Construction and Implementation of an Internal Control Framework System for Document Resources in University Libraries (Post-print)

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Abstract

[Purpose/Significance] To enhance the internal control level of literature resources, meet the requirements of university internal control construction, establish an internal control framework system applicable to literature resources, and consolidate the foundation for scientific library management.

[Method/Process] Based on an investigation into the importance of internal control and the current status of internal control in university libraries, the objectives of literature resources internal control were clarified. An internal control framework system for literature resources was constructed based on lifecycle management. Taking Shanghai Jiao Tong University Library as an example, the implementation and measures of the literature resources internal control system were introduced.

[Results/Conclusion] Strategic objectives, operational objectives, compliance objectives, and asset objectives for literature resources internal control were formulated. The internal control framework system for literature resources was constructed from seven major components: management system and mechanism, planning and allocation, use and maintenance, disposal, informatization management, and performance evaluation & supervision assessment, forming a closed-loop quality management cycle of "planning—execution—evaluation—improvement" to promote dynamic management and quality enhancement of literature resources internal control.

Full Text

Abstract

[**Purpose/Significance**] This study aims to enhance the internal control level of literature resources to meet university internal control construction requirements, establish an internal control framework system applicable to literature resources, and strengthen the scientific management foundation of libraries. [**Method/Process**] Beginning with an investigation into the importance of internal control and the current status of internal control in university libraries, this paper clarifies the internal control objectives for literature resources. Based on the lifecycle management of literature resources, an internal control framework system is constructed. Using Shanghai Jiao Tong University Library as a case study, the implementation and measures of the literature resources internal control system are introduced. [**Result/Conclusion**] The study formulates strategic, operational, compliance, and asset objectives for literature resources internal control, constructs a framework system comprising seven major components: management system and mechanism, planning and allocation, use and maintenance, disposal, information management, performance evaluation, and supervision and assessment. This creates a closed-loop quality management cycle of "planning—execution—evaluation—improvement," promoting dynamic management and quality enhancement of literature resources internal control.

Keywords: university libraries; literature resources; internal control framework system; implementation
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Internal control, as a standardized management approach, has gradually expanded from corporate applications to various social management domains. Since the Ministry of Finance issued the *Internal Control Standards for Administrative Institutions (Trial)* in 2012, requiring the promotion of internal control standards starting in 2014, the intensity of internal control efforts has continuously increased. Between 2012 and 2016, the Ministry of Education and the Ministry of Finance continuously released multiple administrative regulations and policies, universally raising awareness and implementation of internal control among public institutions. University libraries provide literature resource support for teaching and research activities, involving various economic activities in daily operations, particularly literature resource development. To improve the quality of literature resource development, enhance internal control levels, and meet university internal control construction requirements, it is necessary to strengthen internal control and establish a set of internal control framework systems applicable to literature resources, thereby consolidating the scientific management foundation of libraries.

1. Importance of Internal Control in University Libraries

Internal control accompanies economic activities. As an important component of university organizational management systems, implementing internal control in university libraries is crucial for effectively utilizing literature resource funds, further improving management levels, and enhancing management efficiency and effectiveness.

1.1 Necessary Component of University Management System Reform and Deepening

With increased national emphasis on higher education and investment in educational funds, the total volume of economic activities in universities has grown, making them a high-risk area for disciplinary violations [1]. In 2010, the Ministry of Finance first proposed strengthening internal control construction in public institutions in its work report, and in November 2012 promulgated the *Internal Control Standards for Administrative Institutions (Trial)*, proposing that internal control in administrative institutions refers to the prevention and management of risks in economic activities through system formulation, measure implementation, and procedure execution [2], thus providing a foundational framework for internal control work in universities. In April 2016, the Ministry of Education issued the *Guidelines for Internal Control of Economic Activities in Universities Directly Under the Ministry of Education (Trial)*, proposing requirements for internal control in 15 aspects of economic activities, including control environment, budget and final account management, asset management, debt management, income management, and expenditure management [3]. Under the guidance of relevant regulations, universities have begun to clarify risk control and management as an important measure for reforming and deepening internal management systems, requiring libraries—as important economic behavior entities supporting literature resources—to standardize various pre-event procedures and post-event audits to ensure the legality of fund movements, the economy of business activities, and the standardization of management activities, thereby giving rise to the construction and implementation of internal control in university libraries.

1.2 Inevitable Requirement for Business Innovation and Transformation in University Libraries

In recent years, innovation and transformation have been key to business development in university libraries. The 2016 ACRL Top Trends Report for Academic Libraries [4] and the 2017 ACRL Environmental Scan [5] proposed development requirements such as "collection assessment," "open access and collection management," and "collection assessment, evaluation, and analysis." Libraries need to ensure flexibility in fund use, effective cost sharing, and continuous understanding of user behavior to ultimately demonstrate the value and contribution of libraries in students' learning careers and researchers' academic communication processes. Chen Jin, Director of Shanghai Jiao Tong University Library, believes that future university libraries must be innovation-centered and boldly promote service transformation, with performance-based resources being an important transformation direction [6]. Under the premise of meeting reader and disciplinary needs, focusing on library performance management and using scientific models to plan and analyze the benefits and input-output ratios of resource development, evaluating the importance, applicability, and cost-effectiveness before resource procurement, as well as the effects, value, and satisfaction after resource use, forms a reasonable collection optimization mechanism. The basic concept of performance-based resources is to achieve dynamic management of literature resources through comprehensive evaluation of resource input and output, which coincides with the quality management objectives required by internal control and has become an inevitable requirement for university libraries seeking business innovation and transformation.

2. Research Status and Shortcomings of Internal Control in University Libraries

Currently, the most authoritative definition of internal control comes from the Committee of Sponsoring Organizations of the Treadway Commission (COSO). Between 1992 and 2013, COSO continuously improved the connotation of internal control. In the 2013 revised *Internal Control—Integrated Framework*, internal control is defined as a process implemented by an entity's board of directors, management, and other personnel, designed to provide reasonable assurance regarding the achievement of operational, reporting, and compliance objectives, based on five components: control environment, risk assessment, control activities, information and communication, and monitoring [7]. At present, research and exploration of internal control in Chinese university libraries are mainly based on this framework and relevant national laws and regulations, achieving some representative results.

In 2007, Xu Hongbing discussed improving library internal control from the perspectives of control environment, information and communication, risk assessment, control activities, and supervision, arguing that internal control runs through all aspects of library management activities and is necessary wherever libraries and their management activities exist [8], representing early domestic research on internal control. In 2008, M. Mounce and P. Mounce applied ACRL guidelines for preventing and responding to theft to study internal control for book theft in university libraries [9]. In 2011, Li Ximing studied university library internal control from the perspective of university risk control, arguing that the essence of internal control is risk control and suggesting that university library internal control construction should proceed by establishing correct internal control concepts, building internal control systems, and strengthening risk control at key control points such as library cataloging business outsourcing [10]. In the same year, Bowen proposed constructing an internal control system from the perspective of library scientific management to promote scientific management [11]. In 2012, Zhou Liangwen attempted to establish an internal control process for literature resource acquisition in university libraries based on the *Basic Standards for Enterprise Internal Control* to ensure that literature resources remain in a controllable state throughout all economic activities, ensuring their security, integrity, and effectiveness [12]. In 2014, Cao Hong analyzed the causes of internal control problems in university library management systems, such as weak internal control environment, lack of scientific decision-making basis, low-level systematic management, lack of high-level management talent, and imperfect supervision systems, proposing to carry out control activities from three aspects—strengthening internal control environment construction, sorting out business processes, and establishing supervision mechanisms—to promote scientific management [13]. In 2015, Wu Yanqin, based on the research status of university library management, used basic theories of internal control and risk management to elaborate on the universal internal environment of Chinese university libraries from an internal control perspective, analyzed major risks in book acquisition, human resources, and financial management, and proposed risk control countermeasures [14]. In 2015, Kang Anna also proposed from a library management perspective that university libraries have problems such as unclear internal control objectives, imperfect supervision and evaluation systems, poor information channels, and unclear control effects, suggesting strengthening internal control system construction by promoting standardized construction of library internal control standards, strengthening the status and role of internal audit institutions, strengthening the responsibilities of organizational legal persons and responsible persons in the internal control system, introducing external supervision, and establishing internal control supervision and evaluation systems [15]. In 2016, Song Yue and Luo Yadan, starting from the theoretical characteristics of internal control, analyzed specific problems in library internal management such as lack of internal control concepts, non-standard internal control, and lack of management talent from the perspectives of library internal book management processes and library management system construction, proposing measures to optimize and improve library internal control [16].

From the above research, domestic studies on library internal control start from the five-element framework, focusing on internal control concepts and library management, but remain at the level of conceptual discussion and problem analysis, with limited exploration of internal control application in specific library business practices. In studies of specific business management, the scope of business involved is narrow, and no relatively systematic literature resource internal control system has been established for business practice. Moreover, the introduction and reference of the latest internal control thinking are insufficient. In 2013, COSO proposed 17 fundamental principles based on the original five elements, further refining 82 elements representing key characteristics and focus points of related principles, making the evaluation of the internal control system more evidence-based [17]. This provides certain guidance and reference for further improving internal control and enhancing library risk management capabilities.

3. Internal Control Objectives for Literature Resources in University Libraries

The Ministry of Finance's December 2015 guidance on comprehensively promoting internal control construction in administrative institutions clearly emphasized that internal control construction should establish and improve a scientific and efficient restraint and supervision system, promote continuous improvement in public service efficiency and internal governance levels, and lay a solid foundation and provide strong support for modernizing the national governance system and governance capabilities [18]. The 2016 *Notice of the General Office of the Ministry of Education on Issuing the Guidelines for Internal Control of Economic Activities in Universities Directly Under the Ministry of Education (Trial)* (Jiaocai Ting [2016] No. 2) identified the objectives of university internal control as ensuring the legality and compliance of school economic activities, the safety and effective use of assets, the truthfulness and completeness of financial information, effectively preventing fraud and corruption, and improving resource allocation and use efficiency. By examining COSO internal control objectives and relevant regulations, it is evident that control objectives are crucial to internal control measures and their efficiency and effectiveness.

Internal control objectives typically include strategic objectives, operational objectives, compliance objectives, and asset objectives. The internal control objectives for university library literature resources must be closely linked to higher education reform and development needs, and based on the library's functional positioning within the university and the actual role of literature resources, operational objectives should be clarified. On this basis, compliance and asset objectives should be established in conjunction with management requirements for educational auditing, financial management, and quality control. These four objectives are interconnected and mutually dependent, collectively forming a complete set of internal control objectives for library literature resources, as shown in Figure 1 [Figure 1: see original paper].

3.1 Strategic Objectives

Strategic objectives are the highest-level objectives of internal control. The strategic objective of literature resources internal control is to align with the university's educational goals and career development planning, serving talent cultivation and scientific research through library management and services, and ensuring high-quality literature information resource construction and support. Currently, university libraries need to plan their strategic positioning in discipline construction, teaching, and research to meet literature resource demands in discipline construction and support teaching and research activities, particularly in the context of national and university "Double First-Class" construction.

3.2 Operational Objectives

Operational objectives are the core objectives of internal control and the concrete manifestation of strategic objectives. For literature resources, it is necessary to achieve optimized allocation and efficient utilization of literature resources through business flow processes such as bidding, procurement, acceptance, processing, services, and management. Through performance assessment and evaluation of literature resources, the maximization of input-output benefits from literature resource funds should be achieved.

3.3 Compliance Objectives

Compliance objectives are one of the foundational objectives of internal control and an effective guarantee for achieving operational objectives. Literature resources compliance objectives require university libraries to fully recognize the risks in economic activities, prevent and manage related risks through system formulation, strengthened implementation measures, and execution, ensuring that literature resources development complies with laws and regulations, has complete systems, sound regulations, compliant procedures, and standardized processes. This enables literature resources business to achieve standardized management, effective control, accountability, and risk prevention, forming a sustainable service and management mechanism.

3.4 Asset Objectives

Asset objectives are also foundational objectives of internal control and the material prerequisite for achieving operational objectives. Literature resources asset objectives particularly emphasize the safety management of literature resources as assets, ensuring their security and integrity. The asset objective is to establish an asset management system, support daily asset registration, acceptance, custody, and inventory to achieve consistency between accounts and physical assets, and through systematic and information-based management, achieve accurate revelation, complete ordering, reasonable disposal, effective supervision, and scientific management of literature resources.

4. Internal Control Framework for Literature Resources in University Libraries

Following the principles of comprehensiveness, importance, checks and balances, and adaptability in internal control, the literature resources internal control framework system is based on the lifecycle management of literature resources, fully reflecting the entire process of literature resource budgeting, decision-making, execution, use, and supervision. It comprehensively considers the business characteristics of literature resources and their applicability in library management and services, with a focus on preventing and controlling high-risk areas in literature resources, allocating responsibilities for key positions, and balancing core business processes. The framework fully embodies the five elements of internal control and, on this basis, combines the university environment to emphasize the application of a closed-loop management model of planning, execution, evaluation, and improvement (see Figure 2 [Figure 2: see original paper]), forming a management system based on internal control environment construction, guided by risk assessment results, using control measures as means, information and communication as links, and supervision and evaluation as driving forces.

The core of the literature resources internal control system is lifecycle-based literature resources management, including seven major components: management system and mechanism, planning and allocation, use and maintenance, disposal, information management, performance evaluation, and supervision and assessment. These components reflect the requirements of the five internal control elements from different perspectives. Among them, management system and mechanism includes organizational structure systems, departmental authority allocation, and position and personnel control; planning and allocation includes planning, procurement and bidding, procurement acceptance for various types of literature resources in libraries and departmental branch libraries (reference rooms), and also covers donations of literature resources; use and maintenance focuses on the layout, use, and management of literature resources for faculty and students, involving asset inventory and security management of literature resources; disposal mainly includes weeding and donation of literature resources, involving the integrity management of literature resource assets; information management includes not only the management and control of literature resources collection information systems but also information management that assists or supports collection services; performance evaluation is mainly used for controlling literature resource quality, usage statistics, faculty and student satisfaction, and fund efficiency; supervision and assessment mainly refers to controlling the transparency and legality of literature resources management systems and feedback channels for faculty and student opinions or suggestions.

The lifecycle-based literature resources internal control framework system has the following characteristics:

(1) **Integrating the functions and roles of the five internal control elements.** In the literature resources internal control system, by analyzing the characteristics of the five elements, their functions are more specifically defined as: scientification of the control environment emphasizing diversity; proceduralization of risk assessment highlighting dynamism; standardization of control activities based on rigor; transparency of information and communication emphasizing humanization; and normalization of supervision highlighting comprehensiveness, thereby enhancing the effectiveness and efficiency of the literature resources internal control system.

(2) **Achieving internal control based on lifecycle management.** Literature resources internal control, while integrating the functions of the five elements, explores the characteristics of the literature resources lifecycle, establishing a control system from management system and mechanism to allocation, use, disposal, and other seven links. This better aligns with current literature resources management models, helps achieve systematic management and control, and improves the scientific management level of libraries.

(3) **Emphasizing the integration of internal control principles with the control environment.** The literature resources internal control system particularly emphasizes embedding and integration with its own environment. On one hand, it stresses applicability to organizational structure and culture and constructs an information exchange platform to mobilize

all staff to participate in internal control. On the other hand, it highlights control over high-risk areas in the literature resources operation process, focusing on the execution and implementation of regulations, business processes, position responsibilities, and risk assessments, which better reflects the principle requirements of internal control.

(4) **Establishing a closed-loop management model for internal control.** One of the objectives of literature resources internal control is to continuously improve the quality of literature resources construction. Under the background of "Double First-Class" construction, literature resources internal control needs to form a self-improvement and self-enhancement construction model to meet various needs of teaching and research for literature resources. To this end, the literature resources internal control system draws on the Plan-Do-Check-Action (PDCA) quality control model [19] to build a closed-loop quality control model of "planning—execution—evaluation—improvement," promoting dynamic management and quality enhancement of literature resources internal control.

5. Implementation of Literature Resources Internal Control in University Libraries

Seizing the strong momentum of internal control promotion in administrative institutions, Shanghai Jiao Tong University Library has continuously strengthened and improved internal control system construction and implementation under the requirements of university comprehensive reform and library innovation and transformation, achieving remarkable results with significant improvement in the construction and management level of the literature resources internal control system.

5.1 Developing an Internal Control Operation Manual for Literature Resources

Since 2016, to further enhance the university's management effectiveness of literature resources, improve fund use efficiency, and establish a practical internal control operation guide for literature resources, the library, under the university's unified guidance and based on the spirit and requirements of internal control work such as the *Shanghai Jiao Tong University Internal Control Construction and Implementation Measures* and the *Shanghai Jiao Tong University Internal Control Audit Implementation Measures*, established a special working group led by the deputy director in charge. Addressing issues of inadequate existing standards and insufficient supervision and execution in some links, the group coordinated the compilation of internal control operation standards, striving to achieve efficient internal operation with excellent results and standardized external order with open collaboration, ensuring the scientific, systematic, effective, and timely management of literature resources. Following the logical structure of "control objectives—main risk points—business flowcharts—risk control matrices," the group standardized 20 business flowcharts for management and operation mechanisms, allocation, use, maintenance, and information management, identified 46 main risk points in each link (see Figure 3 [Figure 3: see original paper]), and correspondingly formulated 26 operable detailed rules and standards, establishing and revising 26 business systems, achieving the expected goals of internal control construction and management: improving processes and institutional standards for procurement, acceptance, reading, and book circulation according to the latest changes and requirements in literature resources management; focusing on key points and risk points in procurement, acceptance, and disposal procedures, organizing the implementation of requirements for different departments and positions to execute different links of literature resources management; and widely accepting supervision and evaluation by "posting systems on the wall" and making operation processes public, effectively promoting the implementation of literature resources internal control standards according to regulations and improving corresponding supervision and evaluation mechanisms.

5.2 Establishing a University-Level Organizational Management System with Both Collaboration and Checks and Balances

To improve the literature resources management and operation mechanism, the library has established a university-level organizational management system for literature resources internal control consisting of six major components: decision-making system, execution system, control system, consultation system, supervision system, and collaboration system, involving more than 10 university-level units and organizations outside the library. As shown in Figure 4 [Figure 4: see original paper]:

In this organizational management system, the library's administrative office and main business departments such as acquisition and cataloging, reader services, and system support belong to the core of the execution system. To effectively utilize the expert consultation and guidance functions of the consultation system, the Library Work Committee was established in 2017. Composed of university leaders in charge of library work, responsible persons from the library and relevant university functional departments, college (department) leaders, and faculty and student representatives, its main responsibilities are to actively play a consulting and coordinating role in the library's literature resources construction, information sharing services, space layout utilization, budget planning, large-sum resource procurement, and internal and external cooperation, according to the university's development strategy and the needs of faculty and students, guiding the library to effectively support university development and better serve teaching, research, and discipline construction. In addition, the decision-making system, control system, supervision system, and collaboration system mainly come from various functional management institutions of the university. Each system collaborates and checks each other, ensuring the scientific, systematic, and standardized construction and management of library literature resources. Specific responsibilities are shown in Figure 5 [Figure 5: see original paper].

5.3 Strengthening Library Organizational Support for Internal Control Management

The internal control environment is the foundation of the entire internal control framework, and organizational structure is an important component of the control environment. To further align with the university's development mission and "Double First-Class" construction requirements, reflect the library's transformation development goals, strengthen business integration, coordination, and support for university teaching, research, and talent cultivation, the library carried out a new round of organizational restructuring in 2016-2017, adjusting from the original three departments and one institute with 10 departments to six major departments, promoting the specific implementation of internal control responsibilities.

5.3.1 Clarifying the Main Department Responsible for Internal Control The Resources and Public Services Department was established, subdivided into three business teams: resource development, resource discovery, and public services, further strengthening the "one-stop" management of literature resources construction, organization and discovery, and literature resources services. Resource development is responsible for the development planning, budget planning, procurement implementation, evaluation and analysis of all types of collections, carrying out book donation and exchange business, and undertaking related asset management and archive management work. Resource discovery is mainly responsible for connecting with disciplinary resource utilization needs, using modern information technology to effectively reveal and integrate various library resources, improving resource visibility and usage, and is the main undertaker of collection data maintenance and resource integration and discovery. Public services face all faculty and students to carry out collection borrowing, reference consultation, interlibrary loan/document delivery, and complete daily inventory, maintenance management, and statistical analysis of paper collections. The three major businesses achieve effective connection and supervision within the large department, ensuring coordinated business development and effective communication.

5.3.2 Separation of Incompatible Positions and Supervision The separation of incompatible positions and strengthened business supervision are widely implemented both within and outside departments, strengthening authority allocation and checks and balances. Subject librarians from the Learning and Research Support Department are collaborated with to carry out resource procurement acceptance and resource evaluation work; technical librarians from the Platform and Technical Support Department are collaborated with to carry out collection information management and resource usage statistical analysis work; publicity officers from the Administration and Cooperation Department are collaborated with to carry out collection statistics and promotion work; and asset managers from the Logistics Support and Cultural Affairs Department are collaborated with to carry out fund use reimbursement and asset reporting work. Simultaneously, within the department, separation of procurement and acceptance is strengthened, allowing acquisition librarians in resource development and acceptance librarians in resource discovery to supervise each other, making business links more complete.

5.4 Focusing on User Service Experience and Conducting Literature Resources Quality Engineering Construction

Literature resources are the basic support for teaching and research. The quality of literature resources construction and faculty and student experience with literature resources use and services relate to the effectiveness of faculty and student supervision and evaluation and constitute an important component of internal control. From 2016 to 2018, the library continuously paid attention to faculty and student feedback and evaluation, centering on core concepts such as "faculty and student-led, performance-based information resources," "data-driven, precise resource discovery," and "performance-based resources, satisfaction as the goal," to carry out literature resources quality engineering construction. This further strengthened literature resources quality construction and performance analysis, promoted the integration and scientific discovery of literature resources portals, explored disciplinary literature resources utilization analysis, and conducted phased literature resources user satisfaction surveys, routinely carrying out collection problem data analysis and verification. This has holistically improved the systematic management of literature resources from construction to discovery to service, as well as the quality of core business, establishing a more friendly environmental foundation for improving user service experience and forming a smoother feedback mechanism, continuously improving the management mechanism of literature resources internal control from the aspects of risk assessment, information and communication, and supervision.

To timely understand the current usage of literature resources by faculty and students and strengthen their feedback and evaluation, the library conducted a "Literature Resources Utilization Status Questionnaire Survey" in 2016 using sampling methods, analyzing faculty and student satisfaction, usage behavior, and influencing factors to further enhance their experience and effectiveness in using literature resources. The survey found that overall satisfaction with both paper and electronic resources exceeded 95%, and literature resources' overall satisfaction of teaching, learning, research, and management needs reached 94%. Meanwhile, 89% of faculty and students believed that the library responded to literature resources utilization issues in a timely manner, but improvements were still needed in resource discovery and access, resource needs of key groups, and making full use of new media for resource promotion. This survey comprehensively reflects faculty and student satisfaction with literature resources, the library's role in resource utilization evaluation, and faculty and student supervision of resource construction and services, representing a powerful measure for the library to implement internal control construction and improve literature resources quality.

Of course, while achievements have been made, literature resources internal control still has some shortcomings, including weak internal control awareness among some librarians, immature rotation systems for key positions, insufficient risk identification sensitivity, low execution efficiency of some business standards, and inadequate closed-loop management of feedback. These issues require continuous improvement. With the continuous improvement of library management levels and management personnel capabilities, the literature resources internal control system and management mechanism will become increasingly sound, thereby enhancing the effectiveness of literature resources construction and effectively supporting university teaching and research activities.

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Author Contributions

Song Haiyan: Designed the research 思路, wrote and revised the paper;
Li Fang: Determined the paper's theme and framework;
Peng Jia: Provided some research materials and revised parts of the content.

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