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FOREIGN EXPERIENCE OF INFORMATIZATION OF THE ARCHIVAL INDUSTRY

Informatization of archival institutions is one of the priority directions of development of archival business in Kazakhstan. The most important problems of this process are the introduction of information technologies in the archival industry, the automation of the scientific References apparatus, open access to information, and the creation of archives of electronic documents. It is the study of foreign experience in the field of informatization that can give a positive effect in determining the most rational methods and ways of development for the domestic archival industry. Currently, many archives around the world use the ability to present archived documents to users in electronic form. Some experience in this field has been accumulated abroad. Of great interest is the experience of the countries of the near and far abroad that have achieved significant results in the informatization of the archival industry on the example of the Republic of Belarus, China and Korea, which gives an overall picture of informatization on a global scale.

Key words: Informatization, National Archival Fund, automated information system, electronic archive, integrated archival management system, foreign experience, electronic document.

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Архив саласын ақпараттандырудың шетелдік тәжірибесі

Архив мекемелерін ақпараттандыру – Қазақстандағы архив ісін дамытудың басым бағыттарының бірі. Бұл үрдістің маңызды проблемалары – архив саласына ақпараттық технологияларды енгізу, ғылыми-анықтамалық аппараттарды автоматтандыру, ақпаратқа ашық қол жетімділік және электронды құжаттардың архивін құру. Ақпараттандыру саласындағы шетелдік тәжірибені зерттеу, отандық архив саласын дамытудың ең тиімді әдістері мен тәсілдерін анықтауда оң нәтиже бере алады. Қазіргі уақытта әлемнің көптеген архивтері пайдаланушыларға архив құжаттарын электронды түрде ұсынады. Шетелде осы салада белгілі бір тәжірибе жинақталған. Архив саласын ақпараттандыруда айтарлықтай нәтижелерге қол жеткізген жақын және алыс шетелдердің тәжірибесі, соның ішінде Беларусь Республикасы, Қытай және Корея тәжірибелері үлкен қызығушылық тудырады, ол әлемдік ауқымда ақпараттандырудың жалпы көрінісін түсінуге мүмкіндік береді.

Түйін сөздер: ақпараттандыру, ұлттық архив қоры, автоматтандырылған ақпараттық жүйе, электронды архив, біріктірілген архивті басқару жүйесі, шетелдік тәжірибе, электронды құжат.

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Зарубежный опыт информатизации архивной отрасли

Информатизация архивных учреждений – одно из приоритетных направлений развития архивного дела в Казахстане. Важнейшими проблемами этого процесса являются внедрение информационных технологий в архивную отрасль, автоматизация научно-справочного аппарата, открытый доступ к информации, создание архивов электронных документов. Именно изучение зарубежного опыта в сфере информатизации может дать положительный эффект в определении наиболее рациональных методов и способов развития для отечественной архивной

отрасли. В настоящее время во многих архивах мира используется возможность представления пользователям архивных документов в электронной форме. За рубежом накоплен определенный опыт в этой области. Большой интерес представляет опыт стран ближнего и дальнего зарубежья, а именно Республики Беларусь, Китая и Кореи, достигших значительных результатов в информатизации архивной отрасли, который дает общую картину информатизации в мировом масштабе.

Ключевые слова: информатизация, национальный архивный фонд, автоматизированная информационная система, электронный архив, интегрированная система управления архивами, зарубежный опыт, электронный документ.

Introduction

Today an informatization has penetrated into all spheres of human life and activity, society and the state. In modern archival science, the issues of informatization and the formation of a new methodology for archival work are related to the penetration of information technologies into the archive industry. Archival informatization is a process of improving technologies for processing archival documents by introducing theoretical and applied developments of computer science into archival business, as well as using computer equipment and software in the work of archives.

Since the 1990s, archival institutions in foreign countries have been moving to the stage of informatization. At the same time, international standards of description are further developed in accordance with the level of development of information technologies, as well as national concepts for the development of the information infrastructure of society. National integrated information systems are being created and accessed via the Internet.

The mass digitalization of archival heritage has enabled more researchers to work with them, including those who are geographically remote. The document becomes open and accessible due to network technologies. Issues of classification and systematization are solved, computer data banks of archival documents are formed, which together contributes to the solution of document management problems. The tasks of universalization of document management tools, development of common standards and classification schemes for archival documents are becoming urgent. But at the same time, there are new problems related to ensuring long-term storage of electronic documents.

Therefore, the study of foreign experience in the field of information in the archive industry allows us to conclude that it is necessary to improve the research and methodological work of the archives of the Republic of Kazakhstan.

Historiography of the problem

Questions of research and description of electronic information are considered in the works of foreign researchers. The possibility of historical and cultural use of electronic forms of presentation and preservation of information was noted by V. Bush. The idea of infostructure was outlined by him in "As We May Think" in the *Atlantic Monthly* (Bush 1987: 254-261). It is one of the precursors of the scientific approach to the study of an electronic source.

H. Dollar (Ch. Dollar) is among the first researchers of electronic documents, one of the founders of the Archive school of the University of British Columbia, author of the book "Authentic Electronic Records: Strategies for Long Term Access" (Ryskov 2004: 14).

The issues of theory and practice of source analysis of electronic texts received a comprehensive coverage in the research of S. Schreibman, R. Siemens, and J. Schreibman. Unsworth (J. Unsworth). The innovations that occur in modern humanitarian thought, which the authors emphasize are related to the computerization of scientific knowledge. The collective publication covers the problem of methodology for studying digital information (a Companion to digital humanities ... 2004: 145-254).

Constructive suggestions about the need to develop a common methodological platform were made already in the 1990s. J. McGann and P. Shillingsburg, et al., who saw e-text primarily as a product of social interaction between multiple agents: the author, editor, publisher, and so on (Schreibman 2002: 288-291.). The researchers' achievement is to develop General classification criteria and methodological approaches for studying electronic texts from the point of view of archival science. Attention was drawn to their dynamism, i.e. variability, their content, time and place of appearance as features that make it difficult to attribute them.

The practice of analytical reviews of electronic resources has increasingly attracted researchers, so A. McMichael associates the beginning of involvement in the scientific turnover of electronic data with the formation of historical scientific and educational websites, h-net (History-net) (McMichael 1998: 88).

In this area, special mention can also be made of the publications of S. Smith (Smith 1998: 2), Yu. Daniel, (Daniel 2004: 293-301).

As part of the historiographic review, it is worth noting the work of researchers from the CIS countries, primarily Russia. The application of information theory to the study of historical sources is associated with the name of I.D. Kovalchenko (Kovalchenko 2004: 486). L.I. Borodkin devoted his works to the study of historical Informatics (Borodkin 2008: 8), interdisciplinary synthesis in historical research is considered in the works of V.I. Vladimirov (Vladimirov 2005:192), G V. Mozhaeva (Mozhaeva 2004: 58-78). The processes of Informatization of archival business in Russia are covered in the works of Yu.Yu. Yumasheva (Yumasheva 2017: 40), the use of information technologies in the archival sphere is considered in the work of L. p. Afanasyeva (Afanasyeva 2010:406), the theory and practice of information management in the digital economy are considered in the works of M. V. Larin (Larin 2018:279).

If the work of the Belarusian researcher V. L. Nosevich highlights the main activities of Belarusian archives on the introduction of modern information technologies, including the digitization of documents and providing access to archival information on the Internet (Nosevich 2013: 67-70), then the problems of legal regulation of the Informatization of archival business in Belarus are considered in scientific publications by E. p. shcherbatsevich (shcherbatsevich 2014: www.pravo.by).

In Kazakhstan, the problems of studying electronic information are presented in the works of S.A. Zhakisheva (Zhakisheva 2019: 234), K.A. Alimgazinov (Alimgazinov 2014: 348), B. Dzhaparov (Dzhaparov 2014: 16-26), V.M. Chuprov (Chuprov 2018:103-104), and others.

Currently, it is important to expand the theoretical developments in Kazakhstan's historiography devoted to the Informatization of archival business, the study of electronic documents as historical sources, and directions of domestic research based on interdisciplinary synthesis. In this regard, the study of archival documents as sources in the digital environment deserves serious attention from domestic researchers.

Modern trends of automation and informatization of archival business in the Republic of Belarus

Let's focus in more detail on the process of informatization of archival business in the Republic of Belarus.

In the Republic of Belarus, comprehensive automation of the main areas of work of state archives in 2003-2015 was carried out in accordance with the government-approved strategy for the development of the information society in the Republic of Belarus for the period up to 2015, the State program "Archives of Belarus" for 2011-2015, and the industry strategy for automating the archive industry in the near future (2005-2010) (Sherbatsevich 2019: www.pravo.by). The main goal of the state program "Archives of Belarus" is to preserve and replenish the National Archive Fund (hereinafter-NAF) of the Republic of Belarus as an integral part of the historical, cultural, information and intellectual property of the people of Belarus, creating conditions for ensuring broad access of citizens to information resources (<http://archives.gov.by>). Among the identified tasks there are ensuring the safety and replenishment of the NAF of the Republic of Belarus; expanding access to archival documents and providing citizens, society, and the state with retrospective document information; introduction of information products and technologies in the field of archives and records management.

Informatization of the Belarusian archives is developing in three directions. The first of them is to provide acquisition of new types of documents that are initially created in digital form ("digital-born", as they are called recently). For this purpose, in 1998, the Belarusian research center for electronic documentation (Belnitsed) was established in the structure of the archival industry. One of its statutory functions is the state storage of electronic documents of the National Archive Fund. For this purpose, the center has an archive of electronic documents. By the time it was commissioned in 2000, it was the first specialized archive of this kind in the post-Soviet space and one of the first in the world.

The second direction is the creation and implementation of application programs that automate the work of archivists. This applies to traditional activities aimed at accounting, ensuring the safety of paper documents, and managing access to them. The strategy of automation of the archival industry planned until 2010 provided for the creation of a standard information system "AIS archive ED" which automates all the main activities of archivists.

Now this system is put into commercial operation in almost all state archives (5 central and 25 regional and zonal) and in regional government bodies.

The third area of greatest interest is the creation of digital copies of paper documents, scientific References apparatus for them, as well as providing access to archival information through Internet technologies (Nossevich 2013: 69).

Since October 1st, 2012 an online access to the test version of the State stock catalog containing the names and brief annotations of funds stored in all state archives has been opened. This was the first step towards placing a scientific References device on the Internet.

The first experience of creating descriptions in accordance with the ISAD (G) standard was gained by Belarusian archivists when working on the project “Documentary heritage of the Polish-Lithuanian Commonwealth”, which was carried out within the framework of the UNESCO Program in 2009 jointly by employees of archives and libraries in Belarus, Lithuania, Poland, Russia and Ukraine, with BelRCED (Belarusian Research Center for Electronic Documentation) acting as the coordinator. In 2011, the Automated information system (hereinafter – AIS) of the state archive and the automated information system summary for management bodies (AIS summary) were put into commercial operation. The AIS of the state archive consists of a single database (hereinafter-DB) and seven interrelated software modules: “Acquisition”, “Personal funds”, “Accounting”, “Security”, “Scientific References apparatus”, “Use”, “Administrator”. Summary AIS allows you to integrate data accumulated in the AIS databases of state archives, and generate reporting and statistical information. The consolidated AIS consists of a single database and three interconnected software modules: “Acquisition”, “Stock catalog” and “Administrator”.

In 2012, within the framework of the state program “Archives of Belarus”, a project was launched to create a system of open access to documents of the National Archives Fund. This will be the first information system in the archive service of Belarus based on the ISO 14721:2003 standard “Open archive information system. References model».

In 2013, a separate AIS of audiovisual documents was developed for the Belarusian state archive of the FVSD (Film Visual Sound Documents) in connection with the specifics of film and photo documents (hereinafter – FPVD). The digitization of Sound and Visual documents in Belarus started at

the same time as the European archives. Along with photographic materials, archival audio documents are being digitized especially actively, and digitizing film materials is somewhat more difficult. Professional high-quality equipment for digitizing films is very expensive. Therefore, Belarusian TV companies are provided with archival film materials on magnetic tapes in the Betacam and DVCAM standard.

Currently, the main tasks of Belarusian archivists are to ensure the acceptance of electronic documents for storage, and therefore, by 2020, Belarus will begin accepting electronic documents for storage in state archives.

Thus, modern information technologies are being actively introduced in the archive industry of Belarus: digitization of documents, provision of online access to archival information on the Internet, introduction of AIS, open access system, and storage of electronic documents.

Informatization of archives in China

Of great interest is the experience of foreign countries that have achieved significant results in the Informatization of the archive industry on the example of China and Korea, which gives an overall picture of Informatization on a global scale.

Electronic documents have appeared in the archives of the PRC since the end of 1980. a Number of regional archives began to purposefully form digital archive resources in three ways:

- by accepting electronic original archived documents from the record management services;
- digitization of traditional documents stored in archives;
- use of electronic documents.

In order for electronic documents to meet the established requirements, the State interdepartmental joint meeting on electronic document management was established in 2009. It unites a number of specialized central departments for managing records management, archival documents, and information technologies. For the management of electronic archival documents, the State archive administration of China has developed industry standards such as the “Metadata standard for official electronic documents”, “Standard format for ensuring the long-term preservation of electronic documents”, “Package of electronic documents in XML format”. In the field of long-term preservation of electronic information, the National natural science Foundation of China discusses problems related to ensuring the safety of electronic documents, issues

of standardization and development of common strategies (Khrantsovskaya 2009: <http://rusrim.blogspot.ru>).

In 2012, with the support of the State interdepartmental joint meeting, the state archive administration of the PRC developed a Procedure for transmitting and receiving electronic archival documents, which defines the duties of the staff and the organization of work.

During the testing, it was possible to establish a References system for transmitting and receiving electronic archival documents. In addition, a procedure for long-term storage of electronic archival documents, a project for organizing and storing electronic archival documents, a list of metadata of electronic archival documents, and a draft test of electronic archival documents used for quality assessment were prepared. In 2014, after the completion of the pilot projects, the relevant experience was distributed throughout the country.

For the further development of digital archives, a number of tasks have to be solved. So, since 2015, the staff has started to develop new universal functions of the electronic document management system, taking into account the latest technologies. In the second half of 2016, a standard was developed for the unification of electronic document management systems created by different companies, and for the preparation of shared access to data from any digital archive. According to the latest program of the state archives administration of China, by the end of 2020 in all provincial, city, and County archives, the proportion of digitized permanent storage documents should be 30-60%, 40-75%, and 25-50%, respectively.

On July 27th, 2016, the Chinese government released “The national strategy for the development of informatization”, which consists of three stages:

The first of them will be completed in 2020, by which time the PRC should take the leading positions in key technologies of the IT industry, and Informatization should become the leading driving force of modernization.

The second stage will last until 2025. The authorities expect that a group of multinational corporations will appear in China during this period.

The third stage will last until 2050. according to the plan, by this time China will have strengthened its status as a cyber power (national strategy for the development of informatization).

To date, a number of interdisciplinary research projects in the field of information development are planned in the people’s Republic of China:

1. “Studying the formation of collective memory

in the era of transformation of society and the evolution of information carriers” (2013-2014).

2. “Study of identification and capture of electronic documents” (2010-2015).

3. “Exploring the relationship between document classification and archival description” in the framework of the lifecycle management concept (2013-2015).

4. Review of “National and international achievements in electronic document management” (2009-2015).

5. “Strategies and methodologies for implementing metadata schemes for electronic documents” (2013-2016).

6. “Initiatives in the field of open electronic document management” (2014-2016) (<http://www.tsutmb.ru>).

Thus, the informatization of archives in China is presented in the organization of electronic document management (LAN); in the processes of cataloguing, descriptions, and search archived information; to organize the use of documents (e-manuals and copies); in securing (regulation of climate archives, digital restoration).

Korea’s experience in managing and storing electronic documents

The archive system of the Republic of Korea is no less significant. It began to form in the period after the country’s liberation from Japanese colonization and developed in close relationship with socio-political and economic transformations. In the early 1950s, a systematic collection of historical documents on the activities of entrepreneurs, tax policy, and other areas of public life created since the Japanese conquest of Korea was started. Then there was a period of establishing state control over the maintenance and preservation of public documentation, and developing legal documents on business management. In August 1969, the government archives and Records Service was established in Seoul, under the Ministry of government administration. This archive has received the status of a special authorized state body with the right to control the quality of archival work and records management in the country. In November 1984, due to the increase in the volume of documents that were subject to state storage, a branch of the archive was opened in Busan and a repository was built, which is now called the “History Repository”. In July 1998, after the reorganization of the Ministry of government administration into the Ministry of government administration and

internal Affairs, the head office of the Government archive with a record-keeping service from Seoul was moved to Daejeon.

In the period 1999-2004, the legal framework regulating work with documents and archival storage was improved. On January 29, 1999, the law Public Records Management Act was adopted for the first time. In April 2004, the Government archive with records management is renamed the national archive and records Management (<https://cyberleninka.ru/article/n/arhivy-respubliki-koreya-istoriko-dokumentalnoe-nasledie/viewer>).

The period since 2005, marked in the country as the “Era of the evolution of the Korean archival system”, has been marked by a significant strengthening of the legal framework for archival Affairs. In April 2007, amendments were made to the law “on the management of public (public) documents”, and a resolution was adopted on the procedure for its application. The law is aimed at legal regulation of relations between departments and archives for the collection, storage, accounting and use of both traditional and electronic documents. The law “Presidential Records Act” was adopted, and in July of the same year – a resolution on its application. This preceded the opening of the Archive of the President of the Republic of Korea. In October 2007, the national archives and records management service was renamed the national archives of Korea (NAC). In November 2008, construction of a new building was completed in Seoul, where the opening ceremony of the NAC was held in December. It currently houses the National repository (NARA Repository). In 2013, the National archives building in Daejeon was built. In the past, 2016, the Archive of the President of the Republic of Korea was relocated to a new building in Sejong.

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The system for storing documents in the National storage facility in Seoul is standard, and the standards for temperature and humidity, light, security, fire, and other modes are strictly maintained. Attention is drawn to the use of modern information technologies to ensure accounting, control over the safety and maintenance of scientific References apparatus (hereinafter-NSA). A system of RFID technologies (bar-coding of cases) has been introduced, which allows for rapid search and control of their movement within the archive.

Of particular interest is the best practices of the Republic of Korea in managing and storing electronic documents. Public administration in the Republic of Korea is based on e-government. Since 2010, Korea has maintained its top position in the UN e-Government Survey to assess the level of e-government development in the country.

The history of creating information systems related to document management begins in 1999. Then the Law on managing records of a state institution was adopted. A three-stage record management system was created that includes record creation, record management, and archive management.

In 2006, the law was completely changed to strengthen these steps and manage recording procedures, both for electronic and traditional documents. The amendments to the law made it possible to transform a simple electronic document system intended only for signing documents into an integrated “Service management system”, which already had various functions, such as electronic signature, management, document registration, reporting, video conferences, etc.

Since 2004, institutions have started implementing the “Records Centre System” for managing records created from the document creation system. Each institution selected one of the certified commercial programs that met their needs. During the implementation process, there were difficulties connecting this software to the “Central archive management System” (CAMS), developed in 2006 by the national archives of Korea. To solve this problem, NAC developed the standard “record management system” (RMS) software for government agencies and distributed it to nearly 750 institutions. Since 2007, the electronic document management system has been switched to a paperless basis.

The “records management system” (RMS) is a standard system that each institution introduces for record-keeping processes in RMS are organized to perform accounting tasks, regardless of the creation of an electronic record. Documents on traditional media created in structural divisions are registered, digitized and placed in the system.

Transmitted electronic records are stored on the server after sequential procedures, such as checking metadata and checking for viruses. Documents with a retention period of more than 10 years are converted to a long-term storage format (NEO-NAK, s Encapsulated Object), developed by NAC in 2008. NEO-format is an XML-encapsulated format consisting of an object with an electronic signature and certification information used in this electronic signature, which ensures the reliability and integrity of electronic records for a long time.

Created official documents are transferred annually to the “file Records” block, which is a set of “Case” folders. They contain electronic documents consisting of the main document and its Annex. The original document created in various formats is saved. Then each document is converted to PDF A-1, according to ISO 19005-1. The entire Case folder is then converted to NEO format, which includes certification information belonging to the institution, the signed object of the original documents, PDF files, and associated metadata.

The Central archive management system (CAMS) is an integrated archive management system that provides functions such as receiving, storing, recording, using documents, etc.

Every year, each institution prepares lists and files for more than 10 years of storage, which are transferred from the “records management system” (RMS) to the Central archive management system (CAMS) either online or offline via recording on portable devices. Transmitted electronic documents

are stored in the receiving domain then moved to an isolated domain for quality control. At this stage, files are scanned for viruses, visualized and verified that the certificate used to sign files is valid and that the file formats match the technical specifications. After all checks, electronic records are signed electronically using the NAC certificate and transferred to the storage domain. To ensure security, electronic file repositories are geographically separated and located in different cities.

Documents on paper and other media stored in the NAC are digitized and entered into the CAMS system as planned.

Since 2007, the national archives of Korea has established and operated a “long-term verification System” to manage long-term verification data and provide certificate verification services. It is associated with four certification authorities for administrative, educational, military, and civilian domains to collect their certificate revocation lists.

The system also provides online access to archive information of interest. A full-scale transfer of electronic documents has been started since 2015. Now the national archives of Korea is tasked with creating an advanced record management system in accordance with the digital environment, including the expansion of cloud technologies.

The successful implementation of e-government was facilitated by the strengthening of the legal framework for documentation and archival Affairs of the Republic. Today, South Korea has 65 national standards that facilitate the management of archives within certain norms, including the production and management of electronic records. In addition, to increase the level of archive management, each Agency should be provided with special personnel for document management. By 2017, the level of provision of special personnel was 73% (Organization of archival business... 2019: 51).

Much attention is paid to the promotion of archival heritage. All NAC buildings have exhibition halls where permanent and temporary thematic expositions are presented. In addition to documents and photos, items of state symbols, awards, gifts, etc. are displayed. It should be noted that special visiting programs have been developed for school students, including Junior classes, where the material is presented in an interactive form. The exhibition is also available online at the web portal of the company.

The archive system of Korea is similar to the archive system of Kazakhstan. The same principles and methods of storage, acquisition, and use are applied. Archivists in Korea focus

a lot of attention on the problem of ensuring the safety and use of electronic documents in the long term. A policy is being developed to improve preservation functions to extend the durability of originals, high-quality preservation processing to create master copies, adopt a policy for using a single format to ensure cost effectiveness, and promptly expand, modify, and replace digital preservation systems.

Conclusion

Thus, based on the analysis of foreign experience, we can draw a number of conclusions:

Trend of distribution of electronic documents in practice public administration is common.

To date, there is no sufficient legal framework for electronic documents and electronic archives. In this regard, it is necessary to develop state standards for media, description and storage of electronic documents and databases, and technological regulations for the migration of electronic documents at different levels (transfer of electronic documents and databases to departmental archives, and from departmental archives to state archives). For the

archive industry of the Republic of Kazakhstan, such a regulatory and methodological document is required. Therefore, at present, in connection with the digitization of archival documents and the creation of an electronic archive, there is an urgent need to improve the legal and methodological base of the archival sphere, which will give an additional impetus to the development of the archive industry in Kazakhstan.

The introduction of information technology in the archive sector, leads to a specific revision of the content of archival work, the development of new approaches to the preservation of retrospective information, methodical work, including the creation of an electronic archive, automation of the ongoing work of archival institutions in the stages of gathering, recording, transfer to state storage and use of documents of national archive Fund of Kazakhstan.

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