



## **Use of Statistics in Library and Information Science: A study**

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### **Abstract**

*This study presents in a lucid manner the concept of statistics, its use in other subjects, types of statistics. Descriptive statistics deals with the studies related to collection and presentations of data, types of averages (Mean, Median and Mode) and dispersion about the data. Measures of central value, by considering the mass of data in one single value, enables us to get a bird's eye view of the entire data. Thus, one value can represent thousands, lakhs and even millions of values. Inferential statistics is that branch of statistics which is concerned with using probability concept to deal with uncertainty in decision-making. The importance of library statistics for the overall planning, comparison, promoting library services, standards of library statistics mentioned by IFLA is discussed. Various sources of library statistics such as attendance register, user surveys, usage statistics and Library management software are also mentioned. Some practical application of statistics in library and information science is also discussed like. Library statistics are used by libraries for routine service evaluation, identify areas of service growth/reduce, manage stock, staff and services, membership, planning and decision-making, use of resources, stock provision, expenditure, inter library loan activity. Using data and figures, library and information professionals can create pictures in the minds of authorities and present the main aspects with well-prepared statistical data.*

**Keywords:** library statistics, library standard, usage statistics, statistics in LIS

### **Introduction:**

Statistics is an old science that developed gradually and its scope is widening day by day. (Ghosh and Chaudhri,1967) The word 'statistics' is known to be used for the first time in "Elements of Universal Erudition" by Baron J.F.Von Biefield here statistics is defined as "The science that teaches us what is the political arrangement of all modern states of the known world." Kings ordered enumeration of the population and property within their domain; the science of statistics fulfils the need of state administration. The word 'Statistics' is derived from the Latin word 'Status' or Italian word 'Statista' both mean political state. (Webster Dictionary,2026) defines as "a branch of mathematics dealing with the collection, analysis, interpretation, and presentation of masses of numerical data."

(Agarwal,1996) Professor A.L Bowley gave various definitions of statistics as

- 1) The Science of counting
- 2) The Science of averages
- 3) Science of measurement of social phenomena

4) A subject not confined to any one science

(Agarwal, 1996) R.A Fisher defined statistics as "Science of statistics is essentially a branch of applied mathematics applied to observational data."

The statistical methods or techniques are applicable only when some data are available whatever may be the method of data collection. The data can be quantitative or qualitative. If the data is qualitative, they are quantified using techniques like ranking, scoring, scaling or coding etc. The data are collected either by experiments or by survey methods, and they are tabulated and analysed statistically. Statistics is concerned with mass phenomena, with large numbers descriptive of groups, with results of collective action. Individual facts and figures may be of interest of individual, statistics does not deal with them. eg individual income is not statistics, nor does gathering of knowledge about an individual income becomes a statistical study. If, however, we compare total earnings of a group of workers with other elements in business like turnover we arrive at a clearly defined relationships between earnings and turnover. The study of this relationship is called statistical study. Statistics is concerned with collection of statistical data, analysis, interpretation of the results of data analysis.

As such we can understand that the functions of statistics are 1. Collection of data 2. Tabulation of data 3. Analysis of data and lastly 4. Interpretation of data are briefly explained below

1. **Collection of data-** Once the study is decided, it becomes necessary to collect information about the concerned study mostly in the form of data. Information has to be collected from individuals directly or indirectly, such techniques are called survey method. Generally, the respondents or units are selected from a population using some standard sampling techniques. This method is mostly used in for data collection in Social Sciences. Other ways of collecting data are experimentation and observations such type of data collection is used in agriculture, biology, medical science, chemistry, physics etc. These days data are also collected in online platforms like Survey Monkey, Google Forms

2. **Tabulation of data-** After the data collection is over the data are presented in the form of tables or graphs. These tables help us to analyse, determine conclusion and make comparisons. A table is the systematic arrangement of data in rows and columns which makes it easy for further analysis and drawing conclusions. Charts, graphs, mapping and nowadays visualization software's are used for presentation of data.

3. **Analysis of data-** Once data is collected and proper tabulation is over, the raw and unsystematic data becomes ordered and meaningful information partly making the study successful. The measures of central tendency like mean, median, mode, mean deviation and standard deviation etc are parts of analysis of data along with estimation and testing of hypothesis. Software's and statistical tools used to do for drawing inference or making decision on the basis of data are known as analysis of data.

4. **Interpretation of data-** After analysis of meaningful information some numerical values which gives information partly or wholly about the population under study can be achieved. The main aim consists of attaching physical meaning and giving interpretation to the numerical results in real life. The quality of interpretation depends more on the experience and insight of the person conducting survey.

The domains of statistics can be classified into two divisions Statistical Methods and Applied Statistics.

Statistical Methods are considered as a kit for describing and analyzing data for various disciplines, it is concerned with the formulation of the general rules and principles applicable to the collection, processing and analysis of data eg. Methods of collection of data, classification, tabulation, comparison, analysis and interpretation. They provide tools for extracting basic truths which often lie hidden in a mass of data. The methods of statistical analysis can be divided into two groups

I) Descriptive Statistics- It is confined for the treatment of data for the purpose of describing their characteristics. It involves techniques for summarizing data and presenting in a usable form.

II) Inferential Statistics- Inferential statistics involves forecasts, estimations or judgements about some larger group of data than that actually observed or about some future happening based on a study of historical data.

Applied Statistics consists of application of statistical methods and techniques to the problems and facts as they exist. It deals with the application of rules and formulae to concrete subject-matter like wages, prices, trade, population. Applied Statistics may consist of biometry, psychometry, vital statistics, administrative, social and economic statistics

### **Application of Statistics in Library and Information Science:**

Libraries are service institution, here profit generation is not the motive. To make the library users successful and satisfied with the knowledge required respectively by them is the sole aim of librarians. Preservation of knowledge resources and provide access to those knowledge resources are the main functions and services of libraries. Library functions are supported by budgets and funds are provided by governments, students admission, membership, donations, form civil societies. The society spends on libraries and expects results, libraries benefit to societies through its services, readers and users. The benefits sometimes are direct and other times indirect to the society. Library users are the brand ambassador of libraries and also benefited directly and the persons related to those users are indirectly benefitted by libraries through the knowledge of users. Authorities make assessments about the value of libraries, satisfaction of users, cost-benefit analysis about the existence of libraries. Statistics plays a key role to measure the direct benefits of library as a service institution.

### **Need of library statistics:**

- I) Library statistics are used by librarians for promoting service evaluation to different stakeholders like college/university authorities, policy makers, funds provider, local community and users.
- II) Library statistics and reports are used for present and future strategic planning about Identifying areas of service growth or reduction.
- III) Library statistics can compare their input and output data about use of resources and the expenditure involved in purchase of resources.
- IV) Statistics can measure the inputs to library in terms of staff, building, equipments in relation to the service and satisfaction of the users.
- V) Library statistics can help in planning and decision-making about the regular use of resources in daily life.

### **Sources of Library Statistics:**

Physical Checkouts, Patron demography, Library Management Systems, Circulation numbers, holds, renewals, electronic resource usage, database searches, e-journal

downloads. Qualitative data can be gathered from Lib Qual+ or surveys that use rating scales, user surveys with open ended feedback regarding service satisfaction.

**a) Acquisition Section-** Here the records are used to know what resources are purchased and accessioned. Accession register gives the statistics related to the expenditure on books and journals year wise and subject wise. Libraries maintain various accession registers for different collection of books like book banks, Remedial courses, reference collection and special collection these also gives statistics about library collection.

**b) Circulation section-** We get statistics about usage of resources in the library like issues, returns, reissues etc and reports can be generated on daily basis, weekly or monthly basis.

**c) Reference section-** This section gives statistics about users' satisfaction regarding their queries answered. This section also gives statistics about the physical damage of fragile books or genre and do the needful of either digitizing the book or discard the book.

**d) Attendance register-** gives statistics about visitors, time spent in the library, their purpose for visiting the library that may be issue/return of a book, use journals, internet access, reading or for photocopy/printouts, Inter Library Loans. Nowadays, research scholars cum to library for plagiarism checks of their Ph.D works at the University library.

**e) User surveys** are often conducted by the libraries; such surveys provide very relevant feedback about the library collection and its services. On the analysis of data obtained from the user surveys various policy decisions can be taken by the librarian for the betterment of library services and collection.

**f) Usage statistics of e-resources-** These days almost all the academic libraries provide the facility of e-journals, e-books, online/offline databases. The administration module of many subscribed databases provides many statistics about the usage of the resource person wise, date wise, subject wise. NLIST provides usage details of the e-journals used by the faculty members name wise and date wise in a chronological order.

**g) Library Management Software-** gives information about students and faculty members registration, fines and dues, issue/return/renewals, department wise purchase, subject wise use of resources, etc.

**h)** Student book ratio, cost per use, automated gate counters, WiFi logs, chat response times are also some sources of library statistics.

**i) Observations-** This is used to observe the space usage how people used space whether the reading room is overcrowded or new seating patterns should be applied. Books are placed in the front part of shelves that are required for even semester and odd semester books can be placed at the back part of shelves to save time of users and solve the spacing problem.

**j) Electronic resources-** library statistics relate to the number of databases (purchased), virtual visits in the form of searches on online catalogue, hit counter at library website, number of downloads from the library's electronic collection, Usage statistics of electronic resources. 'Downloads' as measure for the use of the electronic collection were preferred to 'sessions' or 'accesses', as downloading shows that user have found items of interest. Physical and virtual visits are an important measure for showing the library's importance as meeting and working place.

**k) For resource allocation-** Libraries can use the usage data, circulation records, downloads to purchase most of the resources. If the demand for competitive

examinations books is more, then more financial resources should be utilized for purchase of books and magazines for competitive examinations in the same way less resources should be spent for books that are not used or borrowed by users like reference collection.

**1) Collection Development:** Descriptive statistics also help library management to know which subjects are popular, books request for Inter library Loan (ILL), transfer of book from stack section to reference section due to fragility, discarded or weeded books that become obsolete due to physical damage.

**Review of literature-** Smith, Edward Reid (2016) in the book chapter discussed the importance of SPSS software, R software and the books division into three main parts consisting of introduction to statistics, making sense of statistics and visualization.

Wang & Mia (2019) This article describes two projects at The College of New Jersey Library that used statistical methods and the programming language R to analyze electronic usage data. Project one utilized simple linear regression to model the monthly database search and full text usage data of eight years from 2010 to 2017. In project two, Pearson correlation was applied to analyzing the relationship between the journal's impact factor and the journal's full text downloads. It was found that there is a moderate positive relationship between these two variables.

Stepanov, V.K (2025) This study is based on evolution of public libraries based on the analysis of library statistics from 31 countries. Study shows technologically developed countries public libraries are declining and opposite is found in developing countries where public libraries are rising.

(IFLA,2010) in Library Statistics Manifesto defined "Quantitative and qualitative data about library services, library use and library users are essential for revealing and confirming the outstanding value that libraries provide. As the informative value of such statistics depends on their comprehensiveness and speed, the participation of all libraries in the country will be necessary. Library statistics are necessary for the effective management of libraries, but they are still more important for promoting library services to the different types of stakeholders: policy makers and funders, library managers and staff, actual and potential users, the media and the general public. Where statistics are aimed at policy makers, managers and funders, they are essential for decisions on levels of service and future strategic planning. Library statistics can reveal a wealth of material, of hidden success stories where libraries have opened and ensured access to relevant information for all groups of the population."

**Case study-** A survey was done regarding - Students feedback about the library facilities of RabindraSadana Girls' College, Sribhumi Assam the results are analysed and form very useful statistics for the library management to improve its services. RabindraSadana Girls' College, Sribhumi conducts both the Higher Secondary and Three Years Degree Course in Arts and Commerce Stream. This survey was conducted on 2024 to know about the use of library resources and services by the students of this college. The Google Form was used, shared by whatsapp and the information was collected, analysed and necessary decisions were taken to improve the services and collection of the library.

Total students participated were 111 and students were from degree classes of 3rd and 5th semester and HS 2nd year.

The results are given below:

1. About (32%) students visited the library after every 2-3 days, (31%) students visited the library weekly.
2. About (34%) students visited library for issue/return of books, (30%) students visited library for previous year question papers, (26%) visited library for reading books, (9%) students come to collect syllabus.
3. (95%) students said that they have joined the library whatsapp groups for getting academic support.
4. (57%) said that they use the online resources that consists of ebooks and ejournals provided under NLIST programme and (43%) said that they do not use any online resources at library.
5. (95%) students said that they find library staff are knowledgeable and friendly, always ready to solve their academic problems.
6. (85%) students said that they are very satisfied with the library facilities.
7. Regarding the use of electronic resources (37%) students mention that they use the ebooks under NLIST programme, (17%) students use online resources for making assignments and (6%) use ejournals under NLIST programme.
8. About (65%) students said they are satisfied with the available books and other resources at the library, (17%) students said they are not satisfied with the available books and other resources at the library.
9. About (80%) students said that they face no problems while using library facilities.
10. Students gave many suggestions to improve library facilities that includes more books on Indian ancient history and Indian rulers, computer teacher, semester wise books, science stream may be opened. Conducting such kind of user survey can help librarians to come out with various statistics about how to improve the smooth functioning of the libraries and rectify the problems of users in using the library resources so that the library funds may be utilized purposively.

**Conclusion:** Using data and figures, library and information professionals can create pictures in the minds of authorities and present the main aspects with well-prepared statistical data. Library statistics helps librarian to do the Strength Weakness Opportunities and Treat analysis of the library so that timely and efficiently library resources and library services can be utilized by users. Regular studies about user community and use studies about the library services and library collection can provide useful library statistics that can be used by authorities and policymakers to regularly update the institutions collection and services.

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