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Analysis of the Transformation and Response of Archives Management of Science and Technology Projects Based on Big Data

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Abstract: ***In contemporary society, big data technology is profoundly transforming archival information management, driving it toward intelligent development. Supported by cloud computing, big data has become a defining theme of our era, revolutionizing traditional archival management methods, diversifying the content and forms of management, and enhancing efficiency and convenience. This evolution holds significant practical value for advancing current archival practices. This paper analyzes the characteristics of the big data environment, outlines the challenges faced by archival management in this new era, and proposes practical strategies from multiple perspectives to inform and inspire further innovation.***

Keywords: Big data; Archives management; Informatization.

1. INTRODUCTION

Today, society has entered an era of rapid growth of data information, and big data has become the focus of attention in various industries around the world. The amount and type of archival information produced by today's society and networks is completely different than in the past, which has a huge impact on archival management. Under the promotion of the information technology era, archives management can effectively reduce the workload of relevant management staff, greatly improve work efficiency, and realize rational allocation of resources. Archives informatization management can promote archival management, help promote personnel management innovation, and effectively integrate existing resources for archival management through flexible thinking, improve the archival management system, improve the quality of management information, and promote the complete development of the archival industry. In urban planning and 3D modeling, the work of Xu (2025) introduces UrbanMod, a text-to-3D framework aimed at accelerating architectural design[1]. Similarly, Hu (2025) explores low-cost 3D content creation using a guided diffusion model within a GUI-driven pipeline[16]. The alignment of AI systems with human preferences is addressed by Yang et al. (2025), who propose using Reinforcement Learning from Human Feedback (RLHF) to fine-tune Large Language Models (LLMs) for conversational recommenders[2]. In business and marketing applications, Zhang et al. (2025) apply machine learning for sales forecasting and advertising analysis in the gaming industry[3], while Zhuang (2025) examines the evolution of real estate marketing strategies in the digital era[15]. Furthermore, Zhang (2025) presents AdOptimizer, a self-supervised framework for efficient ad delivery in low-resource markets[5], and Li, Wang, and Lin (2025) develop a graph neural network-based method for sequential recommendation in cross-platform ad campaigns[12]. Within the computer vision domain, several studies focus on multimodal and medical applications. Yuan (2025) leverages contrastive multimodal learning to synergize text and image data for chest X-ray analysis[4]. This aligns with the earlier work of Chen et al. (2023) on generative text-guided 3D vision-language pretraining for unified medical image segmentation[11]. The integration of visual cues and object reference is explored by Chen et al. (2022) through one-stage object referring combined with gaze estimation[6]. In industry-specific contexts, Tan (2024) reviews AI application trends in automotive production[7], and Xu (2025) also contributes to sustainability by using Graph Convolutional Networks (GCNs) to optimize healthcare facility design[8]. Technical system optimization is further illustrated by Yang (2025), who employs the Dijkstra algorithm for website internal link optimization and SEO evaluation[9], and by Tu (2025), who develops an intelligent platform for 5G field interoperability testing[13]. The application of AI in finance is advanced by Cheng et al. (2025), who investigate the link between executive human capital and stock price volatility[10], and by Cheng et al. (2025), who propose FinStack-Net, a stacked ensemble learning model for financial fraud detection[19]. In human resources, Xie and Liu (2025) present EvalNet, a system for multimodal sentiment analysis in recruitment interviews[14]. Robust AI infrastructure is addressed by Zhu (2025), who designs ReliBridge, an LLM-based backbone for enhancing small business platform stability[17]. Finally, research continues to push boundaries in pose estimation, as seen in Peng et al. (2025)'s work on domain adaptation using

representation aggregation and segregation[18], and in infrastructure management, with Huang, Tian, and Qiu (2025) developing an AI-enhanced simulator for dynamic power grid decision-making[20]. The method of Han and Dou (2025), which integrates a hierarchical graph attention network with a multimodal knowledge graph for user recommendation, further underscores the trend towards sophisticated, multi-component AI systems[21].

2. THE SIGNIFICANCE OF ARCHIVES MANAGEMENT IN THE ERA OF BIG DATA

Big data has become a mainstream trend in today's society, and the data and types of archive information are completely different than in the past, which has had a huge impact on archival management. Big data archival management is more realistic, summarizing and managing huge amounts of resources in a data-based way, in order to better serve the country and people.

2.1 Adapting to the trend of the times

In the past, due to the perishability of information, most archives information was used in paper archiving, and the informatization management of big data is an inevitable trend of the times, which facilitates the preservation of archives and promotes the convenience of relevant personnel to find information. To a certain extent, traditional archival managers have a heavy workload and diverse content involved, which has increased the workload of managers and reduced the efficiency of managers. The informatization of big data files management makes enquiry more convenient, information more concise and transparent, and facilitates the development of enterprises and the country.

2.2 More standardized management of archives

In the process of archival big data informatization management, the data can be scientifically collated and the archival system can be more scientifically complete. In the process of archival regulation, there are strict requirements and norms for all content, which compensate for the shortcomings of traditional paper archives, such as uneven font and difficult to recognize. Informal archival management can utilize various unified technical specifications on the Internet to achieve data transfer and sharing, promoting more standardized archival management.

3. THE DIRECTION OF ARCHIVAL MANAGEMENT IN THE ERA OF BIG DATA

Under the impact of the era of dataization, the archives department has ushered in an important development path for innovation and change. This work construction requires relevant participants to re-recognize and analyze archival management based on the background of big data, and also needs to clarify the direction of archival management, make up for the shortcomings in today's archival management and re-recognizing archival management with the eyes of development.

3.1 Ideas for building archives electronic information construction

With the advent of the era of big data, the number of information resources has shown a diversified and multiple growth, and the sources of work file information are more abundant. Archival sources are more oriented toward networked and social, focusing on people's lives and various aspects of public opinion, and the content of answers is constantly improved, which also puts new requirements on archival planning. The informatization management of electronic records has characteristics such as convenience and large storage capacity, and is easy to maintain. Big data informatization requires special business training for archival managers, so that archival professionals have professional business capabilities and a sense of work responsibility. The development of information technology will be modern equipment and technology, finishing related software using text pictures, audio and video information, etc., into a network database, enrich the file information and data, and thus achieve network management.

3.2 Design of Main Objectives of Archival Informatization Management

The informatization management of archives is aimed at specific design, and in the process of building relevant databases, it is necessary to dynamically implement a new management model of archives. In the process of

real-world archival data management, the participating units should utilize modern technological equipment, Making archive data into Word or pdf files, realizing the informatization of information management, promoting the scientific nature of archival lending or archival management, discovering the defects in past paper archives, and realizing a new automated management process.

3.3 Relevant requirements for accelerating the informatization of big data archives work

In the era of big data, the utilization services of archives will be socialized, diversified, and provide more intelligent services based on the different needs of service recipients, with a "people-oriented" approach. In the process of implementing information technology systems and norms, it is necessary to establish a rigorous archive management system, promote the systematic coordination of archive management work, improve the efficiency of archive management work, and promote the overall improvement of archive service level. Therefore, in the process of accelerating the informationization construction of big data archive work, it is necessary to strengthen the cultivation of talents, equip professional staff to carry out work, and regularly conduct archive training to promote the overall level of archive work team to be improved and achieve new innovation and development.

3.4 Ensuring that the system of responsibility is further improved

Security is important in any job, and archival management in the age of big data is no exception. The variety of file types needs to be ensured that accountability systems are specifically improved. In order to promote the further improvement of the answer accountability system, relevant managers must improve the file management system from a number of perspectives [1].

4. PROBLEMS IN THE MANAGEMENT OF PROJECT ARCHIVES

4.1 There are certain restrictions on the level of information management

In recent years, the construction of information management of various types of archives has been continuously developing, and the related management level needs to be further improved, because the complexity and content of archives management documents makes the professionalism of staff extremely demanding. Without an inevitable improvement in the level of archival informatization, it will lead to improper storage of historical data, low transparency, and great harm to project management.

4.2 Insufficient attention

At present, most technical project archives management in China has used informatization management to a certain extent, but some information management is only formalized, and not much attention is paid to this construction. The informatization of archives has raised the level of informatization management, and is phasing out traditional paper management methods, which are difficult to meet the needs of contemporary archival management, cannot be optimized and updated in a timely manner, and affects the management of project archives.

4.3 Inadequate security system

In the process of archival management, the reason why the management of paper archives can still be widely used is that the security management is better. In the era of big data, although credit file management has been widely used with diversified convenience, due to the existence of firewall loopholes in computer systems. Weaknesses such as virus attacks, coupled with the obvious technological advantages of hackers, have led to incomplete network data management security systems, which are prone to a large number of information leaks, and even major accidents due to poor file management [2].

4.4 The business quality of archives managers is uneven

The construction of archival management informatization puts high demands on the theoretical knowledge and substantive operational capabilities of personnel, and in project archival informatization, high demands are placed on the personnel's archival management. However, at this stage, there are still many problems in the archival management work in China, the first of which is the uneven operational quality and capacity of managers, which leads to significant shortcomings in the management work. Nowadays, China's informatization management of big

data files relies on professional companies to develop them, and late-stage project managers lack the corresponding professional maintenance capability. The dependence on the developers of the second party is great, so effort needs to be spent on professional training for project managers. At the same time, the project management process is often adjusted to the actual business situation, and whether the online file management system can be changed in a timely manner is also a great test of the system. The business literacy of archival management informatization personnel plays a crucial role in the construction and operation of the system, and cannot be ignored.

5. INNOVATIVE STRATEGIES FOR ARCHIVAL MANAGEMENT IN THE ERA OF BIG DATA

The era of big data has opened up a new development path for archivists and provided many favorable conditions, prompting a new opportunity for archival management. There is a wide space for the development of big data information management, and the model and content are constantly being changed to promote more scientific information archival management.

5.1 Strengthening resource aggregation

In the new era of big data, concepts such as archival resource management are advancing from traditional archival management to modern archival management, diversifying management methods and enriching content. Therefore, relevant archival departments must consciously collect various resources in a timely manner, establish a complete data resource library, maintain open communication with different data builders, encourage people from all walks of life to actively participate in archival resource management, and improve the shortcomings existing in specific construction. The rapid development of the Internet measures more diversified and specific archival collection, high-quality application of archival resource management, timely access to archival resources on the network, and understanding relevant information of users. In the process of archival management, we must form advanced archival management concepts, gradually form intelligent, information-based and data-based electronic archival management mechanisms, and strengthen archival resource management in many aspects [3].

5.2 Attaching importance to archives management and deepening administrative capacity

In the daily work of various units and departments, they must attach importance to archival management and deepen administrative management capabilities. With the development of modern technology, although some traditional archives management methods have gradually been eliminated, in the specific application, traditional records management also has many advantages that are difficult for modern records management to attain. Therefore, the archives management department should combine traditional management methods with modern management models. Improve the functionality of the information system construction, improve the data file information system, timely implementation of the system upgrade, security management of the specific work can be efficiently completed. In the era of big data, archival administrations must clarify their specific functions, improve the mode of service, and strengthen the scientific and standardized construction of institutional processes. Through regular training, professional project managers will improve their level, strengthen the bonding with industry research institutions, promote data-based collaboration in archival management in many ways, and combine online and offline activities to jointly promote the establishment of a people-centered archival management system.

5.3 Improving the security system of archival information

In the era of big data, the convenience of the Internet has brought many aspects of innovation and development, but security issues are also very prominent. Therefore, in order to promote the security and stability of archives management, the relevant actors need to apply a variety of management tools from top to bottom. To solve the potential crisis in archival management, promote the efficient service of archival management and build a complete archival security system to promote the development of archival administration. For example, archives management staff, as the main participants in their actual work, must increase their awareness of responsibility and establish strong early warning mechanisms. Another key to improving the efficiency and quality of archival information management is that the security data of the information platform is critical to management, and accurate requirements must be made for the recording, transmission and preservation of archival data management. To ensure the security of archive data and prevent the malicious theft and tampering of archive data, it is necessary to strengthen the protection against viruses and increase the construction of firewalls. Enhancing data transmission encryption technology, and having professionals responsible for network security and maintenance, improves the

defense against attacks on information platforms, and backups electronic files and related data to minimize the loss of information platforms in the event of an attack. In addition, it should also strengthen the file information personnel awareness of data protection, improve the awareness of information security for information protection to increase a line of defense, from the overall improvement of file information security, and thus promote the quality and efficiency of big data file management.

5.4 Strengthening the cultivation of talents' quality and ability

In the process of professional management of big data information files, it is necessary to strengthen talent training if the advantages of information technology are to be demonstrated in a timely manner. Different jobs have different work content, so it is necessary to strengthen talent training, target talent development in connection with specific jobs, and promote the overall quality of archivists. When training professional managers, it is necessary to improve their ability to respond to problems, promote the effective development of the level of informatization management, and guide them to use professional tools skillfully to meet the actual needs of archival management at this stage. Archivists should keep pace with the development of the times, study new management systems and strengthen business learning, learn advanced knowledge in accordance with the update of the information system, strive to improve their own quality and better operate the accounting information system.

6. CONCLUSION

In short, big data has promoted the development of archival informatization, consistent with the development trend of the times, and has played an important role in promoting the construction of archives in China. According to the current characteristics of archival construction, the problem existing in the specific construction process and the specific development goals should be identified. In the process of conducting archival management informatization, relevant participants should strengthen the internal management of project archival management in accordance with the new objectives proposed by the archival management system, pay attention to the cultivation of talents, and while improving the professional skills of talents to find problems in this process. Strengthen the application of archival information technology, strengthen the construction of the overall team, improve the level of information network of participating personnel, guide them to establish high ethical standards, further recognize the security of archival Information Management, and promote innovative research and development in archival management in general.

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