

# Analysis of the Creation of Demonstration Digital Archives: Taking the Construction of Smart Archives in Dongcheng District, Beijing as an Example

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## Abstract

The construction of demonstration digital archives is a key project for the innovative development of the archival industry vigorously promoted by the National Archives Administration. Taking the construction of the Smart Archives in Dongcheng District, Beijing as an example, this paper deeply explores the work objectives, functional requirements, and technical means of creating a demonstration digital archive. One is scientific planning, which is building the basic framework of digital archives. Proposed the infrastructure of “three major supports, five major platforms, and three major guarantees”. The second is to highlight key points and improve the basic functions of digital archives. Including hardware construction, software configuration, digitization of library archives, electronic archive management, sharing and utilization of digital archive information, and formulation of management systems for digital archives. The third is to strive for practical results and deepen the construction of smart libraries. This includes vigorously promoting the construction of smart archive centers, establishing a comprehensive management platform for smart libraries, and introducing new-generation information technology to achieve the integration of smart libraries in order to explore some mature experiences and methods that can be referenced for the creation of demonstration digital archives.

## Keywords

Digital Archive, Smart Library, Digitalization of Archives, Intelligent Management, Infrastructure

## 1. Introduction

Promoting the informatization construction of archives is a major strategic measure to achieve the transformation and upgrading of archival work [1]. In recent years, the National Archives Administration has successively evaluated Qingdao, Taicang, Zhuhai, Shaoxing, Shiyao and other “National Demonstration Digital Archives”. The main goal of constructing a demonstration digital archive is to build a service platform that can support the integrated management and operation of digital archive information, and provide a comprehensive system for efficient archive information services. This goal aims to achieve centralized, unified, and standardized management of digital archive resources, providing modern technical means and procedural operation methods for archive staff, thereby improving the efficiency and modernization level of archive work. In the process of comprehensively promoting the development of the archival industry in the whole district, Dongcheng District Archives attaches great importance to the construction of digital archives, and regards the construction of digital archives as a key project to achieve innovative and transformational development of the archival industry.

## 2. Scientific Planning, Building the Basic Framework of Digital Archives

Strictly in accordance with the overall requirements of the “Guidelines for the Construction of Digital Archives” issued by the National Archives Administration, and closely combined with the current situation and foundation of archive informationization work in Dongcheng District, we have successively studied and formulated the “14th Five Year Plan for Archive Informationization Construction in Dongcheng District”, “Ten Year Development Plan for Archive Informationization Construction in Dongcheng District”, and “Dongcheng District Digital Archives Construction Plan”, clarifying the guiding ideology, work objectives, functional requirements, and technical means of implementing functions, achieving “two clarifications”.

One is to clarify the construction goal, which is to meet the “collection, storage, management, and use” of digital archives. Supported by the internal LAN, government network and the Internet, based on the digitalization of stock archives and the electronization of incremental archives, and centered on the construction of various archives databases, a comprehensive management integration platform integrating archive data collection and archiving, storage management, sharing and publishing, business guidance and system control, which covers all businesses of bureaus (libraries) and connects the party and government organs horizontally, is established to realize the digitalization of archive resources, the networking of information transmission, the sharing of information resources, the online use of services, the automation of business management and the control of information security, and the online and offline archiving, transfer and service of digital archive resources.

The second is to clarify the infrastructure. The overall infrastructure of Dongcheng District Digital Archives has been established around meeting the functional requirements of “collection, storage, management, and use” of digital archives, mainly consisting of “three major supports, five major platforms, and three major guarantees”.

The “three major supports” are to build channels for digital file information transmission and business work, supported by LAN, government network and the Internet. The basic management system for the collection, storage and management of digital archives information is deployed on the LAN, the electronic archives management online receiving and archiving, business guidance and information service system is deployed on the government affairs network, and the open archives and government open information service system are deployed on the Internet.

The “Five Platforms” refer to the establishment and implementation of management and application platforms for various functions of digital archives. One is the resource construction platform. Digitize the catalog and full-text of various archival materials in the collection, including paper archives, photo archives, multimedia archives, and information; Receive and archive incremental electronic archives of each unit online and offline; Collect and save digital resources from major portal websites online. The second is the storage platform. Store and manage various types of digital archive information collected, forming a resource repository, management repository, and several application databases [2]. The third is the application platform. Provide query, utilization, and external release of digital archive information, including service hall intelligent query and utilization platform, archive website archive query platform, mobile WeChat archive query platform, and government website archive query platform. The fourth is the backup platform. Perform heterogeneous, remote, and multiple backups of digital archive information. The fifth is the backend management platform. Implement management of archive data and digital archive system operation.

The “three guarantees” are to provide guarantees for the management and operation of the digital archive system. One is facility guarantee. Including the construction of host rooms and the provision of various necessary facilities and equipment for digital archives. The second is security assurance, including establishing a digital archive information security guarantee system, and configuring security technical means, technical strategies, and technical measures. The third is an institutional guarantee, including the establishment of a series of regulations and standards for the management of digital archives, including computer room management, equipment management, security management, personnel management, digital resource management, etc.

### **3. Highlight Key Points and Improve the Basic Functions of Digital Archives**

The construction of digital archives is a systematic project involving various

aspects, with a long construction period and multiple construction contents. In the implementation process, we closely focused on the basic functions of digital archives and prioritized the improvement of basic functions to organize and carry out basic business construction. We implemented it step by step and promoted it layer by layer, achieving the “six highlights”.

One is to focus on hardware construction. The digitization of archive management requires high-configuration hardware equipment, such as high-performance scanners, servers, and storage devices, to ensure the quality and efficiency of archive digitization. When the new archive of Dongcheng District was constructed in 2018, the infrastructure construction of the digital archive was designed and implemented simultaneously with the construction project of the new archive. Constructed a standard computer host room; Established an electronic archive blocking database; Deploying internal and external networks; Equipped with relevant equipment such as servers, storage backups, network terminals, digital processing, and data collection to meet the functional requirements of the digital archive; Purchased high-precision digital archive collection and archive simulation equipment; Installed safety protection facilities such as automatic gas fire protection, automatic electrical fire alarm, automatic temperature and humidity control, automatic air disinfection, access control management, video surveillance, and far-infrared automatic anti-theft alarm in the computer room.

The second is to focus on software configuration. In terms of software, a unified professional department is needed to develop technical specifications, clarify functional requirements, provide business guidance, and ensure software compatibility and integration. According to the functional requirements of the digital archive, a comprehensive archive management system, an archive digital processing system, an electronic archive online receiving and archiving and business guidance system, an audio and video digital archive conversion and collection system, an intelligent query and utilization system for service halls, an archive website archive information query system, a mobile WeChat remote query system, a government open information online query system, an office automation system for government agencies, as well as genuine operating systems and tool software have been configured.

The third is to highlight the digitization of library archives. Improve the quality and efficiency of archive digitization. In the process of digitization, the original appearance of the archives should be maintained to ensure accuracy and correctness. By standardizing the homework process, identifying the root causes of problems such as scanning equipment issues, archive paper issues, and operator issues, and taking corresponding solutions to improve work quality. Carry out the digitization of archival resources in a planned and step-by-step manner. In terms of establishing a catalog database for all archival materials in the collection, the establishment of a database for all archival materials has been completed. Except for professional and specialized archives such as book materials, physical archives, storage archives, scientific and technological archives, accounting archives, and

engineering archives that are not included in the scope of digitization, all archives that should be digitized have been fully digitized with a digitization rate of 100%; The collection of professional archives such as audio and video, photos, marriage, professional titles, population census, and major events has also been digitized. On this basis, specialized databases such as document archives, professional archives, photo archives, audio and video archives, and open archives have been established.

The fourth is to highlight the management of electronic archives. On the one hand, we will focus on the offline transfer of electronic archives. The standardized management and archiving of electronic documents have been included in the important agenda and annual business goals. Through the formulation of plans, clarification of tasks, pilot projects, tracking and guidance, and exploration of experience, the standardized management and archiving of electronic documents have been effectively carried out throughout the region, and the formats, data standards, and category settings for archive input in various units have been standardized and unified. At the same time, some archives have been digitally backed up in remote locations. On the other hand, we will focus on online reception, archiving, and business guidance of electronic archives. In the process of building the party and government special network, an electronic archives management platform has been synchronously established, which has been connected with various party and government special network application units. Party and government organs can directly log in to the platform to carry out online archiving, online transfer, online reception, online guidance, and online utilization of electronic archives.

The fifth is to highlight the sharing and utilization of digital archive information. Firstly, we independently developed a digital archive utilization query system. By using ID card reading or fingerprint recognition devices to confirm the user's identity and usage permissions, it is possible to conveniently and quickly query the archive directory and original archive information in the service hall, and automatically handle archive certification, query registration, and other related services [3]. Secondly, a self-service query area has been established in the service hall, where users can browse open archive catalogs and original texts through self-service query terminals. Electronic touch screens can be used to view multimedia archive topics, archive information websites, archive search guides, and other information online, basically meeting the needs of users without leaving the warehouse. Thirdly, provide digital archive social sharing services through archive websites. The archive information network has the functions of collection introduction, utilization guide, archive exhibition, appointment for file search, online consultation, open file browsing, government public information query, online video file playing, etc., to realize the publication and utilization of all open archive directories and some original texts on the Internet. Fourthly, launch a mobile WeChat file search service. The service platform for mobile phone WeChat to query open files and current documents has been opened. The public can use

mobile phones to log in to WeChat official account to query the required file information on the WeChat platform, realizing the digital file interaction function. Fifth, a government open information query center has been established. We have developed a specialized query and retrieval system for government public information, which uploads current electronic documents related to policies and regulations that have been made public. These documents are available for the public to access and reference through online platforms.

Sixth, highlight the construction of a management system for digital archives. Optimize management systems and processes. Establish a strict job responsibility system, clarify the job responsibilities of each link and position, and ensure the standardization and systematization of the digitalization process of archives. By implementing institutional management and technical support, we can avoid phenomena such as missed scans, repeated scans, and multiple scans, and improve the quality of work. Firstly, a series of management systems have been established to ensure the normal operation and business development of the digital archive system, mainly including: data center management system, including data center access, security prevention, hygiene, operation, temperature and humidity control, etc; Equipment management system, including equipment registration, inspection, operation, maintenance, and scrapping; Personnel management system, including the responsibilities of system administrators, software and hardware administrators, data administrators, security administrators, auditors, etc; The digital resource management system includes the reception, detection, organization, management, storage, backup, and utilization of digital resources; Emergency plan system, including prevention of natural disasters, environmental accidents, emergencies, and human operational errors; The digital processing system includes digital operation procedures, digital quality inspection, digital result transfer, security and confidentiality, etc. Secondly, we should pay attention to the implementation of the system and strictly carry out various business operations of the digital archives in accordance with the system. The main measures include incorporating the implementation of various systems of the digital archives into the annual target performance evaluation system of the bureau; Decompose and implement responsibilities, decompose the implementation of various systems to functional departments, and assign specific responsible persons; Establish a work ledger for the implementation of each system, and record the entire process of system management, operation, and maintenance; Strengthen supervision and inspection, regularly supervise and inspect the implementation of various systems, promptly rectify problems found, and ensure the safe operation of the digital archive system and the secure storage and utilization of digital archive information.

#### **4. Striving for Practical Results and Deepening the Construction of Smart Museum Libraries**

The Dongcheng District Smart Museum Library has achieved three integrations. One is the integration of smart libraries and smart buildings, which is the way to

obtain the “basic” technology of smart libraries, that is, to obtain the overall control capability of automation through smart building technology. The second is the integration of smart libraries and the Internet of Things, which is the way to obtain the “intelligent” technology of smart libraries. That is, through the Internet of Things technology, archives can obtain more comprehensive and intelligent self-control ability for independent “thinking” and “decision-making”, and perception technology is the core of it. The third is the integration of smart libraries with cloud computing and big data technology, which is the way to obtain the “coverage” capability of smart archives. That is, through cloud computing technology, various archives within a certain area are linked to form a smart library group, which can exchange information and share resources. At the same time, big data technology is used to solve the problem of rapid expansion of data caused by regional linkage, making the realization of smart library groups possible [4].

Vigorously promote the construction of smart archive centers. Implement the “Digitization driven strategy”, incorporate the construction of smart libraries into the overall plan of the “Smart East City” construction, establish a district-wide, distributed, standardized, and shareable archive catalog database, archive full-text database, multimedia archive database, and various types of specialized archive databases, and effectively improve the level of archive intelligence. Promote the modernization of governance capabilities through the intelligence of archives, and achieve full integration of archive work into various agencies and systems, recording of results, supervision of processes, and big data services. Strengthen the business collaboration between the archive management information platform of the archive department, departmental business systems, and official document systems, support online archiving of electronic documents, ensure timely archiving of electronic documents, and regularly transfer electronic documents to the archive. Upgrade and transform the generation and reception system of archived electronic files and electronic directories, realizing remote data submission and management, making it more comprehensive in functionality, more secure in data, more user-friendly, and easier to promote.

Establish a comprehensive management platform for smart museum libraries. In combination with the construction of the Beijing Digital Archives and the “paperless” office platform for departmental collaboration in Dongcheng District, the full process control and management of electronic documents generated by various departments in the entire district from formation to automatic archiving have been achieved. This not only enables the use of computers to draft documents and complete document receiving and sending management, but also enables automatic grouping, indexing, archiving management, and printing of catalogs. At the same time, it can also manage the borrowing, statistics, and retrieval of archives. The integration of electronic files generated from various links, the integration of various systems for electronic file management, and the comprehensive construction of smart libraries and digital archives have achieved a smart archive management model that integrates electronic data, management systems, and operational services.

Emphasize the introduction of new generation information technology. On the basis of cloud computing, cloud computing centers are transforming into big data analysis centers, where data becomes an important resource to be developed and utilized, and the value of big data analysis will gradually be realized. Intelligent hardware drives the update of data collection terminals, connecting everything and further deepening the application of the Internet of Things [5]. Combined with the use of the new library, a comprehensive linkage operation and management platform has been built, which integrates intelligent management of archive storage equipment, intelligent management of warehouse environment equipment, and intelligent management of paper and electronic archives. Taking software systems as the core, IoT technology as the link, and core warehouses as the center, integrating intelligent dense shelves, environmental equipment, security and fire protection, access control monitoring, electronic tags, information release and other intelligent devices, realizing the intelligent integrated operation and management of archive management software with paper archives, electronic archives, warehouse security equipment, archive storage equipment, and warehouse environmental equipment, providing more convenient, efficient, secure and intelligent services for archive business and archive storage [6].

The construction of smart libraries is an important task in the comprehensive construction of digital archives. The Dongcheng District Smart Library utilizes technologies such as the Internet of Things to effectively improve the modern management level of archive warehouses, achieve intelligent processing and storage of archive data, intelligent warehouse environment management, effectively enhance the operational efficiency of digital archives, protect the physical security of archives, and maximize the satisfaction of users' archive needs, achieving the goals of saving time, energy, and improving work management efficiency.

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### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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