

Research on Research Data Management System Based on Research Project Life Cycle (Postprint)

Authors: Jin Zhenyan, Astro Boy

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Abstract

[Purpose / Significance] Centered on the full lifecycle of research projects, this study explores the research data management system to provide reference for the implementation of research data management in China. [Method / Process] Based on the research project lifecycle and guided by participating entities, we construct an organizational system and implementation system for research data management, clarifying the responsibilities of participating entities—the state, research funding agencies, research institutions, and researchers—in research data management, as well as the research data management tasks each entity should perform at each stage of the project lifecycle. [Result / Conclusion] Research data management is grounded in the entire process of project development, establishing a management model led by research funding agencies and based on the full lifecycle of research projects.

Full Text

Preamble

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A Study on the Research Data Management System Based on the Scientific Research Project Life Cycle

Jin Zhenyan, A Tongmu

Library of Renmin University of China, Beijing 100872

[Purpose/Significance] Taking the entire life cycle of scientific research projects as the main thread, this study explores a research data management (RDM) system to provide reference for the implementation of RDM in China. **[Method/Process]** Based on the research project life cycle and oriented toward project participants, we construct both organizational and implementation systems for RDM, clarifying the responsibilities of key stakeholders—national

government, research funding agencies, research institutions, and individual researchers—as well as the specific RDM tasks each should perform at every stage of the project life cycle. **[Result/Conclusion]** RDM should be grounded in the complete process of scientific research activities, establishing a management model led by research funding agencies and based on the full life cycle of research projects.

Keywords: research data, data management, scientific research project

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1. Introduction

In 2007, the Organisation for Economic Co-operation and Development (OECD) issued the *OECD Principles and Guidelines for Access to Research Data from Public Funding* [1], which emphasized open access to publicly funded research data. The document argued that sharing and opening such data not only helps maximize the research potential of new digital technologies and networks but also yields greater returns on public research investments. In recent years, governments worldwide have recognized the importance of research data produced with taxpayer money and have formulated national-level laws, regulations, and policies for research data management and sharing. This trend is particularly evident in major developed countries such as the United States, United Kingdom, and Australia, where research funding agencies have taken the lead in establishing general principles and specific policies for research data management and sharing. Currently, research data management and sharing have become a global movement, with many countries adopting similar strategies—typically regulated by governments and led by funding agencies—with promising results.

Although China issued the *Administrative Measures for Scientific Data* in March 2018 [2], requiring reasonable open sharing and management of research data generated from government budget-funded activities, research funding agencies at all levels have yet to formulate comprehensive policies on data management and sharing. Consequently, research data generated during project implementation often remains on individual researchers' computers or laboratory servers without centralized management, leading to ineffective sharing and risks of loss and unsustainable preservation. While foreign governments and funding agencies have continuously released data management and sharing policies, and domestic scholars have analyzed these developments and proposed countermeasures, most existing studies focus only on specific aspects of RDM or conduct superficial web-based investigations, lacking systematic examination and in-depth analysis from a holistic perspective. This study argues that since research data is produced during scientific research activities, and research projects are one-time

activities with clear beginnings and ends that follow “life cycle” patterns, RDM should be grounded in the entire project process to establish a management model based on the full research project life cycle.

2. Related Research Status

Research data refers to factual records (numerical data, text records, images, and audio) generated from scientific research activities—data universally accepted by the scientific community as essential for research outcomes. Research data constitutes the fundamental unit of scientific research. A research project, as a one-time activity with a defined start and end, follows life cycle patterns, typically encompassing application, approval, initiation, organization and preparation, implementation, and final acceptance. The International Council on Archives maintains that RDM should be based on the entire project process, establishing a management model grounded in the full research project life cycle [12]. RDM activities during research projects are complex systematic endeavors characterized by numerous participating groups and intricate implementation processes.

In recent years, RDM has become a research hotspot in library and information science both domestically and internationally, covering theoretical studies, policy research, service studies, and case analyses. Among these, RDM system research constitutes an important component. Domestic studies on RDM systems are primarily theoretical or case-based, following two main approaches. The first approach uses the data life cycle as its 主线, such as Wang Qi’s construction of a university RDM system based on data science and information life cycle management theory, covering data collection, organization, storage, sharing and utilization, confidentiality and security [4]; Chu Jiewang et al.’s construction of a scientific data management system based on Oxford University’s scientific data life cycle model, addressing each stage including collection, processing, preservation, sharing, analysis, and reuse [5]; and Liu Guifeng et al.’s framework for university scientific data security from a data life cycle perspective, comprising institutional, infrastructure, data literacy, and implementation layers [6]. The second approach uses the research activity cycle as its 主线, such as Yang Le et al.’s view that the research activity cycle forms the foundation for building scientific data management systems, with key components including data management planning, storage, publication, and integrated utilization [7]; Liu Qiong et al.’s framework for university library data management plan services based on information ecology theory [8]; and Zhang Peifeng et al.’s argument that relevant policies, repositories, and various activities in the data management process constitute a complete scientific data management system [9].

Internationally, RDM systems have been established earlier, with legal foundations, national funding agency data policies, and university-level support systems already in place. Supported by scientific funds through research projects, these systems demonstrate relatively mature policy and implementation frame-

works. Consequently, international academic attention has shifted toward practical research on data types, formats, acquisition, and storage [10]. Metadata, in particular, has received widespread attention as detailed descriptive information about research data. J. Stillerman et al. argue that modern science produces large volumes of complex, heterogeneous datasets, and to effectively utilize these data, researchers must locate relevant data and sufficient metadata to understand and contextualize them—a challenge across numerous research fields addressed through specialized tools. However, these methods often prove difficult to scale, and data relationships are not necessarily symmetric [11]. Therefore, Stillerman et al. attempt to establish a universal navigational metadata system that stores relationships between data and between annotations and data as first-class objects, enabling generic programs that allow users to browse these graphs and explore their data [11]. This data navigation provides a precedent for data exploration [11]. In summary, while mature RDM systems and tools exist abroad, China urgently needs to establish its own RDM institutions, systems, and tools. However, foreign RDM systems and tools are designed for foreign contexts and cannot be simply transplanted to suit China's RDM processes.

3. Analysis of RDM System Based on Research Project Life Cycle

3.1 RDM Organization System

During research project implementation supported by research development funds, numerous stakeholders participate, collectively forming a research data management and sharing ecosystem. The key stakeholders include four categories: national government, research funding agencies, research institutions, and individual researchers. From the perspective of the RDM organization system within research projects, the structure comprises three levels: legal, policy, and implementation. Each participant group assumes different functions at these levels: (1) national legislative bodies at the legal level; (2) research funding agencies that support scientific research at the policy level; and (3) research institutions undertaking research tasks at the implementation level, including national research institutes, universities, and researchers who conduct scientific research and generate data. Among these, research funding agencies hold a central position as they are responsible for project application acceptance, review, approval, implementation management, final acceptance, and evaluation. These agencies formulate policies that integrate RDM into project management processes, actively promoting the development of data management and sharing at research institutions (universities). Guided by these policies, research institutions (universities) strictly implement RDM-related policies according to their specific circumstances. [Figure 1: see original paper] illustrates the RDM organization system within the research project life cycle centered on funding agencies, with stakeholder responsibilities as follows:

- (1) **Legal Level.** Data collection, use, and sharing in scientific research must comply with legal provisions and ethical norms. A sound legal system ensures smooth implementation of RDM and sharing. Generally, national government data policies exist in legal form, providing directional planning guidance and principled constraints with authoritative binding force. Most countries have enacted laws and regulations related to data management, collection, organization, and circulation to provide certain guarantees. However, China's RDM-related research and work started relatively late. Although intellectual property protection for researchers has reached consensus, China lacks a comprehensive copyright protection system for research data, representing a significant obstacle to widespread data sharing. In contrast, developed countries like Europe and the United States have achieved considerable progress in data sharing institutional construction, with numerous laws and regulations on data management and sharing that provide valuable references for China's data legislation. For example, the UK's Freedom of Information Act 2000 was enacted to increase transparency in public sectors, allowing ordinary citizens to request information held by public authorities. Under this act, research data copyright belongs to researchers or research institutions, though not all data must be disclosed due to multiple exemption clauses, including personal information, information accessible through other channels (such as websites), information intended for future publication, information protected by confidentiality agreements (such as user consent forms), or sensitive data with restricted database access. The United States also has its Freedom of Information Act, emphasizing free information dissemination and establishing that government information disclosure is the principle while non-disclosure is the exception. Establishing institutional frameworks where multiple stakeholder groups mutually constrain and supervise each other helps improve data sharing extent and efficiency [13].
- (2) **Policy Level.** RDM policies provide a favorable environment for smooth RDM operations and facilitate active data sharing practices. As primary funders of research projects and responsible agencies for public money, research funding agencies play a guiding role in scientific research. Their recommendations and mandatory enforcement often determine data management and sharing status, making them crucial in guiding RDM and sharing. Funding agencies should provide guidance and supervision through standardized data policies that require researchers to submit, store, and share research data, while also incentivizing data management by incorporating RDM into evaluation systems. These agencies aim to maximize the value of their funding investments to achieve maximum societal returns and ultimately realize public interests.

Developed countries in Europe and America have accumulated rich experience in RDM and sharing policy implementation. In these nations, funding agency data policies have become the driving force for promoting data sharing and strengthening data management. Through mandatory policy enforcement, these

agencies can better standardize policy implementation and improve administrative efficiency. These national data policies are based on OECD principles that publicly funded research data is a public good that should be provided to the public with minimal restrictions [1]. The UK exemplifies this approach through mandatory data policies from research funders. The first UK research funders with data policies were those that also supported data centers: the Natural Environment Research Council (NERC), Economic and Social Research Council (ESRC), and Arts and Humanities Research Council (AHRC). In 2004, the UK joined 32 other governments in adopting the OECD Declaration on Access to Data from Public Funding, a key driver for further policy development. Subsequently, principles and guidelines were released to help guide policy formulation and good practices related to research data access, use, and management (OECD, 2007). UK research funders responded to this momentum, with the Medical Research Council (MRC, 2011), Biotechnology and Biological Sciences Research Council (BBSRC, 2010), and Wellcome Trust (2011) launching data policies between 2005-2007, all based on OECD principles. Research Councils UK (RCUK) released its *Common Principles on Data Policy* in April 2011, demonstrating a trend toward harmonized funder policies. The Engineering and Physical Sciences Research Council (EPSRC, 2011) and Science and Technology Facilities Council (STFC, 2011) released their respective data policies in May and September. Disciplinary federations also united in policy statements, with 17 major international public health research funding agencies signing the *Declaration on Sharing Research Data to Improve Public Health* in January 2011 (Wellcome Trust, 2011). This policy consistency and coherence improved RDM implementation efficiency [14]. Notably, 55% of research in UK higher education institutions is funded by research councils, amounting to €3 billion annually, making these policies profoundly impactful on research practices [15]. In the United States, organizations like the National Science Foundation (NSF) and National Institutes of Health (NIH) similarly drive the data sharing agenda and policy formulation.

- (3) **Implementation Level.** The RDM implementation level comprises research institutions (universities) and researchers. Researchers, as data producers and users, play a critical and indispensable role in RDM and sharing processes. Research institutions are where research data is generated and primarily used. These institutions follow funding agency policies, refine them according to their specific circumstances, store and integrate the data they hold, and support researchers in RDM work.

The greatest obstacle at the implementation level is researchers' weak willingness to share data. Although researchers are the primary beneficiaries of data sharing, most express concerns or hesitation, typically due to unknown factors and lack of understanding about actual sharing processes. Additionally, the absence of sound policies and incentive mechanisms, lack of unified data standards, and perceived risks of sharing (unlike academic papers) also inhibit data sharing. As crucial implementing departments, research institutions (universities) play a vital role in successfully implementing funding agency policies. First,

they must widely publicize RDM and sharing policies and benefits to create an atmosphere that enhances researchers' enthusiasm for data sharing. Second, they need to develop scientifically sound RDM strategies and implementation roadmaps tailored to their institutions based on funding agency requirements, while providing researchers with RDM infrastructure (institutional repositories, disciplinary repositories, etc.) and related support services (library support services, etc.). The relationship between research institutions (universities) and researchers is complex, involving both affiliation and jurisdiction, with mutual complementarity and indispensability. The primary contradiction lies in balancing individual and collective interests, making the achievement of win-win outcomes a key challenge in RDM implementation.

3.2 RDM Implementation System

The above describes the RDM organization system within the research project life cycle centered on funding agencies. The purpose of establishing this organizational system is to build policy transmission and implementation frameworks that promote and standardize RDM practices, thereby providing data support for scientific research, government decision-making, and economic and social development while maximizing data sharing benefits. Therefore, we must consider how to ensure policy execution and effectiveness. Building upon the analysis of the project-based RDM organization system, this section further explores the RDM implementation system based on the research project life cycle to ensure smooth policy implementation and achieve desired outcomes.

Both research project activities and RDM activities follow life cycle patterns with distinct stages and activities. During project implementation, we can apply life cycle theory to integrate mandatory DMP policies from funding agencies and RDM activities at various stages into the entire project process. By implementing data management activities step-by-step according to project characteristics and conducting stage-by-stage reviews of DMP implementation, we can promptly identify issues, adjust methods or approaches as needed, effectively improve data management efficiency, and lay a solid foundation for successfully achieving RDM objectives. A typical research project can be divided into three phases: project approval (proposal writing, project demonstration, review, etc.), project R&D implementation (organization, original data collection, research analysis, supervision and inspection, etc.), and project completion and acceptance (finalization, achievement appraisal, acceptance, results publication, etc.). These three phases form a complete project management chain, with each stage requiring specific procedures. Integrating RDM activities into each phase of the project life cycle involves different data management content: (1) data management during project approval primarily includes DMP preparation and review; (2) data management during R&D implementation mainly includes data collection and integration, mid-term tracking and evaluation of DMP implementation, and provision of RDM support services; (3) management during project completion includes research data preservation, evaluation of data shar-

ing based on DMP, and publication and sharing. [Figure 2: see original paper] illustrates the RDM system throughout the research project life cycle. The primary responsibilities across the three phases are as follows:

(1) **Mandatory DMP Submission Policy During Project Approval.**

The approval phase involves proposing research questions, writing research proposals, and submitting them for review. The main RDM task at this stage is implementing mandatory DMP submission policies. Funding agencies should require DMP inclusion in all research proposals at the policy level, with researchers preparing DMPs according to specific funding agency requirements. Research institutions (universities) should provide corresponding material and human resources to support DMP preparation, while funding agencies should review DMPs during project evaluation. A DMP is a planning process for achieving RDM and sharing objectives throughout the proposed research project. This planning should occur before all project activities to determine data management activities, criteria, and requirements for each stage, clarifying objectives, requirements, and responsibilities for everyone involved in each activity. This ensures all RDM activities proceed as planned, minimizing blindness and randomness to achieve intended goals. Many foreign funding agencies provide detailed requirements for DMP content, generally including: DMP concepts, significance, submission timelines, specific content, and emphasis on data discovery methods, access and resource scope, data standards, and metadata standards. Most agencies also provide DMP guidelines and templates.

Based on international experience, the most influential policy in data management is mandatory DMP submission, specifically requiring scientific data management and sharing content in research funding applications and monitoring policy implementation, particularly during project completion. Funding agencies and researchers implementing DMP policies generally agree that while scientific merit is the most important evaluation criterion, weak DMPs can also lead to funding rejection. The U.S. National Science Foundation (NSF) has required mandatory DMP submission since 2011, a practice adopted by most UK research funders and considered highly effective for stimulating RDM and sharing. Preparing DMPs before research begins can improve data quality. However, DMPs alone do not constitute complete RDM policies; they must be combined with various other policy instruments to be effective.

(2) **DMP Implementation Progress Evaluation Strategy During Project R&D.**

The project implementation phase spans from project initiation to pre-acceptance, including original data collection and research analysis. Original data collection involves gathering and using raw data, while research analysis includes comprehensive analysis, data calculation, statistics, and selection criteria and interpretation. The main RDM task at this stage is data collection, with researchers collecting and integrating data generated during the research process. Research

institutions (universities) should provide RDM support services to facilitate effective implementation under limited resource conditions. Funding agencies should track and supervise DMP implementation during mid-term project reviews.

Mid-term DMP implementation evaluation is crucial for ensuring DMP objectives are met. This evaluation involves tracking, supervising, and reviewing implementation progress, quality, and level based on submitted DMPs, conducting stage-by-stage summaries, and providing opinions or suggestions for future implementation and management. During project implementation, in addition to mid-term tracking and evaluation by funding agencies, research institutions and management departments can combine self-inspections and external inspections, stage checks and regular checks to strengthen supervision of DMP implementation, promptly address identified issues, coordinate relationships among stakeholders, and ensure high-quality completion of RDM according to plan.

- (3) **DMP Performance Evaluation System During Project Completion.** In the project completion and evaluation phase, data analysis result assessment and auditing typically occur during peer review processes, mainly through scientific discussion meetings, seminars, or press conferences. Final evaluation results are presented in sub-reports or final reports and disseminated to the public through mass media, popular science, or publications. As the final important process in the project life cycle, RDM tasks at this stage include: researchers depositing, publishing, and sharing research data while continuing data management; research institutions preserving and sharing research data; and funding agencies evaluating DMPs and data sharing submitted during project approval. RDM activities during archiving, publication, and dissemination relate to data archiving and preservation, where researchers determine which data to preserve and for how long.

Compared to project approval, research institutions and researchers typically devote far less effort to project completion, appraisal, and acceptance management than to securing projects, which affects research data access and sharing. To more effectively manage data generated during project implementation, it is important to educate researchers about dataset retention requirements and provide long-term archiving options, including details on access controls, convenient retrieval, and data privacy and confidentiality requirements. This is increasingly important as not only funding agencies but also more journal publishers require researchers to make their supporting data publicly available. This means that when submitting articles for publication, researchers must indicate whether they can provide reviewers with access to supporting datasets. Additionally, completion procedures should be strictly implemented, with DMP performance evaluation systems established and strengthened. Projects failing to implement RDM and sharing according to DMP specifications should face punitive measures, including restrictions on future project applications.

Overall, the RDM process applies modern project management life cycle theory

to manage projects through three control phases: approval, implementation, and acceptance. RDM based on the research project life cycle should track the entire project process rather than focusing on only certain stages. Project work is progressive, typically undergoing several distinct stages with different work requirements, focuses, resources, and personnel at each stage. All stages are interconnected and mutually influential, making it essential to strengthen RDM at each stage to effectively achieve project objectives. Moreover, RDM throughout a complete project from approval to final acceptance often requires participation from multiple project members across different departments to jointly accomplish RDM goals. During the RDM process, only through full cooperation among participating departments and support for data management policies and activities can successful and sustainable data management be ensured.

4. Recommendations

4.1 Promptly Formulate Sound Laws and Regulations for Data Opening

China currently ranks among the world's top in overall research investment, with improving research influence. We cannot continue to delay the opportunity to reuse research data produced with substantial public financial investment. Systematic management and sharing of vast research data would facilitate data reuse and provide an excellent opportunity to enhance China's international scientific research influence. Compared with developed countries, China only mentions scientific and technological resources in the *Law on the Promotion of Science and Technology Progress* and *Law on the Promotion of Transformation of Scientific and Technological Achievements* but lacks nationally mandatory laws and regulations specifically targeting data management and sharing. Existing institutional regulations are guiding but lack influence and comprehensive guidance. Foreign funding agencies directly link project applications with scientific data submission, whereas Chinese funding agencies have few and unsystematic policies with limited specificity. Therefore, China urgently needs to formulate and improve its policy and implementation systems for research data management and sharing. At the national level, targeted legal provisions for data opening should be promptly formulated to safeguard the smooth progress of research data opening and sharing.

4.2 Promptly Establish an RDM Policy Implementation System with Funding Agencies as the Main Body

RDM implementation should focus on managing and sharing data produced by researchers affiliated with research institutions (universities). However, establishing data management and sharing systems solely through institutions and researchers is difficult, particularly changing individual researchers' behavior. In China, major research institutions and universities are basically state-owned, and most national research funding is allocated to these institutions

in the form of research projects. Therefore, strategically, we can approach this from a project management perspective, with funding agencies taking the lead in formulating RDM and sharing policies and integrating them throughout the entire project management process to improve policy effectiveness. Each research institution (university) should then use funding agency policies as guidance to develop detailed policies, processes, and development blueprints for RDM and sharing tailored to their specific circumstances.

Specifically, first, mandatory policies from funding agencies should be considered to strengthen enforcement, such as implementing mandatory DMP submission requirements in all research proposals and tracking DMP implementation throughout the project life cycle. Second, with research institutions (universities) as the center, roadmaps for implementing data management and sharing should be formulated to guide researcher participation. Third, researchers should be incentivized through revised evaluation and reward systems. That is, mandatory DMP submission policies at the funding agency level, development blueprints and incentive measures at the institutional level, and the establishment of multiple support systems should be implemented simultaneously to strengthen collaborative cooperation among funding agencies, research institutions, and researchers, forming joint efforts to promote open research data practices.

5. Conclusion

To establish an effective RDM and sharing system in China, this study analyzed RDM organizational and implementation systems. Effective RDM requires national legal foundations, funding agency policies and procedures, and the establishment of relevant systems, along with extensive reforms including expert cultivation. When establishing a national-level research data management system, funding agencies play a pivotal bridging role. China's funding agencies need to learn from advanced international experiences and institutional requirements to formulate practical and effective RDM policies. Through funding agency policies, RDM responsibilities should be traced to research institutions (universities). It is also necessary to appropriately integrate mandatory policies and policies targeting institutions (universities) to strengthen enforcement. International experience shows that data management and sharing differ from existing outcome management focused on papers, patents, and reports—it cannot be established in the short term but requires long-term development perspectives. Particularly important is that consensus must be formed among funding agencies, institutional leaders, researchers, and other stakeholders who have significantly different understandings about data management and sharing. Therefore, based on the actual processes of China's research projects, project workflows should be divided into several stages with corresponding management responsibility entities clearly defined for each stage, embodying the principle of “whoever owns, whoever is responsible” to build a clear and comprehensive RDM responsibility system.

References

- [1] Organisation for Economic Co-operation and Development. *OECD Principles and Guidelines for Access to Research Data from Public Funding* [EB/OL]. [2020-12-15]. <http://www.oecd.org/science/sci-tech/38500813.pdf>.
- [2] General Office of the State Council. *Administrative Measures for Scientific Data* [EB/OL]. [2020-12-21]. http://www.gov.cn/zhengce/content/2018-04/02/content_{5279272}.htm.
- [3] Tenopir C, Allard S, Douglass K, et al. Research data management services in academic research libraries and perceptions of librarians [J]. *Library & Information Science Research*, 2014, 36(2): 84-90.
- [4] Wang Qi. Research on University Scientific Data Management and Support System in Digital Research Environment [D]. Nanjing: Nanjing University, 2019.
- [5] Chu Jiewang, Xia Li. Research on the Construction of a Scientific Data Management System Embedded with Life Cycle Theory [J]. *Journal of Modern Information*, 2020, 40(10): 34-42.
- [6] Liu Guifeng, Ruan Bingying, Bao Xiang. Construction of a Content Framework for University Scientific Data Security from the Perspective of Data Life Cycle [J]. *Journal of Intelligence*, 2021, 40(2): 46-53.
- [7] Yang Le, Yan Shilei, Li Hongbo. Research on Research Data Life Cycle and Data Repository Theoretical Framework [J]. *Library and Information Service*, 2019, 63(1): 91-97.
- [8] Liu Qiong, Liu Guifeng. Construction and Analysis of Scientific Data Management Plan Service Framework for University Libraries [J]. *Journal of National Library of China*, 2019, 28(4): 21-31.
- [9] Zhang Peifeng, Zhang Lianfen. Library Scientific Data Management Service Innovation Under Global Research Paradigm Transformation—Based on the Perspective of Data Management Life Cycle [J]. *Library Theory and Practice*, 2019(5): 39-48.
- [10] National Science Foundation. Chapter II—Proposal Preparation Instructions [EB/OL]. [2021-02-01]. https://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#dmp.
- [11] Stillerman J, Greenwald M, Wright J. Scientific data management with navigational metadata [J]. *Fusion Engineering and Design*, 2018, 128: 113-116.
- [12] Arovelius R. Management and Preservation of Scientific Records and Data [EB/OL]. [2021-01-28]. https://www.ltu.se/cms_{fs}/1.95314!/file/Handbook%202010%20final%20SUV%20lo
- [13] Mulligan H. Briefing—Freedom of Information: New Rules on Datasets [EB/OL]. [2021-01-21]. <https://www.farrer.co.uk/search/?q=Briefing-freedom+of+information%3A+new+rules+on+datasets>.

- [14] Jones S. Developments in research funder data policy [J]. *International Journal of Digital Curation*, 2012, 7(1): 114-125.
- [15] Louise C, Veerle VDE, Libby B, et al. *Best Practice Guidelines for Research Data Management and Sharing* [M]. Beijing: Science Press, 2018: 4.

Author Contributions

Jin Zhenyan: Conceived the research idea, designed the research framework, wrote and revised the paper.

A Tongmu: Organized materials, revised the paper, and proofread.

Abstract (English)

[Purpose/significance] Taking the whole life cycle of scientific research project as the main line, this paper explores the RDM system and provides reference for the implementation of RDM in China. **[Method/process]** Based on the life cycle of scientific research projects and guided by the participants of scientific research projects, the organization system and implementation system of RDM were constructed. The responsibilities of the participants of scientific research projects, the state, R&D funding institutions, R&D institutions and researchers, and the RDM tasks of each participant in each stage of the life cycle of scientific research projects were defined. **[Result/conclusion]** RDM should be based on the whole process of scientific research projects, and establish a management mode based on the whole life cycle of scientific research projects, which is led by RDM funding institutions.

Keywords: research data; data management; scientific research project

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv — Machine translation. Verify with original.