



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

International Journal of Current Research
Vol. 15, Issue, 04, pp.24327-24329, April, 2023
DOI: <https://doi.org/10.24941/ijcr.45143.04.2023>

**INTERNATIONAL JOURNAL
OF CURRENT RESEARCH**

RESEARCH ARTICLE

OVERVIEW OF THE SIGNIFICANCE OF ACADEMIC LIBRARIES IN MANAGING RESEARCH DATA

***Dr. Amrita Majumdar**

Assistant Librarian, Institute of Management studies, Mahatma Gandhi Kashi Vidyapith, Varanasi

ARTICLE INFO

Article History:

Received 04th January, 2023
Received in revised form
10th February, 2023
Accepted 16th March, 2023
Published online 25th April, 2023

Key words:

Research Data Management (RDM),
Meta Data, Archives, Libraries.

***Corresponding Author:**
Dr. Amrita Majumdar

ABSTRACT

Research is a vital part of higher education and has a big impact on society, but technology changes its process and usage. Research always need data. Due to many companies investing in digital technology, data production and interchange have attracted national attention. Research Data Management is a novel way to organise data from input to the research cycle to distribution and archiving of significant results. Research requires data management. Libraries organise data their way. The article gives a general overview of the role libraries play in the management of research data.

Copyright©2023, Amrita Majumdar. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Dr. Amrita Majumdar. 2023. "Overview of the significance of Academic Libraries in Managing Research Data". *International Journal of Current Research*, 15, (04), 24327-24329.

INTRODUCTION

Research is a crucial component of University that is always changing. Currently, there is a tendency towards conducting research in a digital manner, where scholars are involved in producing and exchanging data with their colleagues. Data sharing has gained national attention as a result of money invested by many organisations. It is obvious that the role of the library in facilitating research must evolve as the kind of research inside our institutions does. The current research's findings are available in both print and digital form and researchers are also creating storing and disseminating data in digital form in addition to textual form. However, these data are not organized for better reuse or access to other uses, nor are they stored on a specific standard platform. This flaw advances the idea of Research Data Management. Research data management (RDM) is about "the organization of data, from its entry to the research cycle through to the dissemination and archiving of valuable results" (Whyte and Tedds, 2011). It includes a variety of distinct tasks and procedures related to the data lifecycle, including designing and creating data, storing it, protecting it, retrieving it, sharing it, and reusing it—all while taking into account technical capabilities, moral considerations, legal ramifications, and governance frameworks. Because of storage issues and technology becoming obsolete, using ICT in research produces massive data sets that are perishable. Most importantly, the fact that most data are produced or gathered as a result of publicly sponsored research creates a demand for responsibility.

In simple terms, research data management is the efficient management of information generated during the course of research. Typically, handling research data is an essential component of the research. Simply put, research data management is the efficient management of information generated during study. The management of research data typically spans the whole data life cycle, from the point of generation to dissemination and archiving, and will typically continue long after the main research endeavour has been completed. The intent of this study is to provide an overview and educate higher education professionals with the idea and significance of RDM in libraries. The literature and various websites have been searched for this review. The article also discusses various elements of research as well as potential sources for libraries to offer their services.

Research Data: Research data refers to any information that has been obtained, observed, created, or otherwise made specifically to support initial study conclusions. It is possible to arrange or structure research data such that it is appropriate for processing, interpretation, and transmission. There are numerous different physical as well as digital formats for data that are available for use and reuse. According to The Queensland University of Technology "Research data means data in the form of facts, observations, images, computer program results, recordings, measurements or experiences on which an argument, theory, test or hypothesis, or other research output is based. It relates to data generated, collected, or used during research projects, and in some cases may include the research output itself. Data may be numerical, descriptive, visual or tactile.

It may be raw, cleaned or processed, and may be held in any format or media. Research data, in many disciplines, may by necessity include the software, algorithm, model and/or parameters, used to arrive at the research outcome, in addition to the raw data that the software, algorithm or model is applied (19). "Research data includes information that has been found, observed, created, or otherwise made with the intention of reinforcing initial study findings. Research data can be organised or structured in a way that makes sense for processing, interpretation, and transfer. Data comes in a wide variety of physical and digital media. There is a fine line between the research data and primary. A guide to supporting the Australian Code for Responsible Conduct in Research states that if the research community regards materials as necessary to validate research findings, then they qualify as research data and should be retained for the recommended period. In this regard, having metadata associated with the research data is equally crucial because it enables further analysis and re-use.

Classification of Research Data: Research's unprocessed data can be found in both digital and analogue forms and can be broadly categorized into five classes:

Observational data: Facts gathered in actual time directly from the social and physical surroundings, such as measurements taken by weather sensors, surveys of animal resources, samples from ancient sites, images from brain scans, and opinion and experience surveys in the social sciences. These data frequently aren't reproducible because they are specific to a certain time and place.

Experimental: Data obtained as the results of in-depth analytical procedures and tests conducted in the field or in the lab, such as clinical trial data, chemical analysis of physical samples, genome sequencing of organic material, and trial findings from the field. In general, these results can be replicated in theory, if the experimental conditions can be repeated.

Simulation: Data produced via computing "virtual tests" are frequently used to simulate complicated systems and processes, such as models of market dynamics and simulations of the weather and climate.

Derived or compiled: Databases created by extracting information from a variety of secondary sources, collections of digitised documents, or corpora gathered via text mining are just a few examples of datasets created by processing or merging source data.

Reference Data: Published and curated data, typically found in managed collections, such as genetics banks, crystallographic databases, and national statistics archives.

Research Data Management

The notion of "research data management" (RDM) refers to the planning, organisation, preservation, and dissemination of data gathered and used in a research work. Throughout the course of a research project, it entails the routine administration of research data (using, for instance, uniform file naming rules). Additionally, decisions must be made regarding how data will be shared and stored when the project is finished (for instance, whether to store the data in a repository for long-term archiving and access). Research data management (RDM) is gaining importance in scholarly communication, funder requirements, rules of academic conduct, university research strategy, and even national policy, according to OCLC. University of Ottawa specifies Research data management includes active data organisation and upkeep during the research process, as well as data preservation that is appropriate for the project's end. Effective data management includes all phases of the data lifecycle, including generation, dispersion, publication, and preservation. A while after the main research Work is finished, certain aspects of data management typically continue. Thus the processes for conducting research can be made more robust, effective, sustainable, and replicable with the use of research data management.

Importance of Research Data Management: Data from research comprise facts, observations, measurements, and experiences that form the basis of a claim, a theory, or a test are considered research data. Research information can be graphical, numerical, or descriptive; unprocessed or processed; experimental, or observational. Included are lab notebooks, field notebooks, primary research data, questionnaires, audiotapes, videotapes, models, photographs, films, test results, biological materials, the byproducts of a process where the material is stable and can be stored for the required amount of time, recordings, films, photographs, models, videotapes, audiotapes, or any other type of primary material.

The Research Data Management may result in time savings later on in the research process as well as the following advantages:

- comply with funding agency requirements, which usually need data management plans when submitting grant applications.
- Examine the research's reliability and replication.
- Make sure that the research data and records are original, comprehensive, accurate, and reliable.
- Improve one's research efficiency by using less time for data cleanup and interpretation and more time to pursue ones own research objectives.
- Long-term resource and time savings improve data security and lessen the likelihood of data loss.
- One can save time and effort by letting people use Research data.
- abide by standards used in business and industry.

Initiatives taken by organization: Many organisations embrace open data to advance research data management, helping the movement grow and maintain momentum globally; (<http://www.dcc.ac.uk>) Access to research datasets created in Australian labs and institutions is made available via the Australian National Data Services (ANDS). It assists researchers and works in partnership with them to publish, share, handle, use, and discover datasets .All datasets and other reading materials, including as codes, patents, fossils, and rare specimens, should be uploaded to authorised repositories, according to the American Association for the Advancement of Science (AAS). The MIBBI (Minimum Information in Biological and Biomedical Investigations) is a standard that the AAAS encourages researchers to follow. Through Open Government Data (OGD, data.gov.in), the Indian government promotes open data. Government agencies and ministries use the site to publish their datasets, papers, services, and tools for use by the general public. The National Data Sharing and Accessibility Policy (NDSAP) was developed to make it easier to share non-sensitive data sets produced by ministries and departments with public funds. To facilitate national planning and development, the government wants to promote dataset sharing. The theses submitted to Indian Universities for the award of a Ph. D. degree must be made available in open access for others to access and consult, according to the UGC Promotion of Academic Integrity and Prevention of Plagiarism in Higher Education Institutions Regulations, 2018.

The major publishers have underlined the need for transparent and repeatable research, which necessitates making the study data freely accessible to the public. Links to the various data repositories are provided by the publishers so that researchers can submit their research data there. The researchers can upload their datasets to Elsevier's repository, for instance, so that others can access, utilise, and share them (Elsevier, 2019).⁸ . Four separate categories of data policies for the submission of research datasets have been established by Springer Nature. Libraries' position in this circumstance has grown significantly. Libraries have always been in charge of collecting and disseminating information. As part of the open access support that librarians offer, the IFLA statement specifically mentions "research data curation and sharing" (IFLA, 2011, p. 2). Data curation programmes, such as those at the Georgia Tech Library and Information Centre, are said to have a "robust growth trajectory" according to Walters (2009, p. 84). Walters (2009) highlights the fact that the Georgia Institute of Technology programme and similar

"entrepreneurial steps" taken by like-minded colleagues at six peer institutions in the US (Johns Hopkins University, University of California-San Diego, University of Illinois at Urbana-Champaign, University of Michigan, Cornell University, and Massachusetts Institute of Technology) have essentially been bottom-up initiatives where individual library and technology professionals have reached out to faculty and research centres without the support of government rules and sophisticated university policies.

libraries' function in RDM: Universities or research libraries from several nations have reinterpreted or expanded their roles in RDM services as a result of these demands. Owing to their work, librarians now play a crucial role not just in the research process but also in the entire ecosystem of research data. As noted by Choudhury (2008), librarians now play the role of "data scientists" or "data humanists," "supporting new forms of data-intensive scholarship" (p. 215). They "serve as the human interface between the library and the eScience projects" in such a capacity. Before the emergence of DMP requirements, information professionals had an important role in data management; nevertheless, the adoption of such standards acted as a "catalyst" for university libraries and librarians to increase the scope of their data management services (Dietrich, Adams, Miner, & Steinhart, 2012). RDM can serve as a productive environment for enhancing the identity of the digital academic library. Only libraries, as Koltay (Citation 2016) shows, can effectively deal with complex problems relating to research data. Saunders (Citation 2015) highlights the ACRL lists from 2012 and 2014 in reference to RDM initiatives by the library, which offer ways to demonstrate value through RDM, particularly if those initiatives are included in a strategic plan. Cox and Pinfield's (Citation 2014) suggestion that RDM is one of the numerous potential positions through which libraries may provide research support is consistent with this. According to Keller (Citation 2015), academic libraries in Australia have strengthened their standing inside the university by systematically working on research support, which includes services like bibliometrics, institutional repositories, open access, and research data management. Keller also gives evidence to support this claim.

The development of suitable skills and competencies, which in turn has an impact on the librarian's professional identity, is a crucial facilitator of academic libraries' contribution to RDM (Cox & Pinfield, Citation 2014). Given that librarians lack confidence in this area (Cox, Verbaan, & Sen, Citation 2012) and that the majority lack personal experience with research (Verbaan & Cox, Citation 2014), several critics draw attention to the difficulties connected with the development of these abilities and competencies. In order to enable RDM, Cox et al. listed a number of skill requirements (2). The ability to lead, analyse data, grasp strategy, and influence others are a few of these, and they are all considered soft talents by observers (3). On the other hand, while there is a sizable body of study on the soft skills of academic librarians, far less focus has been placed on 'hard skills,' which are frequently connected to 'technical' skills. While soft skills are often linked to advising help, hard skills typically consist of technical competencies, such as those involved in repository management and metadata production. RDM always involves the procedure: Create data and make a plan for using it. Data should be organised, named, and Keep it, secure it, grant access to it, store and backup a copy of it, Find information sources, share them with colleagues, and publish and get cited more widely.

RDM Problems and Challenges: Libraries must address a number of obstacles before using RDM like Adoption of regulations, including as embargoes, access rights, and archive regulations. Training of library staff in user-friendliness; Education of stakeholders; Assistance from stakeholders, such as the academic community and those with technical know-how; Voluntary submission of publications to repositories; Data Curation; Database Creation; Compliance with funding agencies' policies; Upgrades to features and software; Culture Change; Change Management Research Data Management Scenario in Indian Libraries.

Research Data Management Scenario in Indian Libraries: The

need for institutional policies for data repositories and their implementation at all of India's research institutes has been made obvious by numerous literature searches and scans of websites. Research data management in libraries is still in its infancy, according to Nishtha Anilkumar's assessment of 15 major research and academic institutions in India (Anilkumar, Nishtha, 2019). They discovered in their research that none of the institute data repositories, with the exception of the ICSSR data service established by INFLIBNET, are listed with the Registry of Research data repository (re3data.org registry). To encourage RDM, the Indian government published a notice in 2012 announcing the National Data Sharing and Accessibility Policy-2012 (NDSAP), which mandates the sharing of all government-funded non sensitive data in order to improve future decision-making (Ministry of Science and Technology, Government of India, 2019). To make the data widely accessible and shareable, it must be released through the open government data platform in an open format (Ministry of Science and Technology, Government of India, 2019). The National Repository of Educational Data (NRED) has been suggested for the sphere of education in the drafted National Educational Policy-2019 (MHRD, 2019). Additionally, the INFLIBNET Centre has been committed to giving researchers and their work a national platform through a variety of services including Shodhganga and Shodhgangotri programme, UGC Infonet Network connectivity (now merged with NKN), and UGC Infonet Digital Library Consortium. In a later stage, the UGC entrusted the INFLIBNET centre to work on the areas of improving research, whether it be the aspect of plagiarism software or the UGC CARE list. The director of INFLIBNET is a member of the UGC Care Empowered Committee and the INFLIBNET centre is listed on the UGC-CARE list. The Plagiarism Detection Software (PDS) "ShodhShuddhi" initiative of INFLIBNET was established on September 21st, 2019, to give plagiarism detection software to research institutions (INFLIBNET, 2019). Additionally, the Vidwan database and the IRINS (Indian Research Information Network System) are significant INFLIBNET programmes that share and network the research platform to a national and international level in a planned manner. The precise details of institutional libraries that have started managing research data are provided in below.

National Informatics Centre (<http://www.nic.in/>): For 30 years, NIC has led the country's e-Governance push, laying the groundwork for better, more transparent governance and helping the government reach the unreachd. Data Centre requirements are developing rapidly due to citizens' growing demands for online services and the government's e-Governance Projects. High availability, quick scalability, efficient management, and optimised resource use require smart infrastructure. To meet this need, NIC has put up state-of-the-art National Data Centres in NIC Hqs, Delhi, Pune, and Hyderabad and 30 small data centres at state capitals to serve the government at all levels.

Indian Space Science Data Center (ISSDC) (<https://www.issdc.gov.in/>): Indian Space Science Mission payload data archives are stored at ISSDC. This data centre at the IDSN facility in Bangalore ingests, archives, and distributes payload data and related ancillary data for space science missions including Chandrayaan and Astrosat. The latest space mission and other news is accessible. Science payload investigators will use this facility. They, other scientists, and the public will have access to the data.

India Meteorological Department (<http://www.imd.gov.in/>): India Weather Portal takes meteorological observations and provides current and projected meteorological information to optimise weather-sensitive activities including agriculture, irrigation, shipping, aviation, offshore oil explorations, and more. Users can check Indian state weather, national weather, and weather forecasts for agricultural, aviation, and maritime services. It warns about severe weather events like tropical cyclones, dust storms, heavy rains and snow, cold and heat waves, etc., which destroy life and property.

ICSSR Data Service (INFLIBNET) (<http://www.icssrdataservice.in/>): The "ICSSR Data Service" is the result of an MoU between ICSSR and MoSPI. The MoU establishes "ICSSR Data

Service: Social Science Data Repository" to hold MoSPI-generated NSS and ASI datasets. The ICSSR Data Service helps researchers, instructors, and policymakers use high-quality social and economic data.

CONCLUSION

Preservation is related. Access is facilitated by preservation, and active use of data is the best justification for ongoing preservation. We are all aware of the intense time constraints facing researchers. In order to increase the likelihood that a new solution will be adopted, it must be relatively simple to use and ideally incorporated into their current workflow. Some of the issues that researchers themselves deem to be the most serious could be resolved by developing a better information management solution around research activity. Better research projects and researcher records would be crucial foundational pieces for a successful RDM system, claim Chad & Suzanne. In terms of libraries, this study seeks to provide a more comprehensive view of research data management. for better and more concrete implementation .A comprehensive National policy is required and University level training and workshop are required for libraries to raise awareness of this issue.

REFERENCES

- Anilkumar N. Research Data Management in India: A Pilot Study (Internet). www.researchgate.net. 2018 (cited 2023 Apr 4). Available from: https://www.researchgate.net/publication/326991769_Research_Data_Management_in_India_A_Pilot_Study
- Cox AM, Kennan MA, Lyon L, Pinfield S. Developments in research data management in academic libraries: Towards an understanding of research data service maturity. *Journal of the Association for Information Science and Technology*. 2017 Mar 25;68(9):2182–200.
- Carter, D. (2017). Creativity in action—the information professional is poised to exploit the fourth industrial revolution: The business information survey 2017. *Business Information Review*, 34(3), 122–137. Retrieved from <https://journals.sagepub.com/doi/full/https://journals.sagepub.com/doi/full/10.1177/02666382117722440>
- Payal M, Awasthi S, Tripathi M. A Selective Review of Literature on Research Data Management in Academic Libraries. *DESIDOC Journal of Library & Information Technology* (Internet). 2019 (cited 2023 Apr 20);39(06):338. Available from: https://www.academia.edu/63626145/A_Selective_Review_of_Literature_on_Research_Data_Management_in_Academic_Libraries
- Pinfield S. Research Data Management and Libraries: Relationships, Activities, Drivers and Influences (Internet). Martin Cox A, editor. www.researchgate.net. PubMed; 2014 (cited 2023 Mar 7). Available from: https://www.researchgate.net/publication/269282837_Research_Data_Management_and_Libraries_Relationships_Activities_Drivers_and_Influence
- Chad K, Enright and S. The Research Cycle and Research Data Management (RDM): Innovating Approaches at the University of Westminster. *Insights*. 2014;27(2):147–145.
- Yoon A, Schultz T. Research Data Management Services in Academic Libraries in the US: A Content Analysis of Libraries' Websites. *College & Research Libraries*. 2017 Nov;78(7).
- Sheikh A, Malik A. Evolution of research data management in academic libraries: A review of the literature. *Information Development* (Internet). 2023 Feb; Available from: https://www.researchgate.net/publication/369365283_Evolution_of_research_data_management_in_academic_libraries_A_review_of_the_literature
- T R M. Research Data Management Service in Libraries of Science and Technology Institutes in India: Perceptions of Librarians. In: Gala B, editor. *NILIS Research Symposium 2020: Challenges and Opportunities for Libraries in the New Normal*. 2021.
- Singh RK, Bharti S, Madalli DP. Evaluation of Research Data Management (RDM) services in academic libraries of India: A triangulation approach. *The Journal of Academic Librarianship*. 2022;48(6):102586.
- Pal B, Singh SK. Indian Academic Research Data Repository (IARDR) With INFLIBNET: A Futuristic Plan (Internet). <https://ir.inflibnet.ac.in>. Available from: <https://ir.inflibnet.ac.in/bitstream/1944/2333/1/5.pdf>
- Australian Research Data Commons* (no date) ARDC. Available at: <https://ardc.edu.au/> (Accessed: April 06, 2023).
- UGC. Quality of PhD Thesis in Indian Universities. Available Available at: https://www.ugc.gov.in/pdfnews/7172274_Public-Notice-Study-on-Quality-of-PhD-Theses-in-Univ.pdf (Accessed: April 15, 2023).
- Borkakoti, R. and Singh, S.K. (no date) *Research data management in Central Universities and institutes of National Importance: A Perspective from North East India, DigitalCommons@University of Nebraska - Lincoln*. Available at: <https://digitalcommons.unl.edu/libphilprac/5848/> (Accessed: April 20, 2023).
- Evolution of research data management in academic libraries: A review ...* (no date). Available at: <https://journals.sagepub.com/doi/10.1177/02666669231157405> (Accessed: April 02, 2023).
- Tripathi, M. (2022) *Research Data Management Practices in university libraries: A study, DESIDOC Journal of Library & Information Technology*. Defence Scientific Information and Documentation Centre. Available at: https://www.academia.edu/63626140/Research_Data_Management_Practices_in_University_libraries_A_study (Accessed: April 18 2023).
- Surkis A, Read K. Research data management. *Journal of the Medical Library Association* : JMLA (Internet). 2015 Jul 1;103(3):154–6. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4511058/>
- Whyte A. Making the Case for Research Data Management. Tedds J, editor. 2011 Sep 1; Available from: https://www.researchgate.net/publication/252931138_Making_the_Case_for_Research_Data_Management
- QUT - MOPP - D/2.8 Management of research data and primary materials (Internet). www.mopp.qut.edu.au. (cited 2023 Apr 20). Available from: https://www.mopp.qut.edu.au/D/D_02_08.jsp
