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Digital Transformation of Publishing Archive Management in the Intelligent Media Era (Post-print)

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Abstract

Purpose: In the era of intelligent media, the digital transformation of publishing archive management is not only an inevitable choice to conform to technological development trends, but also a crucial pathway for enhancing industry competitiveness and promoting cultural inheritance and innovation. Proposing an effective digital transformation strategy is beneficial for improving the efficiency, security, and intelligence level of publishing archive management.

Method: This paper explores the traditional dilemmas affecting publishing archive management and reveals key obstacles and response strategies in the transformation process by deeply analyzing the background and significance, current status, and challenges of digital transformation of publishing archive management in the intelligent media era.

Results: Through in-depth analysis of the impact of the intelligent media era on publishing archive management, the necessity and urgency of digital transformation have been clarified, and it is indicated that publishing archive management in the future intelligent media era will develop toward highly digital, networked, and intelligent directions.

Conclusion: The digital transformation of publishing archive management in the intelligent media era is the inevitable path to industry modernization; therefore, constructing a multi-dimensional, systematic framework for publishing archive digital transformation that includes clarifying strategy, selecting appropriate technologies, strengthening management, cultivating talent, and complying with regulations holds significant practical and theoretical significance for promoting the intelligent and efficient development of archive management.

Full Text

Research on the Digital Transformation of Publishing Archive Management in the Era of Intelligent Media

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Abstract

[Objective] In the era of intelligent media, the digital transformation of publishing archive management represents not only an inevitable choice aligned with technological development trends but also a critical pathway for enhancing industry competitiveness and promoting cultural inheritance and innovation. Proposing an effective digital transformation strategy will improve the efficiency, security, and intelligence level of publishing archive management.

[Method] This paper thoroughly analyzes the background, significance, current status, and challenges of digital transformation in publishing archive management within the intelligent media era, explores the traditional dilemmas affecting archive management, and reveals key obstacles and corresponding strategies in the transformation process.

[Result] Through in-depth analysis of the impact of the intelligent media era on publishing archive management, this study clarifies the necessity and urgency of digital transformation and identifies that future publishing archive management will develop toward highly digitalized, networked, and intelligent directions.

[Conclusion] The digital transformation of publishing archive management in the intelligent media era is an essential path to industry modernization. Therefore, constructing a multi-dimensional, systematic framework for publishing archive digital transformation—encompassing clear strategy, appropriate technology selection, strengthened management, talent cultivation, and regulatory compliance—holds significant practical and theoretical importance for promoting the intelligent and efficient development of archive management.

Keywords: Intelligent Media Era; Publishing Archive Management; Digital Transformation; Artificial Intelligence; Technology

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The era of intelligent media, characterized by the deep integration and pervasive

penetration of information and media technologies, has not only reshaped the information dissemination landscape but also brought profound transformations to numerous fields including the publishing industry. Against this backdrop, the rapid advancement and widespread application of cutting-edge technologies such as information technology, big data analytics, cloud computing services, and artificial intelligence have opened new possibilities for publishing archive management while simultaneously posing severe challenges to its traditional models. As a crucial component of the publishing industry, the digital transformation of publishing archive management has become an inevitable trend, holding significant importance for improving archive management efficiency, optimizing resource allocation, and promoting cultural inheritance.

1. Background and Significance of Digital Transformation in Publishing Archive Management in the Intelligent Media Era

The intelligent media era is a product of highly developed information technology that has transformed how people acquire, process, and disseminate information. As important cultural resources, publishing archives have been profoundly affected by this era. Traditional paper-based archive management, constrained by physical space, inefficient manual operations, inconvenient information retrieval, and isolated resources, can no longer meet modern society's demands for rapid knowledge circulation and efficient utilization. Therefore, in the intelligent media era, the digital transformation of publishing archive management represents a strategic initiative that aligns with technological trends, addresses industry challenges, and enhances management efficiency while promoting content innovation. It not only optimizes internal management processes and boosts the comprehensive competitiveness of publishing enterprises but also injects new vitality into the sustainable development of the entire publishing industry.

1.1 Transformation Background: The Need for Technological and Industrial Development

The digital transformation of publishing archives is an inevitable trend driven by both technological iteration and changes in the internal and external industry environment. It represents not merely a product of technological innovation but also an intrinsic requirement for the industry to adapt to market changes, enhance competitiveness, and achieve sustainable development.

1.1.1 The Need for Rapid Information Technology Development

In recent years, the rapid progress of emerging information technologies such as Artificial Intelligence (AI), Big Data, Cloud Computing, and the Internet of Things (IoT) has provided unprecedented powerful tools for information storage, processing, and dissemination. Cloud computing offers flexible and scalable storage solutions for massive data, big data analytics enables deep mining and value extraction of information, and AI applications have realized intelligent

and automated archive management. These widely adopted technologies provide a solid technical foundation for the digital transformation of publishing archives. Meanwhile, in today's information explosion era, data has become a new production factor. Massive amounts of publishing content, user behavior data, and market feedback all require more efficient and intelligent management approaches that traditional paper-based archives can no longer satisfy.

1.1.2 The Need for Media Convergence Development With the popularization of internet and mobile communication technologies, traditional and new media are accelerating convergence, leading to increasingly diversified information dissemination channels and formats, while content consumption habits have undergone fundamental changes. This convergence trend requires the publishing industry to not only produce high-quality content but also build an efficient and flexible information management system to meet readers' needs for accessing information anytime and anywhere. The digital transformation of publishing archive management actively responds to this trend by seamlessly connecting with new media platforms and smart device ecosystems, enabling archive materials to transcend temporal and spatial limitations for rapid and convenient access and utilization. Through this transformation, archive content can break through the boundaries of single media, achieving flexible distribution and deep interaction across diverse channels, precisely aligning with contemporary readers' preferences for personalized and instant interactive reading experiences. This initiative not only broadens the breadth and depth of information reach but also promotes unbounded knowledge flow and rich cultural experiences, creating a new paradigm for content dissemination and audience engagement in the intelligent media environment.

1.1.3 The Need for Strategic Transformation of the Publishing Industry Driven by the global digital wave, new participants such as online content platforms, independent authors, and self-publishing services continue to emerge, intensifying competition and increasing cost pressures on traditional publishing. To maintain competitiveness, digital transformation has become an inevitable industry trend aimed at enhancing content production efficiency, enriching content formats, expanding distribution channels, strengthening reader interaction, reducing physical storage and transportation costs, and accelerating content production and distribution to build a more flexible and efficient industrial chain. As a fundamental link in the publishing process, the digital transformation of archive management is an integral part of the overall strategic upgrade of the publishing industry and is crucial for enhancing the core competitiveness of publishing enterprises.

1.2 Transformation Significance: Profound Changes in Management Philosophy and Models

The digital transformation of publishing archives represents not only a technological upgrade but also a reshaping of management philosophy and models

within the publishing industry. Essentially, it is a profound transformation from core to surface and from local to global, affecting every corner of the industry's management philosophy, business processes, market strategy, and even cultural inheritance. This transformation lays a solid foundation for the sustainable development of publishing and opens up infinite possibilities.

1.2.1 Significantly Improving Archive Management Efficiency Traditional paper-based archive management and retrieval are often time-consuming and labor-intensive. After digital transformation, archive information stored in electronic form can be rapidly located through keyword searches and intelligent classification technologies, dramatically improving work efficiency. For instance, natural language processing and machine learning algorithms can automatically identify document content, extract key information, and even analyze relationships between archives, providing researchers with deeper data insights and knowledge discovery opportunities. Simultaneously, electronic archives facilitate remote access, promote cross-departmental and cross-regional collaboration, and accelerate information flow.

1.2.2 Effectively Ensuring Archive Information Security In digital environments, encryption technology, access management, and data backup and recovery mechanisms can more effectively prevent archive information loss, tampering, and unauthorized access. Compared with paper archives, digital archives offer greater advantages in both physical security and information protection. This concerns not only the security of the archives themselves but is also a key measure for protecting intellectual property rights, safeguarding corporate interests, and maintaining social trust. For example, digital watermarking technology can embed hidden information without significantly affecting normal file usage to track illegal copying and distribution, while blockchain technology, with its decentralized and tamper-proof characteristics, provides strong proof of archive authenticity. Any modification to archives is recorded, ensuring transparency and traceability of historical records.

1.2.3 Promoting Deep Development and Utilization of Archive Resources Digital archives are easily integrated, analyzed, and reused, providing a rich repository of materials for publishing content innovation. Through data mining and content analysis of historical archives, publishers can discover new market trends, audience preferences, and even inspire new creative ideas, promoting content diversification and personalization. Furthermore, digital archives provide valuable resources for academic research and cultural dissemination, driving cultural inheritance and knowledge innovation. For example, publishers can integrate various archive resources such as historical documents, artistic works, and social survey data to innovate publishing formats like interactive e-books, multimedia databases, and virtual reality experience projects. These new publishing products not only enrich user experiences but also broaden the boundaries of knowledge dissemination.

2. Current Status and Challenges of Digital Transformation in Publishing Archive Management in the Intelligent Media Era

With the rapid advancement of information technology, many publishing institutions have taken solid steps toward digital transformation, building specialized digital archive management systems that have achieved conversion from paper to electronic archives, significantly reducing physical storage burdens and improving archive accessibility and lifespan. These systems typically integrate functions such as document scanning, information entry, retrieval, and version control, facilitating archive preservation, utilization, and research. The core technologies of the intelligent media era, such as cloud computing, big data, and artificial intelligence, are gradually being applied more deeply in publishing archive management. Cloud computing provides unlimited possibilities for remote archive storage and access while reducing local server maintenance costs. Big data analytics helps managers mine valuable information from massive archives for trend prediction and decision support. The introduction of AI, particularly machine learning and natural language processing technologies, has made automatic classification, abstract generation, and intelligent retrieval a reality, greatly improving archive management efficiency and intelligence levels. Meanwhile, an increasing number of publishing archives are being opened to the public through open platforms or API interfaces, promoting academic research, cultural inheritance, and knowledge innovation while enhancing public understanding and participation in publishing history. However, several problems and challenges remain in the digital transformation process, such as technical difficulties, security risks, and legal compliance issues.

2.1 Increased Difficulty in Technology Implementation and Integration

Different technical solutions vary in cost, applicability, and compatibility. How to select the most suitable technical path for one's needs and ensure smooth transition between old and new systems is a complex problem every publishing institution must address. Issues such as data loss and format incompatibility during data migration frequently occur, increasing implementation difficulty.

2.2 Increased Difficulty in Data Security and Privacy Protection

With the explosive growth of data volume, data security and privacy protection have become unavoidable issues. Publishing archives often contain sensitive information such as author copyrights and reader personal information. How to ensure this information is not illegally accessed or leaked during digitalization constitutes a major challenge. Additionally, close attention must be paid to international and regional data protection regulations to ensure compliant operations.

2.3 Severe Shortage of Funding and Talent

Digital transformation is a long-term and capital-intensive undertaking. Beyond high initial investments in software and hardware, subsequent maintenance, upgrades, and personnel training require continuous funding. For small and medium-sized publishing institutions with limited resources, funding shortages may become a major obstacle to transformation. Simultaneously, the lack of interdisciplinary talent who understand both publishing business and digital technology also constrains the depth and speed of transformation.

2.4 Difficulty in Defining Legal and Ethical Boundaries

In digital environments, promoting open knowledge sharing while protecting creators' legitimate rights and balancing public interests with private rights has become a dual legal and ethical challenge. Moreover, laws and regulations regarding archive management and data protection vary significantly across different countries and regions. Publishing institutions must consider compliance during digital transformation to ensure information authenticity and prevent tampering and forgery, which undoubtedly increases operational complexity.

3. Implementation Strategies for Digital Transformation of Publishing Archive Management in the Intelligent Media Era

In the context of the intelligent media era, the digital transformation of publishing archive management is a key initiative for driving industry innovation and enhancing the value of information assets. Therefore, facing the challenges of the intelligent media era, comprehensive digital transformation strategies for publishing archive management should span multiple dimensions including technological innovation, refined management, talent cultivation, and policy guidance to collaboratively construct an all-encompassing execution blueprint. This ensures that on the foundation of information security, the potential value of archive materials is fully activated, empowering the publishing industry to reach deeper levels of digitalization and intelligence.

3.1 Clarify Transformation Objectives and Strategic Planning

In the intelligent media era, the digital transformation of publishing archive management must first establish clear and forward-looking objectives and comprehensive strategic planning. This process begins with in-depth analysis of current archive management conditions to identify pain points and bottlenecks such as retrieval difficulties, storage space constraints, and resource isolation, as well as new opportunities brought by intelligent media technologies like AI-assisted archiving and big data-driven content analysis. Based on this analysis, transformation objectives can be established, including improving archive access efficiency, ensuring information security, promoting cross-regional resource shar-

ing, protecting valuable historical materials, enhancing knowledge innovation, and achieving long-term preservation.

On this foundation, a multi-dimensional digital transformation strategic plan should be developed, encompassing technology roadmaps, budget allocation, data management strategies, personnel training and organizational restructuring, timeline planning, key milestone setting, and quantifiable indicators for expected outcomes. The plan should clearly define phased task lists. For example, the short term could focus on infrastructure construction and basic digital conversion to achieve efficient scanning, storage, and preliminary classification of archives while enhancing information retrieval and data analysis capabilities. The long term should focus on technology integration and service innovation, forming an open and shared archive resource ecosystem through continuous technological iteration and service innovation to drive the intelligent transformation of the publishing industry. Critically, the transformation strategy must be closely integrated with the overall development goals of publishing institutions to ensure that the digitalization process not only optimizes archive management itself but also promotes coordinated development across content production, copyright management, and market expansion. Meanwhile, strategic planning should maintain flexibility, reserving adjustment space to adapt to technological iteration and market changes, ensuring a stable and sustainable transformation path.

3.2 Strengthen Technology Research and Application

In promoting the digital transformation of publishing archive management in the intelligent media era, strengthening technology research and application is the core driving force. Actively explore the integration and innovation of cutting-edge technologies such as cloud computing, big data, and artificial intelligence to build high-efficiency, high-security digital platforms that enable intelligent classification, automatic tagging, content review, precise retrieval, and remote access of archives. This enhances the automation and intelligence level of archive management while improving accuracy and efficiency. For example, adopt advanced cloud computing platforms to achieve elastic storage and efficient processing of archive data; utilize big data analytics to mine deep value from archives and support decision-making and content innovation; integrate artificial intelligence, such as optimizing classification and intelligent retrieval through machine learning to enhance user experience; and employ digital watermarking and blockchain technology to strengthen copyright protection and ensure archive information security and traceability.

Technology research and development should focus on data standardization, system compatibility, user interface friendliness, and the enhancement of intelligent services. Therefore, cross-boundary cooperation is needed to introduce external professional technical expertise, continuously track technological frontiers, accelerate technology transformation and application implementation, ensure that technological iteration keeps pace with industry development trends, and build

a solid technical support system to provide inexhaustible momentum for the modernization transformation of the publishing industry.

3.3 Optimize Archive Management Processes

In the intelligent media era, the digital transformation of publishing archive management is not merely a technological innovation but also a reshaping of management philosophy and processes. Optimizing archive management processes must start from the entire lifecycle management of archives—including collection, processing, storage, retrieval, utilization, and security protection—to establish a management system adapted to the digital environment, ensuring process standardization, normalization, and high efficiency.

First, reconstruct processes by transforming traditional linear workflows into a data-centric network management model. Utilize digital tools to automatically handle repetitive and error-prone tasks such as automatic archiving, metadata extraction, and annotation, thereby streamlining processes, reducing manual intervention, and improving work efficiency. Second, establish standardization and normalization systems by creating unified data formats and metadata standards, archive resource catalogs, and metadata databases to promote information resource integration and open sharing, break information silos, and lay a solid foundation for cross-platform data sharing and deep utilization. Third, introduce workflow management systems and strengthen data security and privacy protection by deploying encryption technology, access control mechanisms, and data backup and recovery strategies to ensure task automation scheduling and progress tracking during archive processing, guaranteeing seamless connection across all archive processing stages. Finally, emphasize user interaction design by building intuitive and user-friendly digital platform interfaces that provide personalized retrieval, visual analysis, and other functions to enhance the convenience of archive utilization and user experience.

3.4 Strengthen Talent Cultivation and Introduction

The strategy for strengthening talent cultivation and introduction is an indispensable driving force for promoting the digital transformation of publishing archive management. Focus on upgrading internal talent skills, introducing external talent, and cultivating cross-boundary cooperation to build a diversified and multi-level talent team that provides solid human resource support for digital transformation and effectively supports industry upgrading and transformation.

First, emphasize the cultivation and transformation of internal talent by enhancing existing employees' skills in cloud computing, big data analytics, artificial intelligence applications, information security, and digital copyright management through various forms such as workshops, online courses, and practical projects. Cultivate cross-boundary cooperation capabilities to enhance the innovation and practicality of archive management. Second, establish a long-term talent intro-

duction mechanism by building partnerships with higher education institutions and research organizations to 定向培养 (cultivate directionally) or recruit professionals with backgrounds in digital publishing, information management, and computer science, injecting fresh blood into the organization. Finally, establish a talent incentive and evaluation system to stimulate employees' enthusiasm and creativity in participating in digital transformation through performance assessments, promotion opportunities, and knowledge-sharing rewards.

3.5 Strengthen Legal and Regulatory Construction

Strengthening legal and regulatory construction is an indispensable component of digital transformation in publishing archive management. It concerns not only the normative nature of technology application but also core issues such as archive information security, copyright protection, data privacy, resource open sharing, and personal privacy rights protection.

Improve the copyright legal framework by clarifying copyright ownership, usage rights, and revenue distribution principles for digital publications. Establish efficient dispute resolution mechanisms for copyright issues that may arise during digital conversion, protecting original authors' intellectual property rights while promoting the legal circulation and utilization of content. Strengthen monitoring and punishment of copyright infringement in network environments, and utilize emerging technologies such as blockchain to enhance transparency and credibility in copyright management. Strengthen data privacy protection by establishing standardized processes for personal data collection, processing, storage, and cross-border transmission in accordance with relevant domestic and international laws and regulations, such as the Cybersecurity Law of the People's Republic of China and the EU's GDPR (General Data Protection Regulation), to ensure effective protection of sensitive data such as personal information and trade secrets involved in the archive digitalization process. The construction of an information security legal system is equally important, requiring the formulation of strict digital archive security management regulations covering data encryption, access control, and disaster recovery, with regular security audits and risk assessments to ensure that archive information systems can withstand internal and external threats.

In conclusion, the digital transformation of publishing archive management in the intelligent media era is an inevitable trend in response to the information technology revolution and a necessary path to enhance the value and utilization rate of archive resources. Through effective digital transformation strategies, not only can archive management efficiency and convenience be substantially improved, but data analysis, knowledge graph construction, and other means can also promote widespread dissemination and deep utilization of knowledge, providing archive resources for academic research, cultural inheritance, and public education. As deep learning capabilities of artificial intelligence, copyright protection applications of blockchain, more mature cloud computing services, and metaverse technologies such as VR/AR continue to evolve, the digital trans-

formation of publishing archives will advance toward higher levels of intelligence and security, with greater emphasis on user experience. Through highly personalized services, immersive content interaction, and instant global access, the boundaries of knowledge dissemination will be greatly expanded, promoting cultural diversity and cross-disciplinary innovation.

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