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INFORMATIZATION OF ARCHIVAL BUSINESS IN KAZAKHSTAN (foreign and domestic experience)

The article deals with the computerization of archival Affairs in Kazakhstan based on the analysis of foreign experiments on the example of Russia and the United States. The United States is one of the most advanced countries in the field of information technology in archival institutions. The experience of the University of Minnesota on the use of digital technology was also considered. University of Minnesota is a leading University in the United States, it is included to the top 200 best universities in the world. In this regard, it is important to study foreign experience in this field. The study of foreign experience in the field of computerization is the exact thing that is necessary for the Kazakh archival industry. The article highlights Kazakhstan's experience of computerization of the archival sphere on the example of the archive of the President of Kazakhstan. The archive of the President of Kazakhstan has done a lot of work in the field of information: the Archive adopted the concept of information, created a system of «Electronic archive», implemented a number of local information retrieval systems (IRS) and databases for thematic complexes (funds) of archival documents, organized on-line access of virtual users.

Key words: Informatization, archival business, information technology, electronic archive, foreign experience.

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Қазақстанда архив ісін ақпараттандыру (шетелдік және отандық тәжірибелер)

Мақалада Қазақстанда архив ісін ақпараттандыру мәселесі шетелдік тәжірибелерді талдау негізінде Ресей мен АҚШ-тың мысалында қарастырылады. АҚШ архив мекемелерінде ақпараттық технологияларды енгізуде ең дамыған елдердің бірі. Сондай-ақ, Миннесота университетінің цифрлық технологияларды қолдану тәжірибесі де қаралды. Миннесота университеті әлемдегі ең үздік 200 университеттің тобына кіреді және АҚШ-тың жетекші ЖОО болып табылады. Осы тұрғыдан алғанда ақпараттандыру саласында шетелдік тәжірибені зерттеу өте қажет. Мақалада Қазақстан Республикасы Президенті Архивінің қызметі негізінде архив саласын ақпараттандырудың қазақстандық тәжірибесіне ерекше назар аударылады. ҚР Президент Архиві ақпараттандыру саласында көптеген жұмыстар атқарды: Архив ақпараттандыру тұжырымдамасын қабылдады, «Электронды архив» жүйесі құрылды, жергілікті ақпараттық іздеу жүйелері және архив құжаттарының тақырыптық кешендерінің мәліметтер базалары енгізілді, виртуалды пайдаланушылардың онлайн режимі ұйымдастырылды.

Түйін сөздер: ақпараттандыру, архив ісі, ақпараттық технологиялар, электронды архивтер, шетелдік тәжірибе.

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Информатизация архивного дела в Казахстане (зарубежный и отечественный опыт)

В статье рассматривается информатизация архивного дела в Казахстане на основе анализа зарубежных опытов на примере России и США. США являются одной из наиболее передовых стран в области внедрения информационных технологий в архивные учреждения. Также был рассмотрен опыт Университета Миннесоты по применению цифровых технологий. Университет Миннесота является ведущим вузом США, входит в топ 200 лучших университетов мира. В этой связи важным является изучение в области информатизации зарубежного опыта. В статье большое внимание уделяется казахстанскому опыту информатизации архивной сферы на примере архива Президента РК. Архив Президента РК проделал большую работу в сфере информатизации: Архивом была принята концепция информатизации, создана система «Электронный архив», внедрены ряд локальных информационно-поисковых систем (ИПС) и баз данных для тематических комплексов (фондов) архивных документов, организован on-line доступ для виртуальных пользователей.

Ключевые слова: информатизация, архивное дело, информационные технологии, электронный архив, зарубежный опыт.

Introduction

In recent years, the introduction of modern information technologies in all spheres of life of our society is of great importance. Modern computer technologies are also widely used in archives. The introduction of new information technologies in the work of archives expands access (including remote, i.e. through global computer networks) to documentary information, creates new forms of publication of documents and directories on non-traditional media.

Computerization of archival business is a process of improvement of technologies of archival documents processing by implementing theoretical and applied developments of computer science in archival business and use of computer equipment and the software in work of archives. The implementation and active use of modern information technologies will improve the efficiency and quality of the archives and the archive Fund as a whole.

Foreign experience in Informatization of archival work.

The study of foreign experience in the field of Informatization can have a positive effect in determining the most rational methods and ways of development for the domestic archival industry. Currently, many archives in the world used the opportunity to present to the users of archival documents in electronic form. There is some experience in this field abroad.

Let us dwell in more detail on the process of Informatization of archival Affairs in the Russian Federation, which are approximately at the same level with Kazakhstan.

Over the past few years, a number of documents have been adopted in Russia, including measures to informatize the sphere of culture. The basic documents in this regard are the State program of the Russian Federation «Information society (2011-2020)», «Strategy of development of the information technology industry in the Russian Federation for 2014-2020 and for the future until 2025» and «action Plan («road map») «Development of the information technology industry».

In order to develop and concretize the state program «Information society» in the archival sphere, a Program of Informatization of the Federal archival Agency and its subordinate institutions for 2011-2020 was developed and adopted, two versions of the project «Concept of development of archival Affairs of the Russian Federation for the period up to 2020»were published.

The problem of creating information resources based on archival documents is closely linked to the issues of copyright, intellectual property, the solution of problems of access to personal data, the «right to be forgotten» and other legal issues that may arise in the process of creating, presenting and

using resources. Therefore, it is necessary to study and constantly monitor the legal field, to some extent regulating the activities in the digital environment.

According to Yumasheva Y.Y. problem it is advisable to consider in connection with necessity of development of a branch of the concept of creation of archival information resources, which should be reflected also questions to study the possibility of adapting traditional archival methods of work and presentation of archive information to electronic environment including the prospects of scientific-reference apparatus (NSA) in the electronic environment: transfer of paper records to electronic form, necessary to determine what should be this kind (Yumasheva, 2015: 321): IPS, graphic image etc.; the fate and functionality of inventories in the era of electronic systems: from EDMS to the industry software complex of the Federal archive Agency «Archive Fund», designed to automate the accounting of archival documents of permanent shelf life transferred to the state archives); the study of techniques and methods of traditional archival heuristics in connection with their transfer to an electronic environment; search and description of new, possible only in the electronic sphere, methods of research documents; the study and development of the basic requirements for the description and publication of archival documents in the electronic environment, the definition of the typology (forms) of publications of archival documents and standard requirements for them; the formation of requirements for various (catalog, within the thematic resources, full Archeographic, accompanying facsimile reproduction) descriptions of electronic copies and originals of archival documents; the formation of requirements for the publication of electronic copies (metadata of different levels and purposes) and the development of standards of description) (Cuz`min, 2013).

Among the automated archive technologies (AAT) the databases of the simplest structure on large homogeneous data sets quantitatively prevail. For each direction there are several software products made by different developers on different shells. For example, the database of the Ministry include «archives», «Stock catalog». The database developed by vniidad includes «archive Passport», «Accounting of funds», «abstract of funds», «Institutions – sources of acquisition», «accounting of Execution of requests», «Reading room», «Physical condition of documents», etc.

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

The United States is one of the most advanced countries in the field of information technology and its applications in the NARA – National Archives and Records Administration (National archives and records administration).

Now, NARA is deservedly one of the largest and most authoritative organizations in the world in the field of archives and records management. The vaults of the National archives of the United States contain more than 7 billion paper documents, 5.5 million maps, about 35 million photos.

The main normative act that guides NARA employees is the Nara Strategic work plan, which is developed for a period of 10 years with possible updates every three years. The current plan is valid from 2006 to 2016 and is called: «Save the past to protect the future». At the end of 2009, the center for advanced systems and technologies (NCAST) was officially announced. According to the plan, the new structure should become a leading research center in the field of computer design and archival Affairs.

Ensuring broad access to archival materials is also a priority for NARA. Since 2010, the national center for declassification of archival documents has been functioning. The center has a special laboratory dedicated to declassification of documents on special media. In early 2013, the NARA administration approved the project to implement the first digital public library in the United States (digital Public Library of America – DPLA). According to the project, it is planned to create conditions free access to archival documents on the political, cultural and scientific history of the United States online. Thus, it is planned to digitize 2 million copies from the NARA catalog (Website of the National Archive of the USA, 2009). These are the main milestones in the formation and development of the National archives and records management of the United States in the field of information technology.

The national archives of the United States began to accept electronic documents for storage in 1970. At that time, a number of search engines were developed and implemented: SPINDEX-II, the purpose of which was to simplify the preparation of guides to various types of documents; NARA A-I, created to compile a topographic index on the placement of groups of documents and the integration of descriptions of archival series in a single file with a standardized format.

In 1972, the Center for electronic archival documents at the National archives was established in Washington. In the center, electronic documents

are stored in flat files consisting of homogeneous data, not related to each other; the content is presented in the form of tables.

In 1997, the Department of defense issued DoD 5015.2 – STD, which set out a list of basic requirements for the document management automation program. NARA specialists for use in all Federal institutions recommend the second version of this standard, created in 2002. The third edition, which was published in 2008, was supplemented by the rules governing the transfer of electronic documents for permanent storage in the national archives of the United States (Afanasieva, 2010:114)

Now let's look at the experience of the University of Minnesota in the use of digital technology. University of Minnesota is a leading University in the United States, it is included to the top 200 best universities in the world and is ranked 156th place in QS – world ranking. The University of Minnesota is a large, public, research institution with five campuses spread throughout the state of Minnesota. The largest campus is located in Minneapolis/St. Paul, the «Twin Cities», and serves nearly 50,000 students, with nearly 4,000 faculty and 14,000 staff. With such a large institution, archiving and preservation tasks take place in many ways, at many levels. The University possess archives including historical documents about the institution and the state, research materials generated by faculty, as well as numerous collections that have been donated or acquired by the University.

The primary organization responsible for the management of archival materials is the University Libraries (http://lib.umn.edu), which oversees a division called the University Archives (https://www.lib.umn.edu/uarchives), as well the department of Archives and Special Collections (https://www.lib.umn.edu/special). The University Archives are responsible for preserving «historically valuable documentation of University units and individuals, including faculty, staff, and administrators». They preserve both physical and «born-digital» assets. The University also serves as a depository for numerous state, federal, and international documents.

In addition to materials specific to the University, Archives and Special Collections maintains over 6000 collections across 14 collecting areas, documenting the history of technology, the world's largest collection of children's literature, the largest collection of material on Sherlock Holmes, and many other extensive collections. These collections are spread across multiple storage facilities, including an extensive underground cavern system specially built for long term archival, and holding over 1.5 million volumes. Beyond archiving, many groups within the University run digital preservation efforts designed to ensure that teaching materials remain accessible and easily discoverable for use within classrooms throughout the University.

At the University level, the digital preservation efforts of the University Libraries are guided by a Digital Preservation Framework (https://www.lib.umn.edu/dp/digital-preservation-framework) which provides guidance for technical and governance policies. These areas include issues of trust, metadata standards, long term file integrity, and access policies. Unless there are specific legal reasons preventing the sharing of information, the goal of preservation efforts is to make materials accessible to a wide audience. This is achieved in a number of ways. The University maintains the UMedia Archive (http://umedia.lib.umn.edu), an in-house digital asset repository which collects a huge volume of digitized documents, images, audio and video files. These include large numbers of whole-book archives and documents ranging from antiquity to the modern day.

With so many archival efforts taking place across the institution, there is no single «standard» in use for the digitization of assets. Different organizations make difference choices based on their professional expertise, budgets, and use cases. The descriptions that follow cover the general cases.

Two-dimensional assets (documents, books, photos, slides, etc.) are generally acquired as TIFF files and stored at their native resolution, without compression, with a color sampling of 24 bits per pixel. Documents and books are captured at either 300dpi or 600dpi, while slides are generally captured at between 5000 and 6000 dpi. There is no fixed resolution target (in terms of pixels), but rather a target dpi determines the resulting resolution based on the physical dimensions of the object. In general, we seek to embed appropriate metadata directly in digital assets.

Capture devices include essentially every type of technology available within this discipline. This includes traditional flatbed scanners, high speed document scanners, overhead scanners, book scanners, copy stands with large format digital cameras, slide scanners, and custom hardware.

It is likely clear by now that there is no «one» platform for the management of digital materials at the University. The University runs some platforms itself, including some that are developed internally. It also takes advantage of numerous platforms maintained by other organizations. A key to all of

these platforms is an ethos of «open source». In general, all of the technology behind these tools are released as free and available for others to examine and repurpose. In general, all of these preservation efforts work to ensure that assets are safe, secure, trusted, and discoverable. This includes things like keeping many redundant copies, chain-of-custody metadata, fixity checks, and reformatting of material as appropriate. Some material is also «dark archived» – stored entirely offline and in long term archival facilities using technologies like LTO tape. Many of the previously mentioned platforms are based on the Fedora open source repository platform (http://fedorarepository.org), with a variety of interfaces based on platforms like Drupal or Hydra/Samvera. Fedora provides much of the necessary integrity management.

One special case is our «Elevator» digital asset platform (http://elevatorapp.net), which was developed by the College of Liberal Arts to provide a low cost, highly flexible digital asset platform for archival collections that are still being developed and actively grown.

Elevator is a cloud-hosted platform that utilizes Amazon Web Services (AWS). It allows for the creation of numerous, independently managed collections, which can have custom metadata structures, organizational standards, and permissions. Elevator is designed to accept any type of digital asset, and leverages an extensive asset processing toolset to automatically create access copies. This same platform can be used to bulk-reformat content if a forward migration is deemed necessary by archivists.

This approach to a rapid, easily scaled digital asset platform has found diverse uses across the University of Minnesota and other institutions. It currently hosts everything from collections of art history research materials (http://dcl.elevator.umn.edu), archival syllabi collections, medical specimen samples, radiology data, archaeological rock samples, and many other types of assets.

By leveraging the Amazon Web Services platform, Elevator is able to take advantage of very low-cost cloud computing and storage. Amazon's S3 storage platform provides high durability data storage at a low cost. The S3 platform itself also includes built in fixity checks and asset restoration in the case of damage. The standard durability figure of 99.999999999% is appropriate for the types of media Elevator preserves, though that can be enhanced by leveraging other Amazon technologies. Elevator is an open source application, built using the PHP programming language with the CodeIgniter framework. It leverages many Linux virtual machines deployed within Amazon's EC2 service. Metadata is maintained in a PostgreSQL database, and search is handled through Elastic. Other key technologies include Redis, Beanstalkd, and Chef. Asset manipulation takes advantage of standard open source tools like FFmpeg, Imagemagick, OpenOffice, Blender, and many others.

Kazakhstan experience of informatization of the archival industry

The archive of the President of Kazakhstan is a pioneer of computerization of the archival sphere in the Republic. The archive of the President of the Republic of Kazakhstan adopted the Concept of computerization of the institution in 2014, for its phased implementation «the Program of computerization of the Archive for the years 2014-2016, then for the years 2017-2019» was approved (Dzhaparov, 2014).

By the decree of the President of the Republic of Kazakhstan dated January 14, 1994 № 1502 on the basis of CGA of modern history of Kazakhstan was created the Archive of the President of the Republic of Kazakhstan, which entered the jurisdiction of the presidential Administration, which had a positive impact on the financing and logistics and continued work on information. In 1998, the Archive was completed development of database software «Accounting of archival funds», «Stock catalog» and «Nominal catalog» (for funds of personal origin).

Work on the development of information technology required the development of a systematic approach based on the policy document. At the request of the Archive of the President of the Republic of Kazakhstan, the Archive Agency of the Russian Federation put into operation the program complex «Archive Fund» and signed an agreement on gratuitous use. By order of the President of the Republic of Kazakhstan dated June 15, 1999 No. 52 a new regulation on the Archive of the President of the Republic of Kazakhstan was approved, which establishes a fundamentally new obligation – to accept electronic documents for state storage together with software and appropriate electronic computing equipment. From 1999 began to operate the program complex «Archival Fund», which took into account the characteristics of accounting documents of the party organs, the party and investigative, personal and appellate cases of the Communists. In accordance with the State program for the formation and development of the national

information infrastructure, approved by presidential decree No. 573 of 16 March 2001, the concept of an «Electronic archive of a state body» was envisaged and implemented, which was designed to create an electronic archive and ensure the storage and retrieval of archival documents, as well as to provide ample opportunities for their classification and use. The archive of the President of Kazakhstan was included in the list of institutions of the first stage.

In 2001, the archive Fund database was again improved – the fields were expanded and data on the physical state of Affairs were entered: the number of damaged documents requiring filing and restoration, restoration of low-contrast text, the presence of particularly valuable documents, insurance Fund, use Fund and secret Affairs.

The system «Electronic archive» (SEAGO), supposed at that time for implementation, was intended for acquisition, storage, accounting and use of electronic documents in departmental and state archives. It is based on a document-oriented data warehouse with an information retrieval system based on the IBM Content Manager Software product that provides the ability to search for information both on the details of the attributed documents and their content (context). The industrial database management system (DBMS) DB2 is used as a database.

The adoption in 2004 of the State program «On the creation of e-government» gave a powerful impetus to the widespread introduction of a unified system of electronic document management in state bodies (esedo). By the resolution of the Government of the Republic of Kazakhstan dated April 17, 2004 № 430 the rules Of electronic document circulation were approved. The archive of the President as a state body was included in the list of users. In April 2005, was approved the program of development of Archives in 2006-2008, in accordance with which provided for digitizing 18 thousand staff microfiche of the insurance Fund copies of valuable documents, 2400 cases of 240 thousand sheets. During the year, more than 5 thousand personnel of microforms from the Fund 139 «Kirobkom RCP (b) were transferred to digital format for the first time. With the help of new equipment the restoration and digitization of audio recordings of the Fund 5-N «President of the Republic of Kazakhstan» for 1992 (about 28 hours. soundings.) In November 2005, SEAGO was officially put into operation in the archive of the President of Kazakhstan (Chuprov, 2018).

In the framework of Informatization since 2006, the Archive was opened to researchers have access to the database: «Decisions of the party committees», «Personal directory», «Personal file Cabinet», «archives», «the Acts of the President of the Kazakh SSR». At the same time, the creation of an electronic photo library and a thematic catalog for photo documents began.

In 2011, the third version of the database «Archive Fund» put into operation, which was developed by the Republican state enterprise «Banking service Bureau of the National Bank of Kazakhstan» on the basis of «Lotus Notus». The database was a separate module in the electronic archive system. The program provides automatically: a General list of funds by types and categories, the number of inventories, storage units, personnel of the insurance Fund of particularly valuable documents, personal, party investigation and personal Affairs, personal origin, passport Archive. The database is connected on a local network to the module «Reading room» and the researchers could receive, taking into account the degree of access to electronic inventories, cases and the entire scientific reference device to them.

Thus, by 2014, a number of local information retrieval systems (IPS) and databases for thematic complexes (funds) of archival documents were developed and implemented in the Archive, which were intended for operational reference and information services for consumers of archival information, as well as for the preparation of archival directories in an automated way. These include local databases (DB) of the most popular funds stored in the Archive: «Policy decisions of the Supreme authorities», «Archival Fund», «Acts of the President of the Kazakh SSR», «Acts of the President of Kazakhstan», «Especially valuable documents», «Institutions – sources of acquisition of the Archive of the President of Kazakhstan», «Personal catalogue of documents of personal origin», «Personal file of documents of personal origin», «reference and information Fund», «Library Fund», «Nomenclature personnel of Soviet Kazakhstan». A total of 16 information retrieval modules were developed and implemented in the main areas of the Archive (Shailazymov, 2017).

The creation in the Archive of a single electronic database of primary documentary information by digitizing paper originals, as well as audio, video and photo documents, lagged far behind modern needs. The objective reasons preventing the mass digitization of documents were a huge amount of source material, the high cost and complexity of work, the limited involvement of foreign organizations in its implementation due to the «regime» conditions.

An important and promising component of the IPS Archive is the organization of on-line access

of virtual users to its information resources on the Internet in the form of a specialized archive portal. Internet technology also plays a significant role in the internal archival segment of the use of documents. In particular, the automation of the reading room requires automated formation of requirements, obtaining permission to issue a document and transfer requirements on the local computer network to the repository, the formation of statistical reporting on the use of archival documents, etc. in Addition, this portal can be used as an innovative educational resource, including for the training of students and advanced training of specialists in archival Affairs.

The development of databases on personnel, financial and material condition of the Archive and the use of electronic systems will make it possible to increase the validity and efficiency of management and planning, monitoring the implementation of decisions.

Informatization of the Archive of the President of Kazakhstan, which is entrusted with the task of providing scientific, methodological and practical assistance to the state and departmental archives of the Republic of Kazakhstan, will achieve the greatest effect when, following his example, « e-archives «of institutions-sources of acquisition of the Archive and all archival institutions of the country will be developed and implemented, and a single corporate electronic network of archives of Kazakhstan will be created.

In April 2017, the Archive of the President of Kazakhstan hosted a presentation of the system «Electronic archive» organized in the framework of the program «Digital Kazakhstan» in accordance with the Message of the President of Kazakhstan N. Ah. Nazarbayev «the Third modernization of Kazakhstan: global competitiveness». During the presentation, topical issues of development and implementation of information technologies in the state archives of Kazakhstan were discussed.

At the beginning of 2017, an introduction to the activities of leading archives and libraries of the United States, which took place within the framework of the program «International visits on request», theme: «Technical development of archives». The organizer was the Department of State. The program included visits to the archives and libraries of four major cities: Washington, Chicago, New York, and Boston.

Much attention was paid to familiarization with the technique and technology of the main directions of archival activities of the host country: ensuring the preservation of archival documents, the creation of an electronic Fund of use, the creation of an insurance Fund, the operation of information systems and databases, scientific reference apparatus, work with researchers, as well as information security (Alimgazinov, 2018).

The electronic archive of the Archive of the President of Kazakhstan was created on the platform of domestic development of TOFI. TOFI technology is a methodology for the study of the subject area and information-analytical system (tools), automating the proposed methodology. The basis of the design of the electronic archive is the modeling of scientific reference apparatus, which is a structured set of elements of document descriptions (secondary documentary information) presented in various types of archival directories, databases designed to search for documents and documentary information. Items finding AIDS are guides to collections, lists, funds, lists, directories, indexes. Archival Fund, archival collection, storage unit – are the main units of accounting documents, regardless of the type of media, method and technique of fixing information.

To conduct scientific reference system has a special module «EEPSEA» – «finding AIDS». This module provides a convenient tool and a set of entities to the technologist designing a scientific reference device (Shailazymov, 2015). The module «Directories and classifiers» is designed to maintain reference information in the system and allows you to create an unlimited number of directories in three languages. In this module, you can create two types of directories: list, hierarchy. The module «Sources of acquisition» is designed to keep records on all Fund-makers of the archive of The President of Kazakhstan and consists of two subsystems: «Institutions – sources of acquisition»; «Sources (persons) of acquisition of documents of personal origin». The module «Institutions – sources of acquisition of the archive of The President of Kazakhstan» is designed to store information about the institutions-sources of acquisition, the composition of the documents accepted for state storage, the state of the regulatory framework for documentation and document management. It is also possible not only to generate standard reports, but also to monitor the timely preparation of documents for transfer to the archive, to take into account the activities of curators and staff responsible for the acquisition of the archive. In the module, «archives» are the key business processes for government Fund accounting. There are funds, inventory, the works and edited them cards, made search and sort by Fund, are formed in passport files and other records, maintain records of the movement of cases

and so on. The «Reading room» module provides both local and remote user access to the electronic archive. Working with the module is characterized by ease of access to cases and documents, ease of use. «Reading room» has sample opportunities to search for cases and documents. At the same time, there is a system of differentiation of readers ' access rights to information. The option is made in a three-tier architecture: client-server database application server. The option automates the process of user access to the following information: archive case cards; archive document cards; electronic images of documents. At the same time, the functions of the «Reading room» allow you to: view the contents of archival collections, cases and documents in accordance with the access rights established for the reader; create and maintain public and personal folders of users, where the selected cases and documents are placed; search for cases and documents by their attributes and content. The module «Workplace of The administrator of the reading room» performs the following functions: registration of new researchers; confirmation of registration of researchers; editing the card of the researcher; adding new research topics; confirmation/rejection of new requirements; preview of ordered cases; formation of a report on the work of the reading room. The modular system of TOFI categorization proposed for the Archive of the President of Kazakhstan, as the experience of working with it, was the most acceptable for the organization of archival work in the «electronic archive».

Hereby, the computerization of archival business has its main goal such as the development of the system of formation, preservation, comprehensive use of the national archival Fund of the Republic of Kazakhstan and protection of its information resources. Currently, computerization (digitalization) is a strategic development priority in many countries.

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