Research on User Credit System in University Library Socialized Services: Postprint

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Abstract

[目的/意义]To address the phenomenon of university libraries in China charging deposits when providing borrowing services to external users, and to seek a deposit-free credit-based borrowing system that can cover the majority of users. [方法/过程]Analyze the causes of credit issues encountered by university libraries and compare the borrowing policies for external readers between domestic and international university libraries. [结果/结论]In an information society, the user credit system in the socialized services of university libraries comprises a user credit information system, a user credit evaluation system, a user dishonesty penalty mechanism, a user credit education system, and a credit risk transfer mechanism.

Full Text

Preamble

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Research on User Credit System in the Socialized Services of University Libraries

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Abstract

[**Purpose/Significance**] This study addresses the phenomenon of university libraries in China charging deposits when providing lending services to off-campus users, seeking to establish a deposit-free credit-based lending system that covers the majority of users. [**Method/Process**] The paper analyzes the causes of credit problems encountered by university libraries and compares the lending systems for external readers between domestic and international university libraries. [**Result/Conclusion**] In an information society, the user credit system in the socialized services of university libraries comprises several components: a user credit information system, a user credit evaluation system, a user dishonesty punishment mechanism, a user credit education system, and a credit risk transfer mechanism.

Keywords: university libraries; socialized service; user credit system
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Both the *Regulations on Libraries in Regular Institutions of Higher Education* and the *Public Library Law of the People's Republic of China* encourage university libraries to provide services to social users. Scholars have also conducted research on related issues concerning university libraries' socialized services. For instance, Hu Wande and Wu Jin [?] argue that obstacles to implementing socialized services include current management systems being ill-adapted to socialized management and potential safety hazards such as damage to book resources. Zhao Guozhong and Zhang Chuangjun [?] attribute these barriers to nine aspects including conceptual factors, management factors, and information resource factors. Scholars such as Hong Yue [?] and Chen Liping [?] have introduced relevant institutional experiences from foreign university libraries to provide reference for domestic institutions. Concurrently, domestic scholars have conducted research on constructing user credit systems for university libraries. Tian Hao [?] explored the necessity and feasibility of establishing credit files for university library users. Zhou Yunmei [?], Hou Ting [?], and Cheng Yongjuan [?] discussed the establishment of credit risk evaluation indicators for library users, incorporating off-campus users into the evaluation scope. Yan Jingyi [?] posited that the reader credit system in university libraries consists of a credit education system, a reader credit archive system, and a credit evaluation system.

In modern society, credit has become a crucial asset for individuals, and the construction of social credit systems is essential for healthy social development [?]. Traditional social credit systems entail high operational costs due to the need for extensive data accumulation; however, the development of modern information technology enables social credit systems to operate at lower costs, thereby facilitating more efficient social governance [?]. Advances in information technology and increasing societal emphasis on credit issues have driven libraries to implement credit-based management as an alternative to deposit requirements. For example, in 2014, public libraries at all levels in Shanghai were the first to incorporate reader borrowing information into the city's public credit information service platform. The following year, Shanghai Library collaborated with Sesame Credit Management Company to provide deposit-free library card services for permanent residents meeting Sesame Credit score thresholds, using credit as a substitute for deposits to strengthen the credit relationship between both parties [?]. In contrast, university libraries have rarely adopted such approaches in managing social users. By analyzing the credit issues faced by university libraries in providing socialized services and comparing domestic and international experiences, this paper proposes a user credit system for university libraries' socialized services.

1. Credit Issues in University Libraries' Socialized Services

The lending relationship between libraries and users constitutes a form of personal credit, with the library and user as credit subjects, borrowed publications as objects, and timely and intact return as credit conditions. Personal credit represents an important component of social credit [?]. In 2014, the *Outline for the Construction of Social Credit System (2014-2020)* established a framework for China's credit system construction at the central level, emphasizing the need to improve credit systems in cultural and natural person domains [?]. Broadly defined, a social credit system is a social mechanism based on law and morality that promotes economic and social health by punishing dishonest behaviors [?].

The credit issues university libraries face in socialized services are primarily influenced by limited resources and moral hazard factors.

1.1 Limited Resources in University Libraries

Limited resources in university libraries manifest mainly in two aspects: constrained physical facilities and low book duplication rates. The primary mission of university libraries is to support teaching and research for their faculty and students, with hardware facilities configured accordingly. Consequently, when opening to the public, libraries may face the awkward situation of suspending card issuance due to facility constraints [?]. Low book duplication rates primarily stem from limited library budgets, forcing libraries to reduce copy numbers to maintain collection diversity [?]. As digital resource acquisition costs increase annually, discussions about implementing a "zero-copy" strategy have emerged [?]. With low duplication rates, if off-campus users fail to return books on time, it affects services for faculty and students. Concerns about this phenomenon have hindered the progress of university libraries opening to society.

1.2 Credit Risk

University library resources primarily serve faculty and students to support research and teaching. While providing services to society benefits off-campus researchers' access to materials and promotes scientific development, libraries must maintain collection integrity. Unlike the relatively homogeneous and high-creditworthiness on-campus community, where credit risks can be handled promptly, off-campus users present more complex occupational and credit backgrounds that libraries must consider comprehensively.

University libraries maintain duplication rates primarily to meet on-campus needs. Credit risks, such as failure to return borrowed materials on time, can impact service quality. Drawing on Liu Xiaoyuan's [?] exposition of credit relationships between consumers and enterprises, we can analyze the game between off-campus readers and university libraries under credit deficiency using a game tree [Figure 1: see original paper].

In this game tree, if the university library distrusts off-campus users, it will not provide lending services, resulting in payoffs of (0, 0). When the library trusts users, users face two choices: maintaining creditworthiness or defaulting. If users maintain creditworthiness, both parties achieve a win-win outcome with payoffs of (5, 5). When users choose not to return books or violate lending rules, the user's payoff is 10 while the library's is -5, illustrating how individually rational choices contradict collectively rational ones. The lower the cost of dishonesty for users, the more likely they are to choose dishonest behavior that violates collective rationality.

Currently, credit consumption is becoming an important social practice, but imperfect credit systems lead to increasing dishonesty. Enhancing off-campus users' credit awareness has become an unavoidable issue for university libraries. Based on this reality, constructing an effective credit system when developing socialized services can reduce the likelihood of moral hazard among off-campus users while cultivating their creditworthiness.

2. Experiences and Insights from Domestic and International Practices

2.1 Domestic University Library Practices

To guard against credit risks from off-campus readers, university libraries typically charge deposits for library card applications or impose restrictive conditions. Deposit amounts vary by institution: Jinan University Library [?] charges 300 RMB for a one-year temporary card, Zhejiang University Library [?] requires 200 RMB, and Southwest Jiaotong University Library [?] demands either 200 RMB or 1,000 RMB. Restrictions mainly concern age, workplace, and household registration. For example, Southwest Petroleum University Library only issues collective library cards for units in Xindu District [?]. While deposit requirements raise the threshold for off-campus users to access resources and user restrictions further increase difficulty, these measures effectively minimize risks from off-campus users from the library's perspective.

Some libraries offer free library cards to users guaranteed by university departments or faculty. Jinan University Library allows department-hired experts to obtain cards with departmental guarantee letters, while Shihezi University Library [?] accepts guarantees from officially employed faculty with library cards. Such guarantee mechanisms effectively reduce credit risks from off-campus readers, but off-campus users like students from other universities or enterprise employees find such guarantees difficult to obtain. Therefore, domestic university libraries currently implement deposit-free credit management only for guarantee-providing populations, leaving room for improvement in their credit management systems.

2.2 International University Library Practices

International university libraries' deposit-free management benefits from well-developed social credit systems. Most require users to pay monthly or annual service fees to obtain library cards, while some offer free card services with simple application processes that do not mention deposits. At some institutions, different payment amounts correspond to different total borrowing values and maximum book limits. For example, at Yale University Library [?], readers can obtain library cards with a driver's license, passport, or permanent resident card, with quarterly cards costing $200 and allowing up to 15 books. Free library cards are available at Frankfurt University Library [?] for permanent residents of the federal state with ID cards, student cards, or passports.

In countries with developed credit systems, social credit frameworks encompass library credit management [?], providing backing for university libraries. The United States, for instance, has a mature personal credit market dominated by three major credit bureaus using FICO scores to evaluate user credit. These bureaus have established a system for collecting, processing, evaluating, and using personal credit information, providing market products that include both positive and negative credit information [?].

3. Framework for User Credit System in University Libraries' Socialized Services

To fully implement credit management in socialized services, university libraries must not only construct a user credit system but also establish a collaborative system with financial intermediaries, social public credit information service platforms, and other institutions.

3.1 Collaborative System for User Credit Management in Socialized Services

Establishing and improving the user credit system in socialized services (see [Figure 2: see original paper]) requires participation from financial intermediaries, third-party credit service institutions, and other entities. By the end of 2014, the People's Bank of China Credit Reference Center had created credit files for 857 million natural persons, though only 350 million had credit records [?]. Credit service institutions such as Ant Financial Services Group had provided Sesame Credit services to 500 million person-times by April 2017 [?], indicating that some population segments remain unserved. Moreover, both the PBC Credit Reference Center and credit service institutions collect targeted credit records. Therefore, developing university library credit systems cannot rely solely on libraries themselves or third-party credit service institutions; it also requires integration with public credit information service platforms and other methods to expand coverage.

Collaboration with financial intermediaries provides credit risk protection for university libraries. Social public credit information service platforms and third-party credit service institutions each have different focuses in user credit information coverage. University libraries can choose cooperative partners based on their circumstances, evaluating users' off-campus credit behaviors to determine service provision. Additionally, regional library consortiums can establish unified credit evaluation indicators to build more targeted credit information platforms. After users successfully obtain credit-based lending services from university libraries, their borrowing and other credit behaviors are directly collected by the libraries and subject to library credit management.

3.2 Components of User Credit System in University Libraries' Socialized Services

Drawing on the U.S. market-dominated social credit system and research by scholars such as Tian Hao [?] and Zhou Yunmei [?] on library credit systems, the user credit system in university libraries' socialized services can comprise a user credit information system, user credit evaluation system, user dishonesty punishment mechanism, user credit education system, and credit risk transfer mechanism (see [Figure 3: see original paper]).

The user credit information system collects records of user credit behaviors, upon which the user credit evaluation system assesses user credit according to established indicator systems. If user credit evaluation falls below standards, the user credit risk early warning mechanism activates, adjusting monitoring levels based on credit rating changes or sending warning information to public credit information platforms. The user credit reward and punishment system implements rewards or penalties based on evaluation results, with case examples enriching the user credit education system. For severe dishonesty where users refuse compensation, the credit risk transfer mechanism triggers, with third-party financial intermediaries responsible for recovery. Users dissatisfied with penalties or with other suggestions can provide feedback through the user credit feedback mechanism, enabling university libraries to improve their socialized service credit systems. Each component connects sequentially and is indispensable for implementing user credit management.

3.2.1 User Credit Information System The user credit information system aggregates basic information, service records, credit status, and guarantee status for segmented off-campus user groups such as employees and students from other universities. Previous scholars have proposed establishing specialized reader credit management departments for collection, organization, analysis, and evaluation [?]. However, a single university library cannot fully grasp off-campus users' credit situations, and users' early dishonesty behaviors affect subsequent credit status [?], requiring external cooperation to maximize effectiveness. Additionally, faster information dissemination increases reputation's impact on users [?].

To objectively evaluate user credit status, university libraries can establish joint credit information platforms among libraries or connect with local credit information platforms or third-party institutions like Alipay to enhance information sharing and timely updates. When users realize each credit behavior is recorded in the system and affects their credit life, they pay greater attention to their reputation within it. After Hangzhou Library launched credit services, readers suggested that overdue issues could be resolved through fee payment rather than credit score deduction [?]. Establishing user credit information systems enables effective information disclosure and reputation mechanisms, providing information for user credit evaluation.

3.2.2 User Credit Evaluation System The user credit evaluation system processes user credit information using scientific evaluation methods to form credit assessment results. As evaluation subjects, university libraries must assess user credit status using evaluation indicators. In this regard, Cheng Yongjuan assigned different weights to indicators to score users, constructing a reader credit evaluation model using neural network methods [?]. Peng Runze found that the Stacking ensemble learning algorithm with two-layer classifiers demonstrated better predictive performance than neural network methods [?], suggesting that university libraries could consider applying Stacking-based ensemble learning models to establish user credit evaluation systems.

To facilitate sharing user credit evaluation information, multiple university libraries within the same region can establish and use a standardized evaluation indicator system. Specific indicators should include off-campus users' identities, research achievements, and literature needs [?], as well as default records in users' historical credit behaviors to improve evaluation accuracy. If university libraries connect with public credit platforms or third-party credit service institutions, they can summarize users' main credit behaviors into credit indicators or adjust based on credit reports provided by third-party institutions. Notably, current research on personal credit evaluation shows contradictory phenomena, as debates exist over whether indicators should include telecommunications arrears records, traffic violations, and other information [?]. Therefore, university libraries must make unified decisions on controversial indicators when formulating evaluation systems. Additionally, since maximum borrowing quantities for off-campus readers may vary across university libraries, libraries should adjust standard evaluation indicators using coefficients based on their specific circumstances.

3.2.3 User Credit Reward and Punishment System The user credit reward and punishment system comprises user dishonesty punishment mechanisms and user creditworthiness reward systems. The dishonesty punishment system uses economic measures combined with moral condemnation to suppress dishonesty motivation, implementing measures such as publicizing dishonest users and establishing joint library dishonesty lists. To expand the effectiveness of public announcements, university libraries can disseminate dishonesty lists not only through traditional postings but also via service accounts and APP clients. Joint library dishonesty lists are generated from inter-library user blacklist databases; if users default at other libraries without resolution, university libraries can raise service thresholds or suspend services accordingly.

Implementation requires university libraries to establish complete scales, imposing corresponding penalties for book damage, overdue returns, and other behaviors based on book values. For instance, for non-intentional overdue returns within a short period (3 days), libraries may consider lenient penalties. For severe dishonesty, libraries can feedback default records through connections with public credit platforms or third-party credit institutions, lowering credit scores and restricting credit life to achieve punitive effects.

The user creditworthiness reward system encourages off-campus readers' creditworthiness through positive incentives. For long-term trustworthy off-campus users, libraries can increase maximum borrowing quantities or offer small gifts, but must avoid blindly expanding permissions to prevent inadvertently reducing dishonesty costs [**?**]. Through incentive and penalty measures, libraries can more effectively guide users toward honesty and trustworthiness.

3.2.4 User Credit Education System University libraries can enhance user credit awareness through credit education, guiding users to value their credit behaviors and thereby reducing credit risk. Generally, libraries offer specialized courses when students enter school, introducing library resources, borrowing rules, and reward/punishment systems. For example, Changshu Institute of Technology provides online education for new students, activating borrowing privileges only after passing exams [**?**]. In contrast, most off-campus users have limited understanding of university libraries before use, and outdated library website information creates further inconvenience. Therefore, establishing and implementing user credit education systems requires not only timely website updates but also credit-themed exhibitions, lectures, and other activities. Libraries can also combine service accounts or APPs to provide online education, strengthening credit education by pushing regulations and announcements of disciplinary actions.

3.2.5 User Credit Risk Transfer Mechanism Credit risk transfer refers to financial institutions using financial instruments to shift credit risk to banks or other institutions [**?**]. Off-campus users borrow books based on promises to return them within specified periods, similar to credit services conducted under contracts. University libraries can introduce credit risk transfer, establishing personal credit risk transfer mechanisms using insurance, guarantees, and other forms for risk management. Third-party involvement can enhance off-campus users' credit and provide additional guarantees for library-user lending relationships. University libraries can cooperate with commercial banks, insurance companies, and other financial intermediaries to expand guarantee channels and coverage. When off-campus users default, guarantee agencies provide compensation first and then pursue recovery from defaulters, resolving difficulties in recovering compensation for damaged or lost books. However, establishing credit risk transfer mechanisms does not mean university libraries can neglect recording and evaluating user credit behaviors; rather, libraries must master users' personal credit information, supplemented by effective credit evaluation and reward/punishment systems, to attract third-party participation and build credit risk transfer mechanisms.

3.2.6 Other Mechanisms In an information society, the credit system for university libraries' socialized services requires supplementary mechanisms such as credit risk early warning systems and user feedback mechanisms. The credit risk early warning system operates based on libraries' ability to share user credit information, issuing different warnings according to the severity of defaults when they occur. Based on warning types, libraries can adopt measures such as monitoring or limiting maximum borrowing quantities for off-campus readers to prevent risks.

The user feedback mechanism provides channels for users to offer feedback through online, on-site, or telephone methods, collecting opinions to improve credit system construction. As recipients of library credit management, users' suggestions help libraries examine whether their institutional systems achieve expected outcomes. A mature credit system requires continuous improvement to fill gaps and adapt to social changes. While not all user suggestions should be adopted directly, each deserves serious consideration.

Constructing university library user credit systems requires strengthening libraries' own credit management awareness to embrace risks that credit management may bring. Admittedly, any credit evaluation only represents judgment of users' past credit behaviors during a certain period and cannot absolutely predict future dishonesty. When university libraries implement credit management in socialized services, they inevitably face the possibility of book losses. Abandoning credit management for this reason would hinder the advancement of socialized services. Against the backdrop of increasingly perfected social credit systems, establishing and improving user credit systems in university libraries' socialized services can enhance user credit awareness, reduce credit risk likelihood, provide sustainable guarantees for lending services, and promote social credit system improvement.

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