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Research on Information Process Reengineering of College Fees under the Background of Smart Campus

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Abstract: Against the backdrop of advancing educational digitalization strategies, smart campus development has become a pivotal driver for modernizing higher education institutions. As a core component of university financial management, fee collection processes require optimized digital workflows that directly impact campus governance efficiency and service quality for faculty and students. Current fee collection systems in Chinese universities commonly suffer from fragmented systems, cumbersome procedures, data silos, and limited service offerings, failing to meet smart campuses' core requirements of "data-driven operations, collaborative efficiency, and precision services." Grounded in process reengineering, collaborative governance, and digital governance theories, this study examines existing workflow pain points and root causes through practical case analyses of university fee collection systems. It establishes clear objectives and principles for process redesign, proposes targeted implementation pathways with operational safeguards, and provides theoretical references and practical insights to facilitate fee collection digital transformation and smart campus development in higher education institutions.

Keywords: Smart campus; University tuition fees; Informatization; Process reengineering

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1. Introduction

1.1. Research background

With the implementation of the "Digital Education Strategy Action Plan", smart campus development has permeated all aspects of higher education institutions, including teaching, research, and administration. At its core, this initiative integrates next-generation information technologies with campus operations to create a data-driven ecosystem featuring seamless connectivity and user-friendly services. As a vital link between universities and their communities, institutional fee management encompasses diverse components such as tuition fees and accommodation charges, involving multiple departments including finance, academic affairs, and student services. This foundational financial management function not only underpins institutional operations but also constitutes a critical component of smart campus development.

Currently, most Chinese universities have implemented specialized fee collection systems, marking the large-scale development phase of fee digitization. However, many institutions remain at the "electronic substitution" stage without achieving systematic process restructuring. Challenges such as cross-departmental data silos and subpar payment experiences persist, falling short of smart campus development goals. Addressing fee management pain points through

process reengineering and enhancing digital fee management efficiency have become critical challenges in university financial management.

1.2. Research significance

(1) Theoretical Significance: By integrating process reengineering theory with smart campus development, this study focuses on specific scenarios of university fee digitization. It enriches the application of process reengineering theory in education, constructs a reengineering framework incorporating collaborative governance and digital governance theories, provides new perspectives for subsequent research, and advances the theoretical framework of university financial management informatization [1].

(2) Practical Significance: Analyze existing issues in the informatization process of university fee collection, propose actionable redesign pathways and safeguard measures, assist institutions in breaking down data barriers, streamlining workflows, enhancing efficiency, and optimizing faculty-student experiences. This provides practical support for smart campus development and drives the digital and intelligent transformation of financial management systems.

1.3. Current research status at home and abroad

Foreign universities pioneered smart campus initiatives earlier, having established mature models for fee collection informatization processes characterized by data synergy, personalized services, and refined management. European and American institutions typically implement unified campus information platforms that achieve deep integration between billing systems and operational systems, with strong emphasis on data security and privacy protection. Domestic research focuses on integrating smart campuses with fee collection informatization. Some universities have improved payment efficiency through platform restructuring and data interoperability, yet existing studies remain limited: they lack systematic redesign of the entire billing workflow, insufficient integration of intelligent technologies, and inadequate practical applicability.

1.4. Research methods and content

(1) Research Methods: Literature review was employed to systematically analyze relevant theories and studies; case analysis combined with practical experiences from domestic universities to summarize insights; questionnaire surveys and interviews were conducted to understand faculty and student needs and identify pain points; summary methods were utilized to propose restructuring pathways and safeguard measures.

(2) Research content: Divided into six sections, including introduction, related concepts and theoretical foundations, current status and pain point analysis, reengineering objectives and principles, reengineering pathways, and conclusions and prospects, constructing a complete research framework of “objectives-principles-pathways-guarantees” [2].

2. Related concepts and theoretical foundations

2.1. Conceptual definitions

(1) Smart Campus: An ecosystem centered on information technology, integrating next-generation technologies such as big data and artificial intelligence to achieve intelligent campus infrastructure, refined management services, and personalized services for faculty and students. Its core characteristics include data interoperability and collaborative efficiency.

(2) Digitalization of university fee collection: Utilizing information technology to achieve digital and automated management across all stages of fee collection processes, establishing an integrated fee information system to ensure standardized, efficient, and convenient operations. Currently, the system is evolving from basic functions to advanced capabilities such as intelligent billing and AI-powered payment reminders.

(3 Process Reengineering: Fundamental restructuring of existing business processes involves eliminating redundant steps and integrating resources to enhance process efficiency and service quality with customer demand as the guiding principle. In the context of university fee collection, this entails reengineering traditional workflows to align with smart campus requirements [3].

2.2. Theoretical foundations

(1) Process Reengineering Theory: Its core principle lies in breaking conventional thinking patterns and conducting fundamental process restructuring, providing essential insights for streamlining fee collection procedures and enhancing operational efficiency in higher education institutions.

(2) Collaborative Governance Theory: Emphasizes multi-stakeholder collaboration and information sharing, guiding universities to break down departmental barriers, achieve coordinated cooperation among fee-related departments, and enhance management synergy.

(3) Digital Governance Theory: Centered on information technology, it promotes the optimization of governance processes and service precision, guiding the transformation of university fee collection processes from "electronicization" to "intelligentization".

3. Current status and pain points analysis of fee collection informatization processes in universities under the smart campus framework

3.1. Overview of current status

With the advancement of smart campus initiatives, universities have made notable progress in fee collection informatization: payment channels have diversified into integrated online-offline models, while fee management systems have become standardized with unified electronic billing solutions. However, disparities in IT infrastructure levels persist across institutions, with deployment models exhibiting distinct characteristics of proprietary systems and SaaS-based solutions. Some regional universities and vocational colleges remain at foundational stages of digital transformation [4].

3.2. Core pain points

(1) System fragmentation and prominent data barriers: The fee collection system operates independently from academic records, academic affairs, and financial aid systems, resulting in data incompatibility and information asymmetry. This leads to errors in cost calculation and inefficient refund processing, with some universities failing to achieve deep integration of core systems.

(2) Complicated procedures and low management efficiency: Redundant processes, such as refunds and accounting, rely on manual approval and verification, resulting in prolonged cycles and high error rates; traditional payment notification methods are prone to omissions, leading to delayed payments by some students.

(3) Single service offerings with suboptimal teacher-student experience: Fee-based services are primarily focused on payment and inquiry, lacking personalized features such as deferred payment and installment plans; some online channels exhibit complex operations, insufficient adoption of electronic receipts, and prominent "App siege" phenomena, indicating inadequate service integration.

(4) Insufficient technological empowerment and low level of intelligence: Most systems only achieve electronic substitution, lacking functions such as big data analysis and intelligent early warning, making it difficult to accurately identify students in arrears and prevent billing risks, with low coverage of advanced intelligent features.

(5) Weak security safeguards and potential risks: Inadequate system security protection, insufficient data backup mechanisms, and low security awareness among staff members. The integration of certain universities with third-party applications further increases data security and public welfare risks.

4. Current status and pain points analysis of fee collection informatization processes in universities under smart campus framework

4.1. Status overview

With the advancement of smart campus initiatives, universities have made notable progress in fee collection informatization: payment channels have diversified, forming integrated online-offline models; fee management has become standardized, achieving unified billing standards and electronic invoice integration. However, varying levels of IT infrastructure across institutions remain evident, with deployment models exhibiting distinct characteristics of proprietary systems and SaaS-based solutions. Some regional universities and vocational colleges still operate at foundational stages of digital transformation [5].

4.2. Core pain points

(1) System fragmentation and prominent data barriers: The fee collection system operates independently from academic records, academic affairs, and financial aid systems, resulting in data incompatibility and information asymmetry. This leads to errors in cost calculation and inefficient refund processing, with some universities failing to achieve deep integration of core systems.

(2) Complicated procedures and low management efficiency: Redundant processes such as refunds and accounting, rely on manual approval and verification, resulting in prolonged cycles and high error rates; traditional payment notification methods are prone to omissions, leading to delayed payments by some students.

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(5) Weak security safeguards and potential risks: Inadequate system security protection, insufficient data backup mechanisms, and low security awareness among staff members. The integration of certain universities with third-party applications further increases data security and public welfare risks.

5. Specific approaches for reengineering college fee information systems in the context of smart campus initiatives

5.1. Establishing a unified data sharing platform to break down data silos

Form cross-departmental task forces to clarify data sharing responsibilities and scopes, while developing standardized data protocols and interface specifications. Integrate existing business systems to enable real-time data synchronization and eliminate manual entry errors. Establish a centralized fee data center to streamline data management, support decision-making processes, and ensure seamless synchronization of student enrollment records and fee structures [6].

5.2. Optimizing core business processes to enhance management efficiency

Streamline expense accounting workflows by leveraging data platforms for automated calculations, generating expense invoices automatically and pushing them out. Simplify refund procedures through online tiered approval systems to shorten processing timelines. Optimize payment notification and invoice management processes by implementing digital push notifications and full adoption of electronic invoices, thereby improving convenience and reducing the need for physical visits by faculty and students.

5.3. Expanding diverse service models to enhance faculty and student experiences

Consolidate online payment channels while simplifying procedures, while maintaining offline options for special groups; introduce personalized services like deferred payments and installment plans with streamlined application processes; establish an AI-powered customer service platform integrated with human support to promptly address inquiries; integrate campus resources to achieve one-stop integration of fee collection and other services, effectively resolving the "app dependency" issue [7].

5.4. Enhancing technological empowerment to elevate intelligence levels

Introduce big data analytics to develop arrears prediction models for precise identification of delinquent students and payment anomalies. Leverage AI technologies to automate billing calculations, approvals, and customer service processes, minimizing manual intervention. Utilize IoT solutions for the intelligent management of payment devices to ensure seamless offline operations. Drive system upgrades by incorporating advanced intelligent features to optimize management efficiency.

5.5. Enhancing security assurance systems to mitigate risks

Establish a comprehensive cybersecurity defense framework by deploying firewalls, data encryption devices, and other protective measures; implement a hybrid backup mechanism integrating cloud and local storage to ensure data integrity; refine security management protocols and conduct thorough staff training; standardize third-party service provider management with clearly defined accountability to prevent data breaches and public welfare risks.

6. Implementation guarantees for information process reengineering of university fee collection under the smart campus framework

6.1. Organizational guarantees

Establish a Process Reengineering Task Force to coordinate overall implementation and resolve issues; assign dedicated personnel to each department to build cross-departmental collaboration mechanisms; invite experts for professional guidance to ensure the feasibility and scientific validity of the plan [8].

6.2. Financial support

Increase funding input and rationally allocate budgets to ensure platform construction, system upgrades, and related tasks. Universities facing financial constraints may seek fiscal support and social collaboration, strengthen fund management, improve utilization efficiency, and select appropriate system deployment models based on actual conditions.

6.3. Talent support

Introduce professionals in financial management, information technology, and related fields; enhance training for existing staff to improve professional competence and operational capabilities; establish incentive mechanisms to motivate staff and strengthen cross-departmental talent exchange.

6.4. Institutional safeguards

Develop detailed implementation rules for process reengineering, improve management systems and operational standards for fee collection and data security; establish an evaluation mechanism to regularly assess implementation outcomes, promptly adjust and optimize plans, and ensure process compliance [9].

6.5. Cultural support

The significance of reengineering the publicity process to cultivate a campus culture characterized by "data-driven and

service-oriented" principles, guiding staff to shift their mindset and establish a service-oriented mindset, enhancing student awareness and digital literacy through publicity initiatives to foster a positive work environment.

7. Conclusions and prospects

7.1. Research findings

The development of smart campuses provides technological support and opportunities for digital transformation in university fee management processes. Current challenges in fee management systems stem from multifaceted factors, including conceptual frameworks, interdepartmental coordination, and funding constraints. Grounded in relevant theories, this study establishes clear objectives and principles for process redesign, proposing a comprehensive roadmap encompassing data integration, workflow optimization, service expansion, technological empowerment, and security safeguards. Five key implementation measures outlined in this framework will effectively drive the digital and intelligent transformation of university fee management systems, thereby accelerating the advancement of smart campus initiatives [10].

7.2. Research limitations and future directions

This study exhibits several limitations, including narrow case coverage, insufficient field research data, and insufficient exploration of technical application details. Future research should expand case coverage, strengthen field investigations, conduct in-depth analysis of technical implementation specifics, align with smart campus development trends, continuously optimize transformation pathways, and promote deep integration between fee management systems and modern campus governance frameworks.

Disclosure statement

The author declares no conflict of interest.

References

[1] Xue Q, 2025, Research on Financial Governance Pathways in Higher Education Institutions from the Perspective of Smart Campus. Economic Management Forum, (2): 14–16.

[2] Huang HF, 2025, The Role and Practice of Smart Campus Construction in Process Reengineering of Student Management in Higher Education Institutions. Economist, (11): 182–184.

[3] Zhang M, 2023, Research on Information Construction of University Fees under the Background of Smart Campus. China Management Informatization, 26(12): 189–190.

[4] Li J, 2022, Research on Optimization and Reengineering of Informationized Fee Collection Processes in Higher Education Institutions. Finance and Accounting, (8): 76–77.

[5] Wang Y, 2023, Analysis of Information Technology Construction Pathways for University Fees from the Perspective of Collaborative Governance. Higher Education Logistics Research, (5): 45–47.

[6] Chen M, 2023, Research on Intelligent Process Reengineering of University Fees under Digital Governance. Education Accounting Research, 34(2): 89–94.

[7] Finance Department of Changchun Guanghua University, 2024, Practice of Information Process Reengineering for New Student Enrollment Fees in Higher Education Institutions. China Education Informatization, (3): 102–105.

[8] Liu M, 2023, Research on Security Risks and Prevention Measures of University Fee Collection Systems. Information Technology, 47(7): 123–127.

[9] Ma C, 2025, Digital Transformation Pathways of University Service Guarantee Management under the Perspective of Smart Campus. Computer Products and Circulation, (9): 23–25.

[10] Wang HM, Zhang LN, Hu BH, 2025, Research on Establishing a Regularized and Standardized Operational Mechanism for Digital Supervision in Higher Education Institutions. Journal of Huanghe University of Science and Technology, 27(12): 85–89.