

Problems and Countermeasures of Informatization Construction in Asset Management of Colleges and Universities

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Abstract:

With the rapid development of higher education and the continuous expansion of asset scale, informatization construction has become a key path to improve the efficiency of asset management in colleges and universities. This paper deeply analyzes the prominent problems existing in the current informatization construction of asset management in colleges and universities, mainly including: the widespread phenomenon of "information silos" and low system integration; single function of management platforms, making it difficult to support full lifecycle management; low data quality and lagging dynamic updates, hindering accurate decision-making; prominent information security risks and privacy protection challenges; and the lack of informatization literacy among management teams, restricting the effectiveness of new system applications. In response to these problems, this paper proposes systematic countermeasures: first, strengthen top-level design and build an integrated intelligent asset management platform to promote system interoperability; second, utilize new-generation information technologies such as the Internet of Things, big data, and artificial intelligence to achieve dynamic monitoring and intelligent decision-making for assets throughout the entire process from "entry" to "exit"; third, establish and improve a data governance system to ensure the accuracy, integrity, and timeliness of data; fourth, strengthen information security protection and build a comprehensive data security and privacy protection mechanism; fifth, strengthen the construction of professional teams and enhance the informatization literacy and comprehensive capabilities of management personnel. Research shows that through the deep integration of technological empowerment, institutional innovation, and management transformation, the bottlenecks in the informatization construction of asset management in colleges and universities can be effectively broken, promoting the transformation of asset management towards digitalization, intelligence, and refinement, providing solid support for the connotative development and modernization of governance capabilities of colleges and universities.

Keywords: Colleges and Universities; Asset Management; Informatization Construction; Information Silos; Full Lifecycle Management

1. Introduction

In recent years, the total volume of assets in colleges and universities has continued to rise, and asset forms have become increasingly complex and diverse, placing unprecedented high demands on the refinement and intelligence level of asset management. The traditional asset management model, relying on manual record-keeping and discrete information systems, can no longer meet the practical needs of high-quality development in colleges and universities. Promoting the informatization and digital transformation of asset management has become an inevitable choice.

Informatization construction serves as the core engine for enhancing asset management efficiency. It aims to achieve real-time collection, dynamic updating, interconnected sharing, and intelligent analysis of asset data through the deep application of modern information technology, thereby optimizing resource allocation, improving utilization efficiency, reducing operational costs, and effectively preventing the risk of asset loss. Although many colleges and universities have carried out asset management informatization practices to varying degrees, overall, they still face numerous challenges and bottlenecks, such as insufficient system integration, low data quality, and overemphasis on technology while neglecting management^[1]. Therefore, systematically analyzing the problems existing in the current informatization construction of asset management in colleges and universities and exploring practical optimization paths hold significant theoretical value and practical significance. Based on reviewing relevant literature and empirical investigation, this paper will focus on the current situation and problems of asset management informatization construction in colleges and universities, and propose systematic development countermeasures.

2. Current Situation and Importance of Informatization Construction in Asset Management of Colleges and Universities

2.1 Connotation and Development Stages of Asset Management Informatization Construction

The informatization construction of asset management in colleges and universities refers to the use of modern information technologies such as computers, network communications, databases, the Internet of Things, big data, and artificial intelligence to digitally, networkly, and intelligently transform and upgrade all stages of the entire lifecycle of university assets, including planning, procurement, warehousing, use, maintenance, transfer, and disposal. Its purpose is to build a management environment characterized by information sharing, process optimization, scientific decision-making, and effective supervision^[2]. Its development has roughly gone through stages from standalone computer-based card management, to departmental-level networked management systems, and currently to the pursuit of university-level integrated intelligent management platforms.

2.2 Importance of Informatization Construction in Asset Management of Colleges and Universities

Informatization construction can enhance management efficiency and reduce operational costs. Informatization methods can automate a large amount of tedious work such as asset registration, inventory, query, and statistics, significantly reducing manual operation links and error rates, thereby improving work efficiency. For example, conducting asset inventory using RFID technology is far more efficient than

manual methods.

Informatization construction can optimize resource allocation and improve utilization efficiency. By integrating asset data through an informatization platform, the distribution, usage status, and utilization rate of various assets can be clearly grasped, providing data support for the scientific allocation, rational transfer, and shared use of assets, avoiding redundant purchases and idle waste. Big data analysis can also predict asset demand trends, enhancing the foresight of resource allocation.

Informatization construction can strengthen internal control and prevent asset loss. The process solidification function of information systems can standardize asset management behaviors and reduce arbitrariness. Real-time monitoring and early warning mechanisms help detect abnormal situations in a timely manner, strengthening the supervision of asset security. Online approval with traces facilitates accountability and enhances the level of internal control.

Informatization construction can support scientific decision-making and enhance governance capabilities. An integrated information platform can provide comprehensive, accurate, and timely asset data dashboards and statistical analysis reports for university leadership and management departments, supporting major decisions such as budget preparation, development planning, and performance evaluation, and promoting the modernization of the university's governance system and governance capacity.

Informatization construction can adapt to policy requirements and improve service quality. The new government accounting system imposes refined management requirements for asset depreciation and cost accounting, and informatization systems are the technical guarantee for meeting these requirements. Meanwhile, convenient online service processes also enhance the experience and satisfaction of teachers and students as users.

3. Main Problems in the Informatization Construction of Asset Management in Colleges and Universities

Although progress has been made in the informatization of asset management in colleges and universities, deep-seated problems remain prominent, restricting the full utilization of its effectiveness.

3.1 Severe "Information Silos" and Insufficient System Interconnection and Interoperability

This is one of the most prominent current problems. The asset management systems in many colleges and universities are independent of financial systems, procurement systems, research management systems, academic affairs systems, and personnel systems. The lack of unified data standards and interface specifications leads to the inability of data to flow smoothly and be shared in real-time. Although 78% of colleges and universities have achieved integration with financial systems, the integration rates with procurement, budgeting, personnel, and other systems remain low. This "siloes" system construction model creates numerous "information silos," fragmenting asset information and making it difficult to form a complete "digital profile" of assets, which severely affects cross-departmental business collaboration and comprehensive data utilization.

3.2 Single Function of Management Platforms, Making It Difficult to Support Full Lifecycle Management

The functions of existing asset management systems in many colleges and universities are relatively simple, mainly focusing on basic transaction processing such as asset registration, card management, information query, and disposal, resembling more an "electronic ledger." Their support capabilities for the budget demonstration in the early stages of assets, intelligent decision-making support during the procurement process, real-time status monitoring and performance analysis during use, residual value assessment and environmental treatment after disposal, and other full lifecycle stages are significantly insufficient. The platforms lack the ability for deep collection and analysis of asset operational data, making it difficult to transition from "static management" to "dynamic optimization."

3.3 Low Data Quality and Lagging Dynamic Updates, Affecting Decision-Making Accuracy

The accuracy, completeness, and timeliness of asset data are the cornerstones of the effectiveness of informatization construction. However, in actual operation, due to reasons such as non-uniform data entry standards, inadequate responsibility implementation, and lack of effective verification mechanisms, asset data suffers from problems like incomplete information, misclassification, and inaccurate value. Particularly, the updating of dynamic information such as asset usage status, storage location, and user heavily relies on manual reporting, often lagging or even missing, leading to the widespread phenomenon of discrepancies between accounts, cards, and physical assets. Surveys show that nearly half of colleges and universities have discrepancies between accounts and physical assets for equipment, furniture, and other assets. Low-quality data greatly reduces the reliability of data-based analysis, prediction, and decision-making [3-4].

3.4 Prominent Information Security Risks and Privacy Protection Challenges

As the integration level of asset management systems and the degree of data concentration increase, the information security threats they face also rise. Risks such as data leakage, hacker attacks, virus intrusions, and system paralysis cannot be ignored. Some systems have weaknesses in user identity authentication, access control, data encryption transmission and storage, etc. [5]. At the same time, asset data may contain sensitive content such as equipment prices and research project information. How to protect the privacy of individuals and institutions during use and sharing has also become a challenge that must be properly addressed in informatization construction.

3.5 Insufficient Informatization Literacy of Management Teams, Restricting the Effectiveness of New System Applications

No matter how advanced the information system is, it requires people to operate and apply it. Currently, among the asset management teams in colleges and universities, some personnel have weak awareness of informatization, and their acceptance and learning ability towards new technologies and new systems need improvement. They may be accustomed to traditional manual operation modes, underutilize the complex functions of the system, or even have resistance emotions [6-7]. Furthermore, there is a relative lack of compound talents who understand both asset management business and information technology, leading to problems such as inaccurate system requirement analysis, hindered implementation process, and weak

post-implementation maintenance and innovation, which restricts the achievement of informatization construction goals [8].

4. Countermeasures and Suggestions for Optimizing the Informatization Construction of Asset Management in Colleges and Universities

In response to the above problems, it is necessary to implement systematic measures from multiple aspects such as top-level design, technology application, data governance, security protection, and team building.

4.1 Strengthen Top-Level Design and Planning to Build an Integrated Intelligent Management Platform

Strengthen unified leadership and coordinated promotion. Establish an informatization construction leading group led by university leaders and involving assets, finance, information technology, logistics, academic affairs, research, and other departments to plan the asset management informatization work of the entire university in a coordinated manner and break down departmental barriers.

Formulate unified standards and specifications. Establish university-wide unified asset data coding standards, classification standards, interface specifications, and management processes to lay the foundation for system integration and data sharing.

Build an integrated intelligent platform. The goal should be to build a university-level intelligent asset management platform that covers the entire asset lifecycle, integrates various business modules, and can deeply interconnect and interoperate with other core systems within the university. This platform should be scalable to adapt to future technological developments and business changes.

4.2 Deepen the Integration and Application of Technology to Enable Full Lifecycle Refined Management

Apply Internet of Things technology to achieve dynamic perception. Widely use IoT technologies such as RFID, QR codes, and sensors to automatically identify, locate, and monitor the status of important assets, achieving real-time and automatic collection of asset data and completely changing the mode reliant on manual inventory.

Utilize big data and artificial intelligence technologies to achieve intelligent decision-making. Introduce big data analysis and artificial intelligence algorithms to mine and analyze massive asset data. For example, use association rule analysis to optimize procurement decisions and avoid redundant purchases; use machine learning to predict equipment failures and achieve predictive maintenance; use optimization algorithms to achieve efficient scheduling and sharing of assets.

Build a visual decision support system. Use data visualization technology to intuitively present key indicators such as asset distribution, utilization rate, and performance in the form of charts, maps, etc., providing management and decision-makers with clear data support.

4.3 Establish and Improve a Data Governance System to Consolidate the Data Foundation

Clarify data responsibilities and quality requirements. Establish a data source responsibility system to ensure the accuracy of data entry. Develop data quality standards and verification rules, and regularly perform data cleaning and verification to improve data quality.

Achieve dynamic data updates and closed-loop management. Ensure that dynamic asset information is updated into the system timely and accurately through the combination of business process driving and IoT automatic collection, forming a data closed loop.

Strengthen data sharing, development, and utilization. On the premise of ensuring security, promote the orderly sharing and comprehensive utilization of asset data within authorized ranges, fully tapping the value of data to serve teaching, research, management, and decision-making.

4.4 Strengthen Information Security Protection to Build a Trusted Network Environment

Improve the security technology system. Adopt technical means such as firewalls, intrusion detection, data encryption, and security auditing to build a multi-layered security protection system. Strengthen system vulnerability scanning and patching.

Establish sound security management systems. Formulate strict data access permission management systems, user identity authentication mechanisms, and operation log audit systems. Strengthen the construction of data backup and disaster recovery capabilities.

Enhance privacy protection. Follow relevant laws and regulations, desensitize sensitive data, clarify data usage boundaries, and protect the privacy rights of individuals and institutions.

4.5 Strengthen the Construction of Professional Teams and Enhance Informatization Literacy

Carry out stratified and classified training. Conduct targeted informatization skills and business knowledge training for management personnel in different positions to improve their system operation ability and data analysis ability.

Introduce and cultivate compound talents. Actively introduce compound talents who understand both technology and management, while strengthening the training of existing key personnel to optimize the team structure.

Establish effective incentive mechanisms. Incorporate the application effectiveness of informatization tools into the performance assessment of departments and individuals, stimulating the enthusiasm of management personnel to learn and use new systems.

5. Conclusion and Outlook

In summary, promoting the informatization construction of asset management in colleges and universities is a complex systematic project and a key measure to improve the resource utilization efficiency and governance capabilities of colleges and universities. Currently, the informatization of asset management in colleges and universities is in a critical period of transition from decentralized application to integrated consolidation, and from transaction processing to deepening intelligent decision-making. Facing challenges such as "information silos," single functions, data quality, security risks, and talent shortages, it is necessary to adhere to a problem-oriented and goal-oriented approach and strengthen top-level design and strategic planning.

In the future, the informatization construction of asset management in colleges and universities should develop towards a more intelligent, visual, and integrated direction. By deeply integrating emerging technologies such as the Internet of Things, big data, artificial intelligence, and digital twins, a truly

"intelligent asset" management ecosystem will be constructed. This system will be able to achieve real-time perception of asset status, self-learning of operational laws, intelligent optimization of management processes, and precise decision-making for resource allocation, ultimately forming a new asset management model characterized by data-driven, human-machine collaboration, transparency, and high efficiency. This will not only greatly improve the quality and efficiency of asset management itself but also provide strong resource guarantee and decision support for the overall development strategy of colleges and universities, assisting the high-quality development of higher education.

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