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Preparing for a paperless future Huang Yuming

With the enhancement of electronic governance and official automatics, a great number of electronic documents came into being. According to sample statistics, Anhui Province produced 825 electronic documents on average in 2003 and 2,267 in 2005, showing that electronic documents have become important assets to organizations. Anhui Province first initiated the establishment of an electronic documentary center at the provincial level in China on October 10, 2005. "Digital Anhui" aims to integrate China's strategic information resources, make clear their adscription and flow direction, protect integration and security, realize long-term preservation and effective use, diligently look for new ways of managing and preserving archives in the era of information.

Preparing the way

The Anhui Provincial Archives Administration (APAA) had been preparing for this over a long time. In 2003, it arranged a pilot spot directly under the district government for electronic document management in Xinwu district, Wuhu. In 2004, it carried out a survey on the management of electronic documents in more than 100 organizations directly under the provincial government. In 2005, the program of building an electronic documentary center was listed on the annual agenda. During February and March, the program of building an electronic documentary center was ratified by experts and the APAA submitted a report entitled Request for Listing Informatization of Archives into the Construction of Digital Anhui to the provincial government. In April, the establishment of this center was approved by the leaders of the provincial government and the APAA was supplemented later as a member unit of the

panel for building "Digital Anhui" at the second meeting of the leading panel. The Informatization Office in the provincial government included the program of building the center on a list of important control programs for the construction of "Digital Anhui". The Anhui Provincial Department of Finance and the Provincial Department of the Information Industry distributed the projects and decided how to use funding. On October 19, the Anhui electronic documentary center held the opening ceremony for the construction. On the same day the governor's working conference decided to invest 3 million yuan in the construction.

Three stages, 2006-2010

The construction of the center is divided into three stages:

1. 2006-2007, setting up a policy framework, drafting related standards, building infrastructure and developing application systems; collecting electronic archives formed in 11 excellent units directly under the provincial government in terms of official automatics and integration of archives, to establish the primary database of electronic documents.

2. In 2008, collecting electronic archives within the range of those formed in 30 departments directly under the provincial government and other electronic documents worth preserving as archives to enrich the electronic documents database.

3. 2009-2010, enlarging the range of succession and setting up a mechanism for long-term preservation to realize effective use; integrating center's database with Anhui's distributed database of archives to realize collectively the management of electronic documents and the information resources of digital archives.

The center completed the first stage in April 2007, and the second stage is smoothly in progress. The construction of the computer room for the center has been finished, the bid for hardware has gone ahead and installation and debugging have been completed. Since the government bid, development of the application system has been entrusted to the Scientific Research Center of Peking University. The following have all been developed:

1. The interface module of the center and documents management system (in units directly under the provincial government).

2. The seal engine (used for unified code, signature and seal for metadata and metadata objects in electronic documents) for electronic document seal object. (i.e. EEO).

3. The EEO editor (used to edit electronic documents metadata).

4. The EEO browser (used to decode and show metadata as well electronic documents objects).

5. The EEO confirmation (used to confirm the authenticity and integration of

received data turned over). By request, the first batch of electronic documents has been turned over to the center. The system for preserving electronic documents and searching has had a test run.

Main ideas

The center mainly abides by the following ideas:

1. Positioning: The construction of the center is an indispensable constituent of the construction of regional informatization and an effective medium for the sharing of electronic information resources. It is a place for the collective consulting of information about the government. The center is not a transitional organization for preservation, nor an electronic version of "the documentary center", but a base attached to archives for the permanent storage of electronic archives.

2. Operation pattern: The APAA fulfills the legal function of managing electronic documents and is the main responsible body for the construction of the center. The APAA and the provincial government's working office for informatization confirm it as the model project for the construction and management of information resources about the national administration. The APAA organized a working team drawn from provincial government offices as well as departments responsible for science and technology, informatization, etc. They also established advisory and expert groups consisting of personnel from the State Archives Administration of China, and well-known domestic universities, enterprises, and scientific research institutions.

3. Technical route: The APAA guarantees that the electronic documents are authentic, integrated, valid and readable in the long term. The design of metadata in electronic documents, the choice of long-term preservation form, the seal of objects based on XML and so on will be analyzed as an indivisible whole. The technical route of "tackling the key scientific and research project - making standards-developing a toolbox-field confirmation" is followed and standardizes the formation, storage and application of electronic documents systematically and comprehensively. The structure of the information packet for sealing electronic documents conforms to the OAIS information model (AIP), and the functional setup of the electronic documentary center conforms to the function model of the OAIS system.

4. Strategy: Insistence that standards determine practice, and practice perfects standards. Members of the project team for the establishment of the electronic documentary center have investigated the current situation of domestic E-government. They have studied theories, standards and optimized practices concerning electronic document management (such as The Record Continuum Theory, InterPARES, Dublin Core metadata element (DC), ICA-ISAD(G), ISO15489, ISO23081, VERS, Chinese Metadata Schema of the

National Library of China, the key project of the National Fund for Philosophy and Social Science Studies Standards for Electronic Document Metadata based on the XML and so on), analyzing carefully the inner requirements of electronic document management. In May 2006, the APAA drafted the standards for the archives profession, Detailed Rules for Electronic Document Management. These, including Electronic Document Metadata Plans, Demands for Long-term Preservation Form of Electronic Documents and Standards for the Sealing of Electronic Documents based on XML, have established a basic guide for electronic document management. The confirmation received by the unit responsible for the turning over of electronic documents indicates that these standards are both scientific and practical.

5. Goals: To preserve digital heritages in order to preserve electronic documents produced by E-government and the official automatics as paper documents in the long-term; to realize the sharing of resources to provide service to the Communist Party of China and governmental organizations for work and policy-making; to provide advisory service for the main bodies of the market economy, to permit the public transparent information about governmental affairs; to save administration costs and hence enhance government efficiency.

New electronic records challenge traditional ways

Wang Jian



The leaders of InterPARES3 teams have all worked on international research.

Since the 1990s, electronic records management has become a key topic in Chinese archives. Chinese archivists have understood that electronic records are a challenge to traditional archival management and archival theory. Because of the value of electronics record management, there is an obvious need to spread

the word. Archivists, therefore, have been putting a great deal of effort into both practical and theoretical research.

Big increases

According to a survey by the State Archives Administration of China (SAAC) in 2006, the total number of electronic records holdings in China was near 180 million, equivalent to 150,000 GB. Of these, 150 million, or about 75,000 GB, were set up by central government departments. In 2006, the number of electronic records created by central government departments and their affiliated businesses and enterprises made up 72.7 percent of the total, an increase of 18.9 percent compared with last year. Over the next five years, more than 50 percent of records will become electronic ones.

Regulation and standards

In order to improve the management of electronic records, relevant departments have adopted a series of regulations and standards, among which, the Electronic Signature Law of China (2004) is the most important. The law is crucial to electronic records management. It clarifies the evidentiary effectiveness of a number of electronic record types including data telegram texts and electronic documents. However, the law mainly focuses on electronic records in the domain of electronic business; it doesn't refer to the electronic records of e-government affairs.

Besides these regulations, archival profession standards promulgated and carried on by the SAAC are as follows:

1. CAD Electronic Record CD Storage, Filing and Archival Management Requirements (1999). Its first part mainly regulates Electronic Record Filing and Archival Management; the second part regulates CD Information Organizational Structure.
2. Electronic Record Filing and Management Standards (2002).
3. Paper Archives Digitization Technology Standard and Official Business Email Filing and Management Rule (2005).

In addition, work on the Electronic Record Management Metadata Standard is in progress.

Academic research projects

In the past two decades, Chinese archivists have paid great attention to records filing, appraisal and long-term preservation. Today, academic research covers the overall aspects of electronic records management. Since 2005 the most important focuses in the field of electronic records management in China have been risk management, national strategy, ERM standards framework, ERMS functional requirements, metadata, digital archives, best-practice and optimization models. Many of the research projects findings have been implemented nationwide. One example is the "Electronic Record Management

Mechanism Research” chaired by Professor Feng Huiling, funded by the China Association for Science and Technology (2007). The Chinese Archives Society and the School of Information Resource Management of the Renmin University of China undertook the research project together. After comprehensive inspection and analysis of the main problems of electronic records management in China, the research group proposed feasible suggestions on restructuring and optimizing the electronic records management mechanism. The findings of the research were highly praised and suggestions related to policies have been reported to the central government.

International cooperation

China has actively involved itself in international cooperation in the field of electronic records management in recent years. Take InterPARES3 for example. China’s InterPARES3 team, together with 13 other teams, has actively been working on the International Research on Permanent Authentic Records in Electronic Systems. Professor An Xiaomi and Professor Zhang Zhengqiang have become members of ISO/TC46/SC11 and take part in research to develop ISO15489 and ISO23081.

The Natural Science Foundation of China (NSFC 70373048) and US Natural Science Foundation (NSF IIS 0456022) held forums on long-term maintenance and preservation between 2007 and 2008. The first forum began in May 2008, with the focus on government information management, the application of OAIS in data-information management, digital archives and digital libraries, the filing and preservation of data records and the application of metadata in information management. It is expected that there will be more international cooperation in the future.

Digital archives complete phase two in Shenzhen

Fang Yan and Zhang Zhimin

Construction of the Shenzhen City Digital Archives (SCDA) started in May, 2000. In December, 2002, it was listed as a government funded project. The construction underwent two phases: the first was between 2001 and 2004, and the second between 2005 and 2007.

Basics first

In this phase, efforts were made concerning the basic theory, structure, infrastructure, applied technology and model of realization of the digital archives. Achievements are mainly as follows:

1. Identified five tasks for the construction of the digital archives, i.e., to formulate standards, to construct software and hardware infrastructure, to develop application systems, to build a digital resources database, and to

encourage new talent.

2. Proposed phased objectives and steps. Accomplished and implemented guiding documents such as the overall planning of the digital archives, first phase project requirement report, implementation program and application requirement analysis report.

3. Developed relevant standards, i.e. Public Business Email Archiving Filling and Management Rules (released in 2005), Shenzhen Electronic Records Archiving and Management Methods (issued in 2003), Electronic Records Metadata Standards (first draft submitted in 2005), Shenzhen Archives Materials Digitalized Technology Standards, Shenzhen Archive Digitalization Copyrighting And Format Rules, Archived Disk Coding Rules, Archived Electronic Records Saving Format And Medium Standards, Filling Electronic Records Disk Saving Standards, General Electronic Records Depository Term List, Archived Electronic Records Arrangement Rules, Electronic Records Appraisal Rules (draft).

4. Developed first phase application system structure and determined four modules (information collection, management, utilization and system security) and 23 sub-systems and finished development of some sub-systems.

5. Established cooperation to create archives digitalization production lines, and completed scanning of 1.3 million paper archives and over 3,000 photos.

6. Completed network layout, wiring and equipment supply for new archives located in the Citizen Center.

7. Made VCD of the SCDA and distributed them at the 2002 National Archive Informatization Conference.

8. Compiled a Brief Description of Digital Archives, as a theoretical summary of the "SCDA System Project Research and Development" and published this book in June, 2003.

9. Edited and issued an electronic file management manual in 2004. The team members also wrote several relevant research papers.

Deepening the work

During the second phase of the digital archives project between 2005 and 2007, major accomplishments were as follows:

1. Progress in theoretical study. Redefined the function and connotations of digital archives, i.e., "digital archives is an information system that utilizes modern information technology and manages digital archival resources, and is to be used through networking for information sharing. It enables distant visits to digitalized archival resources, archives data exchange and inter-operation. Through its network-supporting platform, business management platform and information service platform, system information is transmitted via the network and used online and managed automatically". Levels and categories of digital archives are also redefined.

2. Further develop and apply standards. Participated in the drafting process of the national Management Standards of Electronic Official Documents Based on XML and the industry standard Electronic Records Metadata Standards. In October 2007, the SCDA drafted Digital Archives Design and Construction Standards and revised the standards in April 2008.

3. Developed infrastructure of digital archives. First, Shenzhen City Archives has achieved accomplished network development. Based on the existing network at the Citizen Center, a multi-layer network system connecting archives and branches has been built. This system includes the archives intranet, the government affairs network, which connects people with the government, the public network connected with the Internet. Secondly, there is storage system development. The system applied the SAN structure to receive and manage electronic files from all the bureaus of the archives offices and applied the three-level safety redundancy storage structure. The total storage reached 20T. The three-level storage system is composed of a FC-SAN core, SATA and tape library. The optic fiber RAID online storage, Virtual Tape Library near-line storage and tape drive offline backup storage scheme were developed. A data information life cycle management for online, near-line and offline status has also been adopted. Various back-up strategies have been adopted, for example, data backup in the virtual tape library and ordinary tape library in the new facilities of the Citizen Center, and distant disaster tolerant backup using backup software in the old facilities in the Archives Building. Thirdly, a security system structure, with application system security, a unified trust system, network safety, system safety and physical safety, has been developed.

4. An upgraded and installed constituting unit archival management system. In 2005, the SCDA upgraded management system for constituting units, and transferred data in the current management software system. By the end of 2007, over 200 units of system has undergone such processing and over 600,000 machine-readable catalogue data had been collected and saved.

5. Upgraded network and changed version. Realized content management system based on automatic content collection, management, smart search, filing and automatic release of content, updating of information. Also, an online group was created for archives staff to enable business reference interaction.

6. Research in design of application system function and technical roadmap. In the design of application system, based on ISO14721 Open Archival Information System and Electronic Records Metadata Standards, and by means of capture, management and control of electronic records metadata, the SCDA has realized generation, capture, long-term preservation and access of the content, structure, background and management process information of electronic records.

The SCDA has built a moderate archives digital resource bank. It has also finished entry of 1,041,705 holding comprehensive electronic catalogues, 2,276,917 city construction archives catalogues, 115,031 photo catalogues (all digitized), over 2 million pages of full-text information, 570,000 city construction CAD electronic records, digitized micro-films 114,114 rolls, and over 200 hours of digitized video archives. Overall, the project has been a resounding success.

Welcome to the world of electronic information

Yang Taiyang

“China Archives Information” (<http://www.zgdazxw.com.cn>), a network that integrates both professional and cultural elements, was officially launched in September 2007. The website is supervised by the State Archives Administration of China and sponsored by China Archives News.

“China Archives Information” acquires its main content from the rich resources of China Archives News, but its publications are not limited to materials appearing in the newspaper. The website has columns with such names as “Information Center”, “Summit Forum”, “International Archives”, “Wonderful Archives”, “Regulations and Standards”, “Today’s Focus”, “Hot Topics”, “Archival Overview” . Archival news, archival regulations, archival culture and archival theory can also be found on the website.

The electronic version of China Archives News provided by “China Archives Information” not only allows computer users convenient access, but makes up for the limitations of the print medium with its fast, convenient and low-cost features. It is a new platform keeping domestic archivists in touch with what is happening in archival work around the world to help them improve their professional skills.



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