 Periodicals showed provision to subscribe either for 2 years or 3 years, and same considered for the study. About Rs.7822.92 and Rs.10168.46 can be saved if subscribed for 2 years or 3 years, respectively.

Byrd and Koenig (1978) described in their article the implementation of operation research technique to analyze the serials collection of the Medical Library at the University of Missouri-Kansas City (UMKC). This study resulted in a savings of nearly $1400 per year in subscriptions costs without reducing the net number of 700
titles. In the summer of 1977, before the renewal of the majority of serials subscriptions, the staff attempted to address in a systematic operations research fashion. They divided journals into 44 broad subject categories reflecting the interests of users. In this way they balanced the need to weigh and rank attributes of cost, usage, relevance and accessibility elsewhere for all titles. Each 44 subject listings was divided into two parts: 1) titles already in collection 2) titles might be considered for adding to collection. The results of the study shows that in the end of the selection process, with a collection of 683 active serial titles, reduced subscriptions by 73 titles and on adding 7 titles saved nearly $1400. The average subscription cost of cancelled titles was $65.01, while new titles averaged only $45.14. The overall average cost of serials in the collection was reduced slightly from $ 54.70/title to $52.13/title.

Raghavan (1978) applied Brooke’s model which was based on Bradford’s approach to journals subscribed by the Central Food Technological Research Institute Library, Mysore India. The objective of this case study was to make a cost effectiveness study and compare it with the findings of the earlier studies. The major finding of the study was that there could be substantial reduction in the cost of providing access to relevant journal literature in a special library. The unit of effectiveness for any journal in the context of CFTRI was the relevant items obtained by scanning the journal. In this study the unit of cost was modified to include only the cost of subscription excluding the overhead cost of scanning, maintenance etc, because earlier studies had established that overhead cost had little effect on the final results. For each journal the total number of relevant items published in 1975 was computed and this figure was divided by the subscription cost of that journal to yield a measure of relevant items per unit cost for that journal which was used to rank the journals.

Based on Cost/benefit Ratio approach Kraft, Polasek, Soergel, Burns and Klair (1976) framed a model for deciding which journal titles to select for acquisition in a biomedical library. Authors explained a cost-effectiveness approach to the journal selection problem in a biomedical library. First of all they developed the list of possible journal titles to be considered, the cost of these titles were recorded and updated periodically. Measurement of total journal usage, journal relevance and journal availability elsewhere calculated for each title. A total weighted measure of journal worth is then calculated, based on subjective weights for each measure. Then the algorithm based on ranked cost-benefit ratios can be applied. For testing and
implementing this model The Johns Hopkins University Welch Medical Library was used as a pilot project library.

2.2. COST-BENEFIT ANALYSIS USED FOR MEASURING THE ECONOMIC VALUE OF DIFFERENT TYPES OF LIBRARIES

In the present scenario, University administrators are looking for ways to balance the budget. Therefore libraries are trying to prove their economic value and worth. Now a days libraries provide evidence of value and demonstrate their contribution to University priorities.

Linn (2010) discussed the various types of cost-benefit analysis, their strengths and weaknesses and how they are calculated. The author explained that besides ROI there are various methods of calculating CBA such as Internal Rate of Return (IRR), Net Present Value (NPV), Hurdle Rate, Payback period, discounted payback period, Accounting Rate of Return, Profitability Index. This paper will help librarians better manage their libraries by making them aware of cost-benefit analysis. The author suggested that librarians should have proper knowledge of CBA.

Aabo (2009) reported a meta analysis review study of Return on Investment (ROI) or Cost-benefit ratio. Meta analysis is a quantitative analysis of findings of previous empirical studies, and to combine the results of previous studies to reach a conclusion about a body of research. She selected 38 studies and from which 32 are of public libraries. The tentative conclusion is that for each dollar invested in public libraries they return on average approximately four times more.

Missingham and Zobec (2012) reported a summary of a study group of eight University libraries in Australia commissioned by Outsell and was led by Vic Elliott, the University Librarian, Australian National University (Elliott 2010). He initiated a combined project to carry out a cost-benefit study to assess the value library provided information resources disseminated to their research communities. The group of 8 libraries contracted Outsell to carry out the study. They used contingent valuation method (willingness to pay) for carrying out the study. The result showed that E-journal articles are the most heavily used following Print journal articles, print resources are primarily used for five or less hours per week while electronic information resources are used for significantly more hours per week. The study found a Return on Investment (ROI) of 136 % to derive from centrally provided collections provided by the libraries. For every $1 invested in information resources $1.36 would be saved, representing a total saving across the three participating
universities of $46.9 million on the investment of $34.5 million. The main conclusion from the study was that for the collection a return on investment (ROI) of 136% was achieved by university libraries while the ROI for the British library and public libraries were generally in the order of 4 to 5. These studies have included all services including social support, training and reference activities.

Grzeschik (2010) investigated and verified the methodology developed by UIUC and applied in a German academic environment i.e. at the University Library of the Humboldt University (HU) and the Berlin School of Library and Information Science (IBI). She focused on ROI as a quantitative method to evaluate a library’s monetary value. The main aim of this study was to test and evaluate the UIUC method. Although the study for the IBI is very small in scale and focused on one subject area only. A further study for all subject areas at the Humboldt University, Berlin would provide a clear picture of the strength and weaknesses adapting the formula devised by UIUC in to a different environment. The methodology developed by UIUC (an ROI formula developed for academic libraries based on grant proposal applications and citations) has been taken and tried to use in academic environment of Germany. Findings revealed that it was adaptable enough to be used in a German academic environment for calculating the ROI of a University library. But formula demanded some simplification for further use.

Kaufman (2008) reported a study conducted at the University of Illinois at Urbana-Champaign USA, for measuring the return on university’s investment in its library. The main purpose of this study was to reveal that library and its research collections add to the income generating activities, quantify the return on university’s investments in its library, draw attention to the library’s role in the externally funded research processes and underline the correlation between the library and grant activities. The University of Illinois at Urbana-Champaign is a major research university, whose faculty members are awarded many research grants each year. The majority of grant proposals are in the sciences and engineering and the majority of these proposals included citations to papers procured by library investments. On September 2007, 2,083 faculty members were invited via e-mail to participate in an online survey to help evaluate the role that the library plays in their research and grant processes. 328 faculty members (16%) responded. The team collected data from all sources was entered into the ROI calculator for the financial year 2006. The findings revealed that more than 78% faculty who have grants used citations to the scholarly
literature in their proposals. Over 50% of grants awarded to the campus came from proposals that included citations to materials accessed through the library. The average grant income at Illinois is approximately $64,000. Multiply these 3 numbers to calculate the average grant income generated through the use of the library of just over $25,000. Multiply this average amount of grant income by the number of grants exhausted in 2006 at Illinois and divide that by the total library budget to arrive at a ROI of $4.38 for every dollar invested in the library. The team used the total library budget in calculating the ROI. This ensures that the model takes into account costs such as network infrastructure, personnel and other library overhead activities that enable electronic access for campus researchers. This study developed a quantitative measure that recognizes the library’s value in supporting the university’s strategic goals, using grant income generated by faculty using library resources. This study considered the first ROI research in academic environment.

Harless and Allen (1999) applied Contingent Valuation Method to estimate the economic value that patrons fix to reference desk service in an academic library. The authors stated that the benefits from reference service include use value and option value. The study conducted survey of 382 students and faculty of Virginia Commonwealth University, to obtain willingness to pay (WTP) for reference desk services, WTP to maintain existing hours, to keep the desk open an additional 18 hours per week and to add 18.5 more hours (all hours the library is open). On an average students are willing to pay $5.59 per semester to maintain current hours of the reference desk, faculty indicate they are willing to pay $45.76 per year to maintain current hours. Students and Faculty place a value on the current hours of reference desk service that exceeds the cost by a ratio of 3.5 to 1.

Kelly, Hamasu and Jones (2012) stated that Academic Library, Special Library, Public Library and State library are conducting Return on Investment (ROI) studies and publishing the results of studies for showing the value of their services and sources. Librarians must justify the budget allocations and demonstrate values of library’s collections and services to the higher authorities. ROI is a powerful tool to use when libraries have to prove their worth and economic value. Using ROI, Libraries can establish their credibility and accountability. They recommended that in the current economic crisis every librarian must know how to use ROI and its use to justify the budget and demonstrate the library’s value.
Cervone (2010) explained how cost benefit analysis can be used as a tool for financial decision making in digital library project management. The author used theory and examples of cost benefit analysis for making project decisions. CBA is a useful tool where decisions are based on financial considerations. He explained that with the help of this tool, project managers in libraries will be better prepared to make financial decisions.

Keller (1969) in his article entitled “Program budgeting and Cost Benefit Analysis in Libraries” stated that Academic libraries prepared their annual budgets based on subjective judgments or on oversimplified formulas. The author highlighted two budgeting techniques that are program budgeting and cost benefit analysis. These techniques were introduced into universities from the defence organizations. The author emphasized that if these techniques are properly applied then better decisions can be taken by academic library managers, allocation of library resources can be improved.

Chung (2007) conducted a case study for measuring the economic value of library of KDI School of Public Policy and Management, Korea. A Cost-benefit Analysis is used as a tool to examine the benefits of special libraries outweighing the cost incurred in providing the services. Cost is measured as the sum of the price of providing library services and the benefit is determined by the willingness to pay technique derived from the Contingent Valuation Method. It is based on estimates of how much the user is willing to pay for the service, and the cost of time saved by the use of library services. The study was conducted in July 2005, because of less number of holidays in this month. Respondents were asked to indicate their willingness to pay for the item they used and valuate the time saved as a result of the existence of the library in the event the library no longer existed. The economic value of library services measured in terms of a B/C ratio was 1.97, serving as a strong justification for the library’s existence. This study focused on an individual analysis for each service offered in the library and total economic value of the library.

Ko, Shim, Pyo, Chang and Chung (2012) measured the economic value of public libraries for local residents in Korea. An economic-value measurement model that enables the estimation of different types of public library services was designed; Benefits were taken as the value of the main services provided by public libraries, such as accessibility to informational materials, facilities, and programs. Costs included the total amount of expenses at libraries such as personnel expenses,
materials purchasing expenses, and other operational costs. Data were collected from 1220 users from 22 public libraries in Korean provinces. The return on investment (ROI) was calculated to be 3.66. A combination of measurement techniques was applied, including the contingent valuation method (CVM), to calculate the aggregate value of public libraries in Korea. The total number of users registered at 22 libraries was 862,591 and the total operational budget was KRW 26,272,000,000. The WTP per capita was KRW 9296.78. This amount totals the WTP amounts for three services, such as the use of informational materials, the spaces and the programs. When the amount was calculated based on 12 months, the WTP per capita for a year was KRW 111,561. The ROI was calculated by multiplying the total number of registered users by the WTP per capita for a year and dividing the resulting value by the total cost. The calculated ROI was 3.66.

Hider (2008) conducted a study for measuring the value of technical services of Wagga Wagga City Library in New South Wales, Australia. The author used contingent valuation method for estimating the value in dollars. The survey was conducted in May-July 2007. The overall benefit-cost ratio of the library was calculated as 1.33:1, while benefit-cost ratio of technical services was very high 2.4:1.

White (2007) focussed on new uses of return on investment (ROI) in alternative methods for library assessment and valuation. The author tried to identify potential new applications of ROI in library assessment and valuation. It could provide librarians with practical means of increasing the effectiveness of library assessment valuation and their results. The author thinks that there are at least three possible applications of ROI that should be investigated by libraries: ROI as a practical tool for small-scale activities, introspective service assessment of the library organization activity, and as an offensive assessment tool of insubstantial activities and resources.

Morris, Ayre and Jones (2006) examined the present condition and economic value of audiovisual materials in public libraries of UK. Data was collected through a questionnaire survey of 208 public library authorities to investigate the present status of audiovisual material and expected future condition and the amount spent on and generated by audiovisual materials. These data were used to estimate the cost benefit or value of audiovisuals. The results of this study showed that provision of audiovisual material in UK public libraries is widespread and varied. It generates income from charging for loans. A cost benefit of 1:1.34 resulted based on maximum
loan charges. That means UK gets £1.34 direct benefit from every £1.00 spent on the audiovisual service. This figure would be higher if the PVB (present value benefits) had been based on purchase costs or lower if the PVB was based on mean loan charges. This study does not include indirect benefits, therefore undervalues the true cost benefit of the audiovisual service.

Aabo (2005) conducted a contingent valuation study of Norwegian public libraries. The objective of this study was to explore whether or not the citizens found that their benefits outweighed the costs to provide them. The result of the study indicated the benefits from the public libraries four times their costs. The 1:4 cost-benefit ratio provided a reason for continued government funding for the public library in Norway. This study appeared as the first contingent valuation study of public libraries at the national level in Norway and Internationally.

Missingham (2005) reviewed some studies which were dealing with economic value of libraries and these studies used contingent valuation method and return on investment in public and national libraries for measuring the economic value.

Barron, Williams, Bajjaly, Arns and Wilson (2005) reported a study entitled “The Economic Impact of Public Libraries in South Carolina”. This study was in two parts, the first part was based on survey to determine the perceived value of the libraries for general use, business use, personal investment use and job seeking use. Second part of the study analyzed the financial value of service provided by the library. Direct economic impact of all public library expenditures was $80 million. Public libraries bring almost $5 million from federal and private sources that the state would not otherwise have. Value of the loan and use of books, videos, cassettes, CDs, newspapers, magazines, and other materials to users is approximately $102 million (based on comparable retail costs). Value of reference services to users is approximately $26 million (based on time saved). Total direct and indirect return on investment is $347 million. This means that for every $1 spent on public libraries by governments, the state receives $4.48, nearly 350% ROI. Total direct economic impact of public libraries is estimated at $222 million, while the actual cost of these services to the state and local governments is only $77.5 million.

Holt and Elliott (2003) in their paper summarized the Cost-Benefit Analysis approach for estimating the dollar value of services offered by public libraries. They also thrown lights on the rationale behind a CBA approach and a methodology was projected for a faster, cheaper CBA applicable to mid-size and smaller libraries.
The St. Louis Public Library case study (Holt et al., 1999) used three different measurement methods, including consumer surplus, the CVM, and time value to measure the benefits that libraries provide to individuals. The study included 332 regular users (mostly housewives), 75 teachers, and 25 entrepreneurs. For the regular users, the study measured user benefits based on three methods: consumer surplus, CVM (both WTA and WTP), and time value. For the teachers and entrepreneurs, the measurement was only based on the WTA. The total value that can be generated by the library ranged from $2 to $10.

The St. Louis Public Library, which has conducted a long term, systematic study for the value of library services using a four step research process that continued for more than 10 years (Eliott, Holt, Hayden & Holt, 2009).

Holt (2007) said in his article entitled communicating the value of your libraries, “The decade-long effort to establish a methodologically sound library cost-benefit analysis (CBA) was published by ALA. That study, Donald S. Elliott, Glen E. Holt, Sterling W. Hayden and Leslie Edmonds Holt, Measuring Your Libraries Value: How to Do a Cost-benefit Analysis for Your Library (Chicago, 2006), funded by IMLS, analyzed the complex issues in using an established tool from economic measurement, CBA, to estimate the dollar value of library services as perceived by direct users, as a return on invested capital and as a return on public investment (ROI)”.

Pung, Clarke and Patten (2004) conducted a remarkable study to assess the British Library’s (National Library of UK) contribution to the national economy. The value added by the Library takes many forms i.e. economic, cultural, social and intellectual. Contingent Valuation technique was used to assess the value of the British library. The Library considered both the value enjoyed directly by users of the Library, and the value enjoyed indirectly by UK citizens. In each case, the economic welfare that the British library generates has been measured by the size of the consumer surplus, i.e. by the value gained by beneficiaries over and above any cost to them of the Library’s services- users of the Reading Rooms pay nothing, while users of the Document Supply Service pay fees for receiving documents. The consumer surplus has been measured through surveys in which beneficiaries have been asked, amongst other things: How much they would be willing to pay for the Library’s continued existence? What is the minimum payment they would be willing to accept to forgo the Library’s existence? How much they invest in terms of time and money
to make use of the Library? How much they would have to pay to use alternatives to the Library? The study revealed that the library generates value worth £363m per year which is 4.4 times its annual funding of £83 million. The direct value amounts to £59m and the indirect value amounts to £304m. Thus, British Library generates £4.40 of value to the economy for every £1 that it spends, i.e. a value ratio of 4.4:1.

Fenner (2005) studied that real and hidden costs are involved in book sales, including the opportunity cost of preventing staff from performing normal work. Cost-benefit analysis is applied to models of library book sales of several types: annual, on-going, and online. In each instance, analysis indicates that book sales are not cost-effective. Steve Johnson cited two reasons for libraries to sell used books: collection management and fundraising. A third justification for staging used book sales for building good public relations may outweigh considerations of efficiency and cost-effectiveness.

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Chapter 3
An Introduction to Periodicals
CHAPTER-3
AN INTRODUCTION TO PERIODICALS

3.1. INTRODUCTION

Periodical is a primary source of information. Primary sources of information are the first published records of original research and development or description of new application or new interpretation of an old theme or idea. These are original documents representing original ideas and constitute the latest available information. Researchers produce new information can make it available to the community through the primary sources. Periodical article is the main medium of communication for the exchange of scientific information.

The development of any subject is depends on the new knowledge produced by Research and if it flows freely, speedily and timely among the scientific and technical community. The increased rate of scientific discoveries with the rapid application of Technology has added greater necessity in disseminating research results among Scientists and Engineers. The literature is generally published as periodical articles since periodicals are the best available sources among the primary communicating media for exchange of scientific results. The importance of periodical publication increases as the necessity for going deep, pinpointed and up-to-date knowledge increased.

The periodicals are not only the chief medium for disseminating current information but also served as an important part of a library collection. These are helpful in fulfilling both the objectives of teaching and research of an organisation. University and Research libraries usually spend more than 70 percent of their total budgets on the subscription of periodicals only. Periodicals, a source of current information have become necessary these days because the results of research being done in different parts of the world are communicated through them (Ravat & Kumar, 2002).

3.1.1. Periodicals: Definitions

A Periodical is a publication such as a magazine, journal or newspaper. They are called Periodicals because they are published at periodic intervals, i.e. daily, weekly, fortnightly, monthly, quarterly, or yearly. They are extremely important sources of information.
Some definitions of periodicals are as follows:

*Glossary of Library & Information Science* defines “A periodical is a serial published indefinitely at regular or stated intervals, generally more frequently than once a year. Each issue is numbered and / or dated consecutively and contains articles, stories or other writings. Journals, Magazines, Newspapers and Periodicals publication in a continuous series, with a consecutive number and no predetermined end, as distinct from a single work in several parts” (“Periodical”, 2004).

*Harrod’s Librarians Glossary and Reference Book* defines a periodical as “A publication with a distinctive title which appears at stated or regular intervals, without prior decision as to when the last issue shall appear” (“Periodicals collection”, 2005).

*Encyclopaedia of Librarianship* defines a periodical as “A publication issued at regular intervals, each issue normally being numbered consecutively and usually dated, within foreseen and to the sequence as publication” (“Periodicals”, 1966).

### 3.1.2. Related terms of Periodicals

#### 3.1.2.1. Serial

A Serial is the broadest term for Periodicals, journals, magazines, newspapers and Annual publications. Serials are publications issued at intervals over a period of time in successive parts bearing numeric and chronological designations that are intended to be continued indefinitely. They include periodicals but also proceedings, annuals and irregular publications. The terms serials, periodicals, magazines and journals are often interchanged, and their distinctions are not always cleared. Periodicals are publications that are issued frequently at regular intervals. They include magazines, journals and newspapers. The distinction between magazines and journals is small but can be important. Generally magazines are regarded to be of popular interests. Newspapers are different from other current event magazines, except that some come out daily, and come in the familiar news print formats (Tan, 2009).

#### 3.1.2.2. Periodical

It is a publication which appears indefinitely at regular or stated intervals; generally more frequently than annually, each issue of which is numbered or dated consecutively and normally contains separate articles, stories, or other writing.

#### 3.1.2.3. Journal

A Journal, especially one containing scholarly articles and/or disseminating current information on research and development in a particular subject field.
3.1.3. History of Scholarly Journals

A major thrust to the origin of scholarly journal was the founding of the national academies devoted to the study of science. Between 1635 and 1752, at least 11 such academies were founded in Paris, London, Bologna, Berlin, Lyons, Milan etc. Perhaps the most famous of these is the *Royal Society of London*, founded in 1645 and officially charted in 1662. At the beginning of the seventeenth century, written scientific communication was primarily through books and gazettes. By 1660 the men of science recognised that they were dependent on private correspondence to keep abreast of the new knowledge being discovered throughout the world. From the mid seventeenth century the device of the scientific paper had not yet been invented and men did not publish until they though had mastered completely some whole department of science and could produce a definite book.

The origin of the modern University, the experimental methods widespread adoption by scientists and the development of a dependable European postal system were other factors during the sixteenth and seventeenth centuries that helped by the ground works for scholarly journals. On January 5, 1665, a weekly publication called *Journal des Scavans*, considered the first true scholarly journal by many authorities began in Paris under the direction of Denis de Sallo. Osborn reported that the first issue’s preface stated five objectives, including listing major European books, publishing obituaries, recording advances in the sciences, and citing civil and ecclesiastical court decisions. In its early years, the primary emphasis was on the listing and reviewing of books. Publication was suspended during the French Revolution in Dec. 1792. When publication resumed in Aug. 1816 the periodical was renamed *Journal des Savants*. In March 1665, the Royal Society of London began publishing a monthly periodical titled *Philosophical Transactions*. Giving some account of the Present Undertakings, Studies and Labours of the Ingenious in many considerable parts of the world, edited by Henry Oldenburg, subtitle was dropped after a short time.

In 1684, an academy in Holland issued *Novelles de la Republique des letters*. *Memoirs of the Academy of Sciences* in Russia began in 1728. Benjamin Franklin founded the *Transactions of the American Philosophical Society* in 1771 yet many of the journals founded during the 17th & 18th century ceased existence after a year or two (Balakrishnan, 2000).
Although, the first periodicals disseminated scholarly knowledge, periodicals whose chief purpose was to entertain emerged during the late seventeenth and early eighteenth centuries. Davinson names *Atlantic Mercury* founded about 1690, and *Ladies Mercury* began a few years later, as the earliest popular periodical. The *Gentleman’s Magazine* founded in 1731, was supposedly the first periodical to use the word magazine in its title.

Veaner cites as examples of early disciplinary journal the *transactions of the Geological Society of London*, founded in 1811; *the memoirs of the Royal Astronomical Society*, which began in 1825, and the *Chemical Society’s journal* started in 1848 Moreover, by the mid 1800s most journals were aimed at specialized audiences of scientists and trend that has intensified in the 20th century.

The year 1831 was declared as the golden age of periodicals. Periodicals were found to be very useful in every field. Sects and parties, generous societies, and creative individuals all have their periodicals. Science and literature, religion and law, agriculture and arts, have preferred periodicals the best mode for enlightening the public mind.

### 3.1.4. Types of Periodicals

According to Grogan (1973) periodicals can be divided as primary and secondary journals. The primary journals devote themselves to report the original research and are also known as ‘recording’ journals. They form the foundation of scientific and technological literature, e.g. *Biochemical Journal, Journal of Physiology, Journal of Mechanical Engineering, Molecular Physics*. The secondary journals on the other hand, interpret and comment on the research reported in the primary literature. They are called ‘newspaper’ journals, but they make up a far more heterogeneous collection than the research journals, e.g., *Guide to periodical literature, Applied Science and Technology, Current Contents in Science & Technology in India*.

Appearance of the secondary journals has led to the formation of third category of journals i.e. the ‘review’ journal. These play important role in scientific and technological communication. Review journals specifically survey the developments in a particular field over a period, e.g. *Biological reviews, Advances in physics, Science progress*.

Grogan (1973) categories periodicals on the basis of publication agencies the journals are classified in to following types:
1. Learned societies, academic bodies
2. Government bodies
3. Independent research institutes
4. Professionals bodies
5. Commercial publishers
   - Learned and research periodicals
   - Technical journals
   - Trade Journals
   - Popular Science Journals
6. Industrial and Commercial firms
7. Journal published by Academic Institutions
8. Journal published by Individuals

### 3.1.4.1. **Learned Societies, Academic bodies**

The main purpose of such periodicals is to furnish an opportunity for authors (usually members of the learned bodies concerned) to publish the results of their investigations, and perhaps the majority of titles in this group are research journals, but there are also a number of secondary journals issued by the societies, frequently alongside a primary journal; e.g. in addition to its research quarterly *Computer journal* the British Computer Society also brings out the monthly *Computer bulletin* as its ‘organ’ with reports of meetings, data on new equipment, additions to the library, etc.

### 3.1.4.2. **Government bodies**

As the role played by government, both national and international, in our lives increases, so does the volume of official publication, particularly in science and technology, where vast sums of public money are currently being spent on research and development. Some of these publications are periodicals, e.g., *Meteorical magazine*, *Marine observer* (both meteorological Office journals), *Post Office telecommunications journal*, *Canadian journal of Chemistry* (National Research Council of Canada), *World health* (World Health Organisation).

### 3.1.4.3. **Independent Research Institutes**

A small but interesting group of periodicals come from research institutes that are basically of independent foundation (even though they perhaps have links with universities, or possibly undertake government work under contract). They may have
been established with a particular subject orientation or a particular role to play. Examples of periodicals so produced are *Textile research journal* (Textile Research Institute, Princeton, NJ), and *Polar record* (Scott Polar Research Institute, Cambridge).

### 3.1.4.4. Professional bodies

As a category, bodies like the Institution of Mechanical Engineers, the Royal Institute of Chemistry overlap with the learned societies, and much of their work (and the periodicals they produce) is distinguishable. Periodicals in this category can range from primary research journals of a calibre and prestige fit to match any learned society publication to what are little more than news bulletins. Examples are: Mathematical gazette (Mathematical Association: ‘an association of teachers and students in elementary mathematics’), Journal of basic engineering (American Society of Mechanical Engineers), Journal of the Royal Aeronautical Society, IASLIC Bulletin etc.

### 3.1.4.5. Commercial publishers

This category covers periodical publication from the highly technical to the comic strip magazine. Some commercial publishers are known for their technical lists; others as publishers of trade journals; while other publishes a very wide range of periodicals. The examples are: *The Nature, Psychologist, The Statesman, New York Times* and Publisher catalogues such as *Cumulative Book Index, American Publishing Record* etc. So wide is the variety of such periodicals that it is expedient to subdivide them further into.

(a) **Learned and research periodicals**: Examples have been commercially produced for a hundred years or more, particularly in Germany, but until recently they have always been overshadowed by the famous title issued by the learned and professional societies. Representative titles are *Journal of Molecular Biology, Annals of Physics, Micro Chemical Journal*.

(b) **Technical journals**: These are very closely linked with the needs of industry and although as secondary sources are of limited interest to the research investigator, they are invaluable to manufacturing, sales and commercial personnel. Much of their content value lies in their other features, such as new columns, letters to the editor, book reviews, etc. Examples are *Electronic engineering, Computers and automations, Foundry trade journal*.  

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(c) **Trade journals:** They are more commercial than technical and more news oriented than subject oriented. Otherwise they are very similar to the technical journals, with an equal reliance on advertisements. Examples are *Poultry world* (1874), *Contract journal* (1879). Such journals are particularly useful sources for market news (commodity and share prices), company news (forecasts, dividends, mergers, expansions), and general trade announcements.

(d) **Popular subject journals:** These are familiar to everyone, and include all the titles for the amateur, the hobbyist, and the enthusiast that are to be found on railway bookstalls, as well as large number of mysterious (not to say crank) publications catering for the most unusual concerns. Typical titles are *popular mechanics, Yachting world, Railway magazine, Speleologist, Inventor.*

### 3.1.4.6. Industrial and Commercial firms

A number of ‘house-journals’ are published, primarily for the purpose of advertising by manufacturers, dealers and public corporations. These help to promote the products and services of the organization. These often contain valuable information which in industrial library helps to keep abreast of services of rival companies.

### 3.1.4.7. Journal published by Academic Institutions

Much of the research work is undertaken by the academic institutions and the findings are usually reported in University and college research journals. These play an important role in the dissemination of latest information pertaining to specific fields of Science and Technology.

### 3.1.4.8. Journals published by Individuals

Although the number of journals published individually is quite less but these also play an important role in furnishing the latest information. These are single publication and are usually published mostly for money making ventures.

### 3.1.5. Problems of Periodicals

The importance of periodical to the researchers cannot be over-emphasized, yet full exploitation of the scientific information still remains in doubt. Socio-economic and political compulsions of a country like India have resulted in a gradual increase of scientific and technological research projects, thus contributing to the phenomena of information explosion. The scientists thus remain the ‘producer of information’ and at the same time consumer of information. While performing the second part of the cycle, the scientist confronts with the unlimited and ever-growing
mass of knowledge, out of which the relevant information has to be scanned through by using the techniques of information handling available at his disposal (Parasher, 2000).

The other problem is that of time lag between the submission of scientific papers and their publication in the Journals of repute and in some cases exceeds a year. In certain fast developing subjects, much of the literature becomes obsolete by the time it is published. Another problem with the journals is the restriction in the length of papers imposed by the editors. This might cause either omission or curtailment of some of the supporting data and/or background information. This is generally due to the high costs of journals publication.

Another problem related with journal publication is the refereeing system. Most learned journals control quality of the papers they publish by screening through an editorial board. Mostly the submitted papers are sent to an independent “referee” for an authoritative opinion before publication. This helps in eliminating unfair means of publication, but is a time-consuming process. Advancement in Information Communication and Technology (ICT) has provided solution to the above mentioned problems to a great extent.

3.1.6. Acquisition of Printed Periodicals

Periodical’s selection, acquisition, check-in and cataloguing are difficult tasks. The routines involved are frequent checking prices, title, publisher, frequency and scope are subject to change. Periodicals merge or split, get suspended for varying lengths of time. The acquisition of periodicals is the first step in the management of periodicals. The major components of the acquisition process are acquiring the periodical, check-in claiming, payment and fund accounting. A collection development policy of periodicals is particularly important because they are tougher to select and demand more critically informed selection choices (Chiqu-Sen & Chen, 1995).

Ashraf (2004) describes the general principles of periodicals selection do not vary much from those leading the selection of books. The factors governing the selection of periodicals rely on:

i. The scope of the library
ii. Demands of the users
iii. Whether the title is easily available elsewhere
iv. Periodicals already taken
v. The financial resources of the library

According to Osborn, periodical selection is an art. Its skilled performance
depends primarily on the exercise of trained, informed judgment. He has laid
down certain principles and procedures in this regard under mentioned:

i. Checking the monthly issues of New Periodical Titles- classed subject
   arrangement promptly and systematically.

ii. Acquire the material which opens up the literature of a subject or a country.

iii. The titles that are analyzed in abstracting and indexing services should be
    acquired.

iv. Duplication of periodicals should be avoided.

v. Special attention should be given to the acquisition of the basic journal or
   journals in all fields of interest.

vi. A complete set should be maintained instead of a broken set.

vii. Enrich the resources of a locality, region of group of libraries by carrying out a
     program of cooperative acquisition.

viii. In each area develop a coordinated program for the preservation of local
     publications.

ix. Build up periodical files on the basis of long runs, not broken sets/files.

x. In research libraries allocate an amount for the purchase of back files of
    periodicals.

The mentioned guiding principles can be of use in the selection of periodicals varies
from the library to library (Osborn, 1955).

Kraft, Polacsek, Soergel, Burns, & Klair, (1976) based on Cost/benefit Ratio
approach framed a model for deciding which journal titles to select for acquisition in a
biomedical library. They explained a cost/effectiveness approach to the journal
selection problem in a biomedical library. First of all they developed the list of
possible journal titles to be considered, the cost of these titles are recorded and
updated periodically. Measurement of total journal usage, journal relevance and
journal availability elsewhere calculated for each title. A total weighted measure of
journal worth is then calculated, based on subjective weights for each measure. Then
the algorithm based on ranked cost/benefit ratios can be applied.
3.1.6.1. Selection Aids and Tools

There are some important tools which can be used as they are of enormous help for acquisition purpose and provide sufficient bibliographic and reference service.


iii. World List of Scientific Periodicals, New York.


vi. Periodicals Titles Newly Received (Library of Congress)

vii. Times Literary Supplement under in current periodicals’ column

viii. Aslib Information Guide


3.1.6.2. Periodical Acquisition System

Acquisition and ordering is a difficult stage in periodical management. Periodicals acquisition include identifying and verifying the existence of the item, ordering, receiving, checking, paying, renewing, claiming, or cancelling as needed. Periodicals are identified, ordered, received, paid for, catalogued, renewed, claimed, re-catalogued after the titles change, and renewed again until they are ceased or cancelled. Budget and curriculum are main factors taken into consideration while acquiring the periodicals. Following are the ways of acquiring periodicals to libraries:

i. By subscription to publishers of the periodicals who mail copies directly to the libraries.

ii. By dealing with the vendors/agents (standing orders)

iii. By purchasing from a local book shop or news agents

iv. By taking the membership of the learned society or professional body

v. By gifts

vi. Exchange programmes

vii. Deposits

viii. Bid Contracts

ix. Government Agencies
Publishers

Publishers sell their periodicals directly to libraries and most of them also sell their periodicals to subscription services, who then sell them to libraries. Some subscription services do not do business with some publishers offer packages of their publications to libraries at a reduced charge that may not be available through subscription agencies/services. Organizations may offer their publications through institutional membership, providing publications that are either not available except through membership or are more expensive to non members. A very small library may not use subscription services in order to save the service charge imposed by the Service. This practice is not a cost effective option for large libraries.

Subscription Agents

A subscription service sometimes referred as subscription agency, subscription agent, or a periodical vendor, is a commercial business that processes periodicals order for all types of libraries. Subscription agents provide a variety of services for librarians including placement of new subscriptions, subscription renewal, subscription cancellation, consolidation of periodical orders, customized invoicing, processing claims and providing a variety of specialized customer and computer based services such as online interactive databases. Subscription services maintain detailed records and provide management reports for titles that the library has an order with them.

The advantage of subscription agents is the savings they provide to the library in easing workloads, reducing the number of staff, saving space and saving equipment. Subscription agents can ensure that the libraries subscription are automatically rendered, avoiding loop holes in issues. They can invoice the library at the times that are most appropriate for its budget cycle. The major falls drops associated with agents is the charge of service. Subscription agents provide publishers with benefits similar to those received by libraries like efficient consolidation of orders and renewals, handling of global currencies, assistance with claims, knowledge of the library market, and information distribution.

Standing Orders

Periodical can be acquired through standing order which means that the publisher supplies the title automatically as and when the title gets published. As in case of subscriptions, certain publishers deny business their output except through a
standing order placed by the library directly with the issuing body. A standing order, once passed remains in source until cancelled or the ordered item ceases publication.

**Membership**

It is somewhat similar to standing order; in special library field particularly libraries are often part of an organization or firm which is a member or corporate member of learned societies and research associations. The membership subscription usually includes at least one periodical publication free. In such cases librarian should insist that all publication received by the organization as a result of this membership should be deposited in the library. This also applies to those publications which are received by members of the staff of an organization whose individual membership subscription to a learned society etc, is paid by the organization (Ashraf, 2004).

**Gifts**

Gifts of periodicals may include scattered issues of titles, complete back files of titles, or donated subscription. Donors may be individuals, organizations, or the publishers of the titles. Libraries must evaluate gifts carefully, considering the processing charges, preserving and shifting the materials. Libraries should have policies describing the types of materials that will/will not be accepted as gifts. All donations should meet the criteria established in the collection development policies of the Libraries. Gifts of periodicals can save finance since the libraries do not purchase the subscription, however they do require staff time to evaluate, process, preserve and monitor.

**Exchange Programs**

Acquisition by exchange is a valuable means of acquiring periodical material on regular basis. The exchange of material between two libraries is simple as it requires no payment. Exchange programs usually involve training the publications of an institution for those of another organization. Libraries must identify exchange partners, agree with the potential partners about what titles be exchanged, and monitor the materials to ensure that the program is relatively balanced. If libraries establish exchange programs with organizations at global level, the acquisition staff may need foreign language skills to handle some correspondence. Libraries should create order and check in records in their integrated library systems for titles received on exchange. The records should include the names of exchange partners and notes on whether missing issues should be claimed.
Depository Programs

Deposits are similar to gifts and exchanges, except the fact that they may not be efficiently the property of the receiving library. Before accepting a depository agreement it is necessary to know the terms and conditions in detail, when it comes to a periodical publication. Libraries establish depository programs in order to acquire materials that can’t be purchased through other methods and means to acquire all materials issued by an institution (Wilkinson & Lewis, 2005).

Bid Contracts

It is yet another way of acquiring periodicals in a library. The aim of bidding is to obtain the best service at the minimal charge, although it is sometimes difficult to maximize both the aspects. Since, at present, a library is not likely to save money on the subscription price by working through an agent, it becomes absolutely essential that the quality of agent’s service be of high standard. The library staff must be very careful in writing performance specifications and in monitoring the performance to identify ineffective subscription agencies to which contracts should not be awarded in future. Bid specification for subscription agent should be a description of types of periodical publications to be acquired, such as whether to; they are all domestic publications of periodical type, the span of time given to the agent, to place the subscription; frequency and from of billing; and discount service charges. Once failing in fulfilling the terms of the contract, penalty should be made as per the rules specified.

Through Government Agencies

In some countries government has assigned the responsibility of procuring the periodicals to its own agencies to eliminate agents. In India the responsibility was assigned to State Trading Corporation (STC), with the aim to broaden the scope of Indian Exports and to arrange essential imports. Ultimately, responsibility was given to STC to import foreign publications. Being a government undertaking it could not be as efficient as a private agent and secondly it has no experience in book trade. So STC no longer provide this service (Ashraf, 2004).

A comparative cost-benefit analysis of the two systems of subscription to periodicals i.e. direct subscriptions or the agency system was conducted by Joseph (1983). This study was based on the practice of Calicut University Library, which used direct subscription and Kerala University Library, India, which used an agent. Author estimated the cost per operation and arrived at the average cost involved per
title under both systems. The study revealed comparative efficiency was assessed by the time-lag in the receipt of periodicals and the completion of volumes. The comparative study concluded that the direct subscriptions system is more efficient and economical.

3.1.6.3. Problems in Periodicals Acquisition

Subscription of periodicals creates several problems for a librarian. Various problems faced by the librarians are briefly under mentioned:

i. Subscription Procedure

Generally, most of the libraries subscribe to periodical publications through agents. In case of foreign publishers, publishers appoint their role agents who are appointed for inviting quotations. Librarians found this method to be unsuccessful because the agents who offer lower rates usually do not give standard service. Most of the libraries do not give efficient service. Only those agents who are ensured suitable remuneration provide better services. Most of the libraries do not invite quotations annually and they renew the subscription on the basis of previous year’s performance of the agent. However large numbers of libraries renew their subscription every year which results in the late placing or ordering as also late payment of subscription. It is necessary to reschedule the process to avoid these delays. The other way can be that libraries may consider the placing of standing orders which would assist to avoid delays and to minimize routines.

ii. Problem of Proliferation and High Cost

There is an abnormal increase in the number of periodicals due to explosion of scientific research. Their titles have increased rapid pace and their subscription prices have reproduced continued to increases at an alarming speed. A large number of indexing and abstracting periodicals came into existence which is yet more closely to be acquired by each and every library. These trends have raised the frustration level of both librarians and library users. As a result, libraries as well as their users have become more dependent on one another for supplementing the gaps in their collections. The problem pertaining to gaps in holdings can be solved by acquiring all important periodical selection and reference tools and by taking up seriously the publication of more and more periodical indexing and abstracting journals in the country by either a central agency like the NISCAIR or UGC so as to cover all subject fields adequately. Gaps can also be filled in by exchange programmes amongst the university libraries within the country itself. However, this is possibly only when
some university libraries publish a list of periodical holdings and makes it available to
other university libraries.

iii. Inadequate Rules

Periodical handling is pretty much difficult, even for the cataloguers. Rules have been
laid down for cataloguing periodicals, amended from time to time, Para-rules have been created, and plethora of sub-rules dealing with each idiosyncrasy of
the periodicals. But the situation in libraries around the world is almost unchanged. A
central agency should be there to lay down the rules so that uniformity should be
maintained among the participating libraries.

iv. Identification of Core Journals

Under present circumstances, when academic institutions are not in a situation
to subscribe all journals they require, it is essential that they subscribe to at least some
core journals related to each discipline of academic and research in an institution. List
of core journals based on citation studies are available which need to be updated and
issued as prescribed lists.

v. Proper Selection of Journals

Another problem is that of proper selection of journals to be acquired. Unlike
books, a title once subscribed continues to flow in subsequent years uninterruptedly.
As far as foreign journals are concerned, there are good tools as Ulrich’s Guide kept
updated by successive revised and enlarged editions and Katz’s Management for
libraries which probably gives most balanced critical evaluations for the titles
included. There should be a clear distinction between those journals which are
essential and are used frequently and those which are little used (Pathak, 1977).

vi. Determination of Actual Use

It has been noticed many times that costly foreign periodicals are subscribed
on regular basis but many of them are hardly used due to lack of adequate translation
facilities. One way of determining actual use is keeping the journals in closed access
and computing their use on the basis of the demand slip received. But this proves a
hindrance in free browsing of latest academic materials appearing in the journals. The
process also involves much more additional work for library staff. Use can also be
measured on the basis of citations by academic and research staff in their research
publications and thesis but this measurement will have to consider a period of ten
years, and not on annual basis.
vii. Refund

A common practice among libraries is to ask for refund the missing issues when lost in shipment, etc. But in case complete volumes are not supplied to the libraries, subscription is either adjusted or refunded invariable. It happens when the periodical has ceased its publication when it is behind the publication schedule. In case the library discontinues, if the agents do not like to refund the subscription unless they receive payment from the publishers. In all cases getting the refund is a job demanding regular persuasions from the library, involving a delayed correspondence stretching over a long period.

viii. Loss of Periodicals in Transit

Libraries face the problem of missing issues and incomplete volume of periodicals. Problem of handling and disposing the duplicate journals cases may be seen when the duplicate issue supplied by the publisher also gets lost in transit. The loss of issues in transit is usually of two reasons: (i) issues are undelivered due to someone personal interest or leniency of the postman, (ii) misdelivery due to the carelessness of the postal employees. A large number of journals get delivered to other addresses and some get lost due to poor packaging by the publishers. A central mechanism also needs to be developed which can bear the responsibility of exchanging large number of duplicate issues available with the libraries, which can complete large number of volumes.

ix. Consistent Policy for Subscriptions

At National level some guidelines should be formulated, so that no institution start subscribing large number of journals, when finances are available easily, and discontinues them later in times of stringency. Stray volumes of a journal create frustration among research scholars. Moreover there is sheer wastage of amount spent on subscription of a journal if it is to be discontinued in future.

x. Procurement of Back Files

The cost of back files of periodicals is usually very high and their acquisition is slow and tedious process. Extreme precaution is needed before deciding to acquire back files of a periodical. Quotations are invited from various dealers, orders are to be placed with the one who is willing to supply at the lowest rates and then purchase has to be made. When an order for periodicals is going to be placed, it should also be seen that the rates quoted are for the bound volumes, each complete in all respect with its title page and index. For the periodicals which are infrequently used, inter-library loan
facilities from other libraries may be relied upon or alternatively their acquisition in micro form may be considered. It will be still better if the acquisition of back files of periodicals is organized on cooperative basis among local libraries whether to be acquired in original form or in microform. Instead of acquiring complete back sets which are highly priced, it would be in the fitness of things to acquire complete files of indexing/abstracting journals.

xi. Cost of Journals Vs their circulation

After the insertion of electronic media in libraries, resource sharing, and copying facilities have reduced the number of subscribers to academic journals. Thus, the production cost of the journal is distributed among the remaining subscribers.

xii. Periodical Budgets

The budget is not increasing according to or as per the requirements. There is inadequacy of sufficient funds. There is abnormal rise in the subscription amount of periodicals during the preceding years. Especially the journals published abroad have raised their annual subscription charges substantially. The acquisition of new journals of interdisciplinary and specific nature has become essential for an institution to maintain its quality. But while considering grants for acquiring them, the situation becomes acute. Progressively the intake of journals would go on decreasing in number and it would be impossible to acquire the new titles. Current financial trends indicate that the quantum of grants will rise more slowly than the cost of journals. In order to tackle the situation, it would be desirable that libraries in every Indian city should cooperate and compile an issue of Union list of current journals received in all the libraries in that city. This may be done with a view so that less used and costly journals may not be acquired by more than one library in a city. Another way to tackle with this problem may be to persuade the Heads of Institutions to bifurcate the book-grant and show the amounts chosen for journal subscription and for books etc, separately. Once this has been completed, it would highlight clearly the total paucity of grants for journals.

xiii. Improper Binding Facilities

Most of the libraries do not have proper binding facilities. As such the periodicals go on pilling up and these are not utilized adequately. Even now some libraries do not have their own binderies with enough qualified staff; rather they rely upon commercial binders. Moreover, there are no cooperative storage centres for storing the under used periodical publications which is otherwise essential for coping
with the ever increasing demand for space for the purpose. There is no central agency to guide the various organizational activities of university libraries so far as the co-operative acquisition processing, servicing and maintenance of periodicals exchange of publication is concerned. There is lack of essential periodical reference tools including selection tools, complete sets of periodicals, indexes and abstracts up-to-date lists of several holdings union list of periodicals. Regarding binding problem, it may be suggested that though a binding department should be set up in each university library, yet there is no harm it can be organized on cooperative basis (Mittal, 1965).

3.2. E-JOURNALS: AN INTRODUCTION

The developments in computer and communication networks, especially World Wide Web have facilitated creation of alternative electronic form of the paper journals. The E-publishing has brought evolution in journals publication, subscription, access, and delivery mechanism. Today libraries are providing electronic access to a wide variety of resources, including indexes, full-text articles and complete journals.

Due to digital publishing technologies and internet, the scholarly journals have undergone many changes. The digital technology gave birth the electronic form of journals or e-journal. Apart from publishers, the availability of electronic versions of journals on World Wide Web, led to the emergence of new and modern E-journal service providers. From bibliographic to full-text articles and the citation linking across journals has been another landmark. The digital publication has also shortened time lag between article submission and its publication.

The E-journal is being called by various synonymous terms like online journal, paperless journal and virtual journal. A journal can be called as E-journal, if its contents are produced and stored in electronic form, and if these contents can be scanned in a database and retrieved online, it can be called as online journal. Some experts regard E-journal as the one that is produced, published, and distributed nationally and internationally through some electronic network like internet (Lancaster, 1995).

In the recent years, E-Journals have become the focus of Research and Development. In response to this development, Research and Development Organisations started subscribing E-journals. Academic libraries also could not remain behind. The proliferation of electronic resources, network technology, computer technology and web technology has facilitated this developmental change.
The numbers of quality and refereed electronic journals are growing rapidly and can serve as an addition to hard copy or increasingly serve as substitutes.

The acquisition of E-journals is not same as the Printed journals. Electronically designed content delivery via web, LAN/WAN, wireless networks have crossed earlier barriers of time, speed, and have provided easy and smooth access. Predefined procedures and policies which are used for print, or print along with e-form apply to e-formats. These forms need to be handled and addressed separately. The policies and procedures for E-journal acquisition, licensing, negotiations, order/receipts and control of serials on CD-ROMs, via web, need to be formulated so that effective organization and management takes place (Sahoo, 2004).

3.2.1. E-Journals: Definitions

According to Glossary of Librarianship and Information Science, “an electronic journal is a publication, often scholarly, that is made accessible in a computerized format and distributed over the internet” (“Electronic journal”, 2004).

According to Harrod’s Librarians Glossary & Reference Book, “A journal which is available in electronic format; a physical, printed version may also be available” (“Electronic journal”, 2005).

3.2.2. Historical Development

It was in early 1990s when E-journal emerged for the first time on internet. It was in ASCII text format and made available by e-mail as well as in diskette. In 1991, the commercial publishers, Elsevier started the TULIP Project in collaboration with several academic institutions. In 1992, OCLC published “Online Journal of Current Clinical Trials” (OJ CCT). It was the first E-journal to include graphics. It was networked, referred electronic only journal i.e. without a simultaneous hard copy form, with full-text and graphics available by subscription. OCLC’s “Electronic Journal Online (EJO)” project adopted the World Wide Web (WWW) as a distribution mechanism which later on came to be known as “Electronic Collection Online (ECO)” and it developed specialized viewing software. This made articles as searchable database and with graphical user interface it can be viewed in graphical and ASCII text.

JSTOR (Journal Storage Project) started in 1993, which was the first major retrospective electronic archiving project of printed journals. By 1994, the World Wide Web had gained strong hold and now mostly E-journals are now delivered through World Wide Web (Adhikari, 2000).
3.2.3. Characteristics of E-journals

E-journals have undergone a dramatic transformation in style and format since their initial appearance in the early 1990s. Many now have full colour web pages with an attractive and ease to use layout. Despite the fact that layout and presentation of E-journals have greatly improved, and access has been facilitated by the web and online archives, users still may prefer to print hard copies of selected issues and article to reading from a computer.

3.2.4. Types of E-journals

There are currently two types of electronic journals. The first is offline CD-ROM Journals and the second is the Online or Internet based journals (Woodward & McKnight, 1995).

i. Offline CD-ROM Journals

CD-ROM stands for Compact Disc Read Only Memory, and represents a way of digitally storing large documents of information in a way that is easy to search and retrieve. It is portable and has ability to store graphic data. The most important advantage of a CD-ROM is that if the CDs are on network then the same CD/Database on the CD can be shared by an unlimited number of users, sitting at far off places and at their door step (Hasan, Singh & Sharma, 2002).

ii. Online or Internet based Journals

Online journals are available through online hosts or vendors and allow remote access. It can be used simultaneously by more than one user. It provides timely access. E-journal supports different searching capabilities and saves physical storage. Though on the surface, these two types appear alike there are several points of considerable difference that one could take note of.

Readers of online journals can be alerted to news appears as issues via electronic mail, discussion lists or newsgroups. Clearly this is not exclusive to online publications, but such an information service presupposes that the receipts is online and therefore seems to easy, and have more weight if the publication is also online.

Much easier access to latest articles, due to the immediate nature of distribution of Internet online journals as compared to CD-ROM versions which depend on shall mail to reach the customer.

Cost of updating online journals are much less, since the files are simply added or simply replayed on the specific server. Hence users can be made more
frequent than CD-ROM version, which can out with more or less the same frequently as the print versions (Bhattacharya, 2000).

On the basis of the distribution, Chan (1999) has identified the following types of E-journals:

i. **Classic Electronic Journals/ Internet Application Electronic Journals**

   Some of the E-journals are available through internet applications which are also called as classic journals. Originally they were distributed via e-mail but now available on the web. Access to this category is free of cost.

ii. **Parallel Electronic Journals**

   These types of journals are published simultaneously in both forms print and electronic. The online version may include the full-text of journal, only table of contents of selected articles and excerpts from the print version.

iii. **Database Model and Software Model**

   Under the database model articles reside in centralized database maintained by the publisher and subscribers are given permission to access the database and use search software on central computer to locate and download articles. The software model provides in a piece of software, which runs on the Internet connected computer and connects database to the journals central computer. The users can search and download information, which will be sent in proprietary encrypted form. The software would have an expiration date that corresponds with the length of the subscription.

iv. **CD-ROM Journals**

   Commercial publishers have also made journal titles available on CD-ROM. The full text of journals and newspapers has been made available on CD-ROM. In many cases these titles duplicate print titles held by the libraries. Libraries have often subscribed to journals both in print and in microform (Chan, 1999).

3.2.5. **E-Journal Collection Management Issues**

   Management of collection of E-journal raises a new set of issues for libraries, but these issues still fit within the classical theoretical framework of collection development and management. Electronic journals still need to be selected, acquired, catalogued, disseminated and preserved, in very different ways from traditional journals. The type of collection management issues raised by electronic information resources vary among libraries developing on their individual missions. These issues cannot be addressed in isolation from print resources and libraries need to begin to develop integrated collection policies from print and electronic journal. In this
context, the role of collection manager is crucial in developing policies and structure that will integrate print and electronic media (Nisonger, 1997).

i. **Access**

   E-Journals access is not simple. There are many issues which need to be considered: i.e. technology requirements, restricted or unlimited access vice publisher or aggregator, and making library patrons aware of E-journals access. Access management is concerned with the management and deciding policies, guidelines, legal and technical solutions. Access management strategies, should consider issues of privacy and accountability (Lynch, 1998).

ii. **Pricing**

   The pricing structures of E-journals vary significantly from vendor to vendor and from publisher to publisher. Subscribers or librarians should watch for variations among pricing structure and note that these pricing structures are not static. In contemporary scenario users like access instead of ownership using document delivery service to provide access to set of journals. Another solution is putting together consortia of a library to provide access to set of journals. A third solution is creation and maintenance of electronic archives of journal articles without reference to commercial publishers (Kushwah, Jambekhar & Gautam, 2002).

iii. **Classification, Cataloguing and indexing**

   Classification and cataloguing of E-journal has been a point of discussion since its inception. Libraries should be alert to emerging standards for cataloguing of electronic publication. Some authors suggest that libraries should allow paper and electronic form for the same title resides on the same bibliographic record to facilitate access. On internet there are many sites, which use DDC as a Broad System Ordering (BSO). Some of them are Cyber Dewey: a catalogue for the World Wide Web, available at [http://ivory.in.com/mandie/DDHC/CyberDewey.html](http://ivory.in.com/mandie/DDHC/CyberDewey.html), Internet Resources in Dewey Decimal order with DDC subjects: Mid-continent Public Library available at [http://mcpl.lib.mo.us/dewey.html](http://mcpl.lib.mo.us/dewey.html) Attempts are being made to make classification scheme as a tool for automatic classification and indexing. Scorpion is one of the projects in this area. It is a project undertaken by OCLC, which will help to build tools for automatic subject recognition based on well known schemes such as DDC. The concept of facet analysis can be of much help in overcoming some of the problems in indexing or searching the WWW in a reasonable effective way (Rekha, 2000).
The rapid development in the organization and presentation of E-journals has raised a variety of basic cataloguing questions. Internet services, such as discussion lists and World Wide Web servers have challenged Serial Librarians to reconsider aspects of the traditional definition of Serials, especially with regard to citable issues and their designations. The display of bibliographic information has also become more complex with E-journals. Often, this information is dispersed over several files, giving cataloguers multiple sources for description that can contain different presentation of bibliographic information. The availability of multiple document formats has generated questions about computer file additions and the number of catalogue records to represent them. Many institutions have also been hesitant to include catalogue records for internet resources because of uncertainty about how to record location and holdings information (Chad, Marian, Richard & Annelise, 1999).

iv. Metadata

The wealth of information and the quick access available provides a frustrating dilemma for libraries and information seekers equally. The information is available, but how to find it, to organise it to be found again? This availability of vast sources of E-journals on the net initiated a need to have a tool to organise them, i.e. metadata. Metadata is defined as “data about data includes information about the context of data and the content of data and the control of or over data” (Pasquinelli, 1997).

The term is generally applied to E-resources and refers to “data” in the broadest sense of datasets, textual information, graphics and anything else that is likely to appear electronically. While the concepts include indexing and cataloguing information, it can go far beyond conventional document representation, such as MARC records. Information about authenticity, availability and accessibility, digital signatures, copyright, reproduction, etc. is also metadata.

v. Number of Issues

Publisher sometimes fails to make all issues of their journal available electronically, e.g. publisher may publish issues online sporadically or temporarily. The selector should clarify with the publisher the number of issue a particular subscription covers and ensure that no gaps in coverage occur. Only journals that have a significant run of issues should be added to collection and titles available only temporarily (trial version) should not be selected.
vi. Training and Support of Staff and Users

With the number of E-journals being published and variety of different interface, sophisticated searching and retrieval skills are becoming necessary. People who are familiar with latest developments should be appointed in library and existing staff should be trained well, so that users will get proper guidance to find out the relevant information.

vii. Archiving

Archiving is preserving the document for future use. It is a facility for only right to access and not ownership. Libraries want the assurance that they will retain the right to access volumes of E-journals for which they have paid even if they cancel their subscription at later date. So the question arises, who should be responsible for archiving? There are at least three possibilities. One is that the publishers give commitment for archiving and providing back issues access. This can not be taken on its face value, as we know many publications have ceased or merged with others. Other aspect is that libraries could do archiving for themselves but the issues of cost of archiving need to be seriously considered in the context of everyday changing technology which keeps the cost going up that no library can afford. The third is forming a shared archiving at national level, regional level, and provide access to all members. This relates to forming a consortium for archiving and sharing the equal advantages occurring from the arrangements (Chad et al., 1999).

viii. Licensing

Publishers are not feeling convenient with copyright law; therefore licence agreement came in existence. Licensing agreement that required signatures by both the licensor and licensee appeared in the early 1990 with CD-ROM product continue to be used by publisher as legal contract prices, limit access, define use, and protect their right. It is a written contract between user and developer of the information product service setting forth the term under which a licensor grant to licensed license. It describes the authorized uses and users of licensed information are the core of the license agreement. Judith (1999) enumerates the following important issues should be kept in mind when E-journal licensees in negotiation need with the suppliers:

• Expressly permitted use
• What is the rule if the agreement does not specially deal with a particular use for users?
• Does the agreement provide for all the uses and users that the licensee normally accommodates?
• Whether access is limited or unlimited, open network, stand-alone or simultaneous use?
• Price for site licensing, number of journals, multiform subscription, prints free access.
• Archiving, downloading, printing, CD-storing etc.
• What is the rule in unforeseen circumstances, such as the identification of a new use or user?

ix. Copyright

Electronic media presents new challenges to copyright holders. Copyrighted material converted into digital form can be copied perfectly without any damage or dimension in quality of the original. Electronic copyright is an uncertain area but one, where the establishment of any easily understood legal framework is needed in the interests of publishers and library. ISI Electronic Library project has developed a security and rights management system, which will take care at the client, local and central server level. The system is using passwords, secure printing through encryption and water marks and guaranteed authenticity with the use of digital signatures.

x. E-Journals Inventory/Database/Catalogues

Maintaining E-journal inventory/database details always helps when any dispute or any matter arises related to journals subscribed by the library. Library and information centres are maintaining inventory for the print form of registers, Kardex, systems or computerised system for the management to monitor receipt, reminder and budget. But E-journal subscription management may need a bit of more awareness and knowledge.

3.3. DIFFERENCE BETWEEN PRINT JOURNAL AND ELECTRONIC JOURNAL

Printed and Electronic journals differ to each other in many respects.

1. Print journal does not require any equipment while E-journal requires necessary hardware, software and printer.

2. In the case of print journal only one user can use a particular issue at a time while E-journal allows multiple users to use it simultaneously, provided the subscription is for multiple usages.
3. Print journal easy to locate if shelved properly, otherwise there is always a probability that an issue or bound volume the user is looking for, may have been misplaced or gone for binding, while E-journal easy to locate, provided URL, internet or hardware problems do not occur. In India electricity and internet connection often create problems.

4. Use of print journal is governed by copyright laws, while E-journal use is governed by licensing agreement and copyright laws.

5. Every time when an issue or a bound volume is taken from the shelf, it has to be re shelved, but in the case of E-journal shelving is not an issue.

6. After binding, print journal becomes strong for effective archiving and is always available for consultation, while in the case of E-journal archiving is subject to provisions under licensing agreement with the vendor. If it is not renewed, the vendor may not allow access, after subscription period is over.

7. User can mutilate, steal or misplace print journal, if an item is mutilated or stolen, it is a permanent cost is very heavy, while E-journal cannot be mutilated stolen and misplaced, this is the main advantage.

8. Sometimes, print journal can get lost in post, while the problem of missing issues does not arise in the case of E-journal.

9. Print journal requires considerable storage space which shrinks each year, while in the case of E-journal physical storage space is saved totally, except for space required for hardware.

10. One can get a copy by using a photocopy machine, keeping in view the copyright laws, while in the case of E-journal one can download an article and get prints out, keeping in view the licensing agreement with the vendor.

11. The delivery through post takes lot of time especially if the journal is published abroad. However, air delivery saves a great deal of time but it makes the subscription costlier, while there is no time lag between its publication and delivery as E-journal is received instantaneously.

12. The publication of print journal is slow, in spite of IT, while publication of E-journal is fast.

13. Procedures like ordering, keeping track of current issues, sending missing issues reminders, and sending claim letters for return of payment, binding etc involve lengthy and complex process, as well as heavy cost, while in the case of E-
journals such issues do not occur. There is no need to send reminders of making claims, binding etc. The procedure for ordering remains the same.

14. Print journals can be accessed only within the library, during the hours when the library is open. While E-journals can be accessed from anywhere (home, office and library) or at any convenient time subject to agreement license. However, accessibility is affected if library system is down or there is a server problem with publisher or there is a virus attack on the internet.

15. When the volume is complete of print journal, it is sent for binding, during that period, the particular volume would not be available for user, while there is no question of binding in the case of E-journal and it is always accessible for use.

16. The cost of print journal is more than E-journal and operating cost is rather high as it includes cost for ordering, cataloguing, classification, binding, correspondence for claim for missing issues, shelving etc. But it is less in case of E-journal.

17. Some vendor offer package, covering a group of journals, thus bringing down the total cost. But in the case of E-journal, it is a usual practice for vendors to offer packages at considerably lower cost (Singh and Kumar, 2005).

3.4. E-JOURNAL PROVIDERS

The E-journal providers on internet are categorized broadly into two types:

1. Publishers who provide full-text access of their own journals

2. Aggregators, electronic publishers and subscription agents who provide access to the contents of journals furnished by the publishers. Some E-journals have only text content, but the trend is towards web access to both text and images including 2D and 3D graphics using VRML (Virtual Reality Modeling Language).

3.5. APPROACHES FOR E-JOURNAL ACQUISITION

There are two approaches for acquiring E-journals.

i. Individual Library Approach

Every library differs from one another according to its collection, information needs of users, working methods, sources of finance, processing of information etc.

ii. Consortia Approach

It is more practical than any other approach towards the subscription of E-journals. It is a marketing strategy of commercial publisher to get continuous longer commitment from a group of libraries for their journals (Kanadiya & Akbari, 2009).
3.6. LIBRARY CONSORTIA

The explosion of literature, shrinking library budget, escalating cost of information sources, growing demand of users and multifaceted user requirements are some of the major problems libraries facing today. This led the libraries to formulate a strategy to share resources among themselves to overcome the problems.

The Consortia is the plural form of “consortium” but is often used in place of singular form. The idea of consortium is not new. There were instances of several libraries coming together voluntarily for the mutual benefit of respective users just like cooperatives, it was the earliest stage of library cooperation. In the second stage, computerised networks come into trend for sharing of resources. Till this period, the library resources were mainly in traditional printed format. The networks created their bibliographical databases. The users of the participating libraries could get the required documents from other libraries through document delivery services. With the advent of e-resources, the concept of consortia has been mooted mainly for acquisition of E-journals.

As the resources that are procured today through the consortium are mainly e-resources, it has become possible for the users to access and download the required materials without even going through the complicated process of inter-library lending. Though library consortia have been created with narrow purpose, these can be turned into efficient instruments for sharing all types of library resources.

By definition, a consortium is said to be “a cooperative arrangement among groups or institutions” or “an association or society”. Library consortium would be organisation of libraries formed to realize the benefit and opportunities of collaborative activity. It is a comparative alliance of libraries to share human and information resources. Hirshon (1999) defines library consortia “a generic term to indicate any group of libraries that are working together towards a common goal, whether to expand cooperation on traditional library services (such as collection development) or electronic information services. It is now used perhaps too broadly, and encompasses everything from legal entitles to information groups that come together solely to achieve better pricing for purchasing electronic information.

3.6.1. Major Library Consortia in India

India is a developing country, due to economic reason, it is not in a position to procure all documents, to subscribe journals and databases. As a result many libraries in India have set up consortia for resource sharing among themselves.
In India, major initiatives regarding consortium are:
1. UGC-INFONET Digital Library Consortium
2. INDEST - AICTE Consortium
3. CSIR E-journals Consortium
4. HELINET Consortium
5. FORSA Consortium
6. IIM Consortium
7. TIFR Libraries Consortium
8. ISI Library Consortium
9. DAE Library Consortium
10. ISRO Library Consortium
11. ICICI Knowledge Park
12. ICMR Library Consortium

The features of successfully operational in Indian Central University Libraries such as UGC-INFONET Digital Library Consortium have been given below.

3.6.2. UGC-INFONET Digital Library Consortium

With globalization of education and competitive research the demand for the journals has increased over the years. Due to scarcity of funds, libraries have been forced to discontinue the scholarly journals, which have great impact to the users. UGC initiated the UGC-INFONET Digital library consortium, to facilitate free access to scholarly journals and databases in all area of learning to the research and academic community across the country.

The UGC-INFONET Digital Library Consortium, a major initiative of University Grants Commission (UGC) in the field of education and research was formally launched in December, 2003 by then president of India, Dr. A. P. J. Abdul Kalam, at Vigyan Bhavan on 28th December, 2003. It was a national initiative for providing access to e-resources including full text and bibliographic databases in all subject disciplines to academic community in India. It facilitates access to high quality e-resources to academia in the country to improve teaching, learning and research. The consortium provides current as well as archival access to more than 7500 core and peer-reviewed and ten bibliographic databases in different discipline from 26 publishers and aggregators. The access to all major e-resources was given 50 universities in first phase in the year 2004. So far 209 Universities including 14 National Law schools and central universities that come under the purview of UGC,
have been provided differential access to subscribed e-resources. In terms of no. of users, the UGC-INFONET Digital Library consortium is the largest consortium in India. The programme is wholly funded by the UGC and executed by the INFLIBNET (Information and Library Network) Centre, Gandhinagar. At present there are 419 members.

The following are the core members of UGC- INFONET:

- Universities covered under phase-I 50
- Universities covered under Phase-II 50
- Universities covered under Phase-III 95
- Associate members 204
- IUCs and other institutions 06
- National Law schools and Universities 14

### 3.6.2.1. Electronic resources available on UGC-INFONET Digital Library consortium

The Consortium subscribes to electronic resources covering all major subjects, disciplines being taught in universities. It include wide variety of materials such as e-journals, bibliographic databases, Reviews published by scholarly societies, University presses, institutional and commercial publishers. The member institutions provided differential access to these resources based on their needs and activity profile as per the recommendation of the national steering committee.

The resources subscribed by the consortium can broadly be divided in to the following two categories:

**Full text electronic Resources**

It contains complete articles along with their bibliographic details. The consortium subscribes to full text e-resources from scholarly societies, university presses, commercial publishers and aggregators including American chemical society, American institute of Physics, Oxford University Press, Cambridge University Press, Springer Link, J-Store, Project Muse, etc.

**American Chemical society (ACS)**

Since its inception of 1876, ACS provides the worldwide scientific community the comprehensive collection of high quality product and services. It provides access to about 3 million pages of original chemistry work from way back to 1879. Citation information for articles is available free of charge with “as soon as published” ASAP
alert service. Table of content (TOC) alerts for published issues are also available. Through the consortium ACS is giving access to 38 current full-text E-journals including the ACS Legacy Archives having back files of all the journals from first volume (American Chemical Society, 2014).

- **The American Institute of Physics (AIP)**
  It is a non-profit corporation chartered in 1931 to advance and diffuse the knowledge of physics and its application to human welfare. An umbrella organization for 10 Member Societies, AIP represents more than 134,000 scientists, engineers and educators and is one of the world’s largest publishers of physics journals. It covers fields including physics, chemistry, geosciences, engineering, acoustics, and more. The members of the consortium have access to 18 Full text journals (10 AIP and 8 from AIP’s member societies) with Archival access from 1997 onwards for most of the journals (American Institute of Physics, 2014).

- **American Physical Society (APS)**
  APS was founded in 1899. It provides high quality service and products to its members and scientific community. The PROLA (Physical Review Online Archive) search engine is freely available to all users. Access is made to 10 full text journals since 1997 (American Physical Society, 2014).

- **Annual Reviews (AR)**
  It provides researchers, professors, and scientific professionals with a definitive academic resource in 37 scientific disciplines. Annual Reviews publications are among the highest cited publications by impact factor according to the Institute for Scientific Information (ISI). The consortia provides access to 33 full-text journals and archival access is provided up to 10 years back issues (AR Journals, 2014).

- **Cambridge University Press (CUP)**
  CUP is an academic Publisher in Humanities and Social sciences. It publishes about 1000 new publication annually and about 400 new science publications in the fields of Physics, Earth Sciences, Astrophysics and Mathematics. It leads in the world in areas like Botany and Animal behaviour. Through the consortium, 224 Cambridge University Press journals are available with back-files since 1997 (Cambridge University Press, 2014).
• **Economic & Political Weekly (EPW)**

Economic & Political Weekly (EPW) is one of the Indian publications that enjoy a global reputation for excellence and scholarship, published by the Sameeksha Trust since 1949. The focus of the EPW is economic issues, but it is truly a multidisciplinary publication covering sociology, political science, history, gender and environment studies. The access of EPW is provided to all the universities of the consortium (Economic & Political Weekly, 2014).

• **Emerald**

Emerald has operated for more than 40 years, building a collection of 225 scholarly journals in business and management, library and information sciences, engineering and materials science. As the leading publisher for LIS research, Emerald's Library and Information Studies publications provide comprehensive and quality coverage in all areas of this field. Under UGC-Infonet E-journals consortium access is made available for 29 E-journals from Library and Information Science full text database and archival access is varies from journal to journal (mostly 2001-onwards) (Emerald, 2014).

• **Institute of Physics (IOP)**

IOP is a leading international professional body and learned society and is a major international player in scientific publishing and electronic dissemination of physics. It provides access to 46 full-text top most journals in the area of physic from first volume (Institute of Physics, 2014).

• **JSTOR**

It was established as an independent nonprofit organization in 1995. It offers both multidisciplinary and discipline specific collection. In 2009, JSTOR merged with and became a service of ITHAKA, a not-for-profit organization helping the academic community use digital technologies to preserve the scholarly record and to advance scholarship and teaching in sustainable ways. Currently, there are more than 2000 titles, including previous titles, as well as other content available. New titles and other materials are being added regularly (JSTOR, 2014).

• **J-Gate**

It is an electronic gateway to global E-journal literature updated every day. It was launched by informatics India limited, Bangalore in 2001. J-Gate presently possesses a massive database of journal literature, indexed from more than 41,125 e-
journals with links to full text at 12,356 publisher sites. J-Gate is providing Table of Contents (TOC) from all these E-Journals. J-Gate provides access to 5,453 online-only journals, which are not available in print (J-Gate, 2014).

- **Nature journal**

  It is a weekly international journal of science. It is the world's most highly cited interdisciplinary science journal, according to the 2012 Journal Citation Reports Science Edition (Thomson Reuters, 2013). Its Impact Factor is 38.597. The impact factor of a journal is calculated by dividing the number of citations in a calendar year to the source items published in that journal during the previous two years. It publishes original research articles, letters and brief communications among all the multidisciplinary journals. Since 1997 full text access for nature weekly is available (Nature Journal, 2014).

- **Oxford University Press (OUP)**

  Oxford University Press is a department of Oxford University, which publishes 230 academic and research journals. OUP covers areas such as Life Sciences, Mathematics and Physical Sciences, Medicine, Social Sciences, Humanities, and Law. Through the consortium, 198 Oxford University Press journals are available with back files since 1998 (Oxford University, 2014).

- **Project Muse**

  This programme was started by John Hopkins Press. At present it offers over 400 quality journal titles from 100 scholarly publishers particularly in the areas of Social Sciences and the Humanities. It provides access to about 400 full text journals from 1999 onwards (Project Muse, 2014).

- **Royal Society of Chemistry (RSC)**

  RSC is a professional body for chemist and the learned society for chemistry. It is one of the prominent and influential independent scientific organization in Britain. It provides access to 23 full text journals with six databases from 1997 onwards (Royal Society of Chemistry, 2014).

- **ScienceDirect**

  ScienceDirect is a part of Elsevier and its Headquarter is in Amsterdam, The Netherlands. It is the world's largest scientific, technical and medical information provider and publishes over 2,000 journals as well as books and secondary databases. It covers various subjects such as Biochemistry, Genetics, Mol. Biology, Agriculture,
Biological Science, Chemistry, Computer Science, Economics, Immunology, Microbiology, Mathematics, Physics, Astronomy, Social Sciences, Psychology. It provides around 1000 journal titles to Universities under UGC-INFONET Digital Library Consortium with back-files since 1995 (ScienceDirect, 2014).

- **SpringerLink**
  Springer is an international scientific publisher, delivering quality content through innovative information products and services, as well as provider of local-language professional publications in Europe, especially in Germany and Netherlands. It publishers some 2,000 journals every year in the STM sector. It covers publishing fields mainly in science, technology, medicine, architecture, business and transport. Generally consortium provides access through SpringerLink are around 1400 journals. The archival access is provided from 1997 onwards (SpringerLink, 2014).

- **Taylor and Francis**
  Taylor and Francis established in 1798, is the oldest commercial journals publisher in the world, and one of the leading global academic publishers. Taylor & Francis Group publish more than 1100 journals and around 1,800 new books each year. It is a widely known publisher among researchers, students, academics and increasingly professionals. UGC-Infonet Digital Library Consortium can access more than 1365 journals with archival access to 1998 onwards (Taylor and Francis, 2014).

- **Wiley-Blackwell**
  Wiley-Blackwell was established in February 2007 by merging Blackwell Publishing with Wiley's Global Scientific, Technical, and Medical business. With a combined list of more than 1,400 scholarly peer-reviewed journals and this new business sets the standard for publishing in the life and physical sciences, medicine and allied health, engineering, humanities and social sciences. It provides access to 908 journals of Blackwell publishing with back files since 1997, to the members of the consortium (Wiley Blackwell, 2014).

- **Bibliographic Databases:**
  It contains references to articles published in journals, conference proceedings, chapters in books. Most bibliographic databases contain abstract of the articles along with links to their full text.
• ISID

The Institute for Studies in Industrial Development (ISID), a sponsored institution of the Indian Council of Social Science Research (ICSSR), is a public-funded, non-commercial research and development institution in social science. ISID has developed databases on various aspects of the Indian economy, particularly concerning industry and the corporate sector. It has created Online Indexes of Indian Social Science Journals (OLI) and Press Clippings on diverse social science subjects. It provides access to Indexes of 125 Indian Social Science journals and major newspaper articles, editorials and news features.

• JCCC

J-Gate Custom Content for Consortium (JCCC) is a virtual library of journal literature created as a customized E-journals access gateway and database solution. It acts as a one point access to 7900 journals subscribed currently under UGC INFONET Digital library consortium as well as university libraries designated as Inter Library Loan (ILL) Centers besides index to open access journals. INFLIBNET has identified 22 potential universities as ILL Centers in the country to fulfill ILL request from the users affiliated to universities covered under UGC-INFONET Digital Library Consortium. JCCC has facility to activate e-mail request for article to Inter Library Loan Centers as well as to INFLIBNET Centre.

• MathSciNet

MathSciNet is an electronic publication offering access to easily searchable database of reviews, abstracts and bibliographic information of the mathematical sciences literature. Continuing in the tradition of the paper publication Mathematical Reviews (MR), expert reviewers are selected by a staff of professional mathematicians to write reviews of the current published literature; over 60,000 reviews are added to the database each year. Extending the MR tradition, MathSciNet contains over 2 million items and over 700,000 direct links to original articles. This web of citations allows users to track the history and influence of research publications in the mathematical sciences. Access to MathSciNet has started to 50 universities since 2005 covering files of 1940 onwards.

• Web of Science

Web of Science, provides access to the world’s leading citation databases. It searches over 10,000 journals from over 45 different languages across the sciences,
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social sciences, and arts and humanities with back files to 1900. The citations (or footnotes) allow one to navigate forward, backward, and through journal articles and both journal and book-based proceedings. The access to Web of Science is provided to 100 universities of the consortium through the N-LIST Programme funded by MHRD (UGC-INFONET Digital library consortia, 2015).

3.7. CONCLUSION

Periodical publication is a primary source of information containing the first hand information about the research in progress and development or new interpretation of an old theme or idea. Periodicals are considered the most important form of library’s collection and enlighten the skilled manpower as well as contribute to the development of R&D oriented nation.

The exponential growth of periodical literature has immensely enhanced the need to evolve an effective and foolproof periodical control and management system. This need for establishing an unassailable control method becomes all the more necessary due to the prohibitively exorbitant prices of periodical publications. In libraries of AMU and BHU, Periodical selection is done by the librarian, on the basis of recommendation made by faculty members and students. The subscription of periodicals in both the libraries is through local or foreign subscription agents.

Electronic information sources are attracting reader’s attention in today’s networked environment. Among these sources E-journals open up many exciting opportunities and potential for academic and special libraries. Librarian should be aware of the advantages and disadvantages of E-journals and they should identify and balance the fact that would make E-journals a success or failure in their libraries.

The periodical librarian has always to be on his toes guarding against any possible discrepancy leading to the disruption in the system, in order to develop a useful collection, it is essential to formulate a selection policy for the acquisition of periodicals. The process of selecting and acquiring E-journals is far more complex and cumbersome than print journals. It requires careful review and analyses of many factors such as licensing agreements, vendor aggregator package, consortia package or single library package print plus electronic access, electronic access only and contains coverage. Libraries are facing dual problems increasing cost and the desire to adopt the new and ever changing technologies. Cost of equipments, training of staff and users, ease of access and time spent in updating the software etc. have to be taken in to account while adopting the new technologies. Though subscription to electronic format
is slowly increasing but due to their high cost, substantial numbers of libraries are not able to do so. A possible solution to reduce the subscription cost is consortia approach and minimum possible customisation of number of journals keeping in mind the requirement of subscribing library.

In India library consortium activities are fast evolving. Libraries of AMU and BHU are members of UGC-INFONET Digital library Consortium which provide access to over 7500 full-text E-journals and 10 bibliographic databases from a number of publishers and aggregators worldwide. In the West, Consortium is a thing of past and has flourished to its fullest. However it is gaining momentum in the developing countries like India and in future more and more consortiums would emerge to serve their members with modern technology.

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Chapter-3

An Introduction to Periodicals


Chapter-3

An Introduction to Periodicals


Chapter 4

Cost-Benefit Analysis in Libraries
CHAPTER-4
COST-BENEFIT ANALYSIS IN LIBRARIES

4.1. INTRODUCTION

In the present scenario assessment and valuation plays an important role in library management. As we know, all types of libraries are facing problems such as rapid expansion of knowledge, explosion of literature, escalation of price, growing demand of users, variant user requirements and shrinking budget etc. To overcome these problems librarians are using different ways and means. In this era of decreasing financial resources and increasing calls for accountability, libraries all over the world face the challenge of representing and quantifying their value to their funders and stakeholders. In the context of Academic library, librarians must prove library’s value to the Institution in order to secure the financial resources necessary to serve the university and research community. As Financial Authorities weigh competing priorities and allocate limited resources, they need concrete evidence of how the library supports the institution’s strategic goals. In addition, they need evidence that helps them weigh the value of new directions. As librarians and administrators make budgeting decisions, librarians may be asked to prioritize their products and services to focus on those that are most effective in serving the institutional mission with increased financial challenges. Due to economic crisis, librarians with the help of management tool such as Cost-benefit analysis can prove the value or worth as well as justify the expenditure of library’s collections and services.

Generally every person in his/her daily life uses CBA for making decisions consciously or unconsciously. For example if a person wants to purchase an item then he/she will calculate the cost and then compare the cost with the benefits, he/she will get from this item. If benefits are more than cost, then he will decide to purchase that item, otherwise not. Cost-Benefit Analysis is an important aspect of management and helps in decision making. To study the feasibility of any system, to evaluate it or to choose one system out of several alternatives the decision making authorities have to conduct Cost-Benefit Analysis. In this process, total cost involved in terms of equipments, materials and manpower have to be taken in to account and also value of all the benefits i.e. economy in terms of money, efforts and time involved have to be calculated. If the value of benefits is more as compared to the cost involved, the
system is suitable and if the results are reverse to this, the system is a misfit. It is, therefore essential to conduct a cost-benefit analysis in the libraries instead of blindly following other techniques.

Library is a non profit making organization. Therefore cost and benefits of any activity or service in the library is a very difficult task, due to many immeasurable components in the operations of the library. To proceed with the project, the benefit /cost ratio must be more than one or the benefits must be greater than costs.

Cost-Benefit Ratio = \frac{\text{Cost}}{\text{Benefits}}

The ratio must exceed 1.

Due to exponential growth of knowledge and information, libraries are trying their best to acquire all the documents available worldwide. But lack of funds leads librarians into a situation in which they have to take decisions judiciously as to which documents should be purchased and which not. It is the responsibility of the librarian to convince the higher authorities and prove the value of library’s collection and services. For this purpose cost-benefit analysis and cost effective analysis methods are appropriate. Libraries once considered as the heart of the University are now facing questions about their institutional relevance and value. Over the recent decades with the emergence of internet, user-friendly access systems and web2.0 technology has facilitated the user’s ability to access information without librarian’s assistance. In this scenario to prove the economic value of libraries, librarian’s responsibility increases, but with the help of various types of CBA study librarians can prove the worth of the library collections and services.

There are two types of CBA studies. First, CBA can be performed before undertaking a project and involves estimating costs and benefits. Second, CBA can be performed after a purchase or project has been undertaken that involves measuring past costs and benefits (White & Crawford, 1998).

4.2. COST-BENEFIT ANALYSIS: DEFINITIONS

In *Oxford Advanced Learner’s Dictionary* the term Cost-Benefit Analysis is defined as “The relationship between the cost of doing something and the value of the benefit that result from it” (“Cost-benefit”, 2010).

*Collins the Times English Dictionary & Thesaurus* defines Cost-Benefit Analysis as “denoting or relating to a method of assessing a project that takes into
account its costs and benefits to society as well as the revenue it generates” (“Cost-benefit”, 2010).

According to White and Crawford (1998) CBA is the “methodology in which all potential gains and losses from a proposal are identified, converted in to monetary units, and compared on the basis of decision rules to determine if the proposal is desirable”. This definition is strictly quantitative. CBA also can be defined as a measure that helps determine how the benefits of a product or service can be compared to its costs.

Elliott, Holt, Hayden and Holt (2009) defines Cost-benefit analysis as an economic tool that libraries can use to measure the monetary value of the library to the community relative to the investment the community has made in the library either year by year or cumulatively over many years through its investment in collections, equipment, and buildings.

Van House feels that the field of library and information services is appropriate for cost-benefit analysis. Libraries have begun to redefine their services through cost analysis. Careful planning and evaluation are required to provide the most cost-effective programs. Standard evaluation approaches take into account only the effects of alternatives, such as the number of citizens served. But, cost benefit and cost effectiveness analysis take account of both the cost and effects of selecting alternatives. This makes it possible to choose the alternative that provides the best results for any given amount of resources, or that minimizes the resources that need to be used, for any outcome (Van House, 1984).

4.3. GENESIS OF COST-BENEFIT ANALYSIS

Berghammer (1995) described that Evaluations of public projects have occurred throughout history. The modern literature on Cost-Benefit Analysis (CBA) dates back to an article published by a French engineer and economist Jules Dupuit (1804-1866) in 1844. He developed a method to measure the utility of public works. Afterwards, in the 1920's Professor A. C. Pigou refined this concept of public utility. He introduced the concept of social benefit and social cost and a need for measuring public utility. During this period of history, policymakers accepted the idea that projects, public or private, should have a broader social justification for public investment. Further, these justifications should include the positive and negative consequences of public decisions. This was the beginning of a new way of thinking, though actual applications of the CBA started much later. CBAs have been
synonymous with public works, projects since the U.S. corps of engineers adopted them for assessments of projects under the U.S. Flood Control Act beginning in 1936. The United States Flood Control Act of 1936 was probably the first major legislation to mandate CBA. Since then, Cost-Benefit Analysis has become a tool used to determine whether, or to what extent, a project is worthwhile (Berghammer, 1995).

4.4. PURPOSE OF COST-BENEFIT ANALYSIS

1. The main purpose of CBA is to assists decision makers in making decisions by providing better information.

2. It is helpful in deciding which major projects to undertake.

3. Maximising the level of performance (at output stage/ end result) through best possible utilization of resources (i.e. minimise the costs as far as practicable involved in achieving the level/ target).

4. Ascertaining if any particular alternative has benefits exceeding its cost.

5. Improving service standards.

6. Facilitate self-evaluation and self-actualisation, etc.

7. Can determine whether or not alternative projects are socially profitable.

4.5. DIFFERENT METHODS OF CONDUCTING COST-BENEFIT ANALYSIS

There are various methods of conducting CBA:

I. Net Benefit Analysis

It involves subtracting total costs from total benefits. It is easy to calculate, easy to interpret and easy to present. The main drawback is that it does not account for the time value of money and does not discount future cash flow. Cash flow amounts are shown for three time periods. Period 0 is the present period, followed by two succeeding periods. The negative numbers represent cash outlays. A cursory look at the numbers shows that the net benefit is $550.

<table>
<thead>
<tr>
<th>Cost/Benefit</th>
<th>Year0</th>
<th>Year1</th>
<th>Year2</th>
<th>Year3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs</td>
<td>$-1,000</td>
<td>$-2,000</td>
<td>$-2,000</td>
<td>$-5,000</td>
</tr>
<tr>
<td>Benefits</td>
<td>0</td>
<td>650</td>
<td>4,900</td>
<td>5,550</td>
</tr>
<tr>
<td>Net benefits</td>
<td>$-1,000</td>
<td>$-1,350</td>
<td>$-2,900</td>
<td>$550</td>
</tr>
</tbody>
</table>

The time value of money is extremely important in evaluation processes. Today’s dollar and tomorrow’s dollar are not the same. The time lag accounts for the time value of money. The time value of money is usually expressed in the form of
interest on the funds invested to realize the future value. Assuming compounded interest, the formula is:

\[ F = P (1+i)^n \]

Where,
- \( F \) = Future value of an investment
- \( P \) = Present value of the investment
- \( i \) = Interest rate per compounding period
- \( n \) = Number of years

For example, if $3,000 invested in business for 3 years at 10% interest would have a value $3,993 at maturity.

\[ F = $3,000(1+0.10)^3 = 3,000(1.33) = $3,993 \]

II. Present Value Analysis

In developing long-term projects, it is often difficult to compare today’s costs with the full value of tomorrow’s benefits. The time value of money allows for interest rates, inflation and other factors that change the value of the investment. Present value analysis controls for these problems by calculating the costs and benefits of the system in terms of today’s value of the investment and then comparing across alternatives. Suppose that $3,000 is to be invested in a microcomputer for our safe deposit tracking system, and the average annual benefit is $1,500 for the four year life of the system. The investment has to be made today, where as the benefits are in the future. We compare present values to future values by considering the time value of money to be invested. The amount that we are willing to invest today is determined by the value of the benefits at the end of a given period. The amount is called the present value of the benefit.

To compute the Present value, we take the formula for future value:

\[ [F = P/ (1+i)^n] \]

So the present value of $1,500 invested at 10% interest at the end of the fourth year is:

\[ P = 1,500/ (1+0.10)^4 \]

\[ = 1,500/1.61 = $1,027.39 \]

That is, if we invest $1,027.39 today at 10% interest, we can expect to have $1,500 in 4 years. (Basandra, 2003).
III. Net Present Value

The net present value is equal to discounted benefits minus discounted costs. Present value is the amount of cash today that is equivalent in value to a payment or to a stream of payments, to be received in the future. NPV is the PV of the expected future cash flows minus the cost. NPV is the present value of all the cash flows connected with the project, all its costs and revenues now and in the future. The advantages of NPV include that it is easier to calculate than IRR, it incorporates all cash flows during all periods of the investments life. And it takes the time value of money into account. The time value of money is based on the principle that “a dollar today is worth more than a dollar in the future. This is because waiting for future dollars involves a cost. NPVs’ disadvantages are that it expects one to know the true cost of capital and that if one is comparing possible purchases of significantly different sizes or lifespan, NPV can give a misleading result.

IV. Internal Rate of Return (IRR)

According to Linn (2010), it is the “discount rate at which the net present value of an investment equals zero. IRR accounts for the time value of money and is easily understood. It can however, be difficult to calculate and be misleading when there is not a large initial cash outflow. It usually but not always agrees with the outcomes from NPV. This is because the formula for IRR is very similar to that for NPV.

V. Profitability Index (PI) or Cost-benefit Ratio

It provides the relative profitability of a project. If the PI is greater than 1.0 it is acceptable, and the higher the PI, the higher the project should be ranked when compared to other possible investments (Linn, 2010).

\[ \text{PI} = 1 + \frac{\text{NPV}}{\text{Initial investment}} \]

VI. Pay back Analysis

Basandra (2003) gives the payback method is a common measure of the relative time value of a project. It determines the time, it takes for the accumulated benefits to equal the initial investment. Obviously, the shorter the payback period, the sooner a profit is realized and the more attractive is the investment. The payback method is easy to calculate and allows two or more activities to be ranked. The payback period may be computed by the following formula:

\[ \frac{\text{Overall cost outlay}}{\text{Annual cash return}} = A \times B/5 + C \times D/2 = \text{years + installation time/years to recover} \]
VII. **Return on Investment (ROI)**

ROI is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment. The Return on investment is a quantitative measure of the value returned to the institution for each dollar invested in the library (Luther, 2008). ROI is one approach to meeting the challenge of demonstrating value. The basis of ROI studies is to quantify and demonstrate the library’s economic value to the institution. For every rupees spent on the library, the university receives rupees back in the form of additional grants income or donations or long-term value to the community from an educated workforce, more productive faculty, more successful students and graduates. The aim of ROI is to establish a relationship between the library and its university that could be expressed in quantifiable terms and that would satisfy administrators. To do this, the library needs to be viewed as an asset, where income is generated as a proportion of the amount invested in the asset.

There are also differences in ROI values based on subject discipline, which may account for the differences between institutions depending on the degrees they offer or relative size of subject disciplines (Tenopir, 2010).

There are three ways of measurement. Time saved by library users, money saved by using the library and revenue generated with the assistance of the library (Roger, 2001). The present study attempted to measure the revenue or benefits earned by the users (Research Scholars and Faculty Members) of the Universities under study. The ROI is a comparison of the money earned on investment versus the amount invested (Ko, Shim, Pyo, Chang, & Chung, 2012).

4.6. **METHODS FOR MEASURING LIBRARY VALUE**

Oakleaf (2010) and Tenopir and King (2007) described many methods that can be used to measure the value of library products and services. These can be grouped into three main categories:

I. **Implicit Value**

Measuring usage through downloads or usage logs provide an implicit measure of value. It is assumed that because libraries are used, they are of value to the users. Implicit values however do not show purpose, satisfaction, or outcomes of use (or whether what is downloaded is actually read). Usage of e-resources is relatively easy to measure on an ongoing basis and is especially useful in collection
development decisions and comparison of specific journal titles or use across subject disciplines. The present study used usage statistics of E-journals/Databases and calculated the Cost per use of E-journals/Databases subscribed under UGC-Infonet Digital Library Consortium in both the libraries under study.

II. Explicit Value

Explicit methods of measuring value include qualitative interview techniques that ask faculty members, students, or others specifically about the value or outcomes attributed to their use of the library collections or services and surveys or interviews that focus on a specific (critical) incident of use.

III. Derived Values

Derived values, such as Return on Investment (ROI), use multiple types of data collected on both the returns (benefits) and the library and user costs (investment) to explain value in monetary terms. The present study also calculated ROI and Cost-Benefit Ratio of Journals collection.

4.7. PROCEDURE FOR CONDUCTING COST-BENEFIT ANALYSIS

There is a difference between expenditure and investment. We spend to get what we need, but we invest to realize a return on the investment. Building Periodicals collection in a library is an investment. Benefits are realized in the form of research submitted by Research Scholars and articles written by Faculty Members and Research Scholars. To what extent benefits outweigh costs is the function of cost/benefit analysis. Cost-benefit analysis involves the following steps to determine whether a project is worthwhile.

1. Identify the costs and the benefits that will result from a project or program.
2. Measure in dollars or Rupees the costs and benefits so that both costs and benefits are stated in common denominator units that can be compared with potential alternative uses of revenues.
3. Incorporate the time dimensions in the evaluation, because costs and benefits must be examined for the entire life of the project, not just for the current fiscal year.
4. Decide whether the result of the first steps yields large enough social profit (net social benefits) to justify the expenditures of limited funds (Berghammer, 1995).

According to Basandra (2003) Cost/benefit analysis is a procedure that gives picture of the various costs, benefits and rules associated with a system. The determination of costs and benefits involve the following steps:

1. Identify the costs and benefits of Journals
2. Categorize the various costs and benefits for analysis
3. Select a method of evaluation
4. Interpret the results of the analysis
5. Take action

4.7.1. COSTS AND BENEFITS IDENTIFICATION

Certain costs and benefits are more easily identifiable than others. For example direct costs such as the subscription cost of journals are easily identified from vendor’s bill payments. Direct benefits often relate one-to-one to direct costs especially savings from reducing costs. Some estimated costs or benefits that have some uncertainty.

A category of costs or benefits that is not easily recognized is opportunity costs and opportunity benefits. These are the costs or benefits skipped by selecting one alternative over another. They do not show in the library accounts and therefore are not easy to identify.

4.7.2. CLASSIFICATIONS OF COSTS AND BENEFITS

The next step in cost and benefit determination is to categorize costs & benefits. They may be tangible or intangible, direct or indirect fixed or variable.

I. Tangible or Intangible Costs and Benefits

Tangibility refers to the ease with which costs or benefits can be measured. An expenditure of cash for a specific item or activity is referred to as a tangible cost. The purchase of journals and employee salaries are examples of tangible costs. They are readily identified and measured costs that are known to exist but whose financial value can’t be accurately measured are referred to as intangible costs. For e.g. employee morale problems caused by a new system or lowered University or library image is an intangible cost. In some cases, intangible costs may be easy to identify but difficult to measure. For example the cost of the breakdown of an online system during library hours will cause the library users to unable access to e-journals and waste human Resources. The problem is by how much? In other cases, intangible costs may be difficult even to identify such as an improvement in user satisfaction stemming from a real-time order entry system.

Benefits are also classified as tangible or intangible, like costs they are often difficult to specify accurately. Tangible benefits such as completing jobs in fewer hours or producing reports with no errors are quantifiable intangible benefits such as more satisfied customers or an improved corporate image are not easily quantified.
Both tangible and intangible costs and benefits however should be considered in the evaluation process.

II. Direct or Indirect costs and Benefits

From a cost accounting point of view, costs are handled differently depending on whether they are direct or indirect. For example the purchase of journal for $2200 is a direct cost. Example of direct benefit is a new system that can handle 25% more transactions per day is a direct benefit.

Indirect Costs

Indirect costs are often referred to as overhead. A system that reduces overhead realizes a savings. If it increases overhead, it incurs an additional cost. Insurance, maintenance, heat, light and air conditioning are all tangible costs. But it is difficult to determine the proportion of each attributable to a specific activity such as a report. Indirect benefits are realized as a by-product of another activity or system.

III. Fixed or variable Costs and Benefits

Some costs and benefits are constant regardless of how well a system is used. Fixed costs are sunk costs. They are constant and do not change. Variable costs are incurred on a regular (weekly, monthly) basis.

4.7.3. SELECT EVALUATION METHOD

When all financial data have been identified and broken down into cost categories, the analyst must select a method of evaluation (Basandra, 2003).

4.8. THEORY OF COST-BENEFIT ANALYSIS

Cost-benefit analysis can be applied to a variety of proposals, such as, modification of equipment for a library's computer system, the purchase of a new machine, library automation, subscription of journals, conducting a training programme or travel to an annual conference etc. The essence of cost-benefit principles is that public financial resources are best allocated to those programs which benefit the community. There are two decision criteria:

1) Net Benefit
2) Cost-Benefit Ratio

According to the Net Benefit method, total costs are subtracted from the total benefits. When the difference between benefit and cost is greater than zero, society is better off.

In the Cost-Benefit Ratio, the ratio is computed by dividing the total benefits (B) of a program by the program's total costs (C). If the ratio is greater than 1, then
the benefits from the program exceed its costs and the program is considered acceptable. If the ratio is less than 1, then costs exceed benefits and the allocation of scarce resources to the program would be rejected. It would be inefficient to support the program. The decision criterion in both net benefit and benefit cost ratio may yield different rankings, however they both tell you if the project is acceptable or not. The method of conducting CBA is continuously growing and there is no single methodology for cost-benefit analysis. A common unit of measurement (usually money) and the calculation of net present value and future costs are characteristics that most studies share.

The real trick to doing a cost benefit analysis is making sure you include all the costs and all the benefits and properly quantify them. The formula for calculating a CBA is Total Benefits–Total Cost=Net Benefit. In the case of Periodicals, they are renewed annually without any following spill over costs, therefore future costs will not be considered. Net present value is simply present value, without involving future discounted benefits. Cost-benefit analysis identifies both tangible and intangible benefits and compares these to the costs. In the case of E-journals purchased through consortium, tangible benefits are increased access and ease of use (i.e., consumption), whereas intangible benefits may be increased research output.

There are two costs related with the consumption of any commodity. The first is the cost of acquiring and maintaining these commodities. The second is the economic cost of the value of time associated with the consumption of these goods and services. For example, the economic cost of consuming information in print format is higher than that of consuming it in electronic format. Therefore, switching from paper to electronic translates into a benefit. Cost-benefit analysis is an appropriate tool for evaluating resource allocation in non-profit entities such as academic library consortia (Scigliano, 2002).

White and Crawford (1998) applied the concept of “direct” and “indirect” costs when they used cost-benefit analysis to justify the acquisition of electronic resources at Heindel Library. They stated, “Library services and products have associated costs, including direct monetary costs and indirect costs such as time. The decision to acquire or provide a particular product or service should involve an examination of its costs and benefits to library customers”. They cautioned that, although direct costs are typically easy to measure, indirect costs are much harder to ascertain.”
When economists speak of costs, they are considering something more than explicit costs. Economists are concerned with full opportunity costs. The "opportunity costs" are the costs of using resources for one purpose rather than another. CBA refers to a specific technique for comparing the negative and positive consequences of alternative uses of resources, including money, manpower, facilities and preferences. The CBA method requires an analyst or evaluator to identify measure and compare all the measurable significant costs and desirable outcomes of alternative programs. CBA is a method by which administrators can systematize the selection process of alternatives by offering specific steps and decision rules (Berghammer, 1995).

Librarians make a variety of financial decisions that support program activities. Identifying the costs and the benefits sounds like a relatively simple process; however, it is often difficult to determine the actual costs and benefits. Determining which costs and benefits are relevant is very important to the analysis. Benefits can generally be classified as real benefits. Real benefits are described as direct and indirect as well as tangible and intangible. Direct benefits are closely related to the main project while indirect benefits are by-products of the project. The indirect effects are known as externalities. Sometimes we receive benefits or costs that nobody intended. These costs and benefits of by products can be priced on the market." They represent added benefits or costs to the community as a whole. Some examples of external costs are: the danger to rivers when business firms pour dangerous chemicals into rivers; construction of a convention centre externalities could be identified in terms of increased levels of sales tax, parking fees, sales at retail stores and restaurants. These are the benefits and costs that spill over to the larger community. There are positive and negative externalities. Examples of negative externalities for the construction of a convention centre could be increase in traffic congestion, crime and pollution.

The various types of benefits and costs can be categorized as tangible or intangible. The term "tangible" is applied to benefits and costs which can be priced in the market, while intangible benefits and costs cannot. Pollution would be considered an intangible cost.

4.9. DIFFERENCE BETWEEN COST-BENEFIT ANALYSIS (CBA) AND COST-EFFECTIVE ANALYSIS (CEA)

Cost-benefit Analysis (CBA) is related to, but distinct from Cost-effective analysis (CEA). In CBA, benefits and costs are expressed in monetary terms, and are
adjusted for the time value of money, so that all flows of benefits and flows of project costs over time (which tend to occur at different points in time) are expressed on a common basis in terms of their "net present value."

In a cost benefit analysis, outcomes are measured in a monetary unit. This allows for the development of the benefit cost ratio and net benefit. The advantage to this is that the analyst is able to make comparisons across policy areas. In contrast, cost effectiveness will not be able to make such direct comparisons because the units of measure are different. Same kinds of methodological problems in identifying and measuring costs and benefits. Many of the problems associated with these methodologies relate to the assumptions that must be made by the analyst. The analyst must determine cost and benefit data, and select a discount rate which can bias the final analysis. Despite the difficulties in conducting this type of analysis, it provides useful information about the use of resources.

The steps in cost benefit and cost effectiveness overlap and there are also some differences. CEA assists decision makers in making decisions by providing better information. It is much easier than cost-benefit analysis because it does not require the measurement of benefits. It requires less time, effort and expertise than CBA.

Both cost-benefit and cost-effectiveness deal with decisions about the allocation of scarce resources. These two approaches assume that society will compare costs and benefits, including time and money, to maximize utility or well-being. One of the distinctions of cost-benefit analysis is to determine the costs and benefits and consider a monetary unit of measure for both. Cost-benefit analysis relates to the benefits (outcomes) of a service to the cost (inputs) of providing that service. The problem within a government setting is that the benefits tend to be in terms of social values and are not so easily expressed in the same dollar unit as the costs (Van House, 1984).

Cost-effectiveness is concerned with efficiency of benefits and costs. In this method, the analyst assumes that all benefits are substitutes for each other, and considers them all equal. By keeping all benefits constant, the objective becomes to choose the least expensive alternative. Cost-effectiveness evaluates the effectiveness of ongoing public programs to ensure the efficient use of resources. Both methods attempt to relate costs of programs to performance and to quantify costs in dollar values. The major distinction between cost benefit and cost effective analysis is how
the outcomes are quantified. Cost effective measures outcomes as a quantitative but nonmonetary unit of measure. For example, the unit of measure might be the number of lives saved or the amount of time saved (Berghammer, 1995).

Cost Effective Analysis is used to evaluate two or more alternatives that will achieve the same objective without measuring the benefits. It is used for giving the best possible profit or benefits in comparison with the money that is spent. Cost effective analysis is the preferred method when it is impossible to measure benefits. It is used to evaluate two or more alternatives that will achieve the same objective without measuring the benefits. It may also be used in a situation where an objective is mandated and program termination is not an option. Hence, the purpose of this type of analysis becomes to achieve a desired program goal or objective at minimum costs.

Cost effective is an analytical technique related to cost benefit analysis. Benefits, however, are not considered. If the benefits of each alternative are the same, it is not necessary to give them a dollar value. Cost-effective analysis is a good substitute for cost-benefit analysis. The costs of each alternative must be identified and measured. Then, the most efficient alternative is selected (Berghammer, 1995).

The cost-effectiveness approach has a number of strengths. Most important is that it only requires combining cost data with the effectiveness data that should be readily available. Its one major disadvantage is that you can compare the cost-effectiveness ratio among alternatives only if they all have the same goal. For example, it would not be possible to compare the cost-effectiveness of programs dealing with reading and mathematics, or education versus health. Cost-effective analysis explores how results can be achieved and which costs are attached to them for reaching different levels of the desired outcomes.

4.10. PRINCIPLES OF COST-BENEFIT ANALYSIS

Watkins explained some basic principles for measuring Cost Benefit Analysis.

I. There must be a Common Unit of Measurement

In order to reach a conclusion as to the desirability of a project all aspect of the project, positive and negative, must be expressed in terms of a common unit, i.e. there must be a “bottom line”. The most convenient common unit is money. This means that all benefits and costs of a project should be measured in terms of their equivalent money value. A program may provide benefits which are not directly expressed in terms of dollars but there is some amount of money the recipients of the benefits would consider just as good as the project’s benefits. Not only do the benefits and
costs of a project have to be expressed in terms of equivalent money value, but they have to be expressed in terms of dollars of a particular time. This is not just due to the differences in the value of dollars at different times because of inflation. A dollar available five years from now is not as good as a dollar available now. This is because a dollar available now can be invested and earn interest for five years and would be worth more than a dollar in five years. If the interest rate is $r$ then a dollar invested for $t$ years will grow to be $(1+r)^t$. Therefore the amount of money that would have to be deposited now so that it would grow to be one dollar $t$ years in the future is $(1+r)^{-t}$. This called the discounted value or present value of a dollar available $t$ years in the future.

When the dollar value of benefits at some time in the future is multiplied by the discounted value of one dollar at that time in the future the result is discounted present value of that benefit of the project. The same thing applies to costs. The net benefit of the projects is just the sum of the present value of the benefits less the present value of the costs.

II. Double Counting of Benefits or Costs must be avoided

Sometimes an impact of a project can be measured in two or more ways. For example, when an improved highway reduces travel time and the risk of injury the value of property in areas served by the highway will be enhanced. The increase in property values due to the project is a very good way, at least in principle, to measure the benefits of a project. But if the increased property values are included then it is unnecessary to include the value of the time and lives saved by the improvement in the highway. The property value went up because of the benefits of the time saving and the reduced risks. To include both the increase in property values and the time saving and risk reduction would involve double counting.

III. Cost Benefit Analysis involves a particular Study Area

The impacts of a project are defined for a particular study area, be it a city, region, state, nation or the world. The nature of the study area is usually specified by the organization sponsoring the analysis. Many effects of a project may ‘net out’ over one study area but not over a smaller one. The specification of the study area may be arbitrary but it may significantly affect the conclusions of the analysis.
IV. **The Analysis of a Project should involve a With versus Without Comparison**

The impact of a project is the difference between what the situation in the study area would be with and without the project. When a project is being evaluated the analysis must estimate not only what the situation would be with the project but also what it would be without the project. In other words, the alternative to the project must be explicitly specified and considered in the evaluation of the project. Note that the with-and-without comparison is not the same as a before-and-after comparison.

V. **Benefits are Usually Measured by Market Choices**

When consumers make purchases at market prices they reveal that the things they buy are at least as beneficial to them as the money they surrender. Consumers will increase their consumption of any commodity up to the point where the benefit of an additional unit (marginal benefit) is equal to the marginal cost to them of that unit, the market price. Therefore for any consumer buying some of a commodity, the marginal benefit is equal to the market price. The marginal benefit will decline with the amount consumed just as the market price has to decline to get consumers to consume a greater quantity of the commodity. The relationship between the market price and the quantity consumed is called the demand schedule. Thus the demand schedule provides the information about marginal benefit that is needed to place a money value on an increase in consumption.

VI. **Gross Benefits of an increase in Consumption is an area under the Demand Curve**

The increase in benefits resulting from an increase in consumption is the sum of the marginal benefit times each incremental increase in consumption. As the incremental increases considered are taken as smaller and smaller the sum goes to the area under the marginal benefit curve. But the marginal benefit curve is the same as the demand curve so the increase in benefits is the area under the demand curve. As shown in Figure-4.1 the area is over the range from the lower limit of consumption before the increase to consumption after the increase.
4.11. APPLICATIONS OF COST-BENEFIT ANALYSIS IN LIBRARIES

Cost-benefit Analysis is used as a tool for communicating the value of libraries. It is a powerful tool to use when libraries have to prove their worth and economic value. Librarians must justify their budget allocations and demonstrate values of library’s collection and services to the higher authorities. After the use of CBA, Library can establish the credibility and accountability.

Some applications of CBA in libraries are given below:

1. CBA is used for measuring the economic value of all types of libraries i.e. academic library, public library, special library and national library etc. It can be used to assess the National Library contribution to the national economy. The value added by the national library takes many forms- economic, cultural, social and intellectual.

2. To assess the economic value of all types of collections such as books, e-books, print journals, e-journals, magazines, newspapers, audiovisual materials etc. available in libraries.

3. To estimate the economic value of services provided by libraries such as circulation service, information services, technical services, reference service, newspaper clipping service etc.
4. Cost-benefit Analysis also helps to assess the value library provides in terms of information resources disseminated to their research communities.

5. A Cost-benefit Analysis can be conducted for providing proof of value and demonstrate that their collection development efforts support university priorities and reputation.

6. It can be used to demonstrate that library research collections add to income generating activities, and draw attention to the library’s role in the externally funded research process and underline the correlation between the library and grant activities.

7. Cost-benefit Analysis can be applied to models of library book sales of several types: annual, on-going, and online. In each instance, analysis indicates that book sales are not cost-effective.

8. With the help of CBA, the economic impact of public libraries on the society can be calculated and to explore whether or not the citizens found that their benefits outweighed the costs to provide them.

9. It can be used as a tool for financial decision making for digital library project management. CBA is a useful tool where decisions are based on financial considerations.

10. Cost/benefit Ratio can be used for deciding which journal titles to select for acquisition in a library. Due to shrinking budget CBA provides a hint of journal retention or cancellation.

11. It can be used for comparing print and electronic journals subscribed in the library.

12. It can be used to compare cost-benefit analysis of the two systems of subscription to periodicals i.e. direct subscriptions or the agency system.

13. It can be used for comparing three models of journals access i.e. direct subscriptions, pay per view and big deals.

14. It can be used for comparing the Costs and benefits of periodical ownership against online access of a full-text periodical database in library.

15. It can be used to measure the Return on Investment (ROI) of a Consortium.
4.12. DIFFICULTIES AND LIMITATIONS OF CBA

There are some difficulties in performing a cost-benefit analysis. It is not always a totally objective procedure that can guarantee an evaluation free from error. Identifying the benefits and measuring them in dollars is the most difficult part of cost-benefit analysis in libraries. Choosing different discount rates to compute the present value of net social benefits can drastically affect the outcome of an analysis. Placing a dollar value on benefits can be very subjective, Inflation and other intangible items make placing dollar amounts on future and present value difficult. When many of the important benefits are intangible, cost-benefit analysis is probably not worthwhile. Also, if the needed information is not available at reasonable cost within the time period in which a decision must be made, a major cost-benefit effort is probably not a good idea (Berghammer, 1995).

According to Sidorko (2010) there are many possibilities that may have contributed to the discrepancies. Most of these primarily relate to the data collection processes. For example, the issue of grant funding may be seen as sensitive by some institutions administrations who may have consequently been reluctant to disclose the data, making the investigation process not only time consuming but, more importantly, prone to error and omission. Other factors that certainly contributed to complexity in the data gathering process, and thereby may have contributed to the variance, include:

- Differences in terminology (e.g. different academic ranks and how translated into the data);
- The variations in data collection periods (e.g. the use of fiscal year, academic year, calendar year);
- Languages
- The complexity of managing different datasets of varying quality and volume.

Disadvantages

1) Hard to identify all relevant costs and benefits
2) Mistakenly including "transfers" that are not real costs or benefits
3) Hard to place dollar values on certain benefits and costs
4) Impossible to convert some costs and benefits into dollar values (intangibles)
5) Hard to identify the proper discount rate
6) Considerable time, costs and expertise usually required to do a cost-benefit analysis
7) Some decisions have to be subjective

Severe budget constraints on library budgets have forced decision makers to carefully analyze the different options that are provided within a program. Limited resources force administrators to make difficult choices among competing projects. The most fundamental proposition of economics is that resources are always limited, compared with what people want. "These scarce resources must be allocated among competing wants, so that citizens of the community receive the largest benefits possible.

The allocation of resources involves comparing alternatives. Cost benefit analysis has been used as a method for comparing the worth of competing projects. The objective of a cost-benefit analysis is to provide administrators with a criterion with which they can make choices among competing alternatives.

Administrators must decide if the gain to society (benefit) from the project is greater than the social sacrifice (cost) required to produce the project. If so, the project is recommended as a worthwhile project. A worthwhile project improves society's economic condition because these projects direct resources where their uses provide a greater return than would an alternative use. This is the essence of cost-benefit. The two key decision-making techniques pertaining to the costs of providing automated library service are cost-benefit analysis and cost-effectiveness analysis.

4.13. COST-BENEFIT ANALYSIS AS ECONOMIC ANALYSIS

According to Whitehall (1995) libraries are economic entities, they use resources to satisfy human desires or wants. Economic analysis is relevant to decisions made in libraries because both are about "the allocation of scarce resources to satisfy competing ends" –a definition which describes economics by the nature of the problem to be solved, rather than by the sphere of action. Economists are not people who believe that value is a monetary term only. They are interested in finding a cash equivalent for value because they need to use the measuring rod of money to make comparisons between cost and effect.

Cost-benefit and Cost-effectiveness are types of Economic Analysis and management tools which are used to determine the costs and benefits of a particular project. After costs and benefits are determined these methodologies are used to choose between alternative projects. Hence, they represent a method to make decisions about funding among different types of library functions such as collection development, cataloguing and circulation. Many small libraries cannot keep up with
the rapid increase in technological advancements. The associated costs of expanding computerized library and information services increase faster than library administrators can incorporate such changes in their budgets. Library administrators are thus faced with the task of incorporating new technology in a stressful fiscal environment. Priorities need to be identified, a continuum of services developed and program costs delineated. The issues surrounding costs for automation of small libraries reflect a need for an effective method of outlining priorities and selection of those priorities. This method should also take into account efficiency. The need for cost-benefit analysis in library and information services has become more important as the competition for dollars with other governmental agencies increases.

Several methods for estimating the financial value of libraries have emerged in recent studies. Much of the progress in library valuation methodologies has been made in public libraries. Like academic libraries, public libraries increasingly need to demonstrate their value to their funders in quantifiable terms. The Americans for Libraries Council conducted an extensive review of public library valuation methods and identified 3 popular methodologies: cost/benefit analysis, contingent valuation, and secondary impact analysis (Tenopir, 2010).

4.14. THE CONTINGENT VALUATION METHOD

The contingent valuation (CV) method is a direct and explicit method using surveys to value public goods. The method avoids the absence of markets for public goods by presenting the respondents with a hypothetical market, in which they have the opportunity to ‘buy’ or ‘bid for’ the good in question. The CV method is based on the individual’s own assessment of the good to be valued. The technique aims at eliciting people’s willingness to pay in money amount for a change in the provision of a non-market good. It has been applied for valuing various cultural goods (Noonan, 2003), such as museums and theatres and also libraries (Harless & Allen, 1999; Holt, Elliott & Moore, 1999).

A panel of economic experts set up by the U.S. National Oceanic and Atmospheric Administration (NOAA) examined the technique and supported its reliability (Arrow et al., 1993). The panel also provided guidelines for the appropriate use of the method. These guidelines are still influential in the design of CVM studies.

CV technique is supported by the Nobel Prize winning economists Kenneth Arrow and Robert Solow, permits a rational quantitative evaluation of the total benefit to the nation of publicly funded institutions and programmes. Building on this
analytical achievement, the UK government and international organisations such as the World Bank and the OECD have used the technique, to inform and guide policy (measuring our value).

CVM has been most widely used for estimating through surveys a user’s overall perceived value of all kinds of non-market services. The CVM is used to measure the perceived value of various services offered by the special library by assessing the user’s “willingness to pay” (WTP) and “willingness to accept” (WTA) alternatives to no library services provided (Chung, 2007).

Calculation procedures to determine the benefit score deriving from use of physical resources are as follows:
1. Add all monetary values for time saved (first benefit element).
2. Add all monetary values for resources used (second benefit element).
3. Add 1&2 to obtain the total estimated monetary value for all respondents.
4. Divide the total monetary value by no. of respondents.
5. Multiply the use frequency to measure the actual benefit of the service for the year.
6. Compare this figure with the cost of providing the service.

The outcome can be simplified into the following equation.

The benefit realized through the use of physical resources:

$$\text{Benefit} = \left[ \frac{T_1 + T_2 + \ldots + T_N + I_1 + I_2 + \ldots + I_N}{N\times U} - C \right]$$

Where:
- $T_1$ = Value of saved time
- $I_1$ = Value of resources
- $N$ = Number of respondents
- $U$ = Use frequency
- $C$ = Purchasing price

CVM has been used for decades to estimate the value of nonmarket goods and services in a wide range of areas. Generally two types of methods are available to measure the user benefits of services provided: the revealed preference (RP) and the CV methods. As the RP method drives value estimates from comparable existing market behaviours, it is not readily applicable to evaluate library services that have the characteristics of nonmarket or public goods. In CVM, or stated preference (SP) studies, respondents are presented with fictional situations and asked to respond to
those situations with stated preferences or intentions that reflect the value and benefits of services being measured (Ko, Shim, Pyo, Chang, & Chung, 2012).

In CVM, two types of questions are used to elicit value: willingness to pay (WTP), the maximum amount a person is willing to pay for a service or a good, and willingness to accept (WTA), the maximum amount a person is willing to accept as compensation. Although there has been considerable controversy regarding the difference between and appropriateness of the two types of questions. It is generally agreed that WTP is a more conservative measure than WTA (Martin-Fernandez et al., 2010). As a measure of economic valuation both WTP and WTA represent relative value, expressed in monetary terms, reflecting benefits library users experience in specific situations, rather than the real value of library services.

4.14.1. Difficulties and Limitations of CV Method

There are some difficulties in implementation of methods based on constructed markets, due to their reliance on expressed intent and hypothetical and not real behaviour. Most respondents are familiar to receiving library services at no cost and therefore are not familiar with placing monetary values on library services. Hence, the CVM needs to be modified so that the respondent has an adequate basis to be able to make an educated, well-founded assessment of values they would apply to the library setting. A main objective is therefore to bring respondents’ intentions as closely as possible in line with their feasible actions. The description of the scenario where the valuation is going to take place is critical. Careful considerations are necessary in designing the scenario in a CV study (Chung, 2007).

4.15. COST-BENEFIT ANALYSIS OF JOURNALS

In current years library budgets and shelving space are decreasing, while costs and numbers of journals as well as demands of users are increasing. Librarians are conducting journal use studies for solving these problems. Measuring the use of journal collection is a complicated and tedious process, because Journal collection takes many forms such as journal titles available only in print, print titles that have electronic form also and titles that are only available electronically. Collecting journal usage data has become more complicated because most libraries have both print and electronic journals in their collections. In order to get a complete look at how journal collections are used, collecting usage data for both print and electronic journals is important. Librarians use journal usage statistics for many practical applications:

1. To begin or end subscriptions
2. To justify budget allocations
3. To prioritize research areas, programs and education
4. To seek funding, while university administrations and faculty bodies use citation information for many of the same purposes. Publishers are beginning to price journal and database subscriptions based on the number of articles retrieved from them.

Based on Cost/benefit Ratio approach Kraft, Polacsek, Soergel, Burns & Klair (1976) framed a model for deciding which journal titles to select for acquisition in a biomedical library. They explained a cost/effectiveness approach to the journal selection problem. First of all they developed the list of possible journal titles to be considered, the cost of these titles are recorded and updated periodically. Measurement of total journal usage, journal relevance and journal availability elsewhere calculated for each title. A total weighted measure of journal worth is then calculated, based on subjective weights for each measure. Then the algorithm based on ranked cost/benefit ratios can be applied.

Vaughan attempted to compare the main three methods used in most science libraries; reshelving data, citation analysis and the ISI impact factor rankings. Using the Spearman correlation coefficient $\rho$, it was found that reshelving and citation analyses generate the most similar ranked lists of journals. It was suggested that librarians should combine results from both methods in order to capture a more complete picture of journal value. He also emphasised that use statistics are usually collected in time of crisis, especially when the collection must be cut due to budgetary restrictions or must be weeded for space on the shelves. It is difficult to compare results of use studies across institutions or even among branches of a single library system, since journal use varies by discipline and user base (Vaughan, 2001).

Since journals are so crucial to scientific communication, measuring published use can be useful for research libraries. According to Chrzastowski and Olesko (1997) scientists cite journals more frequently than scholars in the social sciences and humanities do.

The most popular global method of citation analysis is the ISI’s Journal Impact Factor (IF) as reported in the Journal Citation Reports every year. A journal’s Impact Factor is the fraction (number of citations to articles in that journal in the previous 2 years) / (number of articles published in the previous 2 years in that journal). Garfield
originally proposed it in 1995 as a measure of quality of journals in the Science Citation Index (Garfield 1999).

4.15.1. Methods for Measuring the Use of Print Journals

Kraft, Polacsek, Soergel, Burns & Klair (1976) revealed that the key to the journal selection decision model is the measurement of the worth of a journal. Usage is the single most important factor in selecting titles. There are several categories of usage. For example:

1. Circulation, but most libraries do not allow journals to circulate outside the library. In-house use, which is quite difficult to measure, for there is no record keeping involved.
2. One can ask users what items they used via a questionnaire or an interview,
3. One can watch users and record what items one sees in use, one can watch the stacks and record which items are missing from the shelves, or one can investigate to see what items are left in individual carrels, on return carts, on return shelves, and on reading room desks.
4. Another measure of usage is the interlibrary loan (ILL). The count of those items borrowed from other libraries will give an indication of the demand for and use of items not owned by the library. The count of those items borrowed by other libraries may be useful in considering total usage of journal titles.
5. A fifth measure of usage is a count of how often journals are used for photocopying.

Total usage is then the sum of circulation and in-house usage, including photocopying and interlibrary loans (Kraft et al., 1976).

Another method for measuring the use of journals is survey the users by asking question “In the past month (30 days) approximately how many articles have you read? Reading is defined as going beyond the table of contents, title and abstract to the body of the article (King, Boyce, Montgomery, & Tenopir, 2003).

Suseela (2010) has explained some methods for measuring the usefulness of journals such as:

1. Citation analysis i.e. application of quantitative techniques
2. Table count, slips method, direct observation, photocopy requests, interlibrary loan, document delivery requests and data from circulation section or automated circulation system.
3. Conducting surveys by distributing questionnaires to measure the purpose and value of resources especially e-journals.

4. The latest method is the use of log files generated in data servers on every interaction/transaction of the user while accessing the content. They are referred to as usage statistics or usage reports. They will be supplied by publishers, aggregators and consortia to their subscribers or members.

4.15.2. Methods for Measuring the Use of E-journals/Databases

Research has also shown that faculty and students prefer online materials to print (Brown, 1999; Morse & Clintworth, 2000; Rogers, 2001). The ease of access and increased functionality of online materials allow users to review more material in a shorter amount of time, which may lead them to review additional material, review more diverse material or produce publications at a faster rate. These changes in information seeking and use behaviours should be evident from new patterns of citation or online journal usage.

4.15.2.1. COUNTER

COUNTER (Counting Online Usage of Networked Electronic Resources) is an international initiative serving librarians, publishers and intermediaries by setting standards that facilitate the recording and reporting of online usage statistics in a consistent, credible and compatible way. It was launched in March 2002. The first COUNTER Code of Practice, covered online journals and databases was published in 2003. The body of COUNTER compliant usage statistics has steadily grown as more and more vendors have adopted the COUNTER Codes of Practice. This has contributed to the new discipline of usage bibliometrics and a great deal of work is underway to try to establish value metrics associated with usage, in which the COUNTER compliant statistics play an important role.

In 2006 COUNTER carried out research, on the effects of publisher platforms on usage and are currently collaborating with the UK Serials Group on the possible development of a new Journal Usage Factor metric. COUNTER has also worked with NISO on SUSHI (Standardised Usage Harvesting Initiative) to develop a protocol to facilitate the automated harvesting and consolidation of usage statistics from different vendors. COUNTER brings the following benefits to librarians, publishers and intermediaries:
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1. Librarians are able to compare usage statistics from different vendors, derive useful metrics such as cost-per-use; make better-informed purchasing decisions; plan infrastructure more effectively.

2. Publishers and intermediaries are able to provide data to customers in a format they want; compare the relative usage of different delivery channels; aggregate data for customers using multiple delivery channels; learn more about genuine usage patterns.

Objectives

While COUNTER has greatly improved the reliability and usability of online vendor usage statistics, there is still much to do, and keep the COUNTER codes up to date with changes in the online delivery of information. Their future objectives fall into three broad categories.

1. To improve further the reliability of the core COUNTER data and extend scope of the Code of Practice beyond journals, databases and books.

2. To continue to increase the number of COUNTER compliant vendors.

3. To work with other industry organizations to facilitate the implementation of COUNTER and develop metrics based on the COUNTER data that are of practical value to both librarians and vendors.

OTHER INITIATIVES ON USAGE STATISTICS

ARL STATISTICS AND ASSESSMENT

The ARL (Association of Research Libraries) Statistics and Assessment was set up in response to the following two needs: increasing demand for libraries to demonstrate outcomes/impacts in areas important to the institution and increasing pressure to maximize use of resources. Of particular interest is the work associated with the E-metrics portion of this initiative, which is an effort to explore the feasibility of defining and collecting data on the use and value of electronic resources.

NISO/SUSHI (2015)

NISO is the National Information Standards Organization of the United States. COUNTER has worked with NISO on SUSHI (Standardized Usage Harvesting Initiative) to develop a protocol to facilitate the automated harvesting and consolidation of usage statistics from different vendors. This protocol is now available and may be found on the NISO/SUSHI website above.
REFERENCES


http://works.bepress.com/cgi/viewcontent.cgi?article=1049&context=kt_vaugh
an


Chapter 5
Data Analysis & Interpretation
CHAPTER-5
DATA ANALYSIS AND INTERPRETATION

This chapter contains the analysis of responses received from the Librarian of Maulana Azad Library (AMU), Sayaji Rao Gaekwad Library (BHU) and the users (Research Scholars and Faculty Members) of the libraries under study through the interpretation of questionnaires. The analysis has been divided into three parts. First Part-A contains the responses received from Librarians of Central Universities i.e. AMU and BHU. The second Part-B consists of responses received from users (Research Scholars and Faculty Members) of libraries under study regarding the use of Journals collection and their willingness to pay to access articles per month and the third Part-C contains the analysis of usage statistics of E-Journals/Databases acquired through UGC-Infonet Digital Library Consortium in the libraries under study. Analysis of the entire questionnaire has been carried out with the help of tables, statistical analysis, graphs and textual presentations.

PART-A: COST ANALYSIS OF JOURNALS

5.1 INTRODUCTION

Journals are the most essential and expensive resources subscribed in the University Libraries. Therefore there is a need of extra care in purchasing these resources and to check the benefit of these resources and compare with the cost at different intervals. For the present study the investigator calculated cost from the analysis of the responses received from librarians and Benefit from Research Scholars and Faculty Members of Central Universities i.e. AMU and BHU under study.

A questionnaire was prepared by the investigator to know the total library budget, budget of the journals and expenditure (amount spent) on journals, total number of current journals subscribed, various other costs associated with journals and methods used to estimate the usage of Journals. It was administered to the librarians of the two Central Universities of Uttar Pradesh i.e. AMU and BHU for data collection, where hundred percent responses were received. The collected data centered on the following points:

i. Total library budget and total amount spent on current journals
ii. Total number of current journals subscribed by library
iii. Total number of staff working in the Periodicals section and their annual salaries

iv. Amount spent for maintaining journals collection such as stationeries, equipments, machineries etc.

v. Methods used to estimate the usage of Print as well as E-journals

Maulana Azad Library and Sayaji Rao Gaekwad Library are the Central Libraries of AMU and BHU respectively. Both Universities are Central Universities of Uttar Pradesh and established under the University Grants Commission. There are four Central Universities in Uttar Pradesh. The present study is limited to the two Universities which are reputed and well established institutions of higher learning in the state of Uttar Pradesh.

Sayaji Rao Gaekwad Library of Banaras Hindu University was established in 1941, whereas Maulana Azad Library of Aligarh Muslim University was established in 1960 to cater the needs of the Students, Research scholars and Faculty Members of the University. It is found that Sayaji Rao Gaekwad Library (BHU) is the oldest library among the two selected libraries.

5.1.1. Library Budget

Finance is the most significant factor for running any organization successfully, without financial support; no library can achieve its goal or fulfill its commitments. Annual budget is a significant indicator of financial requirements of any library. Central Libraries of AMU and BHU spent considerable amount for subscribing to library resources during the years 2010-15 as depicted in the Table-5.1 and Figure-5.1.

Table-5.1
Library Budget

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>AMU (Amount in Rupees)</th>
<th>BHU (Amount in Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010-11</td>
<td>2,22,20,000</td>
<td>4,92,59,463</td>
</tr>
<tr>
<td>2.</td>
<td>2011-12</td>
<td>2,22,20,000</td>
<td>6,05,84,590</td>
</tr>
<tr>
<td>3.</td>
<td>2012-13</td>
<td>2,22,20,000</td>
<td>4,29,64,375</td>
</tr>
<tr>
<td>4.</td>
<td>2013-14</td>
<td>2,33,74,000</td>
<td>5,35,19,719</td>
</tr>
<tr>
<td>5.</td>
<td>2014-15</td>
<td>2,38,75,000</td>
<td>6,89,63,625</td>
</tr>
<tr>
<td>Average budget</td>
<td>2,27,81,800</td>
<td>5,50,58,354</td>
<td></td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee (₹) the official currency of India
The data provided in the Table-5.1 and Figure-5.1 reveals that in AMU, the annual library budget is constant (₹2,22,20,000) for the financial years 2010 to 2013. AMU library received XIIth Plan Grant (₹72,90,000) and library budget increased to the tune of ₹2,33,74,000 and ₹2,38,75,000 in the years 2013-2014 and 2014-15 respectively. In the case of BHU, there was a constant increase in the allocation of library budget from ₹4,92,59,463 in the year 2010-11 to ₹6,05,84,590 in the year 2011-12. But BHU library revealed a decline in the budgetary allocation, an amount of ₹4,29,64,375 allotted to library resources in the year 2012-13. Again allocation of budget was increased to ₹5,35,19,719 in the year 2013-14 and ₹6,89,63,625 in the year 2014-15.

As far as the total library budgetary allocation in both the libraries is concerned, BHU library got a higher budget i.e. ₹6,89,63,625 than the central library of AMU, ₹2,38,75,000 in the year 2014-15. On an average library budget in AMU was ₹2,27,81,800 whereas BHU library got a higher average budget ₹5,50,58,354.

![Fig. 5.1: Library Budget (Amount in Rupees)](image)

5.1.2 Annual Growth Rate (Library Budget)

The present study focuses upon the annual growth rate in the allocated budget for the libraries under study from 2010-11 to 2014-15 as depicted in the Table-5.2 and Figure-5.2.
**Table-5.2**

**Annual Growth Rate (Library Budget)**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>AMU Annual Budget</th>
<th>Increased/ Decreased</th>
<th>Annual Growth (%)</th>
<th>BHU Annual Budget</th>
<th>Increased/ Decreased</th>
<th>Annual Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010-11</td>
<td>2,22,20,000</td>
<td>-</td>
<td>-</td>
<td>4,92,59,463</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2.</td>
<td>2011-12</td>
<td>2,22,20,000</td>
<td>0</td>
<td>-</td>
<td>6,05,84,590</td>
<td>1,13,25,127</td>
<td>22.99</td>
</tr>
<tr>
<td>3.</td>
<td>2012-13</td>
<td>2,22,20,000</td>
<td>0</td>
<td>0</td>
<td>4,29,64,375</td>
<td>-1,76,20,215</td>
<td>-29.08</td>
</tr>
<tr>
<td>4.</td>
<td>2013-14</td>
<td>2,33,74,000</td>
<td>1154000</td>
<td>5.19</td>
<td>5,35,19,719</td>
<td>1,05,55,344</td>
<td>24.56</td>
</tr>
<tr>
<td>5.</td>
<td>2014-15</td>
<td>2,38,75,000</td>
<td>501000</td>
<td>2.14</td>
<td>6,89,63,625</td>
<td>1,54,43,906</td>
<td>28.85</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Growth</td>
<td>1.83%</td>
<td></td>
<td></td>
<td>11.83%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee ( ₹ ) the official currency of India

It was revealed from the Table-5.2 and Figure-5.2 that in AMU, the library budget was constant from the year 2010 to 2013, an annual growth of 5.19% in the year 2013-14 and 2.14% annual growth in the library budget was observed in the year 2014-15.

In BHU, the library budget is observed to be fluctuating from the year 2010 to 2015, a large annual growth of 22.99% is seen in the year 2011-12 and a decline of 29.08% in annual growth is reported in the year 2012-13. After that there is a steep rise in growth of 24.56% and 28.85% noticed in the year 2013-14 and in the year 2014-15 respectively.

Thus, it becomes apparent from the analysis that there was no growth in the budgetary allocation in AMU except for the year 2013-14 and 2014-15. Whereas a
fluctuating growth pattern (increasing/decreasing) of library budget was discernible in BHU library.

In the light of the Average Annual Growth, analysis shows that BHU library had an average annual growth of 11.83% in the library budget whereas AMU library had only 1.83% average annual growth in the library budget.

5.1.3 Expenditure or Amount Spent on Journals

University libraries usually spend more than 70 percent of their total budget on the subscription of journals only. Journal is a source of current information and has become a very important source these days because the results of research being carried out in different parts of the world are communicated through them.

Understanding the actual needs of Researchers and taking steps to satisfy them is the first step of a University library hence the budgetary allocation of journals according to the need of the researchers play an important role in subscribing to journals. It may vary from one library to another. The total money spent (expenditure) on both the forms of journals (print and electronic) in the central libraries of AMU and BHU are depicted in the Table-5.3 and Figure-5.3.

**Table-5.3**

Expenditure or Amount Spent on Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>AMU Total Amount Spent on Journals</th>
<th>BHU Total Amount Spent on Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010</td>
<td>1,70,000,00</td>
<td>1,96,85,854</td>
</tr>
<tr>
<td>2.</td>
<td>2011</td>
<td>1,70,000,000</td>
<td>2,32,03,516</td>
</tr>
<tr>
<td>3.</td>
<td>2012</td>
<td>1,70,000,000</td>
<td>2,22,89,811</td>
</tr>
<tr>
<td>4.</td>
<td>2013</td>
<td>1,60,000,000</td>
<td>2,55,96,356</td>
</tr>
<tr>
<td>5.</td>
<td>2014</td>
<td>1,60,000,000</td>
<td>1,33,94,352</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>1,66,00,000</td>
<td>2,08,33,977</td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee (₹) the official currency of India

The data available for journals’ budget was provided in the form of amount spent for purchasing/acquiring journals by the BHU library. Whereas, AMU library provided the budget for purchasing/acquiring journals.

A quick look at Table-5.3 and Figure-5.3 shows that the amount spent on journals was higher in BHU library than AMU library except in the year 2014. The BHU library spent maximum amount in 2013 to the tune of ₹2,55,96,356 whereas the AMU library had ₹1,60,000,00 as a budget in the year 2013.
AMU library spent ₹1,70,00,00 on journals for the years 2010 to 2012 and ₹1,60,00,00 for 2013 to 2014. Periodicals Section of the library had ₹2,00,00,00 annual budget allocated for subscription of current journals and spent the same amount in the year 2008-2009 and then onwards it is continuously decreasing, whereas the number and price of Journals are escalating.

Thus, it becomes apparent from the analysis that on an average BHU library spent more amount (₹2,08,33,977) on the journals than the central library of AMU (₹1,66,00,00).

5.1.4 Adequacy of Budget

An attempt has been made to know whether the current budget is adequate to fulfill the requirements for a good journals collection. Data reveals that in AMU library, the present budget was found insufficient for developing a good journals collection and necessary to meet Researchers needs and an additional amount of ₹40,00,00 is required for Print journals and ₹60,00,00 is required for E-journals.

Data reveals that in BHU library, amount spent on subscribing journals is by and large adequate to meet the routine requirements of the Researchers.

5.1.5 Journals Collection

The Journals collection of the University library forms a sound foundation to provide efficient services to its users; however the size of journals collection of a University library depends upon a number of factors such as budget for journals and
users need. The number and type of users, whom the library has to serve also determines the size of the collection. The library management has to strive continuously to get enough funding for developing a worthwhile journals collection of research value. Total number of current journals subscribed by surveyed libraries from 2010-2014 is shown in the following Table-5.4 and Figure-5.4.

**Table-5.4**  
Journals Subscribed by Libraries

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Print Journals</td>
<td>E-Journals (Subscribed)</td>
</tr>
<tr>
<td>1.</td>
<td>2010</td>
<td>921</td>
<td>0</td>
</tr>
<tr>
<td>2.</td>
<td>2011</td>
<td>671</td>
<td>0</td>
</tr>
<tr>
<td>3.</td>
<td>2012</td>
<td>762</td>
<td>0</td>
</tr>
<tr>
<td>4.</td>
<td>2013</td>
<td>694</td>
<td>0</td>
</tr>
<tr>
<td>5.</td>
<td>2014</td>
<td>657</td>
<td>0</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>741</td>
<td>0</td>
</tr>
</tbody>
</table>

It is revealed from the Table-5.4 and Figure-5.4 that the central library of AMU was subscribing to more number of Print Journals than the central library of BHU during the years 2010-14. But the central library of BHU was subscribing to more number of Journals including E-journals than the central library of AMU. On an average BHU library subscribed to 2,603 journals (Print and E-journals) during the years 2010-14, whereas the central library of AMU subscribed on an average a total collection of only 741 comprised of Print journals and one online database i.e. LISA (Library and Information Science Abstract).

The acquisition of Journals in Maulana Azad Library (AMU) is done through a consolidated budget available for Journals (Print and Electronic). The journals are subscribed in accordance with the recommendations from the Faculty Members of the various departments. Most of them prefer to recommend print form of journals leading to the subscription of more Print journals. However, approximately 7,590 E-journals are available through UGC-Infonet Digital Library Consortium to the AMU library.

It was also observed in the above table that there is a trend of decreasing number of Print journals and increasing number of E-journals in BHU from the year 2010 to 2014. Similar findings of a study conducted by Kaur (2011) revealed that
The number of Print journals has decreased in 66% libraries after receiving access to E-journals. The Pearson correlation between Print Journals and Electronic Journals in BHU was worked out to be −0.946 indicating high degree of negative correlation i.e. the number of Print journals is decreasing while the number of E-journals is increasing. The correlation was tested to be highly significant (p < 0.015).

Thus, it is quite clear from the above analysis that BHU library subscribes to more journals (2603) than the AMU library (741).

![Figure 5.4: Journals Subscribed by Libraries](image)

5.1.6 Total Staff in the Periodicals Section

The main purpose of the present study is to calculate cost and benefit of journals, therefore the investigator considered the staff members working in the Periodicals Section of both the libraries under study. The following table gives a brief account of the manpower engaged in the Periodicals Section of the libraries under study.
Table-5.5

Staff in Periodicals Section

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Deputy Librarian</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2.</td>
<td>Assistant Librarian</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3.</td>
<td>Professional Assistant</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>4.</td>
<td>Semi Professional Assistant</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5.</td>
<td>Library Attendant</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6.</td>
<td>Technical Personal Assistant</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total number of Staff</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Table-5.5 states that there are eight staff members engaged in the Periodicals Section of MAL, AMU during 2012-15. Out of them, one is Assistant Librarian, one is Professional Assistant, four are Semi Professional Assistants, one is Technical Personal Assistant (TPA) and one staff is a Library Attendant.

Whereas in the central library of BHU there are seven staff members who handled the Periodicals Section during 2012-15, including one Deputy Librarian, one Assistant Librarian, one Professional Assistant, two Semi Professional Assistants and two Library Attendants. The table illustrates the comparison of working staff in Periodicals Section of the libraries under study. The maximum number of staff working in Periodicals Section on an average is in the central library of MAL, AMU (8) and SRGL, BHU (7).

5.1.7 Annual Salary of Staff in Periodicals Section (2014-15)

The present study has to demonstrate Cost-benefit Analysis of Journals Collection for one year (2014-15), since Journals are subscribed annually. As a result, it was required to calculate the manpower cost of one year for calculating the total cost of Journals in one year. Therefore investigator calculated the annual salary of all the staff working in the Periodicals Section of both the libraries under study in the year 2014-15. As indicated in the table-5.5, there are 8 staff in MAL (AMU) whereas there are only 7 staff in SRGL (BHU) involved in the Periodicals Section in the year 2014-15 respectively. Their gross monthly salaries and annual salaries of the financial year 2014-15 are depicted in Table-5.6.
It is evident from the above table that total annual salary of staff members (8) of Periodicals Section in Maulana Azad Library (AMU) was ₹47,92,920 during the financial year 2014-15. Therefore, the investigator calculated the amount (₹47,92,920) as the Manpower cost of Periodicals Section in AMU for the financial year 2014-15.

However, total annual salary of staff members (7) of the Periodicals Section in Sayaji Rao Gaekwad Library (BHU) was ₹41,53,248 during the financial year 2014-15. Therefore, the investigator calculated the amount of ₹41,53,248 as the Manpower cost of Periodicals Section in BHU for the financial year 2014-15.

Thus, it is clear from the analysis that the manpower cost of Periodicals Section is higher in AMU than the manpower cost of Periodicals Section in BHU during the financial year 2014-15.

5.1.8 Total Cost of Journals

It is a prerequisite to calculate the total cost of journals collection by adding the subscription cost, manpower cost, cost of stationeries and other maintenance cost of computers and equipments etc. The investigator has considered the amount spent on subscription of current journals as a subscription cost, total annual salary of staff in Periodicals Section constituting the manpower cost for hiring the Professionals in both the surveyed libraries during the financial year 2014-15.
It is significant to note that the data for one financial year i.e. 2014-15 was used for the present study. The total amount spent for subscribing journals and other expenditures during the financial year 2014-15 are mentioned in Indian Rupee (₹) the official currency of India is displayed in Table-5.7.

Table-5.7
Total Cost of Journals (2014-15)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Different kinds of Cost of Journals</th>
<th>AMU (Amount in Rupees)</th>
<th>BHU (Amount in Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Expenditure or Amount spent on Journals (subscription cost)</td>
<td>1,60,00,00</td>
<td>1,33,94,352</td>
</tr>
<tr>
<td>2.</td>
<td>Annual salary of the Staff (manpower cost)</td>
<td>47,92,920</td>
<td>41,53,248</td>
</tr>
<tr>
<td>3.</td>
<td>Cost of Stationeries</td>
<td>2000</td>
<td>3000</td>
</tr>
<tr>
<td>4.</td>
<td>Maintenance Cost</td>
<td>6000</td>
<td>9000</td>
</tr>
<tr>
<td><strong>Total Cost (₹)</strong></td>
<td></td>
<td><strong>2,08,00,920</strong></td>
<td><strong>1,75,59,600</strong></td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee (₹) the official currency of India

It is evident from the above table that the total cost of Journals collection in the central library (Maulana Azad library) of AMU is ₹ 2,08,00,920 in the financial year 2014-15. Whereas the total cost of Journals collection in the central library (Sayaji Rao Gaekwad Library) of BHU is ₹ 1,75,59,600.

Thus, it is visible from the analysis that the total cost of journals collection in the central library (Maulana Azad library) of AMU for the financial year 2014-15 was higher than the central library (Sayaji Rao Gaekwad Library) of BHU. This is because of less expenditure on subscribing journals in the central library of BHU in the year 2014-15. It was informed by the librarian of BHU that due to the introduction of IIT in BHU, lesser amount was spent on the subscription of journals in the central library of BHU in the year 2014-15.

5.1.9 Methods Used to Estimate the Usage of Print Journals

There are several methods available to measure the usage of Print journals which embraces both direct and indirect measures including in-house use, photocopy request, reshelving count, interlibrary loan requests, citation analysis and User survey/Feedback. The responses in regard to methods used to measure the usage of Print Journals are displayed in Table-5.8.
Table-5.8

Methods Used to Estimate the Usage of Print Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Methods</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>In-house Use</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>2.</td>
<td>Photocopy Request</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>3.</td>
<td>Reshelving Count</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>4.</td>
<td>Inter Library Loan Requests</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>5.</td>
<td>Citation Analysis</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>6.</td>
<td>User survey/Feedback</td>
<td>×</td>
<td>×</td>
</tr>
</tbody>
</table>

(Multiple responses were permitted)

It is evident from the above table that neither AMU library nor BHU library measure the usage of Print Journals or maintain statistics for recording the usage of Print journals. Although Bodycomb and Baglivo (2012) measured the Print usage from reshelving method for Print journal articles, with one volume shelved equivalent to one article read.

5.1.10 Methods Used to Estimate the Usage of E-Journals

There are various methods available to assess E-Journals’ usage including print outs, hit statistics, number of downloads, citation analysis and User survey/Feedback. The responses in regard to methods used to measure the usage of E-Journals are presented in the following Table-5.9.

Table- 5.9

Methods Used to Estimate the Usage of E-Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Methods</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Print outs</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>2.</td>
<td>Hit Statistics</td>
<td>√</td>
<td>×</td>
</tr>
<tr>
<td>3.</td>
<td>Number of Downloads</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>4.</td>
<td>Citation Analysis</td>
<td>×</td>
<td>√</td>
</tr>
<tr>
<td>5.</td>
<td>User survey/Feedback</td>
<td>×</td>
<td>√</td>
</tr>
</tbody>
</table>

(Multiple responses were permitted)

It is revealed from the above table that MAL (AMU) uses Hit Statistics and Number of downloads for measuring the usage of E-Journals whereas SRGL (BHU) uses Number of Downloads, Citation Analysis and User survey/Feedback.
5.1.11 Preference for E-Journals

Journals are available in two forms i.e. Print and Electronic. Presently E-Journals are considered the more preferred form because of several benefits to librarians as depicted in Table-5.10.

Table-5.10
Preference for E-Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Reasons</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Easy to Order</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>2.</td>
<td>Easy to Maintain</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>3.</td>
<td>Multiple Use</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>4.</td>
<td>No Space Problem</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>5.</td>
<td>No Problem of Theft and Mutilation</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

(Multiple responses were permitted)

The data obtained in the above Table reveals that librarians of both the libraries preferred E-Journals as they are easy to order, easy to maintain, multiple use, no space problem and no problem of theft and mutilation. These are witness to the reasons for acquiring E-journals as unveiled by the librarians of select libraries. The study conducted by Oliver Obst (2003) also showed that what is read or purchased is decided by ease of access and user friendliness.

5.1.12 Benefits of E-Journals in Time saving

Librarians were asked to indicate their opinion about saving time of staff members and users regarding the use of E-journals. Librarians of both the Universities agreed that time of staff members as well as users were saved due to increased use of E-journals as seen in table-5.11.

Table-5.11
Benefit of E-Journals in Time Saving

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Name of the Central Library</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Maulana Azad Library (AMU)</td>
<td>√</td>
<td>×</td>
</tr>
<tr>
<td>2.</td>
<td>Sayaji Rao Gaekwad Library (BHU)</td>
<td>√</td>
<td>×</td>
</tr>
</tbody>
</table>
Similar findings of a study conducted by Kaur (2011) revealed that due to access to E-journals 37% libraries reported that much time has been saved in cataloguing and maintaining print titles.

5.1.13 Impact of E-Journals on the Use of Print Journals

The investigator sought opinion from librarians of both Universities regarding the impact of E-journals on the use of Print Journals as seen in the following Table-5.12.

Table- 5.12

Impact of E-Journals on the Use of Print Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Impact of E-journals on Print Journals</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Usage Increased</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>2.</td>
<td>Usage Decreased</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3.</td>
<td>Decreased first then Increased</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>4.</td>
<td>Increased first then Decreased</td>
<td>×</td>
<td>×</td>
</tr>
</tbody>
</table>

Their opinion reveals that usage of Print Journals decreased with the use of E-journals. Besides this, the quality of research and number of research publications has also increased. Similar findings of a study conducted by Kaur (2011) revealed that the use of print journals decreased in 45% libraries while the use of E-journals increased in 86% libraries.

5.1.14 Impact of E-Journals on Users

The investigator questioned the librarians regarding the impact of E-journals on users. Their opinions revealed that there is a high and positive impact on users after the introduction of E-journals due to various advantages such as time saving, currency of knowledge and information on desktop. The number of users visiting the libraries had decreased as they were accessing E-journals from their respective departments, computer centers and hostels. Similar findings of the study conducted by Kaur (2011) revealed that 59% of the libraries had an increase and 23% show a decrease in the number of library users.

5.1.15 Methods Adopted for Promoting the Use of E-Journals

Effective promotion can serve purposes like increased usage, establishing communication and raising awareness. It also helps in building up the image of the library and librarian. Therefore providing guidance and user education for stimulating
the use of E-journals is essential. There are many methods to promote the use of E-journals as seen in the following Table-5.13.

### Table- 5.13

Methods Adopted for Promoting the Use of E-Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Methods</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Training programs</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>2.</td>
<td>Database specific User guide/hard copy</td>
<td>¥</td>
<td>√</td>
</tr>
<tr>
<td>3.</td>
<td>Library Web Page Links to E-Journal Publishers/Vendors</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>4.</td>
<td>General online guidance/tutorials on library use</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>5.</td>
<td>E-mail alerts to notify new E-journals</td>
<td>¥</td>
<td>¥</td>
</tr>
</tbody>
</table>

*Multiple responses were permitted*

The data from the above table reveals that both the libraries have adopted Training programs and library web page links to E-Journal Publishers/Vendors. BHU library also circulates database specific user guide (hardcopy) and subject list of E-journals on library web pages.

However it is noted that both the libraries do not send E-mail alerts to notify arrival of new E-journals nor do they provide general online guidance/tutorials on library use.

#### 5.1.16 Problems Faced while Providing access to E-Journals

In spite of many facilities provided through E-journals, there are many problems that are faced by librarians as shown in the following table-5.14.

### Table- 5.14

Problems Faced while Providing access to E-Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Problems of E-Journals</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Slow Connectivity</td>
<td>√</td>
<td>¥</td>
</tr>
<tr>
<td>2.</td>
<td>Slow Downloading</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>3.</td>
<td>Lack of Training / Orientation</td>
<td>¥</td>
<td>¥</td>
</tr>
<tr>
<td>4.</td>
<td>Lack of Maintenance</td>
<td>¥</td>
<td>√</td>
</tr>
<tr>
<td>5.</td>
<td>Lack of ICT Knowledge</td>
<td>√</td>
<td>¥</td>
</tr>
</tbody>
</table>

*Multiple responses were permitted*

The data as revealed from the above table shows that ‘Slow connectivity’ and ‘lack of ICT Knowledge’ among users are the major problems in providing access to
E-journals in the AMU library. Whereas, librarian of BHU claimed that lack of maintenance was the major problem in providing access to them.

PART-B: BENEFITS ANALYSIS OF JOURNALS

5.2 INTRODUCTION

For the present study the investigator calculated the cost of Journals using the analysis of librarians’ responses from the Central Libraries under study and Benefits of Journals were analysed from the responses received from the users (Research Scholars and Faculty Members) in central libraries of the Universities under study. Research Scholars and Faculty Members are the major consumers of Journals, therefore, the investigator selected them for the survey for calculating the benefits of journals into monetary terms with the help of Contingent Valuation Method.

5.2.1 Status of Research Scholars and Faculty Members in AMU and BHU

According to the information available on the websites of the select Universities (as on 30.05.2015), the investigator found that there were 2123 Research Scholars and 1209 Faculty Members in Aligarh Muslim University (AMU), whereas there were 5037 Research Scholars and 1218 Faculty Members in Banaras Hindu University (BHU). Thus it was observed that there were more Research Scholars in BHU as compared to AMU. Although number of Faculty Members was almost same in both the Universities.

5.2.2 Sample Distribution and Response Rate

The distribution of sample size for the total population of users in the select libraries is presented in the Chapter-1 (Table-1.1). While distributing the questionnaire, several points were considered such as total population of users and representation of both categories of users such as Research Scholars and Faculty Members of the select libraries. It was not feasible to collect large quantities of data having each and every Research Scholar and Faculty Member from both the Universities. Therefore, samples were selected by using Purposive sampling method having representations of Research Scholars and Faculty Members from Central Library, Maulana Azad Library, AMU and Sayaji Rao Gaekwad Library, Banaras Hindu University.

As mentioned in the Table 1.1, a total of 440 and 770 questionnaires were distributed among the Research Scholars and Faculty Members of AMU and BHU.
respectively. Out of the total administered questionnaires, a total of 356 filled-in questionnaires were received from AMU and 654 from BHU. Of the total questionnaires received, 24 questionnaires from AMU and 29 from BHU were rejected due to incomplete responses. Finally, 332 filled-in questionnaires from AMU and 625 from BHU were considered and used for data analysis. The total response rate of users in AMU and BHU as depicted in table-1.1 is found to be 75.45% and 81.16% respectively. The data obtained from the users (Research Scholars and Faculty Members) in the libraries under study are analyzed in the following tables and graphs along with their interpretation for easier understanding.

5.2.3 Frequency of Use of Journals

The frequency of journal usage is associated with the extent of use by its users. To find out the frequency of journal usage, the frequency of use was divided into four categories such as Daily; Twice in a week; Twice in a month; and Occasionally as shown in the following Table-5.15 and Figure-5.5.

**Table-5.15**

**Frequency of Use of Journals**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Frequency</th>
<th>AMU (RS =212)</th>
<th>FM (N=120)</th>
<th>Total (N=332)</th>
<th>BHU (RS =503)</th>
<th>FM (N=122)</th>
<th>Total (N=625)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Daily</td>
<td>72 (33.96)</td>
<td>42 (35.00)</td>
<td>114 (34.33)</td>
<td>239 (47.51)</td>
<td>46 (37.70)</td>
<td>285 (45.60)</td>
</tr>
<tr>
<td>2.</td>
<td>Twice in a week</td>
<td>67 (31.60)</td>
<td>39 (32.5)</td>
<td>106 (31.92)</td>
<td>164 (32.60)</td>
<td>45 (36.88)</td>
<td>209 (33.44)</td>
</tr>
<tr>
<td>3.</td>
<td>Twice in a month</td>
<td>48 (22.64)</td>
<td>24 (20.00)</td>
<td>72 (21.68)</td>
<td>72 (14.31)</td>
<td>19 (15.57)</td>
<td>91 (14.56)</td>
</tr>
</tbody>
</table>

RS = Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)

In this regard, the data obtained in table-5.15 and figure-5.5 reveals that 34.33% of the total respondents in AMU used journals daily, whereas 45.60% of the respondents in BHU used journals on daily basis.

It is noted that 31.92% of the users in AMU used journals twice in a week, whereas 33.44% used journals twice in a week in BHU and 21.68% of the users in AMU and 14.56% of the users in BHU used journals twice in a month.

However, 12.04% of the users in AMU and 6.40% of the users in BHU used journals occasionally.
Thus, it becomes apparent from the analysis that majority of the respondents 34.33% from AMU and 45.60% from BHU used journals daily, followed by twice in a week and twice in a month. However, a small percentage from both the Universities used the journals occasionally.

5.2.4 Purpose of Using Journals

Journal articles are read for many purposes, so to find out the purpose of using journals by the Research scholars and Faculty members, the purpose is classified into six categories i.e. (i) updating knowledge (ii) research work (iii) teaching work (iv) writing articles (v) presentation/project (vi) for finding relevant information in the area of specialization. The purpose of using journals by Research Scholars as depicted in the following Table-5.16(a) and Figure-5.6(a).

Table-5.16(a)

Purpose of Using Journals (Research Scholars)

<table>
<thead>
<tr>
<th>SL No.</th>
<th>Purpose</th>
<th>AMU RS (N=212)</th>
<th>BHU RS (N=503)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Updating Knowledge</td>
<td>107 (50.47)</td>
<td>242 (48.11)</td>
</tr>
<tr>
<td>2.</td>
<td>Research work</td>
<td>179 (84.43)</td>
<td>419 (83.30)</td>
</tr>
<tr>
<td>3.</td>
<td>Teaching work</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>4.</td>
<td>Writing Articles</td>
<td>99 (46.69)</td>
<td>273 (54.27)</td>
</tr>
<tr>
<td>5.</td>
<td>Presentation/Project</td>
<td>47 (22.16)</td>
<td>111 (22.06)</td>
</tr>
<tr>
<td>6.</td>
<td>For finding relevant information in the area of specialization</td>
<td>127 (59.90)</td>
<td>288 (57.25)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, N=Number
(Figures within parenthesis represent %age)

(Multiple responses were permitted)
The data analysed for the Purpose of using Journals among the Research Scholars in the Universities under study indicates that 50.47% of the users in AMU used journals for updating their knowledge. In comparison, 48.11% of the Research Scholars in BHU used journals for updating their knowledge.

University libraries are regarded as the hub of research and development. In this context, it is seen that Research work is the main activity of Research Scholars. Significantly, majority of the Research Scholars 84.43% in AMU and 83.30% of the Research Scholars in BHU used journals for research work.

Since, writing articles is an important activity of Research Scholars significantly, 46.69% of the users in AMU used journals for writing articles, whereas in BHU 54.27% of the Research Scholars used journals for writing articles.

Table-5.16(a) and Figure-5.6(a) shows that 22.16% of the Research Scholars in AMU used journals for presentation/project purposes. In comparison, 22.06% of the Research Scholars in BHU made use of journals for presentation/project.

It is also evident from Table-5.16(a) and Figure-5.6(a) that 59.90% of the Research Scholars in AMU used journals for finding relevant information in the area of specialization. In comparison, 57.25% of the Research Scholars in BHU made use of journals for finding relevant information in the area of specialization.

![Figure-5.6 (a): Purpose of Using Journals (Research Scholars)](chart.png)
The Purpose of using Journals by Faculty Members is depicted in the following Table-5.16(b) and Figure-5.6(b)

### Table-5.16(b)

**Purpose of Using Journals (Faculty Members)**

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Purpose</th>
<th>AMU FM (N=120)</th>
<th>BHU FM (N=122)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Updating Knowledge</td>
<td>87 (72.50)</td>
<td>109 (89.34)</td>
</tr>
<tr>
<td>2.</td>
<td>Research work</td>
<td>82 (68.33)</td>
<td>102 (83.60)</td>
</tr>
<tr>
<td>3.</td>
<td>Teaching work</td>
<td>46 (38.33)</td>
<td>53 (43.44)</td>
</tr>
<tr>
<td>4.</td>
<td>Writing Articles</td>
<td>54 (45.00)</td>
<td>63 (51.63)</td>
</tr>
<tr>
<td>5.</td>
<td>Presentation/ Project</td>
<td>31 (25.83)</td>
<td>36 (29.50)</td>
</tr>
<tr>
<td>6.</td>
<td>For finding relevant information in the area of specialization</td>
<td>87 (72.50)</td>
<td>110 (90.16)</td>
</tr>
</tbody>
</table>

FM= Faculty Members, N=Number  
(Figures within parenthesis represent %age)  
(Multiple responses were permitted)

The data analysed for the Purpose of using Journals among the Faculty Members in the Universities under study indicates that 72.50% of the Faculty Members in AMU used journals for updating their knowledge. In comparison, 89.34% of the Faculty Members in BHU used journals for updating their knowledge.

University libraries are regarded as the hub of research and development. In this context, it is seen that majority of the Faculty Members 68.33% in AMU and 83.60% of the Faculty Members in BHU used journals for research work.

Teaching work is the main responsibility of Faculty Members significantly, 38.33% of the Faculty Members in AMU used journals for writing articles, whereas in BHU 43.44% of the Faculty Members used journals for teaching work.

Since, writing articles is an important activity of Faculty Members significantly, 45.00% of the Faculty Members in AMU used journals for writing articles, whereas in BHU 51.63% of the Faculty Members used journals for writing articles.

Table-5.16(b) and Figure-5.6(b) shows that 25.83% of the Faculty Members in AMU used journals for presentation/project purposes. In comparison, 29.50% of the Faculty Members in BHU made use of journals for presentation/project.

It is also evident from Table-5.16(b) and Figure-5.6(b) that 72.50% of the Faculty Members in AMU used journals for finding relevant information in the area
of specialization. In comparison, 90.16% of the Faculty Members in BHU made use of journals for finding relevant information in the area of specialization.

![Figure-5.6 (b): Purpose of Using Journals (Faculty Members)](image)

It is observed from the above analysis that most of the users (Research Scholars and Faculty Members) in both the Universities used journals for their research work, followed by finding relevant information in the area of specialization, updating knowledge and writing articles. Similar are the findings of a study conducted by King and Tenopir (2013) which revealed that articles were read for the purpose of research, found by searching and obtained from the library collections have the highest value to faculty.

### 5.2.5 Use of Journals for Academic Purposes

Journals are not only the main medium for disseminating current information but also serve as an important part of the library collection. These are original documents representing original ideas and constitute the latest available information. Therefore journals are helpful for various academic purposes such as writing articles for journals/conference proceedings, thesis/dissertations, books, research reports, book reviews and invited lectures/talks. The use of Journals for academic purposes by Research Scholars as depicted in the following Table-5.17(a) and Figure-5.7(a).
### Table-5.17 (a)

**Use of Journals for Academic Purposes (Research Scholars)**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Academic Purposes</th>
<th>AMU RS (N=212)</th>
<th>BHU RS (N=503)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Articles in Journals/Conference proceedings</td>
<td>173 (81.60)</td>
<td>404 (80.31)</td>
</tr>
<tr>
<td>2.</td>
<td>Thesis/Dissertations</td>
<td>199 (93.86)</td>
<td>472 (93.83)</td>
</tr>
<tr>
<td>3.</td>
<td>Books</td>
<td>15 (7.07)</td>
<td>40 (7.95)</td>
</tr>
<tr>
<td>4.</td>
<td>Research Reports</td>
<td>78 (36.79)</td>
<td>182 (36.18)</td>
</tr>
<tr>
<td>5.</td>
<td>Book Reviews</td>
<td>11 (5.18)</td>
<td>16 (3.18)</td>
</tr>
<tr>
<td>6.</td>
<td>Invited Lectures/Talks</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, N=Number (Multiple responses were permitted) (Figures within parenthesis represent %age)

The data analysis with respect to the use of journals for academic purposes as shown in Table-5.17(a) and Figure-5.7(a) depicts, that 81.60% of the Research Scholars in AMU and 80.31% of the Research Scholars in BHU stated that they used journals for writing articles in journals/conference proceedings.

Table-5.17(a) and Figure-5.7(a) depicts, that 93.86% of the Research Scholars in AMU, whereas 93.83% of the Research Scholars in BHU used journals for writing their thesis and dissertations and 7.07% of the Research Scholars in AMU and 7.95% of the Research Scholars in BHU used journals for writing books.

It is revealed from Table-5.17(a) and Figure-5.7(a) that 36.79% of the Research Scholars in AMU and 36.18% of the Research Scholars in BHU used journals for writing research reports. 5.18% and 3.18% of the Research Scholars in AMU and BHU used journals for writing book reviews, respectively.
The use of Journals for academic purposes by Faculty Members as depicted in the following Table-5.17(b) and Figure-5.7(b).

**Table-5.17 (b)**

**Use of Journals for Academic Purposes (Faculty Members)**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Academic Purposes</th>
<th>AMU FM (N=120)</th>
<th>BHU FM (N=122)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Articles in Journals/Conference proceedings</td>
<td>115 (95.83)</td>
<td>120 (98.36)</td>
</tr>
<tr>
<td>2.</td>
<td>Thesis/Dissertations</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>3.</td>
<td>Books</td>
<td>60 (50.00)</td>
<td>68 (55.73)</td>
</tr>
<tr>
<td>4.</td>
<td>Research Reports</td>
<td>61 (50.83)</td>
<td>106 (86.88)</td>
</tr>
<tr>
<td>5.</td>
<td>Book Reviews</td>
<td>51 (42.50)</td>
<td>107 (87.70)</td>
</tr>
<tr>
<td>6.</td>
<td>Invited Lectures/ Talks</td>
<td>34 (28.33)</td>
<td>73 (59.83)</td>
</tr>
</tbody>
</table>

FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)

The data analysis with respect to the use of journals for academic purposes by Faculty Members as shown in Table-5.17(b) and Figure-5.7(b) depicts, that 95.83% of the Faculty Members in AMU, whereas 98.36% of the Faculty Members in BHU used journals for writing articles in journals/conference proceedings.

Table-5.17(b) and Figure-5.7(b) also shows that 50.00% of the Faculty Members in AMU and 55.73% of the Faculty Members in BHU stated that they used...
journals for writing books. 50.83% of the Faculty Members in AMU and 86.88% of the Faculty Members in BHU used journals for writing research reports.

Table-5.17(b) and Figure-5.7(b) also shows that 42.50% and 87.70% of the Faculty Members in AMU and BHU used journals for writing research reports, respectively.

It is noted that 28.33% of the Faculty Members in AMU, 59.83% in BHU used journals for preparing lectures/talks on invitation.

Thus, it becomes apparent from the analysis that majority of the Faculty Members 95.83% in AMU and 98.36% in BHU used journals for writing articles in journals/conference proceeding. On the other hand majority of the Research Scholars 93.86% in AMU and 93.83% of the Research Scholars in BHU used journals for writing their thesis and dissertations.

Similar findings of a study conducted by King and Tenopir (2013) revealed that value of reading (increased productivity, improved research, or teaching, saving readers’ time or money), which provides as return components of the ROI of academic library journal collections.

5.2.6 Total Number of Articles Read in a Month

Academia read a number of scholarly articles in a month, since scholarly readings improve academic results, change/broaden/narrow their focus and inspire new thinking. Tenopir, King, Mays, Wu and Baer (2010) revealed that faculty who...
published more, read more and the faculty who received awards also read more. A study conducted by King, Tenopir, Montgomery and Aerni (2003) stated “Reading is defined as going beyond the table of contents, title and abstract to the body of the article.” Therefore respondents were asked about the total number of journal articles read in a month. An estimate was made about the extent to which faculty and research scholars, number of articles read using library journal collections as depicted in the following Table-5.18 and Figure-5.8.

**Table-5.18**

<table>
<thead>
<tr>
<th>No. of Articles</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS</td>
<td>FM</td>
</tr>
<tr>
<td></td>
<td>N=212</td>
<td>N=120</td>
</tr>
<tr>
<td>0-10</td>
<td>76</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>(35.84)</td>
<td>(33.33)</td>
</tr>
<tr>
<td>10-20</td>
<td>87</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>(41.03)</td>
<td>(44.16)</td>
</tr>
<tr>
<td>20-30</td>
<td>26</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>(12.26)</td>
<td>(14.16)</td>
</tr>
<tr>
<td>30-40</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>(6.60)</td>
<td>(8.33)</td>
</tr>
<tr>
<td>More than 40</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(4.24)</td>
<td>(0)</td>
</tr>
</tbody>
</table>

*List of Price per Article is given in Appendix-V
RS= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)

The Table-5.18 and Figure-5.8 reveals that in AMU, 34.93% of the users and 32.16% of the users in BHU read 0-10 articles per month. In AMU, majority 42.16% of the users whereas 43.68% of the users read 10-20 articles per month in BHU.

It is depicted in the above Table-5.18 and Figure-5.8 that in AMU, only 12.95% of the users read 20-30 articles per month. Whereas, in BHU 16.16% of the users read 20-30 articles per month.

It is observed from Table-5.18 and Figure-5.8 that in AMU, only 7.22% of the users read 30-40 articles per month. In BHU 5.92% of the users read 30-40 articles per month. In AMU, least percentage 2.71% of the users read more than 40 articles per month. Whereas, in BHU 2.08% of the users read more than 40 articles per month.
Thus it is clear from the above analysis that in AMU majority of the respondents 42.16% whereas in BHU majority of the respondents 43.68% read 10-20 articles per month. A least percentage 2.71% of the users read more than 40 articles per month in AMU. Whereas, 2.08% of the users read more than 40 articles per month in BHU.

5.2.7 Time Spent in Browsing/Searching Articles per Week

Time spent in browsing/searching articles is also an important factor for judging the use of journals collection. Tenopir, King, Mays, Wu and Baer (2010) revealed that the more time spent on an activity, the more value it has. The time spent on reading is a good indication for judging the value of articles, as readers will not choose to use their valuable time, if the information was not of value to them. Research Scholars and Faculty Members spend considerable amounts of their time on discovering, obtaining, and reading articles, thus demonstrating the value of articles for their research and teaching purposes. The analysis of the data regarding time spent in browsing/searching articles per week by the users in the libraries under study is shown in Table-5.19 and Figure-5.9.
Table-5.19

Time Spent in Browsing / Searching Articles per Week

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Time Spent</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RS N=212</td>
<td>FM N=120</td>
</tr>
<tr>
<td>1.</td>
<td>1-3 hours</td>
<td>107 (50.47)</td>
<td>53 (44.16)</td>
</tr>
<tr>
<td>2.</td>
<td>4-6 hours</td>
<td>52 (24.52)</td>
<td>30 (25)</td>
</tr>
<tr>
<td>3.</td>
<td>7-9 hours</td>
<td>33 (15.56)</td>
<td>19 (15.83)</td>
</tr>
<tr>
<td>4.</td>
<td>More than 9 hours</td>
<td>20 (9.43)</td>
<td>18 (15)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)

The Table-5.19 and Figure-5.9 reveals that in AMU library, majority of the users 48.19% spent 1-3 hours, followed by 24.69% users who spent 4-6 hours, 15.66% users spent 7-9 hours and 11.44% users spent more than 9 hours in browsing/searching articles in a week.

As far as BHU library is concerned maximum users 47.52% spent 1-3 hours, followed by 27.36% of the users who spent 4-6 hours, 17.6% of the users spent 7-9 hours and 7.52% of the users spent more than 9 hours in browsing/searching articles in a week.

Figure-5.9: Time Spent in Browsing / Searching Articles per Week

It is significant to note that the time spent in browsing/searching articles in a week by the users of BHU library is more than the users of AMU library.
5.2.8 Benefits of Using E-Journals

Journals are available in both forms, print and electronic. But users are more willing to use E-journals because of several benefits. The analysis of the data regarding Benefits of Using E-Journals by the Research Scholars and Faculty Members of the surveyed libraries is shown in Table-5.20 and Figure-5.10.

Table-5.20
Benefits of Using E-Journals

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sl. No.</th>
<th>Benefits of Using E-Journals</th>
<th>AMU</th>
<th>BHU</th>
<th>Total</th>
<th>AMU</th>
<th>BHU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>RS=212</td>
<td>FM=120</td>
<td>N=332</td>
<td>RS=503</td>
<td>FM=122</td>
<td>N=625</td>
</tr>
<tr>
<td>1.</td>
<td>1.</td>
<td>Expedite the research process</td>
<td>185 (87.26)</td>
<td>42 (35.00)</td>
<td>227 (68.37)</td>
<td>443 (88.07)</td>
<td>56 (45.90)</td>
<td>499 (79.84)</td>
</tr>
<tr>
<td>2.</td>
<td>2.</td>
<td>Improve professional competence</td>
<td>96 (45.28)</td>
<td>46 (38.33)</td>
<td>142 (42.77)</td>
<td>241 (47.91)</td>
<td>89 (72.95)</td>
<td>330 (52.8)</td>
</tr>
<tr>
<td>3.</td>
<td>3.</td>
<td>Access to a current and up-to-date information</td>
<td>199 (93.86)</td>
<td>106 (88.33)</td>
<td>305 (91.86)</td>
<td>482 (95.82)</td>
<td>96 (78.68)</td>
<td>578 (92.48)</td>
</tr>
<tr>
<td>4.</td>
<td>4.</td>
<td>Easier access to information of interest</td>
<td>192 (90.56)</td>
<td>25 (20.83)</td>
<td>217 (65.36)</td>
<td>428 (85.08)</td>
<td>45 (36.88)</td>
<td>473 (75.68)</td>
</tr>
<tr>
<td>5.</td>
<td>5.</td>
<td>Faster access to information of interest</td>
<td>145 (68.39)</td>
<td>92 (76.66)</td>
<td>237 (71.38)</td>
<td>390 (77.53)</td>
<td>100 (81.96)</td>
<td>490 (78.4)</td>
</tr>
<tr>
<td>6.</td>
<td>6.</td>
<td>Access to a wider range of information</td>
<td>131 (61.79)</td>
<td>23 (19.16)</td>
<td>154 (46.38)</td>
<td>263 (52.28)</td>
<td>37 (30.32)</td>
<td>300 (48.00)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number (Multiple responses were permitted)
(Figures within parenthesis represent %age)

The data analysis with respect to the Benefits of using E-journals as displayed in Table-5.20 and Figure-5.10 shows that 68.37% of the users in AMU and 79.84% of the users in BHU stated that they had benefits from using E-journals in terms of expediting their research processes.

It is noted that 42.77% of the users in AMU and 52.8% of the users in BHU responded that they had improved their Professional Competence by using E-journals.

It is further revealed that majority of the users (91.86%) in AMU and 92.48% of the users in BHU benefitted from using E-journals for accessing current and up-to-date information. Whereas, 65.36% of the users in AMU and 75.68% of the users in BHU stated that they made use of E-journals for getting easier access to information of interest.

Table-5.20 and Figure-5.10 also shows that 71.38% of the users in AMU and 78.4% of the users in BHU stated that they had faster access to information of interest by using E-journals. Whereas, 46.38% of the users in AMU and 48.00% of the users...
in BHU stated that they had access to a wider range of information in using E-journals.

Thus, it is clear from the above analysis that majority of the users 91.86% in AMU and 92.48% in BHU opined that they had access to current and up-to-date information by using E-journals, expediting the research process, provides easier and speedier access to information, getting access to a wider range of information and help in improving professional competence. Williams, Nicholas and Rowlands (2010) concluded in their study that it is now unimaginable for researchers to work without the convenience and comprehensiveness that E-journals provide. Similar findings of a study conducted by De Groote and Dorsch (2003) revealed that Overall 71% of respondents preferred E-journals over Print journals. The main reasons for selecting E-journals were convenience and full-text availability.

5.2.9 Effect of E-Journals on Research Publications

Publication of research articles or research output is also an indicator of measuring benefits of Journals. The investigator posed an interesting question to the respondents of the select libraries regarding E-journals having helped them in increasing the number of research publications? The responses regarding the level of agreement with the statement that “Research Publications have increased after Using E-Journals” is given below in Table-5.21.
Table 5.21
Effect of E-Journals on Research Publications

<table>
<thead>
<tr>
<th>RQ= Research Publications have Increased after Using E-Journals</th>
<th>AMU</th>
<th>BHU</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS N=212 FM N=120 Total N=332</td>
<td>RS N=503 FM N=122 Total N=625</td>
<td></td>
</tr>
<tr>
<td>1. Strongly Agree</td>
<td>65 (30.66) 36 (30.00) 101 (30.42)</td>
<td>169 (33.59) 50 (40.98) 219 (35.04)</td>
<td></td>
</tr>
<tr>
<td>2. Agree</td>
<td>114 (53.77) 60 (50.00) 174 (52.40)</td>
<td>262 (52.08) 58 (47.54) 320 (51.2)</td>
<td></td>
</tr>
<tr>
<td>4. Disagree</td>
<td>07 (3.30) 02 (1.66) 09 (2.71)</td>
<td>26 (5.16) 02 (1.63) 28 (4.48)</td>
<td></td>
</tr>
<tr>
<td>5. Strongly Disagree</td>
<td>0 (0) 0 (0) 0 (0)</td>
<td>0 (0) 0 (0) 0 (0)</td>
<td></td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)
RQ= Research Question

Table 5.21 reveals that in AMU, 30.42% of the users and 35.04% of the users in BHU Strongly Agreed that their Research Publications had increased after using E-journals. However, 52.40% of the users in AMU and 51.2% of the users in BHU Agreed to the above statement.

Figure 5.11: Effect of E-Journals on Research Publications

However, in AMU a moderate percentage (14.45%) of the users and in BHU, 9.28% of the users neither agreed nor disagreed to the statement.
The data analysis indicates that majority of the users believed that E-journals have a direct impact on their research publications as they agreed that their research publications have increased by the use of E-journals. Similar findings of a study conducted by Pan, Wiersma and Fong (2010) revealed that use of E-resources contributed to faculty teaching and research publications.

5.2.10 Importance of Journals for Research Work

Journals are the best available means among the primary communication media for exchange of scientific results. The importance of journal increases as the necessity for intensive, pinpointed and up-to-date knowledge increases. Journals are essential sources of information as they report current research articles undertaken in various research organisations and institutions of higher learning in different parts of the world, on a particular subject area. The responses regarding the level of agreement with the statement ‘Research Work is not Possible Without Journals’ is given below in Table-5.22.

<table>
<thead>
<tr>
<th>RQ= Research Work is not Possible Without Journals</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sl. No.</strong></td>
<td><strong>Response</strong></td>
<td><strong>Response</strong></td>
</tr>
<tr>
<td></td>
<td><strong>RS N=212</strong></td>
<td><strong>FM N=120</strong></td>
</tr>
<tr>
<td>1.</td>
<td>Strongly Agree</td>
<td>120 (56.60)</td>
</tr>
<tr>
<td>2.</td>
<td>Agree</td>
<td>74 (34.90)</td>
</tr>
<tr>
<td>3.</td>
<td>Neither Agree nor Disagree</td>
<td>11 (5.18)</td>
</tr>
<tr>
<td>4.</td>
<td>Disagree</td>
<td>06 (2.83)</td>
</tr>
<tr>
<td>5.</td>
<td>Strongly Disagree</td>
<td>01 (0.47)</td>
</tr>
</tbody>
</table>

RQ= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)
RQ= Research Question

The data obtained regarding the level of agreement with the above statement in Table-5.22 reveals that in AMU majority of the users (61.14%) strongly agreed that Research work was not possible without journals. Whereas, in BHU majority of the users (55.68%) also strongly agreed that journals are vital sources of information for research.
The data shown in Table-5.22 reveals that in AMU 33.22% of the users agreed that Research work was not possible without journals and in BHU 40.96% of the users agreed to the statement.

It is observed from the Table-5.22 that in AMU a very low percentage (3.91%) of the users neither agreed nor disagreed to the statement. Whereas, in BHU a still lower percentage (2.56%) of the users neither agreed nor disagreed to the above statement.

Thus, it is clear from the above analysis that majority of the users (61.14%) in AMU and (55.68%) in BHU strongly agreed that Research work was not possible without journals and they are vital sources of information for research.

This is a very important aspect regarding the journals that is observed among the Research Scholars and Faculty Members of the very prominent central universities in Uttar Pradesh. The importance of journals to the users of the select universities is noteworthy for assessing the cost of the value attached to these journals for completing their academic pursuits.

5.2.11 Satisfaction Regarding the Use of Journals

Benefits of the journals can also be measured by assessing the satisfaction regarding use of journals. Generally the effectiveness and success of any system is determined by the satisfaction of users with the system. The analysis of the data
regarding satisfaction with the use of journals in the libraries under study is determined by the following Table-5.23.

**Table-5.23**

**Satisfaction Regarding the Use of Journals**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Satisfaction</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS N=212</td>
<td>FM N=120</td>
<td>Total N=332</td>
</tr>
<tr>
<td>2.</td>
<td>Satisfied</td>
<td>114 (53.77)</td>
<td>62 (51.66)</td>
</tr>
<tr>
<td>3.</td>
<td>Neither Satisfied/nor Dissatisfied</td>
<td>44 (20.75)</td>
<td>28 (23.33)</td>
</tr>
<tr>
<td>4.</td>
<td>Dissatisfied</td>
<td>19 (8.96)</td>
<td>14 (11.66)</td>
</tr>
<tr>
<td>5.</td>
<td>Strongly Dissatisfied</td>
<td>04 (1.88)</td>
<td>0 (0)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)

With respect to the satisfaction regarding the use of journals, the data collected in table-5.23 reveals that 14.15% of the users in AMU and 21.6% of the users in BHU were strongly satisfied with the use of journals.

The collected data however reflects that majority of the users (53.01%) in AMU and 67.52% of the users in BHU were satisfied with the use of journals.

Interestingly, considerable percentages 21.68% of the users in AMU were neither satisfied nor dissatisfied with the use of journals. In comparison, a lower percentage 7.52% of the users in BHU appeared to be neutral to the statement.

Contrary to the above, it is observed that in AMU, 9.93% of the users were dissatisfied with the use of journals. Whereas in case of BHU, a lower percentage (3.04%) of the users reported that they were dissatisfied with the use of journals.

Moreover, the data shows that a very small percentage (1.20%) of the user in AMU and negligible percentage (0.32%) of the user in BHU were strongly dissatisfied with the use of journals. The number of Research Scholars who were strongly dissatisfied with the use of journals is more in AMU. None of the faculty members in both the surveyed libraries stated that they were strongly dissatisfied with the use of journals.
Thus, it is clear from the above analysis that majority of the users (53.01%) in AMU and 67.52% in BHU satisfied with the use of Journals. Since, the percentage of users for satisfaction with the use of journals in BHU is more than the percentage of the users in AMU. It shows that BHU users are more satisfied with the use of journals than the users of AMU.

5.2.12 Reasons for Consulting Journals in Libraries

Scholarly Journals are so expensive that no researcher can afford to have personal subscription. Apart from this, there are many other reasons also for consulting journals in libraries by researchers. The analysis of the data regarding reasons for consulting journals in the libraries under study is shown in the following Table-5.24.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Reasons</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RS N=212</td>
<td>FM N=120</td>
</tr>
<tr>
<td>1.</td>
<td>Very Expensive to purchase</td>
<td>136 (64.15)</td>
<td>67 (55.83)</td>
</tr>
<tr>
<td>2.</td>
<td>To be read only once</td>
<td>36 (16.98)</td>
<td>18 (15.00)</td>
</tr>
<tr>
<td>3.</td>
<td>Not sure the journal will be useful</td>
<td>38 (17.92)</td>
<td>27 (22.50)</td>
</tr>
<tr>
<td>4.</td>
<td>Lack of Space</td>
<td>02 (0.94)</td>
<td>08 (6.66)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number
(Figures within parenthesis represent %age)
In this regard, the data collected in table-5.24 reveals that majority of the users (61.14\%) in AMU and 69.44\% of the users in BHU stated that one of the reasons for consulting journals in library is that journals were quite expensive to purchase.

A considerable percentage (16.26\%) of the users in AMU and higher percentage (23.68\%) of the users in BHU stated that, as the journals are generally read only once, was also a reason for consulting journals in a library.

It is noted from the above table that 19.57\% of the users in AMU opined that they were not sure whether the journal will be of worth purchasing, is the reason for consulting journals in libraries. In comparison, a very low percentage (6.08\%) of the users in BHU also had the same reason for consulting journals in the library.

Contradictory to the above, it is observed that very low percentage (3.01\%) of the users in AMU and a much lower percentage (0.8\%) of the users in BHU stated ‘lack of space’ was the reason for consulting journals in the library.

Thus, it is clear from the above analysis that majority of the users (61.14\%) in AMU and 66.56\% of the users in BHU stated a common reason for consulting journals in the library as ‘very expensive to purchase’. One cannot afford to subscribe individually, therefore library is the only place for consulting journals.

5.2.13 Willingness to Pay (WTP) to Access Articles per Month

A library is a nonprofit making organization. To measure the output of the Journals collection in terms of financial gains similar to other business organizations
Chapter-5

Data Analysis and Interpretation

is very difficult. Therefore, the investigator used the contingent valuation (CV) method to measure the economic value or Benefit of journals into monetary terms by presenting the respondents to a hypothetical situation that in case a particular library would not exist anymore, how much money would they be willing to pay to access articles per month, as it exists today. It is based on the user’s own assessment of the journals to be valued. Its aim is to obtain people’s willingness to pay into monetary units. Respondents were given a range of monetary units i.e. from ₹1000 to ₹6000. The CVM is used to measure the perceived value of Journals collection in the University libraries under study by assessing the user’s “willingness to pay” (WTP) as described in the Table-5.25.

Table-5.25

Willingness to Pay (WTP) to Access Articles per Month

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Amount in Rupees (₹)</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS N=212</td>
<td>FM N=120</td>
<td>RS N=503</td>
</tr>
<tr>
<td>1.</td>
<td>1000-2000</td>
<td>150 (70.75)</td>
<td>28 (23.33)</td>
</tr>
<tr>
<td>2.</td>
<td>2000-3000</td>
<td>44 (20.75)</td>
<td>72 (60.00)</td>
</tr>
<tr>
<td>3.</td>
<td>3000-4000</td>
<td>10 (4.71)</td>
<td>15 (12.50)</td>
</tr>
<tr>
<td>4.</td>
<td>4000-5000</td>
<td>04 (1.88)</td>
<td>03 (2.50)</td>
</tr>
<tr>
<td>5.</td>
<td>5000-6000</td>
<td>04 (1.88)</td>
<td>02 (1.66)</td>
</tr>
</tbody>
</table>

RS= Research Scholars, FM= Faculty Members, N=Number (Figures within parenthesis represent %age)

The data analysis for the purpose of Willingness to Pay (WTP) to access articles per month among the users (Research Scholars and Faculty Members) indicates that in AMU majority of Research Scholars (70.75%) were willing to pay ₹1000-2000 per month to access articles, whereas in BHU also majority of Research Scholars (73.95%) were willing to pay ₹1000-2000 per month to access articles.

The Table-5.25 reveals that in AMU, majority of Faculty Members (60%) were willing to pay ₹2000-3000 per month to access articles, whereas in BHU, majority of Faculty Members (54.91%) were willing to pay ₹2000-3000 per month to access articles.

Therefore, the investigator calculated the mid value of the ₹1000-2000 and considered ₹1500 as WTP value for Research Scholars and mid value of the ₹2000-
3000 and considered ₹2500 WTP value for Faculty Members. Similar findings of a study conducted by Harless and Allen (1999) revealed that on average students were willing to pay $5.59 per semester, whereas Faculty members indicated that they were willing to pay $45.76 per year to maintain current hours.

### 5.2.13.1 Total Benefit of Journals based on Annual WTP (2014-15)

Cost-Benefit Analysis is possible to be analysed/worked out when cost and benefit are in the same unit. Therefore, the investigator used the Contingent Valuation Method for converting the benefit of using journals into monetary term i.e. in Rupees ( ₹ ). It is clear from the table-5.25 that WTP value for accessing articles per month for Research Scholars is ₹1500 and WTP value for accessing articles per month for Faculty Members is ₹2500. Annual Willingness to Pay (WTP) Value for accessing articles by Research Scholars = 1500×12= ₹18,000. Annual Willingness to Pay (WTP) Value for accessing articles by Faculty Members = 2500×12= ₹30,000. The calculation of total benefit of journals based on Annual WTP value is shown in the following Table-5.26.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>AMU (Amount in Rupees) RS = 2123, FM = 1209</th>
<th>BHU (Amount in Rupees) RS = 5037, FM = 1218</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Benefit assessed by Research Scholars 2123×18,000= ₹3,82,14,000</td>
<td>5037×18,000= ₹9,06,66,000</td>
</tr>
<tr>
<td>2.</td>
<td>Benefit assessed by Faculty Members 1209×30,000 = 3,62,70,000</td>
<td>1218×30,000 = 3,65,40,000</td>
</tr>
<tr>
<td>Total Benefit</td>
<td>₹ 7,44,84,000</td>
<td>₹ 12,72,06,000</td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee ( ₹ ) the official currency of India

It is clear from the above table that Total benefit of Journals based on Annual WTP was ₹7,44,84,000 for AMU and ₹12,72,06,000 for BHU during the year 2014-15. It shows that benefit of Journals in BHU is more than AMU because they are having more number of users.

### 5.2.13.2 Cost-Benefit Analysis of Journals in Libraries (2014-15)

Cost-Benefit Analysis of Journals in Central libraries for the current financial year 2014-15 was done after getting total benefit of journals into monetary term i.e. in
Rupees (₹). Table-5.26 revealed the total benefit of Journals based on Annual WTP value was ₹7,44,84,000 for AMU and ₹12,72,06,000 for BHU.

Total cost of Journals was calculated ₹2,08,00,920 for the library of AMU and ₹1,75,59,600 for the library of BHU (Table-5.7).

**Net Benefit**

Net Benefit in AMU = Total Benefit – Total Cost

₹7,44,84,000 – ₹2,08,00,920 = ₹5,36,83,080

Net Benefit in BHU = Total Benefit – Total Cost

₹12,72,06,000 – ₹1,75,59,600 = ₹10,96,46,400

Therefore Net Benefit ₹5,36,83,080 was calculated for the library of AMU and ₹10,96,46,400 was calculated for the library of BHU.

**Cost-benefit Ratio (CBR)**

Cost-benefit Ratio in AMU = 2,08,00,920: 5,36,83,080 = 1: 2.5

Cost-benefit Ratio in BHU = 1,75,59,600: 10,96,46,400 = 1: 7.2

**Return on Investment (ROI)** Pan, Wiersma and Fong (2010) conducted a similar study and used the generic formula of ROI i.e. benefit minus cost divided by cost and multiplied by 100.

The formula of ROI = Net Benefit ×100 ÷ Cost

ROI in AMU library = 5,36,83,080 × 100 ÷ 2,08,00,920 = 258%

ROI in BHU library = 10,96,46,400 × 100 ÷ 1,75,59,600 = 624%

The Cost-Benefit Analysis of Journals collection in the Central libraries of AMU and BHU for the current year 2014-15 is depicted in the Table-5.27.

**Table-5.27**


<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Particulars</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total Cost of Journals</td>
<td>₹ 2,08,00,920</td>
<td>₹ 1,75,59,600</td>
</tr>
<tr>
<td>2.</td>
<td>Total Benefit of Journals based on WTP</td>
<td>₹ 7,44,84,000</td>
<td>₹ 12,72,06,000</td>
</tr>
<tr>
<td>3.</td>
<td>Net Benefit</td>
<td>₹ 5,36,83,080</td>
<td>₹ 10,96,46,400</td>
</tr>
<tr>
<td>4.</td>
<td>Cost Benefit Ratio (CBR)</td>
<td>1 : 2.5</td>
<td>1 : 7.2</td>
</tr>
<tr>
<td>5.</td>
<td>Return on Investment (ROI)</td>
<td>258%</td>
<td>624%</td>
</tr>
</tbody>
</table>

Note: Values are in Indian Rupee (₹) the official currency of India
It is significant to note that Cost-Benefit Ratio (1:7.2) and Return On Investment (624%) is much higher in BHU library as compared to Cost-Benefit Ratio (1:2.5) and Return On Investment (258%) in AMU library. Similar findings of a study conducted by King and Tenopir (2013) revealed that ROI of journals collection between 3.3 and 3.6 to 1. Hider (2008) revealed that the overall benefit-cost ratio of the library was calculated as 1.33:1, while benefit-cost ratio of technical services was very high 2.4:1. Similar findings of a study conducted by Bodycomb and Baglivo (2012) revealed that CBR was calculated as 21.2: 1 and ROI 2,017% for the fiscal year 2008. For the year 2011 CBR was 23.3: 1, and ROI was 2,234%. A study conducted by Barron, Williams, Bajjaly, Arns and Wilson (2005) revealed that for every $1 spent on public libraries by governments, the state receives $4.48, nearly 350% ROI.

The reason of higher CBR and ROI in BHU is because the number of Research Scholars (5037) is more than twice to the number of Research Scholars (2123) in AMU, whereas the number of Faculty Members (1218) in BHU is also more than in AMU (1209).

5.2.14. Productivity or Research Output in Select Universities

Research Productivity or Research Output of Research Scholars and Faculty Members in an University/Institution is also an indicator of the use (benefit) of Journals. A study conducted on the research productivity of Indian Universities as reflected in INDCAT placed AMU at the 5th Rank. INDCAT is one of the largest bibliographical databases of Indian Universities supported by INFLIBNET. A ranking of these HEIs reveals that in a list of top 25 HEIs of India contributing to the INDCAT, AMU is the fifth most productive in terms of HEIs contribution to the INDCAT. AMU has contributed 9564 Doctoral theses, whereas BHU is the third most productive and contributed 14772 Doctoral theses (AMU Annual Report 2013-14).

In AMU during the year 2013-14, total 2074 Research Papers and Articles were published, Faculty Members published 159 Books. Total 321 M. Phil. / Ph. D. Degrees were awarded and a total number of 210 Research Projects were carried out.
Table-5.28

Productivity or Research Output in Select Universities (2013-14)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Research Output</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Research Papers and Articles</td>
<td>2074</td>
<td>2669</td>
</tr>
<tr>
<td>2.</td>
<td>Books</td>
<td>159</td>
<td>175</td>
</tr>
<tr>
<td>3.</td>
<td>M. Phil / Ph. D.</td>
<td>321</td>
<td>714</td>
</tr>
<tr>
<td>4.</td>
<td>Running Research Projects</td>
<td>210</td>
<td>402</td>
</tr>
</tbody>
</table>

In BHU during the year 2013-14, total 2669 Research Papers and Articles were published, Faculty Members published 175 Books. Total 714 M. Phil. / Ph. D. Degrees were awarded and a total number of 402 Research Projects were carried out.

Thus, it is observed from the above table that the Productivity or Research Output of BHU is more than AMU.

PART-C

5.3 ANALYSIS OF USAGE STATISTICS OF E-JOURNALS/DATABASES

The main function of usage statistics is to evaluate the use of E-journals/Databases. It is useful during subscription/renewal i.e. the selection of E-journals/databases, upgrading the versions, increasing licenses, cancellation of subscriptions of databases and in providing direction to library management regarding the utilization of the log data which reflects the true value of E-journals/databases, as well as, while taking decisions during their selection/renewal in university libraries.

It was observed that approximately 7,590 E-journals are offered through UGC-Infonet Digital Library Consortium in both the libraries under study. The consortium provided 219 full-text e-resources and 10 bibliographic databases from 25 publishers and aggregators. The member institutions provided different ways of access to these resources based on their needs and activity profiles as per the recommendations of the National Steering Committee.

Full-text E-Journals/Databases contain complete articles along with their bibliographic details. The consortium subscribes to full-text E-journals/Databases from scholarly societies, universities press, commercial publishers and aggregators including American Chemical Society, American Institute of Physics, Oxford University Press, Cambridge University Press, Cell Press, Springer Link, J-STOR,
Project Muse, etc. All full-text Databases contain E-journals subscribed by the consortium.

The popular method used for measuring the usage of E-journals/Databases is the Usage Statistics supplied by publishers, aggregators and consortia to their subscribers or members. Librarians of AMU and BHU provided the usage statistics of E-Journals/Databases subscribed through Consortium (UGC-Infonet Digital Library Consortium) in the libraries under study.

### 5.3.1 Use of E-Journals/Databases in the Select Universities

The investigator with the help of usage statistics calculated the total usage of E-Journals/Databases subscribed through Consortium (UGC-Infonet Digital Library Consortium) for the period of 2012-2014 in the libraries under study as depicted in the following table-5.29.

#### Table-5.29
Use of E-Journals/Databases in the Select Universities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>ACS</td>
<td>20484</td>
<td>29649</td>
<td>30039</td>
<td>26724</td>
<td>87235</td>
<td>96356</td>
<td>94621</td>
<td>92737</td>
</tr>
<tr>
<td>2.</td>
<td>AIP</td>
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<td>1570</td>
<td>1827</td>
<td>1768</td>
<td>11484</td>
<td>19662</td>
<td>15142</td>
<td>15429</td>
</tr>
<tr>
<td>3.</td>
<td>APS</td>
<td>3652</td>
<td>3890</td>
<td>3625</td>
<td>3722</td>
<td>16069</td>
<td>15787</td>
<td>11035</td>
<td>14297</td>
</tr>
<tr>
<td>4.</td>
<td>AR</td>
<td>1904</td>
<td>1880</td>
<td>1562</td>
<td>1782</td>
<td>5554</td>
<td>7897</td>
<td>6520</td>
<td>6657</td>
</tr>
<tr>
<td>5.</td>
<td>CUP</td>
<td>2760</td>
<td>2036</td>
<td>2063</td>
<td>2286</td>
<td>4152</td>
<td>5376</td>
<td>3757</td>
<td>4428</td>
</tr>
<tr>
<td>6.</td>
<td>Emerald</td>
<td>1695</td>
<td>9428</td>
<td>7748</td>
<td>6290</td>
<td>8971</td>
<td>6621</td>
<td>7938</td>
<td>7843</td>
</tr>
<tr>
<td>7.</td>
<td>Euclid</td>
<td>152</td>
<td>193</td>
<td>118</td>
<td>154</td>
<td>169</td>
<td>186</td>
<td>230</td>
<td>195</td>
</tr>
<tr>
<td>8.</td>
<td>IOP</td>
<td>3927</td>
<td>5478</td>
<td>4335</td>
<td>4580</td>
<td>12410</td>
<td>14800</td>
<td>12664</td>
<td>13291</td>
</tr>
<tr>
<td>9.</td>
<td>JSTOR</td>
<td>42405</td>
<td>35402</td>
<td>40430</td>
<td>39412</td>
<td>54848</td>
<td>61575</td>
<td>58437</td>
<td>58286</td>
</tr>
<tr>
<td>10.</td>
<td>Nature</td>
<td>2611</td>
<td>2107</td>
<td>2360</td>
<td>2159</td>
<td>12174</td>
<td>16014</td>
<td>36654</td>
<td>21614</td>
</tr>
<tr>
<td>11.</td>
<td>OUP</td>
<td>15483</td>
<td>14217</td>
<td>16241</td>
<td>15313</td>
<td>27335</td>
<td>29385</td>
<td>22385</td>
<td>26858</td>
</tr>
<tr>
<td>12.</td>
<td>Portland Press</td>
<td>637</td>
<td>575</td>
<td>845</td>
<td>685</td>
<td>1430</td>
<td>1381</td>
<td>908</td>
<td>1239</td>
</tr>
<tr>
<td>13.</td>
<td>Project Muse</td>
<td>1278</td>
<td>2249</td>
<td>858</td>
<td>1461</td>
<td>1653</td>
<td>3300</td>
<td>3513</td>
<td>2822</td>
</tr>
<tr>
<td>14.</td>
<td>RSC</td>
<td>9815</td>
<td>18912</td>
<td>23412</td>
<td>17379</td>
<td>35568</td>
<td>62498</td>
<td>68014</td>
<td>55360</td>
</tr>
<tr>
<td>15.</td>
<td>SD</td>
<td>149496</td>
<td>170397</td>
<td>188845</td>
<td>169579</td>
<td>495328</td>
<td>615554</td>
<td>739188</td>
<td>616690</td>
</tr>
<tr>
<td>16.</td>
<td>SIAM</td>
<td>81</td>
<td>169</td>
<td>202</td>
<td>150</td>
<td>971</td>
<td>568</td>
<td>819</td>
<td>786</td>
</tr>
<tr>
<td>17.</td>
<td>SL</td>
<td>32848</td>
<td>56291</td>
<td>48583</td>
<td>45907</td>
<td>80146</td>
<td>175929</td>
<td>262990</td>
<td>127555</td>
</tr>
<tr>
<td>18.</td>
<td>T &amp; F</td>
<td>12488</td>
<td>21025</td>
<td>23072</td>
<td>18861</td>
<td>-</td>
<td>41552</td>
<td>35714</td>
<td>25755</td>
</tr>
<tr>
<td>19.</td>
<td>WB</td>
<td>26081</td>
<td>32790</td>
<td>34311</td>
<td>31060</td>
<td>58201</td>
<td>95946</td>
<td>97999</td>
<td>84048</td>
</tr>
</tbody>
</table>

| Total No. of Downloaded Articles | 329706 | 408258 | 430476 | 389472 | 913698 | 1270387 | 1343598 | 1175890 |

It is evident from the above Table-5.29 that in the year 2012, a total of 3,29,706 articles were downloaded in AMU whereas in the same year 9,13,698
articles were downloaded in BHU from the E-Journals/Databases subscribed under UGC-Infonet Digital Library Consortium.

It is noted from the above table that in the year 2013, 4,08,258 articles were downloaded in AMU whereas 12,70,387 articles were downloaded in BHU.

It is also evident from the Table-5.29 that in the year 2014, total number of downloaded articles were 4,30,476 in AMU, whereas total number of downloaded articles were 13,43,598 in BHU for the year 2014.

Table-5.29 reveals that on an average 3,89,472 articles in AMU and 11,75,890 articles in BHU were downloaded from the E-Journals/Databases provided by the Consortium.

Thus, it is apparent from the table-5.29 that on an average downloaded articles 11,75,890 were quite high in BHU as compared to AMU 3,89,472 during the period of 2012-2014. The articles downloaded in BHU is almost three times more than AMU. It shows that the usage of E-Journals/Databases is more in BHU than in AMU.

It is significant to note that in AMU, the usage of E-Journals/Databases had increased from 3,29,706 to 4,30,476 per full text articles downloaded during the period 2012-2014. Whereas in BHU also the usage of E-Journals/Databases had increased from 9,13,698 to 13,43,598 as per full text articles downloaded during the period 2012-2014.

![Figure-5.15: Total Number of Downloaded Articles](image-url)
5.3.1.1. Average Use of E-Journals/Databases in AMU

Analysis of Usage Statistics was also done to check the highly used E-Journals/Databases and the less used E-Journals/Databases in the libraries under study during the period of 2012-2014 as depicted in the following Table-5.29.1 and Figure-5.16.

Table-5.29.1

Average Use of E-Journals/Databases in AMU (2012-14)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>E-Journals/Databases</th>
<th>Average Use</th>
<th>Average Use (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Science Direct</td>
<td>169579</td>
<td>43.54</td>
</tr>
<tr>
<td>2.</td>
<td>Springer Link</td>
<td>45907</td>
<td>11.79</td>
</tr>
<tr>
<td>3.</td>
<td>JSTOR</td>
<td>39412</td>
<td>10.11</td>
</tr>
<tr>
<td>4.</td>
<td>Wiley-Blackwell</td>
<td>31060</td>
<td>7.97</td>
</tr>
<tr>
<td>5.</td>
<td>American Chemical Society</td>
<td>26724</td>
<td>6.86</td>
</tr>
<tr>
<td>6.</td>
<td>Taylor &amp; Francis</td>
<td>18861</td>
<td>4.84</td>
</tr>
<tr>
<td>7.</td>
<td>Royal Society of Chemistry</td>
<td>17379</td>
<td>4.46</td>
</tr>
<tr>
<td>8.</td>
<td>Oxford University Press</td>
<td>15313</td>
<td>3.93</td>
</tr>
<tr>
<td>9.</td>
<td>Emerald</td>
<td>6290</td>
<td>1.61</td>
</tr>
<tr>
<td>10.</td>
<td>Institute of Physics</td>
<td>4580</td>
<td>1.17</td>
</tr>
<tr>
<td>11.</td>
<td>American Physical Society</td>
<td>3722</td>
<td>0.95</td>
</tr>
<tr>
<td>12.</td>
<td>Nature</td>
<td>2359</td>
<td>0.60</td>
</tr>
<tr>
<td>13.</td>
<td>Cambridge University Press</td>
<td>2286</td>
<td>0.58</td>
</tr>
<tr>
<td>14.</td>
<td>Annual Reviews</td>
<td>1782</td>
<td>0.45</td>
</tr>
<tr>
<td>15.</td>
<td>American Institute of Physics</td>
<td>1768</td>
<td>0.45</td>
</tr>
<tr>
<td>16.</td>
<td>Project Muse</td>
<td>1461</td>
<td>0.37</td>
</tr>
<tr>
<td>17.</td>
<td>Portland Press</td>
<td>685</td>
<td>0.17</td>
</tr>
<tr>
<td>18.</td>
<td>Euclid</td>
<td>154</td>
<td>0.03</td>
</tr>
<tr>
<td>19.</td>
<td>SIAM</td>
<td>150</td>
<td>0.03</td>
</tr>
</tbody>
</table>

The data analysis with respect to the usage of E-Journals/Databases, the data received in the Table-5.29.1 shows that in AMU, during the period of 2012-2014 Science Direct (43.54%) was the highly used E-Journals/Databases, followed by Springer Link (11.79%), JSTOR (10.11%), Wiley-Blackwell (7.97%), American Chemical Society (6.86%), Taylor & Francis (4.84%), Royal Society of Chemistry (4.46%), Oxford University Press (3.93%), Emerald (1.61%), Institute of Physics...
(1.17%), American Physical Society (0.95%), Nature (0.60%), Cambridge University Press (0.58%), Annual Reviews (0.45%), American Institute of Physics (0.45%), Project Muse (0.37%), Portland Press (0.17%), Euclid (0.03%) and SIAM (0.03%). Similar findings of a study conducted by Bravo and Diez (2011) revealed that Science Direct was the distributor preferred by all five universities studied. Its percentage of downloads were over 80% of the total for the year 2009 in four institutions. Another similar findings of a study conducted by Prem Chand et al. (2006) revealed that ACS, Springer Link, AIP/APS databases were ranked first to third.

It is revealed from the above Table-5.29.1 and Figure-5.16 that in AMU, Science Direct, Springer Link and JSTOR were highly used E-Journals/Databases whereas Portland Press, Euclid and SIAM were least used E-Journals/Databases in the library during the period of 2012-2014.

5.3.1.2. Average Use of E-Journals/Databases in BHU

Analysis of Usage Statistics was also done to check the highly used E-Journals/Databases and the less used E-Journals/Databases in the libraries under study, during the period of 2012-2014, as depicted in the following Table-5.29.2 and Figure-5.17.
Chapter-5  
Data Analysis and Interpretation

Table-5.29.2

Average Use of E-Journals/Databases in BHU (2012-14)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>E-Journals/Databases</th>
<th>Average Use</th>
<th>Average Use (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Science Direct</td>
<td>616690</td>
<td>52.44</td>
</tr>
<tr>
<td>2.</td>
<td>Springer Link</td>
<td>127555</td>
<td>10.84</td>
</tr>
<tr>
<td>3.</td>
<td>American Chemical Society</td>
<td>92737</td>
<td>7.88</td>
</tr>
<tr>
<td>4.</td>
<td>Wiley-Blackwell</td>
<td>84048</td>
<td>7.14</td>
</tr>
<tr>
<td>5.</td>
<td>JSTOR</td>
<td>58286</td>
<td>4.95</td>
</tr>
<tr>
<td>6.</td>
<td>Royal Society of Chemistry</td>
<td>55360</td>
<td>4.70</td>
</tr>
<tr>
<td>7.</td>
<td>Taylor &amp; Francis</td>
<td>38633</td>
<td>3.28</td>
</tr>
<tr>
<td>8.</td>
<td>Oxford University Press</td>
<td>26858</td>
<td>2.28</td>
</tr>
<tr>
<td>9.</td>
<td>Nature</td>
<td>21614</td>
<td>1.83</td>
</tr>
<tr>
<td>10.</td>
<td>American Institute of Physics</td>
<td>15429</td>
<td>1.31</td>
</tr>
<tr>
<td>11.</td>
<td>American Physical Society</td>
<td>14297</td>
<td>1.21</td>
</tr>
<tr>
<td>12.</td>
<td>Institute of Physics</td>
<td>13291</td>
<td>1.13</td>
</tr>
<tr>
<td>13.</td>
<td>Emerald</td>
<td>7843</td>
<td>0.66</td>
</tr>
<tr>
<td>14.</td>
<td>Annual Reviews</td>
<td>6657</td>
<td>0.56</td>
</tr>
<tr>
<td>15.</td>
<td>Cambridge University Press</td>
<td>4428</td>
<td>0.37</td>
</tr>
<tr>
<td>16.</td>
<td>Project Muse</td>
<td>2822</td>
<td>0.23</td>
</tr>
<tr>
<td>17.</td>
<td>Portland Press</td>
<td>1239</td>
<td>0.10</td>
</tr>
<tr>
<td>18.</td>
<td>SIAM</td>
<td>786</td>
<td>0.06</td>
</tr>
<tr>
<td>19.</td>
<td>Euclid</td>
<td>195</td>
<td>0.02</td>
</tr>
</tbody>
</table>

The data analysis with respect to the usage of E-Journals/Databases, Table-5.29.2 and Figure-5.17 shows that in BHU, during the period of 2012-2014 Science Direct (52.44%) was among the highly used E-Journals/Databases followed by Springer Link (10.84%), American Chemical Society (7.88%), Wiley-Blackwell (7.14%), JSTOR (4.95%), Royal Society of Chemistry (4.70%), Taylor & Francis (3.28%), Oxford University Press (2.28%), Nature (1.83%), American Institute of Physics (1.31%), American Physical Society (1.21%), Institute of Physics (1.13%), Emerald (0.66%), Annual Reviews (0.56%), Cambridge University Press (0.37%), Project Muse (0.23%), Portland Press (0.10%), SIAM (0.06%) and Euclid (0.02%).
It is very interesting to note that Science Direct and Springer Link were in the first and second positions respectively among the most highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases in both the universities, during the period of 2012-2014.

Thus, the data analysis from the above Table-5.29.2 and Figure-5.17 reveals that in BHU, Science Direct, Springer Link and American Chemical Society were among the highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases, during the period of 2012-2014.

5.3.1.3. Comparative Average Use of E-Journals/Databases in select Universities

An account of comparison of average use of E-journals/Databases in select Universities is presented in the following Table-5.29.3 and Figure-5.18.
Table-5.29.3
Comparative Average Use of E-Journals/Databases in select Universities (2012-14)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>E-Journals/Databases</th>
<th>Average Use (%)</th>
<th>AMU</th>
<th>Average Use (%)</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Science Direct</td>
<td>43.54</td>
<td></td>
<td>52.44</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Springer Link</td>
<td>11.79</td>
<td></td>
<td>10.84</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>American Chemical Society</td>
<td>6.86</td>
<td></td>
<td>7.88</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>JSTOR</td>
<td>10.11</td>
<td></td>
<td>4.95</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Royal Society of Chemistry</td>
<td>4.46</td>
<td></td>
<td>4.70</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Taylor &amp; Francis</td>
<td>4.84</td>
<td></td>
<td>3.28</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Oxford University Press</td>
<td>3.93</td>
<td></td>
<td>2.28</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Nature</td>
<td>0.60</td>
<td></td>
<td>1.83</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>American Institute of Physics</td>
<td>0.45</td>
<td></td>
<td>1.31</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>American Physical Society</td>
<td>0.95</td>
<td></td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Institute of Physics</td>
<td>1.17</td>
<td></td>
<td>1.13</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Emerald</td>
<td>1.61</td>
<td></td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Annual Reviews</td>
<td>0.45</td>
<td></td>
<td>0.56</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Cambridge University Press</td>
<td>0.58</td>
<td></td>
<td>0.37</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Project Muse</td>
<td>0.37</td>
<td></td>
<td>0.23</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Portland Press</td>
<td>0.17</td>
<td></td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>SIAM</td>
<td>0.03</td>
<td></td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Euclid</td>
<td>0.03</td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

The Table-5.29.3 and Figure-5.18 shows the comparative average use of E-Journals/Databases in select Universities during the period of 2012-2014. Science Direct in AMU (43.54%) whereas in BHU (52.44%) was highly used, followed by Springer Link in AMU (11.79%) and in BHU (10.84%), JSTOR in AMU(10.11%) and in BHU (4.95%), Wiley-Blackwell in AMU (7.97%) and in BHU (7.14%), American Chemical Society in AMU (6.86%) and in BHU (7.88%), Taylor & Francis in AMU (4.84%) and in BHU (3.28%), Royal Society of Chemistry in AMU (4.46%) and in BHU (4.70%), Oxford University Press in AMU (3.93%) and in BHU (2.28%), Emerald in AMU (1.61%) and in BHU (0.66%), Institute of Physics in AMU (1.17%) and in BHU (1.13%), American Physical Society in AMU (0.95%) and in BHU (1.21%), Nature in AMU (0.60%) and in BHU (1.83%). Cambridge University Press
in AMU (0.58%) and in BHU (0.37%), Annual Reviews in AMU (0.45%) and in BHU (0.56%), American Institute of Physics in AMU (0.45%) and in BHU (1.31%), Project Muse in AMU (0.37%) and in BHU (0.23%), Portland Press in AMU (0.17%) and in BHU (0.10%), Euclid in AMU (0.03%) and in BHU (0.02%), SIAM in AMU (0.03%) and in BHU (0.06%).

5.3.2 Cost per Use of E-Journals/Databases

Cost per Use is a method used for Cost-benefit Analysis and Cost-effectiveness of Journals collection. Milne and Tiffany (1991) also used Cost per Use method in evaluating the cost-effectiveness of Periodicals in the library. For the purpose of Cost per Use, E-Journals/Databases were considered specifically because it was a consolidated cost that could be precisely measured using statistics from E-Journals/Databases provided by UGC-Infonet Digital Library Consortium. Whereas, Cost per Use of Print Journals could not be measured due to unavailability of usage statistics in both the libraries under study. Cost per Use (per article) is calculated for those E-Journals/Databases which were common in both the libraries. Therefore, the investigator analyzed Cost per Use of E-Journals/Databases for the current year 2014 in both the libraries under study to check the cost-effectiveness of each E-journal/Database as presented in the following Table-5.30.
### Table-5.30

**Cost per Use of E-Journals/Databases (2014)**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>E-Journals/Databases</th>
<th>Subscription Rates in original currencies ((\text{\vuat}))</th>
<th>Subscription Rates ((\text{\rupees}))</th>
<th>AMU</th>
<th>BHU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. of downloaded Articles</td>
<td>Cost/Use ((\text{\rupees}))</td>
<td>No. of downloaded Articles</td>
<td>Cost/Use ((\text{\rupees}))</td>
</tr>
<tr>
<td>1</td>
<td>ACS</td>
<td>$4725</td>
<td>293233.5</td>
<td>30039</td>
<td>9.76</td>
</tr>
<tr>
<td>2</td>
<td>AIP</td>
<td>$4935</td>
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<td>211810</td>
<td>3625</td>
<td>58.43</td>
</tr>
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<td>4</td>
<td>AR</td>
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<td>93245.15</td>
<td>1562</td>
<td>59.69</td>
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<tr>
<td>5</td>
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<td>£1797.28</td>
<td>18486.22</td>
<td>2063</td>
<td>89.61</td>
</tr>
<tr>
<td>6</td>
<td>Emerald</td>
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<td>152536.23</td>
<td>7748</td>
<td>19.68</td>
</tr>
<tr>
<td>7</td>
<td>Euclid</td>
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<td>35932.74</td>
<td>118</td>
<td>304.51</td>
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<td>8</td>
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<td>142049.66</td>
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<td>32.76</td>
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<td>9</td>
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<td>40430</td>
<td>6.43</td>
</tr>
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<td>10</td>
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<td>156244.34</td>
<td>2360</td>
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</tr>
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<td>11</td>
<td>OUP</td>
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<td>352912.66</td>
<td>16241</td>
<td>21.72</td>
</tr>
<tr>
<td>12</td>
<td>Portland Press</td>
<td>£360</td>
<td>37029.6</td>
<td>845</td>
<td>43.82</td>
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<td>13</td>
<td>RSC</td>
<td>£1665</td>
<td>171261.9</td>
<td>23412</td>
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<tr>
<td>14</td>
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<td>8054891.52</td>
<td>188845</td>
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<td>15</td>
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<td>$7283</td>
<td>451982.98</td>
<td>23072</td>
<td>19.59</td>
</tr>
<tr>
<td>18</td>
<td>Wiley-Blackwell</td>
<td>$17035</td>
<td>1057192.1</td>
<td>34311</td>
<td>30.81</td>
</tr>
</tbody>
</table>

1 USD = 62.06 INR as on January 2014
1 UKP = 102.86 INR as on January 2014

The above table reveals the Subscription Rates in original currencies i.e. $, £, € and Cost per Use of E-Journals/Databases subscribed in both the libraries through the UGC-Infonet Digital Library Consortium. Subscription Rates in original currencies were converted into Rupees (\(\text{\rupees}\)), the official currency of India and Dollars ($), the official currency of USA for better understanding.

#### 5.3.2.1 Cost per Use of E-Journals/Databases in AMU (2014)

The data analysis for Cost per Use of E-Journals/Databases indicates that in AMU, the cost per use for JSTOR was ₹6.43 ($0.10); RSC, ₹7.31 ($0.11); ACS, ₹9.76 ($0.15); Springer Link, ₹12.09 ($0.19); Taylor & Francis, ₹19.59 ($0.31); Emerald, ₹19.68 ($0.31); OUP, ₹21.72 ($0.34); Wiley-Blackwell, ₹30.81 ($0.49); IOP, ₹32.76 ($0.52); Science Direct ₹42.65 ($0.68); Portland Press ₹43.82 ($0.70); APS, ₹58.43 ($0.94); AR, ₹59.69 ($0.96); Nature, ₹66.20 ($1.06); CUP, ₹89.61

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($1.44); AIP, ₹167.63 ($2.70); Euclid ₹304.51 ($4.90) and SIAM, ₹865.15 ($13.94) respectively in the year 2014. Similar findings of a study conducted by Scigliano (2002) revealed that Annual Review Online had cost per use averaged over the 14 institutions was CA$ 4.45. From the use data, cost per use and rate of use for each institution were estimated for the year 2002.

The result of the analysis revealed that in AMU, JSTOR had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014.

It shows that the journals provided by JSTOR is used more and thus, is cheaper in terms of cost (₹6.43 or $0.10) and shows greater cost-effectiveness.

Whereas, SIAM (₹865.15 or $13.94) is expensive as it is costlier in terms of use as its usage is less, Hence it is not cost-effective. Similar findings of a study conducted by Shahrzadi (2006) revealed that cost per use for Science Direct, ProQuest, ACS, IOP, Ovid, EBSCO and Emerald was $0.24, $0.88, $1.11, $1.21, $1.66, $2.02 and $4.4 respectively and the result of the present study also revealed that Science Direct had the highest cost-benefit ratio.

### 5.3.2.2 Cost per Use of E-Journals/Databases in BHU (2014)

However, in BHU the Cost per Use for RSC was ₹2.51 ($0.04); ACS, ₹3.09 ($0.04); Nature, ₹4.26 ($0.06); JSTOR, ₹4.44 ($0.07); Springer Link, ₹4.64 ($0.07); Wiley-Blackwell, ₹10.78 ($0.173); Science Direct ₹10.89 ($0.175); IOP, ₹11.21 ($0.18); Taylor & Francis, ₹12.65 ($0.20); AR, ₹14.30 ($0.23); OUP, ₹14.79 ($0.23);
APS, ₹19.19 ($0.30); Emerald, ₹19.21 ($0.30); AIP, ₹20.22 ($0.32); Portland Press ₹40.78 ($0.65); CUP, ₹49.20 ($0.79); Euclid ₹156.22 ($2.51) and SIAM, ₹213.38 ($3.43) respectively.

The result of the analysis revealed that in BHU, Royal Society of Chemistry had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014. It shows that the journals provided by Royal Society of Chemistry is used more and thus is cheaper in terms of cost (₹2.51 or $0.04) whereas SIAM is expensive (₹213.38 or $3.43) as it is costlier in terms of use as its usage is less.

REFERENCES


Chapter 6
Major Findings, Recommendations and Conclusion
CHAPTER-6
MAJOR FINDINGS, RECOMMENDATIONS AND CONCLUSION

On the basis of the study conducted in respect of “Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study”, some of the major findings and possible suggestions for the improvement of their Journals collection and services have been given in the following paragraphs:

The data collected through survey method by administering a well structured questionnaire, was divided into three parts.

PART-A
LIBRARIANS’ PERSPECTIVE

For the present study the investigator calculated the cost of Journals from the analysis of librarians’ responses of the Central Libraries under study.

6.1. COST ANALYSIS OF JOURNALS FROM LIBRARIAN’S RESPONSES

Library Budget
1. The findings of the study reveals that BHU library got a higher library budget i.e. ₹6,89,63,625 than the central library of AMU, ₹2,38,75,000 in the year 2014-15. On an average library budget in AMU was ₹2,27,81,800 whereas BHU library got a higher average budget ₹5,50,58,354 (Table-5.1, Figure-5.1).

2. It was observed that there was no growth in the budgetary allocation in AMU except for the year 2013-14 and 2014-15. Whereas a fluctuating growth pattern (increasing/decreasing) of budget was discernible in BHU library. BHU library had an average annual growth of 11.83% in the library budget allocation whereas AMU library had only 1.83% average annual growth in the budget allocation (Table-5.2, Figure-5.2).

Expenditure or Amount Spent on Journals
3. It is further studied that on an average BHU library spent more amount on journals (₹2,08,33,977) than the central library of AMU (₹1,66,00,000) (Table-5.3, Figure-5.3). For the AMU library, the present budget was found to be insufficient for developing a good journals collection and to meet Researchers needs, an additional amount of ₹40,00,000 was required for Print journals and ₹60,00,000
was required for E-journals as stated by the authorities in charge of the library. In BHU library, the amount spent on subscribing journals is by and large adequate to meet the routine requirements of the Researchers.

**Journals Collection**

4. Central library of BHU was subscribing to more number of journals than the Central library of AMU. On an average BHU library subscribed to 2603 journals (print and e-journals) during the years 2010-14, whereas the central library of AMU subscribed to 741 print journals and one online database (LISA). It is found that a trend of decreasing number of Print journals and increasing number of E-journals is seen in BHU for the years 2010 to 2014. The Pearson correlation between Print Journals and Electronic Journals in BHU was worked out to be $-0.946$ indicating high degree of negative correlation i.e. the number of print journals is decreasing while the number of E-journals is increasing, considering the correlation, was tested to be highly significant at $p < 0.015$ (Table-5.4, Figure-5.4).

**Manpower Cost**

5. Total annual salary of staff of Periodicals Section in Maulana Azad Library (AMU) was ₹47,92,920 during the financial year 2014-15. However, total annual salary of staff of Periodicals Section in Sayaji Rao Gaekwad Library (BHU) was ₹41,53,248 during financial year 2014-15. Thus, it is clear from the analysis that the manpower cost of Periodicals Section is higher in AMU than the manpower cost of Periodicals Section in BHU during the financial year 2014-15 (Table-5.6).

**Total Cost of Journals**

6. Total cost of Journals collection in the central library (Maulana Azad library) of AMU was ₹2,08,00,920 in the financial year 2014-15. Whereas the total cost of Journals collection in the central library (Sayaji Rao Gaekwad Library) of BHU was ₹1,75,59,600 (Table-5.7).

**Preference for E-Journals**

7. Librarians of both the libraries preferred E-Journals as they are easy to order, easy to maintain, multiple use, no space problem and no problem of theft and mutilation are the reasons for acquiring E-journals as unveiled by the librarians of the select libraries (Table-5.10).
Impact of E-Journals
8. Librarians of both the Universities agreed that time of staff members as well as users were saved due to use of E-journals (Table-5.11).
9. Regarding the impact of E-journals on the use of Print Journals, librarians of both Universities agreed that usage of Print Journals decreased with the use of E-journals. Besides this, the quality of research and number of research publications had also increased (Table-5.12).
10. There is a heavy impact on users after the introduction of E-journals due to various advantages such as time saving, currency of knowledge and availability of information on the desktop. The number of users visiting the libraries has decreased as they are accessing E-journals from their respective departments, computer centre and hostels.

Methods for Promoting the Use of E-Journals
11. Regarding methods to promote the use of E-journals, both the libraries have adopted provisions for Training programs and library web page links to E-Journal Publishers/Vendors. BHU library also circulates database specific user guide (hardcopy) and subject list of E-journals on library web pages. But both the libraries do not use E-mail alerts to notify new E-journals nor provide general online guidance/tutorials on library use (Table-5.13).

Problems of E-Journals
12. ‘Slow connectivity’ and ‘lack of ICT Knowledge’ are the major problems faced by the users while accessing to E-journals as stated by the librarian of the AMU library. Whereas, librarian of BHU claimed that lack of maintenance was the major problem while providing access to them (Table-5.14).

PART-B
USERS’ PERSPECTIVE
For the present study the investigator calculated the cost of Journals utilizing the data collected from the analysis of responses received from the librarians of the Central Libraries under study and Benefit of Journals were calculated from the analysis of responses received from the users (Research Scholars and Faculty Members) of central libraries of the Universities under study.
6.2. BENEFIT ANALYSIS OF JOURNALS FROM USERS’ RESPONSES

During the present study there were 2123 Research Scholars and 1209 Faculty Members in Aligarh Muslim University (AMU), whereas there were 5037 Research Scholars and 1218 Faculty Members in Banaras Hindu University (BHU). Thus it was observed that there were more Research Scholars in BHU as compared to AMU and the numbers of Faculty Members were almost same in both the Universities.

Usage of Journals Collection

13. Majority of the respondents 34.33% from AMU and 45.60% from BHU used journals daily, followed by twice in a week and twice in a month. Moreover, a small percentage from both the Universities used the journals occasionally (Table-5.15, Figure-5.5).

14. Majority of the Research Scholars (84.43%) in AMU and 83.30% in BHU used journals for research work followed by finding relevant information in the area of specialization, updating their knowledge, writing articles and presentation/project purposes (Table-5.16(a), Figure-5.6(a)).

Majority of the Faculty Members (72.5%) in AMU and 90.16% in BHU used journals for finding relevant information in the area of specialization followed by, updating their knowledge, research work, writing articles, teaching work and presentation/project (Table-5.16(b), Figure-5.6(b)).

15. Majority of the Faculty Members 95.83% in AMU and 98.36% in BHU used journals for writing articles in journals/conference proceeding. On the other hand majority of the Research Scholars 93.86% in AMU and 93.83% of the Research Scholars in BHU used journals for writing their thesis and dissertations (Table-5.17(a&b), Figure-5.7(a&b)).

16. A good number of respondents (42.16%) from AMU and 43.68% from BHU read around 10-20 articles per month. In AMU, a lesser percentage of 2.71% users read more than 40 articles per month and 2.08% of the users read more than 40 articles per month in BHU (Table-5.18, Figure-5.8).

17. The users of BHU Central library spent more time in browsing/searching articles in a week than the users of AMU Central library (Table-5.19, Figure-5.9).
Benefits of Using E-Journals
18. Majority of the users 91.86% in AMU and 92.48% in BHU opined that they had access to current and up-to-date information using E-journals along with the ability to expedite their research process, provided easier and speedier access to information, getting access to a wider range of information and help to improve professional competence (Table-5.20, Figure-5.10).

19. Majority of the users 52.40% in AMU and 51.2% in BHU stated that E-journals had a direct impact on their research publications as they agreed that their research publications had increased after the use of E-journals (Table-5.21, Figure-5.11).

Importance of Journals
20. Majority of the users in AMU (61.14%) and 55.68% in BHU strongly agreed to the statement that journals were important for research work (Table-5.22, Figure-5.12).

Satisfaction Regarding the Use of Journals
21. With respect to the satisfaction level regarding the use of journals, majority of the users 67.52% in BHU were satisfied, whereas in AMU 53.01% of the users were satisfied. It revealed that BHU users were more satisfied with the use of journals than the users of AMU (Table-5.23, Figure-5.13).

Total Benefit of Journals
22. Majority of the users (61.14%) in AMU and 66.56% of the users in BHU stated a common reason for consulting journals in the library as ‘very expensive to purchase’. One cannot afford to subscribe individually, therefore library is the best place for consulting journals (Table-5.24).

23. Total benefit of Journals based on Annual WTP was ₹7,44,84,000 in AMU and ₹12,72,06,000 in BHU. It shows that benefit of Journals in BHU is more than AMU because of the larger number of users (Table-5.26).

Cost-Benefit Analysis of Journals
24. Cost-Benefit Ratio (1:7.2) and Return On Investment (624%) is much higher in BHU library as compared to Cost-Benefit Ratio (1:2.5) and Return On Investment (258%) in AMU library (Table-5.27).

Productivity or Research Output
25. During the year 2013-14, in AMU a total 2074 Research Papers/Articles were published and 159 Books were published by Faculty Members. Total 321 M. Phil./Ph.D. Degrees were awarded and a total number of 210 Research Projects
were carried out. Whereas in BHU during the same year (2013-14) a total of 2669 Research Papers/Articles were published and 175 Books were published. Total 714 M.Phil./Ph.D. Degrees were awarded and a total number of 402 Research Projects were carried out. Hence the Productivity or Research Output of BHU was more than AMU in the year 2013-14 (Table-5.28).

PART-C

6.3 ANALYSIS OF USAGE STATISTICS OF E-JOURNALS/DATABASES

The usage statistics of E-Journals/Databases subscribed through Consortium (UGC-Infonet Digital Library Consortium) was provided by the libraries of both the Universities under study and the analysis of usage statistics was done and findings are presented in the following paragraphs.

Use of E-Journals/Databases

26. On an average the downloaded articles 11,75,890 were quite high in BHU as compared to downloaded articles in AMU (3,89,472) during the period 2012-2014. The articles downloaded in BHU were almost three times more than in AMU. It shows that the usage of E-Journals/Databases is more in BHU than in AMU (Table-5.29).

27. In AMU, the usage of E-Journals/Databases had increased from 3,29,706 to 4,30,476 full-text downloads during the period 2012-2014. In BHU also the usage of E-Journals/Databases had increased from 9,13,698 to 13,43,598 full-text articles were downloaded during the period 2012-2014. It shows the increasing trend of using E-Journals/Databases (Table-5.29, Figure-5.15).

28. During the period 2012-2014 in AMU, the five most used E-Journals/Databases included Science Direct (43.54%), followed by Springer Link (11.79%), JSTOR (10.11%), Wiley-Blackwell (7.97%) and American Chemical Society (6.86%). The five least used E-Journals/Databases included American Institute of Physics (0.45%), Project Muse (0.37%), Portland Press (0.17%), Euclid (0.03%) and SIAM (0.03%) (Table-5.29.1, Figure-5.16).

29. In BHU, during the same period (2012-2014) the five most used E-Journals/Databases included Science Direct (52.44%), followed by Springer Link (10.84%), American Chemical Society (7.88%), Wiley-Blackwell (7.14%) and JSTOR (4.95%). The five least used E-Journals/Databases included Cambridge
University Press (0.37%), Project Muse (0.23%), Portland Press (0.10%), SIAM (0.06%) and Euclid (0.02%). In both the universities, Science Direct and Springer Link were among the most highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases during the period 2012-2014 (Table-5.29.2, Figure-5.17).

30. A Comparative study of the average use of top five E-Journals/Databases in select Universities during the period 2012-2014 shows that, Science Direct was highly used in AMU (43.54%) and (52.44%) in BHU, followed by Springer Link (11.79%) in AMU and (10.84%) in BHU, JSTOR (10.11%) in AMU and (4.95%) in BHU, Wiley-Blackwell (7.97%) in AMU and (7.14%) in BHU, American Chemical Society (6.86%) in AMU and (7.88%) in BHU (Table-5.29.3, Figure-5.18).

Cost per Use of E-Journals/Databases
31. In AMU, JSTOR had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014. It indicates that the journals provided by JSTOR were used more and thus was cheaper in terms of cost (₹6.43 or $0.10) whereas SIAM (₹865.15 or $13.94) was expensive as it is costlier in terms of use as its usage is less (Table-5.30, Figure-5.19).

32. In BHU, Royal Society of Chemistry had the highest cost-benefit ratio and SIAM had the lowest cost-benefit ratio in the year 2014. It shows that the journals provided by Royal Society of Chemistry were used more and thus was cheaper in terms of cost (₹2.51 or $0.04) whereas SIAM was expensive (₹213.38 or $3.43) as it was costlier in terms of use as its usage was very less (Table-5.30, Figure-5.20).

6.4 TENABILITY OF HYPOTHESES
Tenability of the hypotheses has been checked in the light of the above findings.

Hypothesis # 1
There exists higher Cost than Benefit of Journals in the libraries under study.

Table-5.7 revealed that the total Cost of Journals in the central library of AMU was calculated as ₹ 2,08,00,920 and ₹1,75,59,600 in the central library of BHU for the year 2014-15. Whereas, the total Benefit of Journals was calculated to be ₹ 7,44,84,000 for AMU and ₹12,72,06,000 for BHU during the year 2014-15 (Table-5.26).
It is clear that there is higher Benefit than the Cost of Journals in both the libraries under study in the year 2014-15. Although it appears as though universities are spending more on journals in reality the benefit is more as compared to cost. Therefore hypothesis is rejected.

**Hypothesis # 2**

*The Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection is higher in BHU than AMU.*

The Table-5.27 revealed that the Cost-Benefit Ratio (1:7.2) and Return On Investment (624%) is much higher in BHU library as compared to AMU library. AMU had Cost-Benefit Ratio (1:2.5) and Return On Investment (258%) only.

It is clear that Cost-Benefit Ratio (CBR) and Return on Investment (ROI) of Journals Collection is higher in BHU than AMU. Hence, the hypothesis is proved.

**Hypothesis # 3**

*There are significant differences in the total number of articles read in a month in AMU and BHU.*

**Table-6.1: T-test for Total number of articles read in a month**

<table>
<thead>
<tr>
<th>Pair</th>
<th>AMU - BHU</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>95% Confidence Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-58.600</td>
<td>53.135</td>
<td>23.763</td>
<td>-124.575</td>
<td>7.375</td>
<td>-2.466</td>
<td>4</td>
<td>.069</td>
</tr>
</tbody>
</table>

On applying the T-test to Table-5.18, the resulting Table-6.1 shows that the t statistic, t= -2.466 and p=0.069, since p>0.05, thus there exists significant differences in the total number of articles read in a month in AMU and BHU.

According to the above analysis and discussions, it can be concluded that there exists significant differences in the total number of articles read in a month in AMU and BHU. Hence, the hypothesis is proved.

**Hypothesis # 4**

*There are significant differences in the time spent in searching articles per week in AMU and BHU.*
Table 6.2: T-test for time spent in searching articles per week

<table>
<thead>
<tr>
<th>Pair</th>
<th>AMU - BHU</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>73.250</td>
<td>53.767</td>
<td>26.884</td>
<td>-158.806</td>
<td>12.306</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>53.767</td>
<td>26.884</td>
<td>-158.806</td>
<td>12.306</td>
<td>-2.725</td>
</tr>
<tr>
<td>Std. Error Mean</td>
<td>26.884</td>
<td>12.306</td>
<td>-2.725</td>
<td>3</td>
<td>.072</td>
</tr>
</tbody>
</table>

On applying the T-test to Table-5.19, the resulting Table-6.2 shows the t statistic, t= -2.725 and p=0.072, since p<0.05, thus there is a significant difference between the time spent in searching articles per week in AMU and BHU. Hence, the hypothesis is proved.

**Hypothesis # 5**

*There is a significant difference in the satisfaction level with the use of Journals collection among the users of AMU and BHU.*

Table 5.23 revealed that 67.52% of the users in BHU were satisfied with the use of Journals whereas in AMU 53.01% of the users were satisfied with the use of Journals. Since, the percentage of users for satisfaction with the use of journals in BHU is more than the percentage of the users in AMU. It shows that BHU users are more satisfied with the use of journals than the users of AMU.

Table 6.3: T-test for level of Satisfaction

<table>
<thead>
<tr>
<th>Pair</th>
<th>AMU - BHU</th>
<th>Paired Differences</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>-58.600</td>
<td>113.925</td>
<td>50.949</td>
<td>-200.056</td>
<td>82.856</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>113.925</td>
<td>50.949</td>
<td>-200.056</td>
<td>82.856</td>
<td>-1.150</td>
</tr>
<tr>
<td>Std. Error Mean</td>
<td>50.949</td>
<td>82.856</td>
<td>-1.150</td>
<td>4</td>
<td>.314</td>
</tr>
</tbody>
</table>
On applying the t-test to Table-5.23, the resulting Table-6.3 shows the t statistic, $t= -1.150$ and $p=0.314$, since $p<0.05$, thus there is a significant difference between the satisfaction level of the users of AMU and BHU. Hence, the hypothesis is proved.

6.5 RECOMMENDATIONS

In the light of the analysis of data, findings and the opinions received from the librarians and users, the following recommendations are made in order to increase the benefits of Journals.

1. More funds should be made available to the Central library (Maulana Azad Library) of AMU to develop the Journals collections like that of BHU library.
2. The budget allocated to both the libraries should be with the escalating cost of Journals every year.
3. The requirements of users may be fulfilled by adopting a sound collection development policy that may be supplemented by ILL.
4. Maulana Azad Library should subscribe to E-Journals/Databases besides the E-Journals/Databases subscribed under UGC-Infonet Digital Library Consortium, to meet the current information requirements of the Research Scholars and Faculty Members.
5. Both the libraries should maintain statistics for recording the use of Print journals.
6. Both the libraries should subscribe to more number of E-Journals/Databases as they have many advantages.
7. Both the libraries should send E-mail alerts or sms alerts to notify the arrival of new journals to Research Scholars and Faculty Members for increasing the usage.
8. Both the libraries should increase their subscription to more number of consortium for providing maximum benefits of best collection at least cost.
9. Both the libraries should cancel the subscription of the E-Journals/Databases like Portland Press, SIAM and Euclid because they are among the least used E-Journals/Databases, as well as they prove to be expensive as Cost per Use was calculated to be high in the current year 2014.

6.6 CONCLUSION

The present study compared the Cost-benefit analysis of Journals collection in the central libraries of AMU and BHU for the current year (2014-15). Findings revealed that BHU library had larger budget and was subscribing to more journals
than the AMU library. Findings revealed that benefits of Journals in BHU are more than AMU because of greater usage subsequent to the larger number of users resulting in a higher Cost-Benefit Ratio and Return On Investment.

The analysis of usage statistics revealed that the articles downloaded in BHU were almost three times more than in AMU. It indicates that the usage of E-Journals/Databases was more in BHU than AMU which further is reflected in the Productivity or Research Output of BHU which is higher that of AMU. The study revealed that in AMU, Science Direct, Springer Link and JSTOR were highly used E-Journals/Databases as compared to Portland Press, Euclid and SIAM which were among the least used E-Journals/Databases. In AMU, the Cost per Use of JSTOR was very low (₹6.43 or $0.10) whereas SIAM had high Cost per Use (₹865.15 or $13.94).

In BHU, Science Direct, Springer Link and American Chemical Society were among the highly used E-Journals/Databases whereas Portland Press, SIAM and Euclid were the least used E-Journals/Databases. The Cost per Use of the journals provided by Royal Society of Chemistry was low (₹2.51 or $0.04) whereas the Cost per Use of SIAM was high (₹213.38 or $3.43).

Both the libraries preferred E-Journals/Databases because of several benefits and cost-effectiveness of E-Journals/Databases. Journals are very important information sources used by Research scholars and Faculty members. Majority of users in both the universities used journals for their research and writing articles. The users of BHU read more number of articles and spent much time than the users of AMU. As a result, users of BHU library were more satisfied with the use of journals than the users of AMU library.

6.7 IMPLICATIONS OF THE STUDY
1. The library authorities as well as the Funding Agencies should improve the journals collection in libraries by increasing the budget allocation for the central library of AMU, so as to provide better access to information sources and services for Research Scholars and Faculty Members.
2. The study may help the librarians to prove the economic value or worth as well as justify the expenditure of journals collection in this era of decreasing financial resources and increasing demands for accountability.
3. The Cost per Use of E-Journals/Databases presented in the study will guide the librarians to evaluate the performance of each E-journal/Database.
4. The study will be helpful for librarians to provide an insight of highly used E-journals/Databases at low cost and less used E-journals/Databases at high cost by guiding them at the time of subscription or renewal of journals.

6.8 **RECOMMENDATIONS FOR FURTHER RESEARCH**

During the period of the research study, the investigator realized that the following similar studies may be carried out in other areas and on other types of collections in libraries.

1. A similar study may be undertaken to assess the economic value of collections such as Books, E-books, Magazines, Newspapers, Audiovisual materials etc. available in libraries.

2. A similar study can also be conducted to estimate the economic value of services provided by libraries such as circulation service, information services, technical services, reference service and newspaper clipping service etc.

3. Another similar study may be undertaken for measuring the economic value of different types of libraries.

4. A comparative study is also suggested between the libraries of reputed universities and Institutions such as JNU, DU, IITs and IIMs.
Bibliography
BIBLIOGRAPHY


Bibliography


Appendices
APPENDIX-I
DEPARTMENT OF LIBRARY & INFORMATION SCIENCE
ALIGARH MUSLIM UNIVERSITY, ALIGARH

QUESTIONNAIRE FOR LIBRARIAN

Dear Sir,

I am pursuing my Ph.D. on “Cost-Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” from Aligarh Muslim University. In this regard, I would like to request you to kindly fill up this questionnaire and give additional suggestions in the space provided. I shall be grateful if you could spare sometime from your busy schedule to fill up this questionnaire.

The information gathered shall be kept confidential and will be used for the research purpose.

Thanking you for your co-operation.

Sincerely Yours
Saba Nasreen Bano (Professional Assistant)
Research Scholar
Deptt. of Library & Information Science
A.M. U., Aligarh
Email id: saba.nasreen1@gmail.com

PERSONAL DETAILS

Name .......................................................... Designation ........................................

Institution: ................................................................................................................................

Year of Establishment.............................................................................................................
LIBRARY BUDGET

1. Please indicate the total annual library budget including five year plan budget.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>(Amount in Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010-11</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2011-12</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2012-13</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2013-14</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>2014-15</td>
<td></td>
</tr>
</tbody>
</table>

2. Please indicate the Annual budget allocated for the acquisition of Journals or Expenditure (amount spent) on Journals during the following years:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Expenditure on Journals (Amount in Rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2011</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2012</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2013</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>2014</td>
<td></td>
</tr>
</tbody>
</table>

3. Is present budget adequate to meet your requirement for Journals Collection?
   (a) Yes [ ]
   (b) No  [ ]

4. If No, how much additional amount is required for:
   (a) Print Journals ............................................
   (b) Electronic Journals ........................................
JOURNALS COLLECTION

5. Please indicate the total number of Journals subscribed by your library?

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Print Journals</th>
<th>Electronic Journals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>2014</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Please give a list of databases and usage statistics which are subscribed by your library through consortium or any other consortium/databases

...............................................................................................................................................

ACQUISITION OF JOURNALS

7. What is the selection policy adopted for journals in your library? (Multiple responses are permitted)

   (a) Annual budget of the library [ ]
   (b) Scope of the library [ ]
   (c) Recommendation by Chairman of the Deptt. [ ]
   (d) Announcements of the review [ ]
   (e) Keeping user’s demand in view [ ]
   (f) Recommendation by Library committee members [ ]

8. When did you start E-journal services in your library?

...............................................................................................................................................

9. In which year did your library become a member of the E-journal consortium?

.............................................................................................................................................
STAFF

10. Total number of Professional staff in Periodicals Section at present.........................

(Please indicate the Number & Salary of the staff category wise below)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Designation of the Staff</th>
<th>2014-15</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Gross Salary (Monthly)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number</td>
<td>(Amount in Rupees)</td>
</tr>
<tr>
<td>1.</td>
<td>Deputy Librarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Assistant Librarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Professional Staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Semi-Professional Assistant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Library Attendant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Any other</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Please indicate any other amount (Rupees) spent for maintaining Journals Collection per year.
   (a) Stationeries ..............................................................
   (b) Equipments ..............................................................
   (c) Machineries .............................................................

12. Please give the details of any other amount spent in maintaining the Journals Collection
   ........................................................................................................

METHODS USED TO ESTIMATE THE USAGE OF JOURNALS

13. How do you estimate the usage of Print journals in your institution? (Multiple responses are permitted)
   (a) In-house Use [  ]
   (b) Photocopy Request [  ]
   (c) Reshelving Count [  ]
   (d) Inter Library Loan Requests [  ]
   (e) Citation Analysis [  ]
   (f) User survey/Feedback [  ]
14. How do you estimate the usage of E-journals in your institution? (Multiple responses are permitted)
   (a) Print outs [ ]
   (b) Hit Statistics [ ]
   (c) Number of Downloads [ ]
   (d) Citation Analysis [ ]
   (e) User survey/Feedback [ ]

(Note: kindly provide a copy of the above hits/indicators/documents used by you to estimate the usage of E-journals/Databases during the last 3 years)

**PREFERENCE FOR E-JOURNALS**

15. Please indicate the various reasons for acquiring E-journals? (Multiple responses are permitted)
   (a) Easy to Order [ ]
   (b) Easy to Maintain [ ]
   (c) Multiple Use [ ]
   (d) No Space Problem [ ]
   (e) No Problem of Theft and Mutilation [ ]

16. The E-Journals used in the library has reduced the amount of staff time devoted to repetitive activities and simultaneously has saved the time of users:
   (a) Yes [ ]
   (b) No [ ]

**IMPACT OF E-JOURNALS**

17. Did you find any impact on the use of Print journals after the introduction of E-journals?
   (a) Yes [ ]
   (b) No [ ]

If yes:
   (a) Usage increased [ ]
   (b) Usage decreased [ ]
   (c) Decreased first then increased [ ]
   (d) Increased first then decreased [ ]
18. Please indicate the impact on users after the introduction of E-journals?

(a) Time saving [ ]
(b) Currency of knowledge [ ]
(c) Increased number of Journal use [ ]
(d) Information on desktop [ ]

METHODS ADOPTED FOR PROMOTING THE USE OF E-JOURNALS

19. What are the various methods adopted by you for promoting the use of E-journals? (Multiple responses are permitted)

(a) Training programs [ ]
(b) Database specific User guide/hard copy [ ]
(c) Library Web Page Links to E-Journal Publishers/Vendors [ ]
(d) General online guidance/tutorials on library use [ ]
(e) E-mail alerts to notify new E-journals [ ]

PROBLEMS OF E-JOURNALS

20. Problems faced by you while providing access to E-journals? (Multiple responses are permitted)

(a) Slow Connectivity [ ]
(b) Slow Downloading [ ]
(c) Lack of Training / Orientation [ ]
(d) Lack of Maintenance [ ]
(e) Lack of ICT Knowledge [ ]

21. Do you organize any training programs on E-journals for library staff to provide better services to the users?

(a) Yes [ ]
(b) No [ ]

If yes, then mention total cost of the training programme conducted

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Year</th>
<th>Cost of Training Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2012-13</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2013-14</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>2014-15</td>
<td></td>
</tr>
</tbody>
</table>
SUGGESTIONS

22. Please enlist your suggestions for rationalisation of Journals with an emphasis on achieving maximum benefits with minimum investments.

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

Thank you very much for your cooperation
APPENDIX-II
DEPARTMENT OF LIBRARY & INFORMATION SCIENCE
ALIGARH MUSLIM UNIVERSITY, ALIGARH

QUESTIONNAIRE FOR USERS

Dear Respondent,

I am pursuing my Ph.D. on “Cost Benefit Analysis of Periodicals Collection in Central University Libraries in Uttar Pradesh: A Comparative Study” from Aligarh Muslim University. I shall be grateful to you, if you could kindly fill the questionnaire and return back the same as soon as possible. Please answer all the questions and make any additional suggestions in the space provided. The data collected through the questionnaire will be kept highly confidential and used for research purpose only.

Your Cooperation will be highly solicited

Sincerely Yours

Saba Nasreen Bano (Professional Assistant)
Research Scholar
Deptt. of Library & Information Science
A.M. U., Aligarh
Email id: saba.nasreen1@gmail.com

Part I

PERSONAL DETAILS

Name: .........................................................................................
Status: Faculty Member: Professor/Associate Professor/Assistant Professor
Research Scholar: 1st year/2nd year/3rd year/4th year/5th year and above
Department: ...............................................................
Faculty: ................................................................
University: .................................................................
E-mail: ..............................................................................
Part II

USAGE OF JOURNALS COLLECTION

1. How often do you consult Journals?
   (a) Daily [ ]
   (b) Twice in a week [ ]
   (c) Twice in a month [ ]
   (d) Occasionally [ ]

2. Please indicate the purpose of using Journals? (Multiple responses are permitted)
   (a) Updating knowledge [ ]
   (b) Research work [ ]
   (c) Teaching work [ ]
   (d) Writing Articles [ ]
   (e) Presentation/Project [ ]
   (f) For finding relevant information in the area of specialization [ ]

3. Please indicate the use of journals for Academic purposes? (Multiple responses are permitted)
   (a) Articles in Journals/Conference proceedings [ ]
   (b) Thesis/Dissertations [ ]
   (c) Books [ ]
   (d) Research Reports [ ]
   (e) Book Reviews [ ]
   (f) Invited Lectures/ Talks [ ]

4. How many articles do you read using the Journals subscribed by library?
   (a) 0-10 [ ]
   (b) 10-20 [ ]
   (c) 20-30 [ ]
   (d) 30-40 [ ]
   (e) More than 40 [ ]
5. How many hours on an average do you spent in browsing/searching articles weekly?
   (a) 1-3 hours  [  ]
   (b) 4-6 hours  [  ]
   (c) 7-9 hours  [  ]
   (d) More than 9 hours [  ]

**BENEFITS OF USING E-JOURNALS**

6. What are the benefits of using E-journals for your study/work? (Multiple responses are permitted)
   (a) Expedite the research process  [  ]
   (b) Improve professional competence [  ]
   (c) Access to a current and up-to-date information [  ]
   (d) Easier access to information of interest  [  ]
   (e) Faster access to information of interest [  ]
   (f) Access to a wider range of information [  ]

7. To what extent do you agree or disagree with the statement “Whether number of research publications has increased after using E-journals subscribed by your library”?
   (a) Strongly Agree  [  ]
   (b) Agree  [  ]
   (c) Neither Agree nor Disagree [  ]
   (d) Disagree  [  ]
   (e) Strongly Disagree  [  ]

**IMPORTANCE OF JOURNALS**

8. To what extent do you agree or disagree with the statement “Research work is not possible without journals”?
   (a) Strongly Agree  [  ]
   (b) Agree  [  ]
   (c) Neither Agree nor Disagree [  ]
   (d) Disagree  [  ]
   (e) Strongly Disagree  [  ]
SATISFACTION REGARDING THE USE OF JOURNALS

9. Please give your level of satisfaction regarding the Journals collection of your library.
   (a) Strongly Satisfied [  ]
   (b) Satisfied [  ]
   (c) Neither Satisfied/nor Dissatisfied [  ]
   (d) Dissatisfied [  ]
   (e) Strongly Dissatisfied [  ]

ECONOMIC VALUE OF JOURNALS

10. Select a reason for consulting journals in library, rather than buying/ subscribing the Journals:
    (a) Very expensive to purchase [  ]
    (b) To be read only once [  ]
    (c) Not sure the journal will be useful [  ]
    (d) Lack of space [  ]

11. Suppose that this library would not exist anymore, how much money (Indian Rupee (₹)) would you be willing to pay to access articles per month as it exists today, including the time, effort, travel etc. to access the journals.
    (a) 1000-2000 [  ]
    (b) 2000-3000 [  ]
    (c) 3000-4000 [  ]
    (d) 4000-5000 [  ]
    (e) 5000-6000 [  ]

SUGGESTIONS

12. Kindly provide some suggestions or comments for the improvement of Journals collection subscribed by the library.
    ........................................................................................................................................
    ........................................................................................................................................
    ........................................................................................................................................

Thank you very much for your cooperation
APPENDIX-III
PROFILES OF CENTRAL LIBRARIES STUDIED

The study has been conducted using the data collected from Central Libraries of AMU (Maulana Azad Library) and BHU (Sayaji Rao Gaekwad Library). An overview of the Central Libraries under study i.e. Maulana Azad Library (AMU) and Sayaji Rao Gaekwad Library (BHU) are described in the following sections.

ALIGARH MUSLIM UNIVERSITY, ALIGARH

About the University

Aligarh Muslim University is a residential academic University of International repute, established in 1875 by Sir Syed Ahmad Khan and in 1920 it was granted a status of Central University by an Act of Indian Parliament. AMU provides education from School level to Higher Education level. It has more than 39,015 students, 1,480 teachers and some 5,709 non-teaching staff on its rolls. (Aligarh Muslim University, Annual Report 2014-15). The University offers around 300 courses in its 12 Faculties comprising 98 Departments viz. Agriculture Sciences, Arts, Commerce, Engineering & Technology, Law, Life Sciences, Management, Medicine, Science, Theology, Unani Medicine and Social Sciences. The University also has 3 academies and 15 centers and institutions. There are 19 halls of residence for students with 80 hostels. The University had opened three new Centres of study outside Aligarh in the year 2011 at Murshidabad (West Bengal), Kishanganj (Bihar) and Mallapurum (Kerala).

The University also maintains a number of Colleges, Institutes, Centres and Schools. Notably among them are Women's College, Centre of Professional Courses, Interdisciplinary Biotechnology Unit, Zakir Hussain College of Engineering & Technology, Ajmal Khan Tibbiya College, Jawaharlal Nehru Medical College, Dr. Ziauddin Ahmad Dental College, Institute of Ophthalmology, Centre for Advanced Studies in History, Centre for Women Studies, Centre for Nehru Studies, University Polytechnic University, Women's Polytechnic, K.A. Nizami Centre for Quranic Studies, Schools including one for the visually challenged.

Maulana Azad Library (Central Library)

The central library of Aligarh Muslim University is known as Maulana Azad Library. It is regarded as second largest University Library of Asia with more than
13,01,029 volumes including departmental seminar libraries of the University (as on 31.03.2015). The foundation of the Library was laid in 1875 when Sir Syed Ahmad Khan, a great social reformer of his time, established a school that later became Mohammaden Anglo Oriental College in 1877 and finally Aligarh Muslim University in 1920 by an Act of Parliament. The foundation stone of the Library was laid by Lord Lytton, the then Viceroy of India. That is why the Library was originally named as Lytton Library.

The present grand seven storied building surrounded by 4.5 acres of land was inaugurated in 1960 by Late Pandit Jawaharlal Nehru, Prime Minister of India and was named as Maulana Azad Library, after the name of Maulana Abul Kalam Azad, the first Education Minister of independent India.

Maulana Azad Library has introduced state of the art information technology and it is fully automated with LibSys 7.0 software which connects almost all 9,500 computers within the University as well as the centers in distant states. The 3M security system and three dozen CCTV cameras ensure safety of the Library material. Over 5000 students, teachers and other members visit the Library almost every day.

In the central hall of the Library at the entrance are displayed ‘new arrivals’, ‘university staff publications’, ‘must read books’ and ‘founders library collection’ in respective showcases. Several systems providing search facility for library materials through OPAC and traditional catalogues are available in the Central Hall.

**Library Hours**

Maulana Azad Library remains open for 18 hours a day on all days except a few national and religious holidays. During examination period opening hours of library are further extended for 20 hours a day. M.A. Library is highly used library where various users, i.e., Students, Research scholars, Faculty members, outsiders as guest members etc. visit the library. Being a residential university, a large number of students utilize resources of the library.

**Library Staff**

At present, Maulana Azad Library has 01 Acting University Librarian, 04 Deputy Librarians, 18 Assistant Librarians, 18 Professional Assistant, 38 Semi-Professional Assistants, 01 Information Science Officer, 01 Care taker, 19 Library Attendants, 4 Clerical Staff, 12 Binders and 10 other workers such as Safaiwalas, daily wagers, skilled and unskilled supporting staff. Total number of professional staff at present is 125.
Library Collections

The Library collections comprise of about 18,00,000 documents including books, periodicals, newspapers, theses, dissertations, reports, pamphlets, manuscripts, paintings, photographs, CDs, microfilms, databases, e-books, talking books etc. There are about 15,000 theses and dissertations forming perhaps the largest collection of such documents in the Country. Besides hard copy collections of about 13,00,000 books, about 1,20,000 e-books and 300 full text theses uploaded at Shodhganga.

The oldest manuscript owned by the library is more than fourteen hundred years old. It is a fragment of the Holy Quran transcribed by Hazrat Ali, the fourth caliph of Islam and is written on parchment in Kufi script. Another rare collection is the Halnama of Beyazid Ansari, no copy of which is available anywhere else in the world. The Library has a sizeable collection of early printed books in various languages. The most outstanding among them is the Latin translation of the celebrated Arabic work on optics, opticam praefatis, by Ibn-al-Haitham (965-1039) published in 1572. There are several farmans (decrees) of the Mughal kings like Babur, Akbar, Shahjahan, Shah Alam, Shah Alamgir, Aurangzeb etc. Another prized possession of the library is a “Shirt” on which the whole Quran is inscribed in kufi script. This shirt is believed to have been worn by a warrior of Mughal army. Among the large collection of Mughal paintings is the painting of Red Blossom, which is magnum opus of Mansoor Naqqash, the celebrated court artist of Emperor Jahangir. Some valuable Sanskrit works translated into Persian have also been preserved in the library. Other possessions worth mentioning are the Ayurved in Telugu and the Bhasa’s in Malyalam script written on palm leaves. Abul Faiz Faizi, an eminent scholar of Akbar’s court translated several Sanskrit works into Persian, such as Maha Puran, Bhagvat Gita, Mahabharat and Lila Wati, all these are available in the library.

(i) Manuscripts: The library has 15162 manuscripts mostly in Persian and Arabic language pertaining to almost all disciplines and Research scholars pursuing their studies in Persian, Arabic, Urdu, History, Islamic Studies can use them and digitisation of these manuscripts is in progress through CDA.

(ii) Urdu Collection: The library has the largest collection of Urdu literature specifically the Periodicals of 19th century in Urdu language that are very frequently consulted by research scholars and readers pursuing their studies in Urdu literature, Journalism and History etc.
(iii) **Reference Collection:** The library has a specialized collection of reference books like Dictionaries, Encyclopedias, Guide books, Census publications, Biographical Sources, Geographical sources, Atlases, Gazetteers, Maps, Statistical information, etc.

(iv) **Microfiche Collection:** The library has substantive number of microfiche pertaining to documents of historical importance. The library has thousands of microfiche which contain some of the important items as Census of India 1872-1951, Indian Register (India Office List) from 1771 to 1947, Selection from Dispatches to the Government of India from 1858 to 1936 and some priceless journals published during last two centuries.

(v) **Microfilms Collection:** Quite a good number of microfilms of printed books and manuscripts are also available in the library.

(vi) **Rare Books, Arts Books & Theses Collection:** The Library has a very large collection of rare books published in 18\textsuperscript{th} and 19\textsuperscript{th} century.

(vii) **Phonodiscs and Phonorecords:** The Library has a fine collection of phonodiscs of concerts, instrumental music, orchestral music, rhapsodies, sonateas, symphonies, etc. as well as phonodiscs of eastern music including the performance and recordings of the eminent personality.

(viii) **Print and Online Journals:** Library subscribes 657 journals including about 262 foreign journals and 395 Indian journals. The Division also subscribes to online resources such as LISA, J-Gate, Delnet, UGC-Infonet Digital Library Consortium. Trial access of e-resources has been offered by many publishers and are being used by the Academic fraternity. (Aligarh Muslim University Annual Report 2014-15).

(ix) **Other Collections:** Sir Syed Collection, Ghandhiyan Collection, Aligarh Collection, Digital resources and E-books etc. are also important collections of M.A. Library.

**Library Services**

Maulana Azad Library provides number of services to the users some of these services are noted below:

**Circulation Service**

The Readers can make use of books and other reading material by use of resources within library and borrowing of books. Various categories of users, i.e., Undergraduate,
Postgraduate Students, Research Scholars, Faculty Members and Non-Teaching Staff may borrow the books.

**Reference Service**

Reference service is the most important service from the point of view of readers. Library has sufficient trained staff to help readers in locating the documents required by them. Library helps the reader by assisting research scholars in selection of topics for research and subsequent assistance by providing various reference tools. Helping the users in how to use/locate the material and reference tools, i.e., Encyclopedias/dictionaries/biographies/year book/directories etc. The Library has further strengthened its reference division by procuring new editions and entirely new reference tools during current year.

**Bibliographic Services**

Maulana Azad Library also provides bibliographic services to the faculty members and research scholars on demand. The staff of research division prepares such bibliographies on request of Research Scholars. Library has published Sir Syed and Aligarh Movement: a select bibliography and Abul Kalam Azad: an annotated subject bibliography. Library is also publishing as a regular publication such as M.A. Library Documentation Service (Urdu): a quarterly index to Urdu periodical Literature received in library.

**Current Awareness Services (CAS)**

The library had started this service as Content Page Service. Contents of all new issues of journals received in the library are being photocopied before transfer to respective departments and the same is sent to various departments. It is being a widely appreciated service.

**Digitization of Manuscripts and Printed Rare Book Materials**

Library has started digitization of manuscripts and some rare printed materials. In this respect, library has so far digitized around 150 manuscripts and rare printed bilingual publication brought out by Sir Syed Ahmad Khan i.e. Aligarh Institute Gazette from 1864-1922. The library has also digitized all files of Tehzibul Akhlaq.

**Online Journals Service**

Maulana Azad Library has established an online journals lab with 20 nodes. It is connected with the main server of Computer Centre through optical fibre. They are getting around 5,000 online journals under UGC-Infonet programme. About 300
online journals are available under free online scheme of various publishers. All the research scholars and teachers are getting benefitted through this service.

**Inter Library Loan Service**

The Library obtains the required document on Inter Library Loan if it is not available in the library. It also offers the documents to other libraries on Inter-Library Loan.

**Extension Services:** Extension services provided by the library are:

(i) Organization of Exhibition of Book/Photographs on various occasions.

(ii) Book release functions etc.

**Division/Sections**

**Acquisition Section**

This section is responsible for selecting, ordering and acquiring books and reference sources. In selecting books and references these points should be considered as the identification of the needs of academic society and the university current fields of study and educational levels and university research fields. Library materials and resources are acquired through inspecting lists of different publications and attending book fairs, periodical fairs, book review sessions and informed people in the field. Students can give their requests to the librarians or the acquisition section to bought after being inspected in the acquisition committee, regarding resources which do not exist in the collection. After being acquired recorded books are sent to technical section.

**Technical Section**

After being acquired and accessioned, books are sent to the Technical Division for classification, cataloguing and putting references on intranet of the University and internet to make their references accessible all over the world. In this Section, the records of newly added books are added to the existing database which is followed by pasting of book-pocket, date-slips, tattle tapes and spine labels. Documents are then sent for Circulation and Services Divisions for issue outside the Library or reading inside. The Library provides current awareness service to its users by uploading list of new arrivals on its web page and putting their lists on display for general users.

**Circulation Section**

The Circulation Section of the University library, AMU provides open access to its service. Students can go to the book store of different stacks and after inspection, borrow the intended book. They can also have membership of the library
by submitting their student card and one photo. It is one of the busiest section and deals with charging and discharging of books, maintaining statistics of the total number of books issued and returned in a day, shelving of books and filing of catalogue card. If the book is lost or returned back late then users have to pay fine for the same.

Reference Section

This section keeps the books that cannot be borrowed and students can use the available resource just at place to obtain the required information. The reference sources of this section are Dictionaries, Encyclopedias, Bibliographies, Directories, Indexes, Geographical sources, Subject Dictionaries, Statistical Sources, Calendars, Yearbooks and Biographies. Reference librarians guide students and other clients to access their needed sources.

Periodicals Section

Periodicals section is responsible for collecting and managing the periodicals which contain the latest information on current developments. The Library makes every effort to procure the maximum number of journals on all subjects of studies. This Division also procures and manages the current newspapers and general magazines. At present, about 657 Print journals and 7,590 (approx.) e-journals are subscribed under the UGC-Infonet Digital Library Consortium.

Computer Section

The Library provides campus wide access to online resources through a well-equipped Computer Lab. The Section has started housekeeping operations in Acquisition, Periodical, Technical and Circulation Divisions. OPAC (Online Public Access Catalogue) is now being accessed by large number of readers and the digital resources are accessible in Digital Resource Centre also. CDs of lectures of IITians, Medical tutorials, reference documents, over three lac Ph.D. theses, one lac e-books and over one lakh of e-books in English and thousands of rare printed books of Maulana Azad Library in oriental languages also are accessible in the Digital Resources Centre.

Reprographic Section

The main purpose of Reprographic section is to help in achieving objectives of the library. This section Xeroxes copies, scanned and prepares CD’s for exposures on the occasion of exhibitions, functions and visiting dignitaries.
Conservation & Binding Section

The Library is very much concerned with conservation and preservation of the World's documentary heritage. It maintains a Conservation Laboratory for manuscripts and Bindery for books, journals, newspapers etc. The Library's conservation team includes skilled technicians, qualified conservators and bookbinders. At the core of our work is the care and understanding of the collections. The Library uses a combination of "preventive" and "intervenive" activities. Reduction and wherever possible, elimination of the causes of deterioration is the most effective and least expensive strategy for collection.

Online Journals Section

The library provides the whole university campus wide access to online journals through a well-equipped Computer Lab. M.A. Library has setup computer section to keep pace with the modern times. The library acquired LIBSYS Software package for computerization purposes. Library now has about 80 IBM P-IV and a new IBM Server X-320 series with high configuration. Retrospective data conversion is being modified in LIBSYS format. Library personnel have been trained in various modules of LIBSYS. This section has started housekeeping operations in Acquisition, Periodical, Technical Division and Circulation. OPAC (Online Public Access Catalogue) is now being visited by large number of readers.

Digital Resource Centre

Digital Resources on many subjects are made accessible through Digital Resource Centre, established in January 2009 in the library for the University’s academic and research community. It provides the access to databases of electronic resource to the bonafide members. These services are available through internet. The database of resources are constantly reviewed and updated according to the growing need of the users.

Gift & Exchange Section

Gift & Exchange Section is also one of the important sections in the Library where documents of many languages are received as gift especially in Urdu, Arabic and Persian. Individual authors also prefer to donate copies of their works. Private collections from eminent personalities are also received as gift from time to time.

Manuscripts Division

The Manuscript Division is the most prestigious division of the M. A. Library. Manuscripts are invaluable for the scholars in the academic world. These manuscripts
are consulted with the permission of University Librarian within the Division. The manuscripts are kept under security with continuous vigil in air-conditioned environment.

**Oriental Division**

Oriental Division is also very important division of the Library, consisting of following sections, i.e., Urdu, Arabic, Persian, Hindi and Sanskrit. The Division is very rich in collection comprising of about two lakh printed books & periodicals including 10,000 items belonging to rare category in Urdu, Persian, Arabic, Hindi and Sanskrit forms the most significant part of the collection. Donations received from great bibliophiles and literary persons are designated as special collections by the names of their donors. The Urdu collection with more than one lakh books on almost all aspects of Indian Life and Culture forms the largest part of Oriental Division.

Apart from the collection of oriental, the Library has a vast collection of books in English belonging to different subjects especially in Science & Technology.

**Braille Section**

One of the special features of Maulana Azad Library is its service to the visually impaired students through Braille Section. Apart from the books in Braille script, a large number of documents and devices in electronic format are also available in this section which is provided to the students. Angel Pro, a mobile like apparatus along with memory chips of 32 GB for recording the classroom lectures and listening to the already recorded books are issued to all the students for the entire duration of the course. Many students have showed excellence and have qualified state and national level competitions after the new electronic resources and devices have been made available to them in the recent past.

**Sir Syed Room**

The Library has a separate room in which books written by Sir Syed as well as on Sir Syed are kept. The Aligarh Institute Gazette started by Sir Syed in 1866, Tahzeeb-ul- Akhlaq started in 1870 and Aasar-us-Sanadeed (about monuments of Delhi) are also available in Sir Syed Room which are consulted by scholars from India and abroad.

**Reading Halls**

There are six large size reading halls apart from eight small reading rooms with a seating capacity of about 1350 students at present which will be extended to 1500 seats in near future.
Newspapers Reading Area

Almost all current newspapers and magazines of English, Urdu and Hindi are available in the Library. Back files of some reputed newspapers are also being preserved and maintained.

Library Security System

Maulana Azad Library implemented the 3M Library Systems to improve the efficiency, productivity and customer service of their libraries by offering security, productivity and information management solutions that harness technology to help create a more human library, one that allows librarians to spend more time helping people. The present system of CCTV is also a boon for the security of the invaluable collection of manuscripts, as in case of any intrusion in odd hours; the system will send messages to three authorized persons.

BANARAS HINDU UNIVERSITY

About the University

Banaras Hindu University ranks among the first few in the country in the field of academic and research output. BHU has two campuses, 3 institutes, 16 faculties, 140 departments, 4 advanced centers and 4 interdisciplinary schools. The University is making its mark at the national and international levels. BHU today has nearly twenty thousand students including 5000 research scholars and 650 foreign students from 34 nations. Banaras Hindu University is an internationally reputed temple of learning, situated in the holy city of Varanasi. This Creative and innovative university was founded by the great nationalist leader, Pandit Madan Mohan Malviya, in 1916 with cooperation of great personalities like Dr Annie Besant. Banaras Hindu University was created under the Parliamentary legislation BHU Act 1915.

Sayaji Rao Gaekwad Library (Central Library)

The Banaras Hindu University Library system is one the largest University Library System in the country, germinated from a small but precious collection donated by Prof. P.K. Telang in 1917. Library was also shifted to the Central Hall of the Arts College (now Faculty of Arts) and then in 1941 to its present majestic building built with the munificent donation from Maharaja Sayaji Rao Gaekwad of Baroda, on the pattern of the great library British Museum of London on the
suggestion of Pandit Madan Mohan Malaviya, the founder of university. In 1931, library grew by leaps and bounds with magnificent donations of personal and family collections from many eminent personalities and families like Lala Sri Ram of Delhi, Jamnalal Bajaj of Wardha, Roormal Goenka, Batuk Nath Sharma, Tagore Family collection, Nehru Family collection, etc. amongst a score of others and purchase of books and journals out of the regular fund with the result that it has a collection of around 60,000 volumes. The trend of donation of personal and family collection to the library continued as late as forties with the result that it has unique pieces of rarities of books and journals dating back to 18th century. With this sound footings and background, the library took long strides during sixties and seventies in its development and metamorphosed in a system of libraries with the establishment of institute, faculty and departmental libraries during the period. Presently, the Banaras Hindu University Library System consists of Central Library at apex and 3 Institute Libraries, 8 Faculty Libraries, 25 Departmental Libraries, with a total collection of over 10,46,064 lakh volumes to serve the students, faculty members, researchers, technical staff of fourteen faculties consisting of 126 subject departments of the university.

Library Staff

At present, Sayaji Rao Gaekwad Central Library has sanctioned positions of 01 Librarian Incharge, 05 Deputy Librarians, 12 Assistant Librarians, 01 Information Scientist, 14 Professional Assistant, 34 Semi-Professional Assistants, 45 Library Attendants, 01 Binder and 17 other workers such as Safaiwalas, Chokidars, daily wagers and skilled and unskilled supporting staff.

Library Hours

Library opens 359 days in a year. It remains open generally for 11 hours in a day. During Sunday/Holidays open hours of library are only for seven hours. SRG Library is highly used library. Being a residential University a large number of students utilise resources of the library.

Library Collections

Recognizing the role of library and information services in meeting the requirements of the University's academic and research programmes, the library purchases books and other information resources related to the courses offered by the University. Library has adequate number of information resources to satisfy the information need of library users. A separate periodical section has recently been set
up for students and faculty members. The library has stock 10, 46,069 books, 990 current journals. It has 27583 bound periodicals. Library provides the facilities up to access the electronic journals. Other prominent collections are manuscripts, Ph.d. theses (700). Other collections are CD, DVD (510), paintings (700) and e-Journals has 9699.

**Library Services**

Sayaji Rao Gaekwad, the Central Library of BHU categories the services in two types. First, library provides “Inside the Library Study facility” for Research Journals, Books, Ph.D. theses, UN and Govt. Publications, Text Books, Reference Books, etc. However, through “outside the Library Study facility”, user can be provided lending for home study departmental study.

**Information Services**

Library provides Information Services through DELNET and INFLIBNET.

**Reprographic Service**

The Reprographic Section of the Library is equipped with four photocopying machines. Photocopy of periodical articles and parts of books are made available to the readers at a nominal rate.

**Internet Facility**

Internet connectivity with 12 nodes has been provided for the use of teachers, researcher and undergraduate and postgraduate students of the university for browsing of websites and databases, of their interest.

**Electronic Database and Online Journals**

SRG Library is a part of UGC- INFONET and INDEST Consortia for e-journals subscription. SRG library is having access to about 4000 online journals and databases. It includes publications of American Chemical Society, Royal Society of Chemistry, Nature, Science Direct (Elsevier), Project Muse (Social Science & Humanities), Emerald, Institute of Physics, American Institute of Physics, American Physical Society, Cambridge University Press, Springer, Kluwer online publications, etc. BHU is having access to databases like Chemical Abstracts and Biological Abstracts. The access is available to all users through campus network of BHU.

**Electronic Document Delivery Services**

To fulfill the information needs of the end user through information/document supply library has document delivery service, which is new service initiated by
INFLIBNET in collaboration with other six university libraries which are well known for their strong collection base and commitment to provide timely service.

**Institutional Membership**

Sayaji Rao Gaekwad Central Library is the member of DELNET and INFLIBNET Programme (Banaras Hindu University, 2015b).

**UN Depository Library for UN Publications**

The Central Library has a Depository Library for publications of the United Nations and its agencies. After the scheme of depositing (free of cost) ceased in 1973, the library continued to obtain U.N. publications by way of depository library subscription scheme and select purchases. This is a unique feature of this library (Banaras Hindu University, 2015b).

**REFERENCES**


## APPENDIX-IV

UGC-INFONET Digital Library Consortium
Publisher wise Usage Statistics for 2012
Aligarh Muslim University

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## APPENDIX-V

### LIST OF PRICE PER ARTICLE

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1 USD = 62.06 INR as on January 2014  
1 UKP = 102.86 INR as on January 2014