

# A CUTTING-EDGE DATA SCIENCE BREAKTHROUGH IN LIBRARY SCIENCE: A STUDY

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**Abstract:** Since young adulthood, the idea of the library and librarianship has evolved. It is expanding like an organism, with increases in the number of books in the library and the emergence of new fields in library science like computer science, management, mathematics, and engineering, among others. As a result, the library is gradually changing to become a data science library. The emerging field of library science known as data science uses cutting-edge scientific and technological methodologies to create library works. This essay examines a few components of contemporary data science applications, such as recent library comments on departments' use of data science and its applications at science and management departments of Tripura University in Agartala, Tripura, and data science awareness in nearby colleges under MBB University.

**Keywords:** Data science, Tripura University, MBB University, MOOC, Open courseware,

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## 1.0 Introduction:

Data science is an independent field that has been around for more than 30 years. The foundation is built on century-old statistical, mathematical, and, as of the mid-20th century, computer science practises. It goes beyond simply rebranding statistics and machine learning for the tech sector. A large portion of field development takes place in industry. In order to extract knowledge from data, a set of fundamental principles known as data science must be followed. The "civil engineering of data" involves transforming data into data products. Data science's primary goal is to enhance decision-making for the benefit of businesses and society at large.

Similar to Knowledge Discovery in Databases (KDD), data science is an interdisciplinary discipline that focuses on scientific methods, procedures, and systems to extract knowledge or insights from data in various formats, either structured or unstructured.

## 1.1 Tripura University

The first institutions of higher learning in Tripura were the CU-affiliated MBBC, Ramkrishna Mahavidyalaya, Iswar Chandra Vidyasagar College, and Ramthakur College. Tripura University was founded in 1987. Sudip Bandopadhyaya served as the first chancellor and Arunoday Saha served as the first vice chancellor when Tripura University was upgraded to a central university in 2007. The Tripura University Act aims to spread and advance information, establish special provisions for tribal life and culture studies, and add practical topics to create job prospects. Tripura University is linked with 52 colleges, which include 27 General Degree Colleges, 19 Professional Degree Colleges, 2 Technical Colleges, and 4 Polytechnic Institutes. It offers 41 doctoral programmes, 60 postgraduate programmes, six postgraduate diploma programmes, and seven undergraduate programmes. The Tripura University Act of 2006 designated it as a Central University.

## 1.2 Maharaja Bir Bikram University

Maharaja Bir Bikram University (MBB University) is a public university in the Indian state of Tripura. It is the state of Tripura's first and, as of 2023, only public university. Bir Bikram Kishore Debbarman, the final maharaja of the princely state of Tripura, is honoured by having the university bear his name. The Maharaja Bir Bikram University Act, 2015, was passed by the Tripura government in 2015, and Tathagata Roy, the state's former governor, lay the cornerstone for the university. Gautam Kumar Basu served as the first vice chancellor (VC). In December 2019, Satyadeo Poddar was chosen as the VC. The University's mission is to share and enhance knowledge by providing instructional and research facilities, making special allowances for tribal life and culture, and promoting interdisciplinary study and research. There are 3 degree colleges affiliated under MBB University.

**2.0 Concepts of Data Science Relating To Engineering**

- **Data mining:** Technologies that incorporate data science principles aid in achieving data science goals, but their approaches are considerably more extensive than the set of principles that make up data science.
- **Data warehousing:** Technology that facilitates "data mining," but isn't always included in "data mining"
- **Data processing:** Compared to data science, it is more all-encompassing because processing is used in every element of computing.
- **Big Data technologies:** These are frequently utilised for the data processing necessary to support data mining methods and other data science endeavours.

**2.1 Examples Of Data Science Products**

Domain	Example
Internet	Recommendation systems (Amazon = books; Face book = friends)
Finance	Credit ratings
Education	Personalized learning and assessment
Government	Policies based on data

**2.2 Mooc And Open Courseware Use Of Data Science Is Incredible**

Data or information retrieval in a systematic order refers to the integration of two components that include the notions of data and science: By employing the following open cloud libraries, a user can access an online library at any time, anywhere.:

Sl. No	OpenCourseWare	Principal Implementing Agency
1		Indira Gandhi National Open University
2		Indian Institute of Technology, Madras
3		NCERT, New Delhi
4		Indian Institute of Technology Bombay
5		MHRD
6		MHRD

OpenCourse Ware in India ([www.tezu.in/Library/opencourse.htm](http://www.tezu.in/Library/opencourse.htm))

### 3.0 Objectives

- to assess the level of data science knowledge among TU faculty members;
- to examine the function of data science in libraries;
- to examine potential changes to libraries using data science; and
- to educate college students and librarians about libraries using data science.

### 4.0 Methodology

The study used a questionnaire-based survey method with 10 participants from the computer science, engineering, management, and science departments at Tripura University. the following ideas are covered by the questionnaire

- i) The TU, Agatala Faculties, college librarians, and students are aware of data science.
- ii) Data Science's effect on libraries

Some relevant questions in particular are:

- a) Do you know what data science is?
- b) Do you believe your subject is applicable to libraries?
- c) What changes might be made if your subject concept is included to a library?
- d) Does your subject benefit librarians in any way? Yes, then how?
- a) How does your subject benefit academic researchers and teachers?

However, via project work and interviews with college students and librarians, primary data has been gathered. Some specific questions for college librarians connected to MBB University are as follows:

- a) Do you know what data science is?
- b) What services does your library offer to instructors and students separately?
- c) How does your library assist outside students in finding study materials?
- d) What are the data Science elements are using in your library?
- g) How do you involve your users in data science principles in library works?

### 5.0 Findings from Departments of Tripura University

#### i. Do you know what data science is?

Due to the participants' familiarity with data science, the entire survey yields excellent results

#### ii. Do you believe your subject is applicable to libraries?

Every discipline uses computerised or data science systems in some capacity. It is used to streamline tasks and save time. Using soft architecture will aid in the utilisation, management, and upkeep of library resources in an institutional library. It assists with book sorting and searching as well as the methodical classification of physical and digital library study materials.

However, the engineering department claims that while all technical topics cannot be covered, some ideas from the following areas, including structural design, interior design, architectural design, safety design, etc., can be used.

Management can aid in the management of library data, including the budget and finances, rules and regulations, and so forth.

#### iii. What changes might be made if your subject concept is included to a library?

Data science systems will be introduced in library science to assist students, faculty, and other staff in utilising both online and offline resources. With the right tracing methods, books and materials can be sorted, issued, and used. The advantages will increase with internet use.

Libraries are expensive, especially research libraries, and a digital library should be available to access any journal or periodical subscriptions. Although they are somewhat expensive and the costs to the consumers are shared with other services like email and word processing, it also requires computers and networks. However, data science can also assist libraries in the ways listed below:

- Systematic arrangement of library stock.
- Comprehensive data base of library users (students teacher and staffs)
- Transparency and non- redundant issue of library materials
- Computerized grant of time slots for user to use online materials as well as offline digital archive
- Comprehensive data base of library materials

**iv. Does your subject benefit librarians in any way? Yes, then how?**

Yes, some specialised topics are very beneficial for librarians, such as administration, engineering, and computer science. These topics are beneficial to librarians in a variety of ways. Some of the advantages of library science can be seen in other fields, including:

- Library staff members can use computers to electronically track concerns and returns.
- By using library management software, new additions, updates, or removals of library stock can be made quickly.
- If professionals use a digital database, a new setup may be simply copied in case of expansions and moving. They will have a non-redundant, unified database to work with.
- The interior of the library can be organised in a systematic sequence with the use of engineering sketch planning.
- Accounting and finance are beneficial for managing accounts and spending.
- Management will support the library's efforts to be successful and productive.

**v. How your subject is helpful for research scholar and teaching professions?**

Different concepts arise from different departments when it comes to the application of various subjects in libraries. A library must have internet connectivity, a subscription to impact factor referred publications, and other IT resources for research and teaching staffs. Additionally, it must hold offline digital copies of books, magazines, articles, audio and video files, and other content. To efficiently utilise resources, there must be a sufficient number of nodes.

It also helps graduates pick and pursue their postgraduate, doctoral, or even postdoctoral studies in a field in greater depth. A profession in academics requires further education, and it might be beneficial for managing other careers like creating new technology and goods. Information security, data mining, computer networks, and big data analysis are promising research areas that will also be helpful to librarians who must connect network databases to library databases.

**5.1 Findings From College Librarians And Students Under Mbb University****i. Do you know what data science is?**

Yes, 90% of the results back with the findings of the current survey, and the remaining 10% of college librarians are familiar with the idea of data science but not the specific term .

**ii. What services does your library offer to instructors and students separately**

Numerous results have been released individually from various colleges. Some of the comments include:

- Books are distributed to patrons for various subjects on Mondays, Wednesdays, and Fridays
- They used to give students access to the internet thrice a week, but teachers have access to it round the week.
- For both teachers and students, a variety of news publications in the three languages of English, Hindi, and Assamese are available.
- They occasionally hold awareness programmes on various topics, particularly for undergraduate students, which are led by teachers from other institutes

**iii. How does your library assist outside students in finding study materials?**

In order to encourage participation and the application of students' original ideas in the relevant works, some college librarians used to deliver information to students via audio-visual sources, workshops, seminars, etc.

**iv. What are the data Science elements are using in your library?**

Computers, the internet, OpenCourseWare, CD-Roms, project work in the social sciences, mathematics, and other fields, etc.g) How do you involve your pupils in data science principles in library work

**v. How do you involve your users in data science principles in library works?**

They used to hold presentations, audio-visual lectures, workshops, and other events.

**6.0 Comments and Advice from a Range of College Students and Librarians**

The comments below were provided by several college students and librarians. Some of these include:

- They have a keen interest in applying science and technology to everyday life.
- They can use the internet to access a variety of sources for their study materials.
- They learn about numerous data science applications in many fields, etc.

In addition, they offer the following commentary on how their library system can be improved:

- the college's internet services will be improved.
- Limit on book issues ought to be lowered.
- Books ought to start appearing soon.
- Wi-Fi access should be available 24 hours a day.
- Expand the selection of books on various topics.
- The library area needs to be expanded.
- Books should be organised systematically.

**7.0 Data Science's Effects On Libraries And Library Users**

- Data Science tools like the internet and computers Sites offering OpenCourseWare can offer professors and students subject-related resources.
- News Papers and more than 2000 periodicals are available online for download from various regions.
- IPL2's Special Collections, which include author pages, websites, blogs, museums, and other web-based innovations.
- For children, Data Science Elements offers resources including dictionaries, references, arithmetic, and science.
- For researchers and teenagers, websites with information on how to manage your finances, read and write effectively, and more.

**8.0 Advantages and Disadvantages of Big Data**

There is a talent shortage for Big Data, which presents challenges for librarians. The Big Data SIG is working to comprehend and frame big data. Big Data provides opportunities for librarians include developing their data analysis abilities and taking online courses like Software Carpentry, Khan Academy, and Coursera. Free software tools include: Python and R are also included in SQL Server 2016.

**9.0 Role of Libraries and Library Professional in Data Science**

The word "data" in data science seems to be a step down from information, yet libraries are known for their function as guardians of information. Big data's unexplored unprocessed data, for instance, has no inherent worth; in contrast, information found in a book from the library, for instance, provides easily available insights. Data seem to be excluded from the discussion since library science and library and information science are frequently used interchangeably. It's crucial to understand that the raw data utilized in big data and data science methodologies serves as the foundation for knowledge and useful information. This explains why librarians may be so essential in maximizing the potential of this new profession. There are now too few people in the world who can take unprocessed data and turn it into knowledge. This is where librarians can significantly advance the subject of data science and be of great assistance. The next generation of data scientists may benefit from the administration and organization skills that librarians possess.

**10.0 Conclusion**

It appears that the use of data science in libraries is essential to the creation of library works. Utilising diverse data science techniques from many areas, it aids in vast library collections. As a result, the aforementioned research significantly supported the application of data science in libraries. It has a significant impact on certain library changes like stock verification, updating, data entry, etc. Because of this, the poll described above describes the level of knowledge about data science among TU, Agartala Faculties, college librarians, and students under MBB University. It also discusses how data science has affected the library, industry and other fields.

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