

Cost-benefit Analysis of Journal Collections at Maulana Azad Library, AMU

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Abstract

This paper measures the cost and benefits of the journal collections (print and e-journal) subscribed in the year 2014 in the Central Library i.e. Maulana Azad Library of Aligarh Muslim University (AMU), India. This study quantified the benefits of journals getting by users (Research Scholars and Faculty Members) in to monetary terms (in Rupees) by the use of Contingent Valuation Method. The benefits of journals are based on estimates of how much the user is willing to pay for journals. For this purpose a total number of 280 and 350 questionnaires randomly were distributed among the Faculty members and Research Scholars in all faculties of AMU, out of which 216 and 308 were completed and returned back by respondent, showing overall response rate of 77.14% and 88% respectively. The results revealed that Cost benefit Ratio (CBR) is 1:3.9 and Return on Investment (RIO) is 287%.

Keywords: Cost-benefit Analysis (CBA), Return on Investment (ROI), Economic value, Contingent Valuation Method, Journal collections, Aligarh Muslim University (AMU)

1. Introduction

The general aim of libraries is to provide reading facilities to the users so that their intellect and personality is enlightened. The aims and purposes differ to some extent in different types of libraries. In case of University libraries they 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.

But in the present scenario all types of libraries are facing problem of shrinking budget. In this era of decreasing financial resources and increasing demands 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 University 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 librarians and administrators make budgeting decisions, librarians are asked to prioritize their collections and services to focus on the most effective in terms of serving the institutional mission with increased financial challenges. Under such 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.

Due to exponential growth of knowledge and information, libraries are trying their best to acquire all the documents available worldwide. But lack of funds lead the librarians to a situation in which she/he has to take decisions judiciously as to which documents to 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.

The journals subscribed in the library, 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. 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 has decided to conduct a study to identify the Cost and Benefits of Journal Collections in the Central Library, Maulana Azad Library of Aligarh Muslim University (AMU), India.

1.1 Cost-benefit Analysis

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 policy making authorities have to conduct 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. cost 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.

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 compare to its costs.

2. Review of Related Literature

King and Tenopir (2013) conducted a study and revealed that articles are read for the purpose of research, found by searching and obtained from the library collections have the highest value to faculty by many measures. The articles provided by the library saved the time and effort of the faculty which can be quantified using contingent valuation. Library journal collections were estimated to have an ROI of between 3.3 and 3.6 to 1.

A cost benefit Analysis was conducted by Pan, Wiersma and Fong (2011) 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. This pilot study focused on calculating CBA and ROI for e- journal access because a majority of library materials budgets are allocated for e-resources. The findings revealed that the total CBA over the study period was nearly \$1.50. Denver’s ROI was nearly 50%. Boulder’s overall ROI was 117%.

Similar study was conducted by Tenopir, et al. (2010) for examining the value and ROI of e-journal collections in the grants process in 8 universities in 8 countries. The findings revealed that libraries provided access to scholarly journals and they helped in faculty productivity. Therefore faculty members value and use e-resources for doing their research, grant and publishing activities. Faculty members who are grant active and non active reported reading on an average about 24 articles for each one they cite. Faculty reported that spending on an average 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 spend a good deal of time each week reading work related articles. They spend about 12 hours a week reading for work.

The study of Tenopir (2010) highlighted Return on Investment (ROI) as another method of measuring the value of a library's e-journal collection. 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.

Another landmark study of Pan and Fong (2010) reported the cost-benefits and the RIO of consortium in the University of Colorado (CU) System. The average cost was \$83,590.26 and the median cost \$10,494.00 during July 2009 – June 2010. 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. 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.

Missingham and Zobec (2012) used contingent valuation method (willingness to pay) and result showed that e-journal articles were the most heavily used following print journal articles. Print resources are primarily used for 5 or less hours per week while e- resources are used for significantly more hours per week. The study found ROI of 136 % derived 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 3 participating universities of \$46.9 million on the investment of \$34.5 million. The main conclusion from the study was that for the collection ROI of 136% was achieved by university libraries while the ROI for the British library and public libraries are generally in the order of 4 to 5.

Grzeschik (2010) 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. 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.

Chung (2007) measured the cost as the sum of the prices of providing library services and the benefit was determined by the willingness to pay technique derived from the Contingent Valuation Method. It was based on estimates of how much the user is willing to pay for the

service, and the cost of time saved by the using of library services. The economic value of library services measured in terms of a B/C ratio was 1.97, serving as strong justification for the library's existence.

Ko, et al. (2012) calculated Benefits 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. The return on investment (ROI) was calculated to be 3.66.

Hider (2008) conducted a study for measuring the value of technical services and used contingent valuation method for estimating the value in dollars. 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.

Aabo (2005) conducted a contingent valuation study of Norwegian public libraries. The result of the study indicated the benefits from the public libraries are 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 was appeared the first contingent valuation study of public libraries at a national level in Norway and Internationally.

The St. Louis Public Library case study (Holt et al., 1998) used three different measurement methods, including consumer surplus, the CVM, and time value to measure the benefits that libraries provide to individuals. The total value that can be generated by the library ranged from \$2 to \$10.

Pung, Clarke and Patten (2004) conducted a study to assess the British Library's (National Library of UK) contribution to the national economy. Contingent Valuation technique used to assess the value of the British library. The study revealed that the library generates value worth £363m per year which is 4.4 times its annual funding of £83million. 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.

3. Need and Purpose

Journals are the most expensive resources to subscribing in the University libraries. Therefore there is a need of extra care in deciding or selecting the journal titles at the time of subscribing them. In the current economic crisis, Cost-benefit Analysis method is used by the researcher for proving the value of Journals collection. With the help of Cost-benefit analysis

the value or worth as well as justification of the expenditure of the Journals collection in the Central Library can be calculated.

The purpose of this study is to assess the Cost and Benefits of Journals subscribed in the Central Library of Aligarh Muslim University (AMU). A comparison will enable to find out benefits of using journals with the cost of journals in order to check the extent of benefits outweighing costs in the library under study. In addition, the purpose is to assess the economic value of journals used by the Faculty members and Research Scholars in the library in this era of decreasing financial resources.

4. Significance of the Study

The study aims to identify the importance and use of Journal collections in to monetary terms. The results of the study will help to librarians:

- To represent economic value of Journal collections to their funders and to higher authorities.
- To prove Journal collections value to the institution in order to secure the financial resources necessary to serve the university and research community.

5. Scope and Limitations

Scholarly Journals are considered a very important type of information resources in University libraries and used extensively for helping the research programme and updating the knowledge of Faculty members and Research Scholars of the University. Scholarly Print Journals as well as E-journals which are subscribed in the year 2014, selected for conducting this study to identify the Cost-Benefit of journals in AMU.

The study seeks to measure the benefits of Journals in to monetary term i.e. in Rupees by the use of Contingent valuation method. Further an attempt has been made to compare these benefits with the cost of Journals, in order to check the extent to which benefits outweigh Costs. The literature review illustrates clearly that no attempt has been made so far, to study the Cost-Benefit Analysis of journal collections in University Libraries in India. The present study aims to give an approach to Cost-Benefit Analysis of journals Collection in the Central library of Aligarh Muslim University.

6. Objectives

- i. To assess the various types of costs involved in maintaining the Journal collections and to check the available infrastructure and human resources.
- ii. To measure the benefits of using Journals into monetary terms.
- iii. To compare the benefits of using Journals with the cost of Journals, in order to check as to what extent benefits outweigh costs in library under study.
- iv. To measure the Cost-benefit Ratio (CBR) and Return on Investment (ROI) of Journal Collections in library under study.

7. Hypotheses

The study attempts to test the following hypotheses:

Hypothesis 1

Ho: There are significant higher benefits than Cost of Journals in AMU.

Ha: There are no significant higher benefits than Cost of Journals in AMU.

Hypothesis 2

Ho: There are significant higher Returns (Profits) than investment of Journals in AMU.

Ha: There are no significant higher Returns (Profits) than investment of Journals in AMU

8. Research Methodology

The investigator used Contingent Valuation Method for deriving monetary value of Journals and then compared this value with the cost of the journals.

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 library by assessing the user's "willingness to pay" (WTP) and "willingness to accept" (WTA) alternatives to no library services provided. (Chung, 2007) 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). CV technique is supported by the Nobel Prize winning economists Kenneth Arrow and Robert Solow.

9. Data Collection Methods

The investigator has designed two questionnaires one for the University librarian of AMU and another for the users (Faculty Members and Research Scholars) of Library. After that, a pilot

study has been conducted to check the feasibility and objectivity of the prepared questionnaires, samples were selected and then questionnaires were administered for data collection.

Pilot Study

Pilot study was conducted for both the questionnaires prepared for Librarian and users in February 2015. The questionnaire for Librarian was administered to the Librarian of AMU and an informal interview was conducted. The questionnaire for users was distributed to 30 users of University Library. Finally editing and modifications were done of the questionnaires.

Population and Sample

The population from which a sample was drawn included only Faculty Members and Research Scholars enrolled in Aligarh Muslim University. Random sampling method was used for the selection of respondents for the study.

10. Data Analysis and Interpretation

This part contains the analysis of responses received from the Librarian of Maulana Azad Library, Aligarh Muslim University (AMU) and the users of Journals (Faculty Members and Research Scholars) through the questionnaires. The analysis has been divided into two parts. First part contains the responses received from the Librarian and the second part consists of the data collected from users. Analysis of the entire questionnaire has been carried out with the help of tables and textual presentations.

Part I -A questionnaire was prepared by the investigator to know the various costs associated with journals, Total Budget of Journals, total number of current journals and Number of Professional staffs and their salary of Periodical Section etc.

a. Total number of Current Journals

Maulana Azad Library has subscribed 657 Journals in the printed form and only 01 journal (LISA) in electronic form in the year 2014. Although the library is a member of UGC-Infonet Digital Library Consortia, 7590 e-journals and 11 databases are accessed with the help of Consortia at a very minimum cost.

b. Annual library budget allocated for Current Journals

Further a question was asked from the Librarian to know the Annual library budget allocated to the acquisition of current journals. It is revealed from Table-02 that in the year 2014 total budget for journals was 1,60,00,000.00 Rupees and there is no separate budget for e-journals. The whole amount was used for purchasing 657 Print Journals and LISA. The e-journals are subscribed through UGC Infonet Digital Library Consortia at a very nominal cost. Therefore the researcher has taken whole budget of the year 2014 as a subscription cost of the journals.

It is evident from table-02 that Annual library budget allocated to the acquisition of current journals is either static or decreasing from the year 2008 to 2014. Which is not a good sign for library and research community. The result of this study presents a strong justification of expenditure of journals and increasing budget of journals in the library.

Table-02 Annual library budget allocated to the acquisition of current journals

Year	Annual Budget for current Journals in Rupees
2008	2,00,00,000.00
2009	2,00,00,000.00
2010	1,70,00,000.00
2011	1,70,00,000.00
2012	1,70,00,000.00
2013	1,60,00,000.00
2014	1,60,00,000.00

c. Total no. of Professional staff in Periodical Section & their Salary

Manpower cost is essential for calculating the total cost of journals subscribed in the library. In order to know about the total number of Professional staff involved in Periodical Section, the investigator has asked the librarian about the manpower availability and their Gross salary. It is found that there is *one assistant librarian, one professional assistant, four semi-professional assistant, one library attendant and one TPA*. It is revealed from Table-03 for calculating Annual salary of the staff, monthly salary is multiplied by 12 and resulting total manpower cost is 47,92,920.00 Rupees.

Table-03 Total no. of Professional staff in Periodical Section & their Salary during the year 2014-2015

S. No.	Designation of the Staff	Total no.	Gross Monthly Salary (Amount in Rupees)	Annual Salary (Amount in Rupees)

1.	Assistant Librarian	01	1,29,161.00	15,49,932.00
2.	Professional Assistant	01	77,479.00	9,29,748.00
3.	Semi-Professional Assistant	04	29,600.00 28,215.00 29000.00 43,000.00	3,55,200.00 3,38,580.00 3,48,000.00 5,16,000.00
4.	Library Attendant	01	26,000.00	3,12,000.00
5.	TPA	01	36,955.00	4,43,460.00
Total Manpower cost				47,92,920.00

d. Total Cost of Journals

In order to measure the Cost-benefit Analysis of Journals subscribed in the Maulana Azad Library (AMU), it is required to add all the cost such as Annual subscription cost, Annual Manpower cost, Annual cost of Stationeries and Annual maintenance cost of Computers. Table-04 revealed that Total cost of current journals subscribed in the library in the year 2014 is 2,08,00920.00 Rupees.

Table-04 Total Cost of Journals in the year 2014

S. No.	Different types of cost of Journals in the year 2014	Amount in Rupees
1.	Annual Subscription cost	1,60,00,000.00
2.	Annual Manpower cost	47,92,920.00
3.	Annual cost of Stationeries	2000.00
4.	Annual maintenance cost of Computers	6000.00
Total Cost		2,08,00920.00

PART II -User's Analysis

For measuring benefits of the Journals received by Research Scholars and Faculty Members, a questionnaire for users is prepared. The distribution of sample size for the total population of users in the library is presented below in table-05. Notably, the investigator has selected a sample of 18% of the total population. This sample was randomly selected.

Table-05 Response Rate

Users	Questionnaires Administered	Questionnaires Received	Questionnaires Analyzed
Research Scholars (RS)	350 (18.01%)	321 (91.71%)	308 (88%)

Faculty Members (FM)	280 (19.83%)	230 (82.14%)	216 (77.14%)
Total	630 (18.77%)	551 (87.46%)	524 (83.17%)

This part of analysis covers the responses received from the users (Faculty Members as well as Research Scholars) of AMU about the perceived economic value of Journals (Print as well as Electronic).

The investigator has administered 350 (18.01%) questionnaires to the Research Scholars and 280 (19.83%) questionnaires to Faculty Members randomly. 321 (91.71%) questionnaires from Research Scholars and 230 (82.14%) questionnaires from Faculty Members were duly filled and returned back. 13 questionnaires out of 321 from Research Scholars were found incomplete and therefore excluded from the analysis in order to keep the originality and reliability of the data collected. Thus the investigator considered 308 (88%) & 216 (77.14%) questionnaires for analysis. The response rate of Research Scholars is 88 percent and 77.14 percent of Faculty Members in AMU respectively. Analysis of the questionnaires is given below.

It is found from Table-06 that Total number of users (Faculty Members and Research Scholars is 3355 in AMU.

Table-6 Total number of users

S. No.	Users of Journals	
1.	Total number of Faculty Members	1412
2.	Total number of Research Scholars	1943
	Total number of users	3355

e. Reasons for consulting journals from library rather than purchasing Journals

A question was asked to users (Faculty members and Research scholars) to know the reasons for consulting journals from library rather than purchasing. It is revealed from Table-06 that out of 524 respondents 317 (60.49%) users revealed that journals are very expensive to buy. 84 (16.03%) users revealed that journals will read only once/lesser use. 103(19.65%) users are not sure that journals would be useful and 20 (3.81%) revealed that there is no room to keep means having space problem.

Table-06 Reasons for consulting journals from library rather than purchasing Journals

S. No.	Reasons	Research Scholars N=308	Faculty Members N=216	Total N=524
1.	Very expensive to buy	197 (63.96%)	120 (55.55%)	317 (60.49%)
2.	Will read only once/lesser use	52 (16.88%)	32 (14.81%)	84 (16.03%)
3.	Not sure it would be useful	55 (17.85%)	48 (22.22%)	103 (19.65%)
4.	No room to keep	4 (1.29%)	16 (7.40%)	20 (3.81%)

Thus, it becomes apparent from the analysis that majority of the respondents (60.49%) stated the reason “very expensive to buy” i.e. they cannot afford to buy individually from the Market. Therefore library is the only place for consulting journals.

f. Willingness to pay to access articles per month by users

For Cost-benefit analysis (CBA), it is mandatory that both cost and benefit must be measured in the same unit. Cost of the journals is in monetary terms i.e. in Rupees, therefore it is essential to have benefits in to monetary terms i.e. in Rupees. Contingent Valuation Method is the only method which is used for converting benefits in to monetary terms. Therefore a question asked to users that this library would not exist anymore, how much money would you be willing to pay to access articles per month as it exists today, including the time, effort, travel etc. in order to know their willingness to pay (WTP) for accessing articles per month and given a range of Rupees from 1000-10000. It is clear from the table-07 that majority of Research Scholars 124 (40.25%) and majority of Faculty members 80 (37.03%) are willing to pay 2000 Rs. per month for accessing articles. Therefore researcher considered 2000 Rs. as an amount of willingness to pay (WTP).

Table-07 Willingness to pay to access articles per month by users

S. No.	Amount in Rupees	Research Scholars N=308	Faculty Members N=216	Total N=524
1.	Rs. 1000-2000	124 (40.25%)	80 (37.03%)	204 (38.93%)
2.	Rs. 2000-3000	76 (24.67%)	72 (33.33%)	148 (28.24%)
3.	Rs. 3000-4000	36 (11.68%)	16 (7.40%)	52 (9.92%)

4.	Rs. 4000-5000	24 (7.79%)	4 (1.85%)	28 (5.34%)
5.	Rs. 5000-6000	18 (5.84%)	20 (9.25%)	38 (7.25%)
6.	Rs. 6000-7000	8 (2.59%)	8 (3.70%)	16 (3.05%)
7.	Rs. 7000-8000	4 (1.29%)	-	4 (1.29%)
8.	Rs. 8000-9000	4 (1.29%)	-	4 (1.29%)
9.	Rs. 9000-10000	14 (4.54%)	16 (7.40%)	30 (5.72%)

Table-07 reveals that majority of users 204 (38.93%) are willing to pay to access articles per month i. e. 2000 Rs.

Willingness to pay to access articles per month = 2000.00 Rs.

Willingness to pay to access articles per annum = $12 \times 2000 = 24000.00$ Rs.

Total no. of users (Faculty Members and Research Scholars) in the University = 3355

Total Benefit of Journals perceived by users = $24000 \times 3355 = 8,052,0000.00$ Rs.

Table-08 Economic value of Journals in Maulana Azad Library

S. No.	Particulars	Amount in Rupees
1.	Total benefits of Journals	8,052,0000.00
2.	Total cost of Journals	2,08,00920.00
3.	Net Benefit	5,97,19,080
4.	Cost benefit Ratio (CBR)	1 : 3.9
5.	Return on Investment (RIO)	287%

Cost - benefit Ratio (CBR) = $2,08,00920.00 : 8,052,0000.00$

= 1: 3.9

RIO = $\text{Net Benefit} \times 100 \div \text{Cost}$

RIO = $5,97,19,080 \times 100 \div 2,08,00920.00$

RIO = 287%

10.1 Tenability of hypothesis

At the beginning of the study two hypotheses had been formulated based on previous researches and literature. In the light of study findings, the tenability of hypotheses is checked and presented below:

Hypothesis 1

Ho: There are significant higher benefits than Cost of Journals in AMU.

Ha: There are no significant higher benefits than Cost of Journals in AMU.

Table 08 shows the Total cost of journals is 2,08,00920.00 Rs. and Total benefits of journals is 8,052,0000.00 Rs. It is clear that there are significant higher benefits than Cost of Journals in AMU. So the null hypothesis is accepted and alternative hypothesis is rejected.

Hypothesis 2

Ho: There are significant higher Returns (Profits) than investment of Journals in AMU.

Ha: There are no significant higher Returns (Profits) than investment of Journals in AMU.

Table 08 shows the Total Net Benefit (Profits) of journals is 5,97,19,080.00 Rs. and Total Investments of journals is 2,08,00920.00 Rs. It is clear that there are significant higher Returns (Profits) than investment of Journals in AMU. So the null hypothesis is accepted and alternative hypothesis is rejected.

11. Findings & Conclusion

In the present scenario of decreasing budget and increasing demands for accountability, librarians are facing the problems of representing and quantifying the economic value of collections and services to their higher authorities. The study reveals that cost of the current journals subscribed in the library is much lower than the benefits of journals received by users (Faculty members and Research scholars). It is a strong justification for increasing budget of journals for the benefits of Research community. The result reveals that Cost benefit Ratio (CBR) is 1:3.9 and Return on Investment (RIO) is 287%.

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