

Survey and Analysis of the Current Status of Knowledge Repository Construction in China's Educational and Scientific Research Institutions

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Abstract

[Purpose] To gain a better understanding of the current development status of Chinese institutional repositories and provide recommendations for future development strategies. [Method] Targeting 130 Abstract: [Purpose] To gain a better understanding of the current development status of Chinese institutional repositories and provide recommendations for future development strategies. [Method] Targeting 130 samples, an online questionnaire survey was conducted. [Results] China's institutional repositories have experienced varying degrees of development in three aspects: content storage, system platforms, and management policies. [Limitations] The overall survey scale is limited, and the analysis of survey results focuses on institutions that have already established institutional repositories. [Conclusion] The survey report comprehensively summarizes and analyzes the current construction status of institutional repositories in China's educational and scientific research institutions, and recommends future compilation of best practices for institutional repositories.

Full Text

Survey and Analysis of the Status on Institutional Repository in Chinese Academic and Research Libraries

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Abstract

[Objective] This survey aims to better understand the current development status of institutional repositories in China and provide recommendations for future development strategies. **[Methods]** An online questionnaire was administered to 130 representative samples. **[Results]** China's institutional repositories have achieved varying degrees of development in three key areas: content deposition, system platforms, and management policies. **[Limitations]** The overall survey scale was limited, and the analysis focused primarily on institutions that have already established institutional repositories. **[Conclusions]** This report comprehensively summarizes and analyzes the current state of institutional repository development in Chinese educational and research institutions, and recommends compiling best practice cases for institutional repositories in the future.

Keywords: Institutional Repository; Chinese education research institution; Open access

Classification: G250

1. Research Background and Survey Needs

The growing volume of open access scholarly resources has emerged as a significant new challenge for academic information resource management [1]. For libraries and information centers, the open scholarly resource environment necessitates re-examining fundamental questions: What constitutes library collections? How should they be built? How can open resources be organized? How can open publishing be supported? How can long-term preservation of open resources be ensured? [2] Institutional repositories (IRs), as databases that collect, store, and disseminate scholarly literature created by one or more academic institutions (such as universities, research institutes, libraries, and museums) for sharing among both internal and external users, play a vital role in preserving institutional knowledge assets and facilitating knowledge management.

Domestic practice in this area has been extensive, including implementation of institutional repositories in mainland universities [3], development of institutional repositories in Taiwanese universities [4], case studies from Hong Kong universities [5], construction of institutional repositories in research institutes [6], and summaries of open access promotion practices in research libraries [7]. To promote widespread construction and healthy development of institutional repositories in China, the China Institutional Repository Implementation Group was established in October 2012 [8]. Its 2013 work plan included promotional activities such as the "China Institutional Repository Conference" [9] and support tasks for other organizations. A key initiative was conducting a nationwide survey on the current status of institutional repository development in China to comprehensively understand the present situation and inform long-term development strategies and implementation plans.

2. Research Objectives and Survey Questions

Institutional repositories bear the important responsibility of preserving institutional knowledge assets and supporting open knowledge sharing, representing an integral component of the new scholarly communication system and knowledge infrastructure for education and research. Numerous domestic studies have investigated the status of institutional repository development in mainland China, Hong Kong, Taiwan, and globally using data from platforms such as OpenDOAR (The Directory of Open Access Repositories), ROAR (Registry of Open Access Repositories), and Ranking Web of Repositories (The Spanish National Research Council). For instance, Zhao et al. [10] analyzed statistical data from ROAR to examine foreign institutional repository development, focusing on China's situation and recommending national policy support, clear leadership roles for university libraries, establishment of incentive mechanisms, implementation of liaison librarian-assisted deposition, technological innovation to develop IR software suited to Chinese user needs, and formation of institutional repository consortia. Tang et al. [11] surveyed institutional repository development in Hong Kong and Taiwan, finding widespread adoption of low-cost DSpace-based systems, decentralized construction with centralized presentation, and policy and financial support from education authorities. The China Academic Library & Information System (CALIS) previously conducted questionnaire surveys among Chinese universities [12]. Ji [13] investigated software platform adoption in domestic institutional repositories using ROAR data. Yuan et al. [14] examined global institutional repository development based on OpenDOAR data. Wang [15] compared institutional repository development between Hong Kong and mainland universities and offered recommendations.

Given that China's institutional repository development remains in its early stages—many repositories are operational but not yet registered in international directories due to language barriers, while many others are still under construction—the China Institutional Repository Implementation Group decided to organize this national survey. The objective was to understand the current status, problems, strategies, measures, challenges, and difficulties in institutional repository development to provide insights and reference points for future progress. This survey focused on key aspects including: what content to deposit, deposition methods, content types, storage approaches, services built around deposited content, and future development directions.

3. Survey Design and Implementation

3.1 Questionnaire Design Process

The questionnaire was initially drafted according to the “China Institutional Repository 2013 Annual Work Plan,” building upon the CALIS Phase III Institutional Repository Construction and Promotion Subproject survey. After comprehensive revision, supplementation, and expansion, expert opinions from the working group were solicited. The questionnaire underwent five rounds of

revision based on pilot testing before the final version was confirmed.

3.2 Survey Planning

The survey targeted librarians from representative educational and research institutions that had either established or planned to establish institutional repositories, with one sample per institution. Survey objects were drawn from two major systems: research institute libraries and university libraries. The research institute library survey was organized by the National Science Library of the Chinese Academy of Sciences, while the university library survey was organized by Peking University.

3.3 Implementation

The survey was conducted using an online questionnaire system and consisted of two versions: Version A for institutions that had already established IRs, and Version B for those planning to establish IRs. Both versions contained identical questions, but all questions were mandatory in Version A, while only basic information questions were mandatory in Version B. The survey was administered from May 15 to July 10, 2013, collecting 130 responses.

3.4 Response Overview

According to the survey results, 40 educational and research institutions reported having established institutional repositories, while 61 had not yet established or were planning to establish them. Among the 40 institutions with established IRs, 21 were from the Chinese Academy of Sciences and 19 were from domestic universities. Among the 61 institutions without IRs or planning to build them, 5 were from the Chinese Academy of Sciences and 56 were from domestic universities.

4. Survey Results

4.1 High Proportion of Data Migration and Replication

Among five deposition method options (A. Individual self-deposition; B. Individual submission to management department for deposition; C. Individual submission to management department, which then submits to IR manager; D. Individual submission directly to IR manager; E. Data migration or replication from other platforms), data migration or replication from other platforms was the most common method, as shown in Figure 1 [Figure 1: see original paper].

4.2 Batch Import by Libraries Predominant

Survey results revealed multiple concurrent operational approaches. Further analysis of Version A responses showed that “submitting data and information on the IR webpage” (primarily individual submission) and “batch importing data

via programmatic commands in the IR backend” (i.e., intermediary submission by libraries) were the most widely adopted methods, each used by nearly 80% of institutions, as shown in Figure 2 [Figure 2: see original paper].

4.3 Journal Articles, Conference Papers, and Dissertations Most Common Content Types

The survey indicated that all institutional repositories recognized the importance of diverse content types, with “journal articles, conference papers, and dissertations” receiving the highest priority, accepted by over 95% of surveyed institutions, as shown in Figure 3 [Figure 3: see original paper].

4.4 Primary Support for Text, Tables, Images, and Courseware

Deposited content also featured diverse carrier formats. Support for the four mainstream formats (text, tables, images, and courseware) exceeded 80%, as shown in Figure 4 [Figure 4: see original paper].

4.5 Few Institutions Have Incentive Measures, with Some Implementing Mandatory Requirements and Evaluation

The survey revealed low adoption rates for all six incentive measures. However, over 35% of surveyed institutions employed “mandatory requirements” and/or “evaluation and assessment” measures, as shown in Figure 5 [Figure 5: see original paper].

4.6 Nearly Half of IRs Have Explicit Deposit and Dissemination Policies

The survey found that 52% of established IRs had strict, unified deposit policies, while 36% lacked explicit IR deposit policies. Among institutions planning to build IRs, 52% had not yet considered establishing explicit deposit policies, as shown in Figure 6 [Figure 6: see original paper].

Regarding open service policies for IRs, 59% of established IRs strictly adhered to a unified open service policy, while 29% had no explicit open service policy. Institutions currently building IRs expressed concern about unified open service policies but remained uncertain in their policy choices, as shown in Figure 7 [Figure 7: see original paper].

4.7 Most Established IRs Adopt Institution-Wide Regulation of Content Openness

The survey showed that 76% of institutions with established IRs adopted the approach of “institution-wide regulation of deposited content openness.” Among institutions planning to build IRs, fewer than half had unified regulations regarding content openness, as shown in Figure 8 [Figure 8: see original paper].

Regarding open access embargo periods, over half of institutions chose “immediate open sharing after deposition,” as shown in Figure 9 [Figure 9: see original paper].

In terms of access control for IR browsing, searching, and downloading, survey results indicated that only a very small number of surveyed IRs implemented closed access measures, as shown in Figure 10 [Figure 10: see original paper].

4.8 Established IRs Have Achieved Considerable Scale

Among institutions with established IRs, 14% had over 100,000 metadata entries, while 38% had substantial metadata volumes between 10,000 and 100,000 entries, as shown in Figure 11 [Figure 11: see original paper].

Regarding full-text volume, 7% of established IRs had over 100,000 full-text items, while 43% had more than 10,000 full-text items, as shown in Figure 12 [Figure 12: see original paper].

In terms of current registered users, 7% of established IRs had over 10,000 registered users, 10% had between 1,000 and 10,000 users, and 83% had fewer than 1,000 registered users, as shown in Figure 13 [Figure 13: see original paper].

4.9 Diverse Platform Construction Methods, with Institutional Assistance Slightly More Common

Among surveyed institutions, various methods were employed for IR platform construction, with assisted construction being most prominent. Open-source software applications became mainstream, as shown in Figure 14 [Figure 14: see original paper].

Regarding utilization of open-source tools, 62% of established IRs used the open-source software DSpace for IR system development, 12% chose other open-source tools, and 26% did not use open-source software, as shown in Figure 15 [Figure 15: see original paper].

4.10 Most IRs Choose Centralized Content Management

In terms of content organization and management, both Version A and Version B responses showed that centralized management of metadata and full-text was the most adopted approach, reaching 81% and 66% respectively. A minority of IRs chose “centralized metadata management with full-text managed by different departments and organizations within the institution” or “both metadata and full-text managed by different departments and organizations within the institution,” as shown in Figure 16 [Figure 16: see original paper].

4.11 New Service Functions Built According to Needs

The survey revealed that most established IRs possessed service functions such as “homepage search functionality, advanced search functionality, and display

of resource types,” with adoption rates exceeding 90%, as shown in Figure 17 [Figure 17: see original paper]. However, some new functions await broader application.

4.12 Subject Librarian Visits as Primary IR Promotion Method

As shown in Figure 18 [Figure 18: see original paper], regarding promotion scope, institutions responding to Version A most frequently used “promotion within the institutional unit,” adopted by 83.33% of respondents. Additionally, nearly 60% of surveyed IRs employed “national-level promotion (participation in domestic conferences and IR consortia).” International promotion was least common but represents an important approach for enhancing IR influence and aligning with international standards.

Regarding promotion methods, “subject librarian visits” were the most frequently used IR promotion approach, while “conducting lectures and training” and “issuing news releases” were also widely adopted, as shown in Figure 19 [Figure 19: see original paper].

4.13 Primary Purposes: Knowledge Asset Preservation and Expanded Scholarly Impact

Survey results demonstrated high consistency between Version A and Version B regarding IR construction purposes. The highest support was expressed for “perfecting preservation of institutional scholarly achievements” and “expanding institutional scholarly influence,” with respondents also recognizing IRs’ roles in “increasing academic exchange channels to promote innovation vitality” and “serving as a method for education and research evaluation and assessment,” as shown in Figure 20 [Figure 20: see original paper].

4.14 Funding and Policy Support Require Attention

Regarding predetermined issues for next steps in IR construction—including funding, policy support (copyright openness and protection), human resources, content, promotion, participation enthusiasm, etc.—approximately 90% of surveyed institutions considered the listed issues relevant to their organization, with 60% viewing these issues as urgently needing resolution, as shown in Figure 21 [Figure 21: see original paper].

5. Conclusions and Discussion

(1) China’s Institutional Repositories Entering Rapid Growth Phase

Survey results regarding data volume, user volume, and access statistics indicate that certain institutional repositories have already achieved considerable scale, with IR metadata exceeding 100,000 entries, full-text volume surpassing 100,000 items, registered users exceeding 10,000, and monthly visits over 10,000.

This demonstrates that China's institutional repositories are beginning to show tangible service benefits.

(2) Libraries Should Pursue Cooperative Storage Approaches

Regarding operational methods for IR content and metadata deposition, both web submission (by individuals) and backend batch data import (by intermediaries) showed the highest adoption rates. "Automatic storage by cooperative units" had the lowest adoption rate, likely because cooperative units (such as publishers and database integrators) currently lack sufficient awareness and enthusiasm for IRs. Libraries need to strengthen collaboration with publishers and content providers during IR construction to explore mutually beneficial and applicable cooperative approaches.

(3) Libraries Should Actively Pursue Institutional-Level Incentives

Survey results on seven types of incentive measures (including others) showed low adoption rates, all below 40%. Libraries and information centers should learn from each other's experiences and strive to implement incentive measures for IR deposition and dissemination within their educational and research institutions. This involves improving IR deposit and dissemination service policies, clarifying management and evaluation incentives, including flexible options for depositors to "choose different open sharing timelines for different types of deposited content," and formulating or improving IR management policies based on institutional policies.

(4) Institutions Planning IRs Can Learn from Existing IR Experience

Regarding platform construction, most domestic institutions highly endorse IR development based on DSpace and have accumulated considerable experience. Institutions planning to build IRs can fully leverage these existing experiences and adopt open-source software for IR construction. These practical experiences can be shared through future case compilation efforts. Additionally, current IRs offer rich service functions that can be adapted according to needs, such as personal scholarly profile display, work claiming, fine-grained rights management, and knowledge mapping.

(5) Recommendation to Compile "Institutional Repository Construction Practice Cases" and Other IR Development Guides

Chinese educational and research institutions show strong consensus regarding IR construction goals, with most aiming to improve preservation of institutional scholarly achievements and expand institutional scholarly influence. However, current IR construction faces certain challenges, including researchers' enthusiasm for submitting work, content organization methods, promotion approaches, intellectual property policies, human resource and funding evaluation, and publishers' copyright control. These issues should not become obstacles to IR development. On the contrary, future efforts should compile China's "Institutional Repository Construction Practice Cases" to disseminate operational guidelines on system technologies, policies, regulations, and promotion methods used in IR construction in an accessible manner, thereby contributing to robust IR development.

This survey has relatively comprehensively presented the institutional repository construction situation in China's universities and research institutes. Through analysis of survey results, the above five constructive strategies have been proposed for industry reference.

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Author Contributions:

Yao Xiaoxia and Nie Hua: Proposed survey concepts and organized survey design;

Nie Hua, Ku Liping, Yao Xiaoxia, Zhang Dongrong, Wu Yue, and Wei Chengfu: Designed and revised the questionnaire;

Nie Hua, Yao Xiaoxia, Zhang Dongrong, and Ku Liping: Organized and implemented the survey;

Wei Chengfu: Designed the online survey platform and collected survey data;

Wu Yue, Yao Xiaoxia, and Wei Chengfu: Analyzed questionnaire data and drafted the initial manuscript;

Ku Liping and Nie Hua: Revised the final version of the paper.

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

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