

Preface

Research data management is the collection, processing, storage, sharing and archiving of research data. Approaches to these activities at all stages within the research data lifecycle, from handling research data at its inception through to the preservation and archiving of data in a quality-controlled manner, need to be highly professional. Researchers need to know how to document data and support its' traceability and to make it reusable and productive while institutions and funding agencies have varying requirements relating to the archiving and subsequent reuse of research data, that researchers and data managers or librarians need to meet. Research data management is the process of organising research data and administering those activities and processes designed to make the research process more efficient, in a way that meets the different standards and requirements of research institutions, funders and legislators. As such, it has gained much attention as a professional discipline from the academic and research community in recent years. This book brings together the latest thinking in research data access and management from academic and research libraries around the world with a strong focus on innovative practice, smart tools and technological solutions that will serve to guide and assist those involved in developing good research data management practices within their own libraries and institutions.

At its simplest level, research data management enables the reuse of archived research data to facilitate the verification of results and related processes, thereby ensuring the integrity of research which in turn enhances the impact of that research. Several funding agencies around the world have mandated the management of research data to ensure the integrity of the research undertaken and to avoid the unknowing duplication of research at other institutions and by other researchers, thereby saving time and money. Ensuring research data is accessible and reusable will not only save researchers' time but in addition, the sharing of research data across disciplines contributes to interdisciplinary research. With good data management practices and a data retention policy in place, researchers are obliged to follow the correct procedure for the acquisition, storage, use and sharing of research data. Good data management practices can also incentivise researchers to share their datasets

with others in the public domain, promoting a culture of openness in research. Counting data citations alongside the citation of publications, increasing funding for data-managed research projects, noting data-sharing in promotions and awards and highlighting the socio-economic impact of data-driven research, can all help to incentivise excellence in data management practices, to the extent that planning research data management prior to the commencement of research work becomes imperative for both researchers and institutions.

Academic and research institutions have faced problems in establishing good research data management processes, systems and services however, due to a lack of funds, a shortage of trained staff and poor awareness among researchers and institutional leaders (LERU Advice Paper No 14, 2013). Library and information professionals have taken a lead by educating researchers about the benefits of research data and its long-term preservation but the support of institutional leaders is crucial to fostering a culture of open data. Leaders need to be aware of and engaged in debate and discussions about research data management and must engage all stakeholders in framing the data management policies of an institution in order to reap the full benefits of good research data practice and a culture of open research. Likewise researchers should clearly understand the institutional requirements for their management of research data and to ensure the visibility of their data, be able to describe this accurately in data management planning.

Beyond institutional requirements and researcher engagement, research data should also be discoverable so that it can be easily found and reused correctly. Research institutions should establish data retention policies and standards that clearly set out the types and formats of data for inclusion in their repositories; and the processes, standards and timescales that need to be adhered to in archiving and naming data. Adhering to quality standards and clear processes avoids or at least limits ambiguity so that the research community fully benefits from easily discoverable, open research data.

The technical aspects of research data management are another significant aspect for institutions to consider when designing data management services. The selection, purchase and implementation of new repository software or a research information management system involves staff from many different departments, from research managers and librarians to finance and IT staff. Institutions frequently face difficulties in finding a team leader to implement a research data management project that impacts so many areas. Libraries are undoubtedly best placed to lead such a project and to develop research data management services; librarians' understanding of the organisation of knowledge, of the research process and the importance of research outputs provides the perfect background for the generation, dissemination and preservation of research data within an academic institution.

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This book serves as a much-needed, comprehensive source of information for the understanding of data access and management issues in academic and research libraries. Numerous concepts are involved including data access, data preservation, building document and data institutional repositories, the application of Web 2.0 tools, mobile technology applications in data access, conducting information literacy programmes and so on.

Chapter 1 describes the engagement of national libraries with the data community to raise awareness of the relevance of data management and to promote their role as an essential place for data repositories and the researcher community. The author emphasizes that libraries' multi-faceted and synergistic relationship with research data actors makes them a unique participant in research data management and that a national library can be vital in developing a national strategy to develop open data in the country.

Chapter 2 proposes a framework for research data management services in academic and research institutions. It discusses in detail, the challenges encountered in establishing such services and recommends that all stakeholders should be consulted at the planning stage to ensure their involvement and to reap the benefits of the new services.

Chapter 3 compares research information management systems (RIMS) and the implementation of RIMS in universities. It highlights that research data management has become a more complex process because of the range of research information types; larger data sets, multimedia formats, teaching materials and structured models etc. RIMS providers must respond to this requirement to capture and manage complex research data.

Chapter 4 discusses the results of a survey carried out to assess data accessibility at research and academic institutions in Zimbabwe. The chapter highlights the challenges associated with accessing research data and proposes mechanisms to address these challenges.

Chapter 5 summarizes the state-of-the-art research paper recommender systems' classification categories and concepts on data access and manipulations in the field of research paper recommendation.

Chapter 6 explains data mining techniques in the context of these systems, mentioning various mathematical models and tools that are utilized in discovering patterns in data and outlining critical data mining issues facing research paper recommender systems.

Chapter 7 suggests new approaches to research data management that ensure the visibility of research output and data and compliance with open access standards. It describes multiple data management activities, covering automated data capture, metadata enrichment, dissemination and compliance-related workflows as well as open integration with the research ecosystem.

Chapter 8 covers the very significant role of libraries in the management of institutional repositories and discusses important issues and challenges concerning institutional repositories in Africa. It highlights that the establishment of repositories is a compulsory venture for institutions of higher learning in Africa.

In Chapter 9, the authors discuss the availability of open access literature and the open access publishing opportunities for authors including scientists. A particular emphasis has been given to the distribution of active open access journals indexed in the fields of life sciences, social sciences, physical sciences, and health sciences. \

Chapter 10 emphasizes the challenges faced by library and information science professionals in the selection and acquisition of electronic resources in academic libraries; the authors meticulously touch on all the pertinent aspects of electronic resources.

Chapter 11 elaborates on the benefits and challenges of the digital library and of distance learning in developing countries. The authors recommend that stakeholders give attention to addressing the problems faced by distance learners in their use of the digital library so that they can reap the full benefits of digital access.

In Chapter 12, the author explores the various dimensions of metaliteracy in academic libraries through a detailed case study at Jawaharlal Nehru University, New Delhi. The author stresses the relevance of metaliteracy for students and its importance in developing digitally-aware learners who can share knowledge effectively in collaborative online communities and research networks. Goals and learning objectives are concrete competencies and metaliteracy for learning are its basic components.

Chapter 13 deliberates on the librarian's approach to innovation in library services, emphasizing that library professionals should re-think and re-invent existing technologies, services and facilities to fulfill the changing needs and demands of library users. Technological Innovation (TI) can be considered as an innovative solution for the sustenance and rejuvenation of libraries.

Chapter 14 deals with research data analysis using EViews and explains an empirical example of modeling volatility.

Chapter 15 describes the use of federated access technologies in libraries. Interviews with experts in the field were conducted to determine current trends and to provide a collective insight into future developments. The chapter also briefly discusses the widespread migration towards cloud-based services, the open access movement and new ways of delivering content.

The book finishes with Chapter 16 which tackles the challenges and issues around successfully measuring the research outcomes of academic institutions. The authors analyze the research outcomes of ten universities in India on the basis of Participative Index (PAI), Average Publications per Faculty Member (APPFM) and Combined Arithmetic Mean (CAM).

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The book in its entirety serves as a comprehensive resource for all those seeking to initiate, develop or deliver research data management services within their own institutions. It will guide readers, from institutional policy makers and senior library managers through to research data service managers, researchers and new entrants, to understand the latest thinking and innovative practice in this increasingly complex but important professional discipline that is rapidly emerging as an important role for modern academic libraries.

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