



## Electronic publications of archival institutions in the Republic of Kazakhstan and features of the developed E-Doc Complex website

**Gulnaziya T. Zhakupova, Aigerim A. Sydykova**

*Al-Farabi Kazakh National University, Republic of Kazakhstan,*

**Victor Donninghaus**

*The Northeast Institute (Institute for the Culture and History of Germans in Northeast Europe), Germany,*

**Venera Zh. Elle**

*International University of Information Technology, Republic of Kazakhstan*

*At the present time, electronic publication of archival documents is a modern high-profile way to use them and satisfy information needs of the society and researchers, as well as to popularize the documentary heritage. Publications of archival institutions on the Internet imply a multi-faceted practice, which includes development of search tools and reference mechanisms for collections, providing digital copies of archival documents on certain topics. Archival institutions create various types of electronic publications, namely databases, online exhibitions, collections of archival materials. Thus, currently, electronic archaeography is a promising research area due to the active advancements in the discipline's practical applications. Publication of collections of archival documents is the most problematic issue among all types of documentary publication in electronic form.*

*The purpose of the article is to analyze the main types of documentary publications provided by archival institutions in the digital environment and to reveal the specifics of the developed software product for publishing collections of archival materials. The research uses materials from the state archives of the Republic of Kazakhstan, regulatory and methodological documents. The results of the research include the following: an analysis of the academic discourse on the problems of publishing documentary heritage at the present stage was carried out; types of electronic publications and methods of their creation in the digital space were examined using the example of the state archives of the Republic of Kazakhstan; the E-Doc Complex website was developed as a separate software product for creating three types of collections of archival documents and thematic virtual exhibitions.*

**Keywords:** *documentary publication; electronic archaeography; archival documents; types of electronic publications; collections of archival documents; virtual exhibitions; E-Doc Complex website; digitalization; digital space; online visualization*



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**ZHAKUPOVA, Gulnaziya Tolgaevna**, Candidate of History, Associate Professor; Associate Professor, Department of World History, Source Studies and Historiography, Al-Farabi Kazakh National University. Postal address: Al-Farabi Ave. 71, 050040 Almaty, Republic of Kazakhstan. E-mail: [gulnaztolgaevna777@gmail.com](mailto:gulnaztolgaevna777@gmail.com)

ORCID: 0000-0003-1519-9043

**SYDYKOVA, Aigerim Amangeldyevna**, Doctoral Student, Department of World History, Source Studies and Historiography, Al-Farabi Kazakh National University. Postal address: Al-Farabi Ave. 71, 050040 Almaty, Republic of Kazakhstan. E-mail: [saigerim1702@gmail.com](mailto:saigerim1702@gmail.com)

ORCID: 0009-0002-8459-5242

**DONNINGHAUS, Victor**, Doctor of History, Professor, Deputy Director, The Northeast Institute (Institute for the Culture and History of Germans in Northeast Europe), Germany. Postal address: 31 Lindenstrabe, 21335 Lunenburg, Germany. E-mail: [v.doenninghaus@ikgn.de](mailto:v.doenninghaus@ikgn.de)

**ELLE, Venera Zhanatkyzy**, Senior Lecturer, Information Systems Department, International University of Information Technology (IITU). Postal address: 34/1 Manas St., 050000 Almaty, Republic of Kazakhstan. E-mail: [v.elle@iitu.edu.kz](mailto:v.elle@iitu.edu.kz)



## ТЮРКО-МОНГОЛЬСКИЙ МИР

Статья

## Электронные публикации архивных учреждений Республики Казахстан и особенности разработанного вебсайта E-Doc Complex

**Гульназия Т. Жакупова, Айгерим А. Сыдыкова**

Казахский национальный университет имени аль-Фараби, Республика Казахстан,

**Виктор Дённингхаус**

Институт культуры и истории немцев в Северо-Восточной Европе при Гамбургском университете, Германия,

**Венера Ж. Элле**

Международный университет информационных технологий, Республика Казахстан

В настоящее время электронная публикация архивных документов является современным востребованным способом их использования и удовлетворения информационных потребностей общества и исследователей, а также популяризации документального наследия. Публикации архивных учреждений в Интернете предполагают наличие различных практических компетенций, которые включают разработку инструментов поиска и справочных систем для коллекций, предоставление цифровых копий архивных документов по определенной тематике. Архивные учреждения создают различные виды электронных изданий: базы данных, онлайн-выставки, коллекции архивных материалов. Таким образом, в настоящее время электронная археография является перспективным направлением исследований благодаря активному развитию возможностей ее прикладного применения. Публикация сборников архивных документов является наиболее сложной проблемой среди всех видов документальных публикаций в электронном виде.

Целью статьи является анализ основных видов документальных публикаций, предоставляемых архивными учреждениями в цифровой среде, и раскрытие специфики разработанного программного продукта для публикации коллекций архивных материалов. В исследовании использованы материалы государственных архивов Республики Казахстан и нормативно-методические документы. Результаты исследования заключаются в следующем: был проведен анализ научного дискурса по проблемам публикации документального наследия на современном этапе; на примере государственных архивов Казахстана были рассмотрены типы электронных публикаций и методы их создания в цифровом пространстве; разработан веб-сайт E-Doc Complex как отдельный программный продукт для создания трех типов коллекций архивных документов и тематических виртуальных выставок.

**Ключевые слова:** документальная публикация; электронная археография; архивный документ; виртуальная выставка; вебсайт E-Doc Complex; цифровизация; цифровое пространство; онлайн-визуализация



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**Жакупова Гульназия Толгаевна** — кандидат исторических наук, доцент; доцент кафедры всемирной истории, историографии и источниковедения Казахского национального университета имени аль-Фараби. Адрес: 050040, Республика Казахстан, г. Алматы, пр-т аль-Фараби, д. 71. Эл. адрес: [gulnaztolgaevna777@gmail.com](mailto:gulnaztolgaevna777@gmail.com)

**Сыдыкова Айгерим Амангельдыевна** — докторант кафедры всемирной истории, историографии и источниковедения Казахского национального университета имени аль-Фараби. Адрес: 050040, Республика Казахстан, г. Алматы, пр-т аль-Фараби, д. 71. Эл. адрес: [saigerim1702@gmail.com](mailto:saigerim1702@gmail.com)

**Дённингхаус Виктор** — доктор исторических наук, профессор, заместитель директора Северо-восточного института (Институт культуры и истории немцев Северо-Восточной Европы, Германия). Адрес: 21335, Германия, г. Люнебург, Линденштрассе, д. 31. Эл. адрес: [v.doenninghaus@ikgn.de](mailto:v.doenninghaus@ikgn.de)

**Элле Венера Жанаткызы** — старший преподаватель кафедры информационных систем Международного университета информационных технологий. Адрес: 050000, Республика Казахстан, г. Алматы, ул. Манаса, д. 34/1. Эл. адрес: [v.elle@iitu.edu.kz](mailto:v.elle@iitu.edu.kz)



## Introduction

In modern conditions, the concept of the archive is radically changing in all areas of its implementation due to digitalization, including the creation and use of digital heritage. Archives are becoming active agents of democratizing information and offering a comprehensive view of cultural heritage. Publication of archival materials in the digital space is based on archaeography. It is one of the historical disciplines that repeatedly rethink the positions fundamental to any science throughout their development. This is due to the specific features of archaeography itself, which is constantly evolving and is closely related to the digitalization of historical science as well as to the development of printing and publishing technologies (Olimpieva, 2018). Due to its ability to transform itself, archaeography has successfully applied the accumulated experience over the centuries, especially in the context of electronic documentary publication.

Currently, electronic archaeography is a promising area for the active use of documentary heritage by archival institutions. The rapid development of digitalization and electronic data processing requires the development and streamlining of principles, methods and tools for electronic documentary publishing. After the adoption of the State programs “Information Kazakhstan 2020”<sup>1</sup> (March 19, 2010), “Digital Kazakhstan”<sup>2</sup> (December 12, 2017) and “Archive 2025”<sup>3</sup> (December 20, 2019), the archives of the Republic of Kazakhstan have commenced active work on the development of electronic websites providing open access to archival fonds and documents. At the same time, the issue of developing software products for creating electronic documentary publications is particularly relevant.

The research objective is to evaluate the significance of electronic publications and their types, and to present a new website for digital publishing of archival records. The main goals of this work are as follows: firstly, to identify the current state of electronic publications of the state archives in the Republic of Kazakhstan; secondly, to develop a software product for creating an electronic publication, namely, collections of archival documents and virtual exhibitions in the digital space. Thus, we identified the following tasks: analysis of studies on the issues of electronic publications of archives; evaluation of the methods for creation of electronic publications of documentary heritage of a number of state archives in the Republic of Kazakhstan according to certain indicators; identification of the specific features of electronic publishing of collections of archival materials of the Archives of the President of the Republic of Kazakhstan and the Central State Archives of Almaty; development of a website for publication of collections of archival documents and creation of virtual exhibitions.

This research is interdisciplinary and based on software development methods and electronic archaeography. It is also based on the ideas of the theory of use proposed by Vladimir N. Avtokratov. He emphasizes that “the meaning and ultimate goal of the existence of archives and the entire state archival service is to provide society with necessary retrospective documentary information” (Avtokratov, 2001: 28; all translations from Russian are by the authors). On October 17, 2003, the Charter on the Preservation of the Digital Heritage was adopted at the 32nd session of the UNESCO General Conference. Article 1 of this Charter highlights important aspects of the meaning, creation, authenticity and protection of digital heritage:

“The digital heritage consists of unique resources of human knowledge and expression. It embraces cultural, educational, scientific and administrative resources, as well as technical, legal, medical and other kinds of information created digitally, or converted into digital form from existing analogue resources. Where resources are ‘born digital’, there is no other format but the digital object.

<sup>1</sup> Decree of the President of the Republic of Kazakhstan dated January 8, 2013 No. 464 “On the State Program ‘Information Kazakhstan 2020’ and Amendments to the Decree of the President of the Republic of Kazakhstan Dated March 19, 2010 No. 957 ‘On Approval of the List of State Programs’”. *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/docs/U1300000464> (accessed 15.12.2023). (In Russ.).

<sup>2</sup> Resolution of the Government of the Republic of Kazakhstan dated December 12, 2017 No. 827 “On Approval of the State Program ‘Digital Kazakhstan’”. *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/archive/docs/P1700000827/12.12.2017> (accessed 13.11.2023). (In Russ.).

<sup>3</sup> Resolution of the Government of the Republic of Kazakhstan dated December 20, 2019 No. 953 “On Approval of the Comprehensive Action Plan for the Implementation of Project ‘Archive 2025’”. *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/docs/P1900000953> (accessed 13.11.2023). (In Russ.).



Digital materials include texts, databases, still and moving images, audio, graphics, software and web pages, among a wide and growing range of formats. They are frequently ephemeral, and require purposeful production, maintenance and management to be retained.

Many of these resources have lasting value and significance, and therefore constitute a heritage that should be protected and preserved for current and future generations. This ever-growing heritage may exist in any language, in any part of the world, and in any area of human knowledge or expression”<sup>1</sup>.

The use of a systematic research approach allows a holistic assessment of electronic documentary publications depending on the technologies of their creation. A group of analytical, comparative and typological methods allows us to determine the types of documentary publications in electronic format, the specific features of electronic publications in the state archives of the Republic of Kazakhstan. Statistical methods reveal the trends of publishing activity in the digital space. We interviewed the chief expert of the State Archives of Almaty Oleg R. Belonosov on March 19, 2024. This allowed us to determine the ins and outs of publishing the documentary heritage in the form of an electronic book. An object-oriented approach as well as design and modeling methods were used to develop the software product and provide a description of its life cycle and external interconnection. The linear approach in software development, Waterfall, provides an opportunity to collect and document project requirements, create a design, code modules, test the system, fix problems. It is developed with the use of Scrum for agile project management. Both of these methods are considered the most convenient.

The object of the research is electronic documentary publications. The subject of the research is the use of information and network technologies for popularization of archival documents. The source base of the research is the following groups of sources that provide an understanding of the long-term importance of digital information of archival institutions:

– The UNESCO Charter on the Preservation of Digital Heritage and state programs of the Republic of Kazakhstan in the field of digitalization – “Information Kazakhstan 2020” and “Archive 2025”, which define strategic activities of the archives today;

– normative and methodological documents on digital publications: “Rules for the Publication of Documents of the National Archival Fonds”<sup>2</sup>, “Guidelines for the Preparation of Scientific Reference Apparatus for the Publication of Documents on Modern History”<sup>3</sup>, “Guidelines for the Creation of Electronic (Virtual) Exhibitions”<sup>4</sup>, which provide a mechanism for the preparation of publications of archival materials;

– electronic documentary publications of the state archives of Kazakhstan (the Archives of the President of the Republic of Kazakhstan (AP RK), the Central State Archives (CSA RK), the State Archives of Almaty (SA Almaty), the State Archives of the East Kazakhstan Region of Ust-Kamenogorsk (SA EKR)) located on their websites: databases, exhibitions (photo, virtual, personal fonds), collections of documents that allow us to evaluate their features;

– software product E-Doc Complex developed jointly with the specialists of the International University of Information Technology in order to expand prospects for creation of electronic documentary publications.

### ***Research discourse on the issues of electronic documentary publications***

Researchers study the problems of electronic archaeography in various aspects. This issue has been discussed in the field of museum affairs since 2012. Later, they began to consider it in a new interdisciplinary direction and refer to it as “social” or “sociocultural” archaeography. Irina V. Pozdeeva defines documentary

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<sup>1</sup> Charter on the Preservation of the Digital Heritage. UNESCO. 2009, January 16. [online] Available at: <https://unesdoc.unesco.org/ark:/48223/pf0000179529> (accessed 10.03.2024).

<sup>2</sup> Order of the Minister of Communications and Information of the Republic of Kazakhstan dated November 16, 2011 No. 349. *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/docs/V1100007342> (accessed 13.11.2023). (In Russ.).

<sup>3</sup> “Guidelines for the Preparation of Scientific Reference Apparatus for the Publication of Documents on Modern History” the Archives of the President of the Republic of Kazakhstan. Reference and information fonds No. 1546 of the Archives of the President of the Republic of Kazakhstan. Almaty, 2008. (In Russ.).

<sup>4</sup> “Guidelines for the Creation of Electronic (Virtual) Exhibitions” of the Archives of the President of the Republic of Kazakhstan. Almaty, 2023. [online] Available at: [https://archive.president.kz/upload/fayly/metodicheskie-posobiya/Virtualnye\\_vystavki\\_rus.pdf](https://archive.president.kz/upload/fayly/metodicheskie-posobiya/Virtualnye_vystavki_rus.pdf) (accessed 05.02.2024). (In Russ.).



publication as one of the directions in archaeography and “traditional archival studies” (Pozdeeva, 2002: 61). The theoretical and methodological foundations of electronic archaeography in modern conditions are studied by Vladimir P. Kozlov (Kozlov, 2001). This author notes that “documentary publication is one of the most organized ways of promulgating documentary memory” (Kozlov, 2017: 30).

In turn, the researcher Fred Moody states that

“A digital archive is effectively an analog archive’s apotheosis. Once archived materials are digitized, possibilities for orchestrating access to them and building thematic (and even argument-making) connections with other materials increases exponentially. In structuring the archive, writing its metadata, and designing its interface, the digital archivist is making an argument about the meaning and cultural context of the archive’s contents”<sup>1</sup>.

Undoubtedly, Adam Kriesberg’s studies in the field of digital preservation, data management and digital curation are of great interest. The researcher emphasizes that digitization is rapidly becoming an imperative for many cultural heritage organizations. However, digitization is an expensive undertaking, and library and archive budgets will be lucky if they can raise enough funds to digitize even part of their collections. To fill this gap, many public sector libraries and archives started to participate in a public-private partnership to digitize their assets (Kriesberg, 2017). Amelia Acker and Adam Kriesberg in their article “Social Media Data Archives in an API-driven world” define application programming interfaces (APIs) as storage technologies that allow extracting and accessing data: “Different APIs allow for purpose-driven access and extraction” (Acker, Kriesberg, 2020: 107).

Daniel V. Pitti also states that “designing complex, sustainable digital humanities projects and publications requires familiarity with both the research subject and available technologies” and that “the design process is iterative”, where “each iteration leads progressively to a coherent, integrated system” (Pitti, 2004: 471, 473). Some researchers consider options for hybrid publishing of archival materials: “...the library developed researcher tools that allow concurrent exploration of the paper material and the born-digital material via emulation and item-level, database-driven searches” (Carroll et al., 2011: 61). They propose to consider digital materials “as artifacts or simply as intellectual content” (Pace, 2000: 55).

The basic concept of archaeography is used only by researchers who live in the CIS countries, whereas the concept of digital collection is used in the USA and Europe. Documents in a digital collection are of a hybrid nature, i.e. it is a combination of “digital and traditional paper archives”<sup>2</sup>. Archival institutions are actively promoting documentary heritage today by using the potential of the Internet. As Ian Milligan notes, “Digital dissemination enables the diverse spread of ideas, using mediums such as blogs, social media, online visualizations and databases, online exhibits, and even innovative digital-first presses which lower bars to innovative scholarship” (Milligan, 2022: 47). The author states that at the present stage “given the wide array of digitized primary and secondary sources, ultimately all historical sources are mediated to some degree through technology. Even sources still consulted exclusively on paper have been made more easily discoverable by digitized finding aids, or they are contextualized and read within a larger body of digital material” (ibid.: 60).

The NARA Guidelines for Digitizing Archival Materials for Electronic Access<sup>3</sup> were developed in the USA in 1998. They contain the requirements for scanning, processing and storing an electronic document. Ricky Erway raises the issue of preserving digital heritage due to constant changes in software and the emergence of new formats incompatible with existing ones<sup>4</sup>. In addition, the researcher Diane M. Zorich analyzes the origin of the term “Digital Art History”, which arose not among historical researchers, but among “applied researchers” engaged in the implementation of IT applications in archives, museums, libraries and other institutions specializing in the preservation of historical and cultural heritage. These applications help to

<sup>1</sup> Moody F. Publishing the archive. *Archive Journal*. 2014, April. [online] Available at: <https://archivejournal.net/essays/publishing-the-archive/> (accessed 10.03.2024).

<sup>2</sup> Ashikuzzaman Md. Digital archives. *Library & Information Science Education Network — Academic blog for Library and information Science*. 2014, January 19. Updated: January 14, 2024. [online] Available at: <https://lisedunetwork.com/digital-archives-concepts-meaning/> (accessed 10.03.2024).

<sup>3</sup> Guidelines for digitizing archival materials for electronic access. *National Archives*. 2004, June. [online] Available at: <https://archives.gov/preservation/technical/guidelines.html> (accessed 10.03.2024).

<sup>4</sup> Erway R. Defining “born digital”. *OCLC Research*. 2010, November. [online] Available at: <https://oclc.org/research/activities/hiddencollections/borndigital.pdf> (accessed 03.11.2023).



determine activities for the solution of practical problems of digitizing relevant objects and providing access to them, including through the development of databases, online resources, etc.<sup>1</sup>

Vitaly Yu. Afiani proposed the following terms of electronic archaeography: “Internet archaeography”, “computer archaeography” or “electronic archaeography”. His work provides an assessment of the potential of online publishing:

“The preparation of a facsimile publication is greatly simplified when a scan of a document is given in parallel with its text. We can make additions and corrections to an online publication, unlike a typographic one. Opportunities regarding reference apparatus of a publication are expanding. Developed navigation tools allow to quickly search for documents on a wide range of queries and keywords. The use of hyperlinks allows to simplify the compilation of a biographical commentary, referring users to resources of digitized encyclopedias and biographical dictionaries posted on the Internet, to Wikipedia; to link a specific publication with other works, as well as with studies and audiovisual documents on this topic that have been put on the web. Finally, online publications allow to reach a much larger audience of users and readers than any printed publication” (Afiani, 2019: 26).

Julia Yu. Yumasheva explores a number of key issues related to electronic publication of documentary heritage: source studies and archaeography in academic documentary publications of historical documents in electronic environment; publication of electronic copies of archival documents in the digital space. The author emphasizes that

“a copy is an independent physical object combining the authorship, creation goals (to some extent) and semantic information of the original with the authorship, physical form and creation goals of the copy that differ from those of the latter. <...> In digital environment, the quality of an electronic copy is ensured by:

- the quality of the description of the original historical source and a distinct, exclusive description of its digital copy;
- the quality of an electronic image (the quality of scanning or digitization);
- the quality of graphic processing of an electronic copy;
- the quality of storage and use of an electronic copy” (Yumasheva, 2017b: 101–102).

The scholar suggests that any copy is not identical to the original. The most obvious way to overcome this difference in electronic environment is to compile and present two descriptions to researchers simultaneously alongside with the presentation of the copy itself:

1) “a full-scale archaeographic description of the original that both takes into account requirements of the professional academic community and is adapted to the perception of an unskilled audience...” (ibid.: 102);

2) “a detailed description of the electronic copy, the content of which should include data on technical and technological properties, characterizing the copy as an independent physical object, as well as information on the properties of the original” (ibid.: 103), which cannot be reproduced in the copy for various reasons (see: Yumasheva, 2012, 2017a).

Yuri V. Grum-Grzhimailo and Irina V. Sabennikova have interesting points that

“an electronic publication of an archival document can be understood as an electronic publication containing an electronic copy (or a group of electronic copies) of archival documents which have undergone archaeographic, editorial and publishing processing; it is intended for distribution unchanged on a machine-readable media and includes credits.

It is necessary to distinguish between:

- electronic analogues of printed publications of archival documents, which reproduce mainly the corresponding printed publication (text and its layout on the pages, illustrations, links, notes, reference apparatus, etc.);
- separate electronic publications of archival documents that do not have printed analogues.

<...>

From the standpoint of information technology for publishing an archival document, the question arises about choosing an appropriate digital format that is largely determined by purposes of using the document in a particular electronic publication” (Grum-Grzhimailo, Sabennikova, 2006: 307–308).

<sup>1</sup>Zorich D. M. The “art” of digital art history. *The Index of Medieval Art at Princeton University*. 2013, June 26. [online] Available at: <https://ima.princeton.edu/pubs/2013Zorich.pdf> (accessed 10.12.2023).



Irina V. Sabennikova states that “the physical data carrier does not disappear as such, but it is reduced to a digital code used to record the information of an electronic document” (Sabennikova, 2022a: 252; see also: Sabennikova, 2022b). Ivan M. Chikunov divides electronic publications into two types: standard (PDF and HTML files) and special (databases, file systems and software)<sup>1</sup>.

The opinion of researchers who consider the archival affairs as “a social institution performing certain functions in the system of social structure” (Munge, Kuular, Lamazhaa, 2020: 4) is also of interest. The authors reveal changes in the activities of archival institutions in Tuva:

“In 2018, the Archives<sup>2</sup> acquired the software and information complex KAISA-Archive that is implemented in more than 60 archives of the country, including four federal state archives: Russian State Archives of Literature and Art (RGALI), Russian State Historical Archives (RGIA), Russian State Film and Photo Archives (RGAKFD), Russian State Archives of Scientific-Technical Documentation (RGANTD). The complex makes it possible to automate the maximum number of processes within the framework of intra-archive activities, providing remote user access to archived documents. ...since 2019, secure communication channels have been set up in the archives; this made it possible to provide data electronically through a remote system of public services. <...> In 2021, on the eve of the celebration of the 100th anniversary of the Tuvan People’s Republic, the National Archives of the RT developed a departmental program “Providing Preservation and Accessibility of the Historical and Cultural Heritage of the Peoples of Tuva for 2018–2021”, within which it began the development of the web portal ‘Cultural Heritage of Tuva’ that will collect materials on culture and art of Tuva” (ibid.: 24, 26).

Taking into account the development of information technology today Maja S. Maadyr notes that

“archeography occupies an important place in the popularization of documentary heritage. <...> Moreover, the promising areas of Tuvan archeography include identification of relevant historical topics, prospects for the preparation and release of new documentary publications and opportunities for the development of electronic archeography and many others” (Maadyr, 2020: 33, 43).

Ruslana N. Bazyr concludes that

“in the future, the entire photo collection of the State Archives of the Republic of Tuva should be digitized and entered into the database of the software and information complex KAISA-Archive developed by Alt-Soft company, St. Petersburg. The digitized photo collection... will be available to any Internet user through the module ‘Electronic Reading Room’ on the official website of the Archives. <...> A separate and still unresolved problem is the issue of tracking copyright compliance of photographic documents; it has become especially acute due to the repeated replication of images on the Internet. The Archives has recently begun to add watermarks to images posted on its web resources. Nevertheless, the problem of piracy requires a systematic approach” (Bazyr, 2020: 59).

Studying the history of informatization of the archives in Kazakhstan in 1991–2020, the Kazakhstani researcher Aliya Kh. Mustafina presents the experience of the Archives of the President of the Republic of Kazakhstan (AP RK) in the field of online publications<sup>3</sup>.

### ***Electronic publications of archival institutions in the Republic of Kazakhstan and their methodological support***

Dynamic types of online publication of archival materials are used in world practice: virtual exhibitions, web collections, interactive displays and multimedia presentations. Today, in modern archives “content is stored in electronic formats, such as digital files, databases, and multimedia. Digitization allows for converting physical materials into digital representations, ensuring compatibility with modern technology. <...> The diversity of materials ensures that digital archives cater to a broad audience with varied interests and research needs”<sup>4</sup>. The most accurate transmission of the document text, a high-quality reference apparatus that allows to work comfortably with texts of documents; archaeological design which makes it possible to link to a document that meets the requirements for academic research — all these indicate a first-rate archaeological work. It is a properly organized publication of historical sources that allows to give maximum information about the document.

<sup>1</sup> Chikunov I. M. Electronic publications: Definition, classification. *CLAIM — Scientific and Educational Cluster* [online] Available at: <http://it-claim.ru/Library/Books/ITS/wwwbook/ist4b/its4/chikunov.htm> (accessed 10.03.2024). (In Russ.).

<sup>2</sup> The State Archives of the Republic of Tuva.

<sup>3</sup> Mustafina A. Kh. History of informatization of archives in Kazakhstan (1991–2020) : Diss. ... Candidate of History. Moscow, 2023. P. 142, 146.

<sup>4</sup> Ashikuzzaman Md. Op. cit.



For the analysis of electronic publications of archival institutions of the Republic of Kazakhstan, we have identified some indicators: databases; exhibitions of three types (personal collections, thematic virtual exhibition, photo and video materials); guides and reference books; collections of archival materials (hyperlinks, e-books); information and methodological bulletins; conference materials; inventories of especially valuable documents; electronic catalogs of collections; methodological manuals. These analysis indicators reveal the activities of archival institutions in the Republic of Kazakhstan in the digital space: firstly, the creation of a digital reference apparatus; secondly, the types of electronic publications on documentary heritage; thirdly, methodological support of archival work at the present stage.

In the Republic of Kazakhstan, the process of creating an electronic local reference apparatus of archival institutions began in the 1990s. The Archives of the President (AP RK) was the first to start this work. The method of converting typewritten documents into electronic format was used at the initial stage, then the Lithograph company's platform was used for document management and automation.

In January 2013, the State Program "Information Kazakhstan 2020"<sup>1</sup> (hereinafter referred to as the Program) was approved by Decree No. 464 of the President of the Republic of Kazakhstan. The program has become one of the most important initiatives aimed at the development of innovation and information policy of the state. It has contributed to the creation of conditions for the transition to an information society. One of the systemic tasks of the Program was to expand citizens' access to objects and materials of archival institutions by making proposals for the development of a unified automated document recording system of the National Archival Fonds of the Republic of Kazakhstan with the functionality of information retrieval of documents and developing proposals for the creation of a unified electronic archive system. The implementation of this task required professional archaeological work, the development of theory, methodology and practice of creating an electronic publication.

Thus, since 2013, the archives of the Republic of Kazakhstan have been actively working to achieve their goals of automation of archiving and access to reference apparatus of the archives. First, the template of the database "Electronic Archive" (UAED, Unified Archive of Electronic Documents 2018) was developed in the Access format, providing for the transition of reference apparatus of the archives into an electronic format. Simultaneously, projects on the development of archival websites were implemented. They have begun the work on creating a database not only for official purposes, but also for hosting archival websites in order to improve the quality of a web resource, as well as to ensure broad access of citizens to retrospective open archival information. This was the beginning of the active work of the national archives to create electronic stock catalogs with the function of automated web search on archival websites, as well as the publication of a scanned version of a document. Today, the websites of the archives of the Republic of Kazakhstan provide access to the catalog of collections, inventories and archival documents.

The Electronic Reading Room has been launched since 2017. It automates the work of researchers with documents in the Archives of the President of Kazakhstan (AP RK). Online access to the electronic catalog and the Guide to the Archive's collections is provided through the website. The electronic catalog also provides a search for archival information, as when working as a researcher in the reading room. The website of the AP RK has the following sections: "List of Collections", "Registers of Inventories", "Inventories", "File Names" and "Information on the Chronological Extent of Archival Documents". Especially valuable documents are presented in PDF files.

At the present time, electronic publishing of archival documents plays an important role in the system of academic historical knowledge. The documentary publication of archival materials implies an organized selection of documents. At the same time, the high level of its preparation allows to examine historical events and processes more effectively (Ponassenko, Studenikina, 2018: 66).

Electronic documentary publications of the Archives of the President of Kazakhstan (AP RK) are versatile. Since 2015, the Archives has developed the following:

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<sup>1</sup> Decree of the President of the Republic of Kazakhstan dated January 8, 2013 No. 464 "On the State Program 'Information Kazakhstan 2020' and amendments to the Decree of the President of the Republic of Kazakhstan dated March 19, 2010 No. 957 'On Approval of the List of State Programs'". *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/docs/U130000464> (accessed 14.11.2023).





### 1. Databases<sup>1</sup>:

- “Kazakhstani War Prisoners During the Second World War”<sup>2</sup>;
- “Hunger Victims”<sup>3</sup>;
- Republican databases “Nomenclature Cadres of Soviet Kazakhstan”<sup>4</sup> and “Special Folders”<sup>5</sup>.

Various methods were used in developing these databases; digitization was carried out by using document, tablet and planetary scanners, as well as SOM system. The JPEG format (Joint Photographic Experts Group) was initially used to digitize photographs and other visual documents in the Archives of the President, but TIFF format (Tagged Image File Format) was preferred due to the poor quality of the digital copies. The TIFF format is popular due to the ability to preserve image quality thanks to lossless data compression algorithms. The JPEG format provides the possibility for a high degree of compression, but at the same time there is a loss of image quality.

2. Thematic documentary photo exhibitions dedicated to significant dates in the history of the country, anniversaries of political and public figures<sup>6</sup>. 40 historical and documentary exhibitions dedicated to symbolic events have been developed: “Independence Above All”, “The Constitution of the Republic of Kazakhstan”, “Non-ferrous Metallurgy of Kazakhstan”, “Roads of Victory”, etc. In 2012, electronic versions of the traditional exhibitions were presented as MS PowerPoint presentations. The list of available tools and techniques has increased over the years, modern multimedia technologies and the synergy method are used in order to make the exhibitions more interesting. In 2023, the AP RK developed a memo on the compilation of electronic exhibitions.

3. Virtual exhibitions have been created since 2023<sup>7</sup>. TabList functionality was implemented due to the large amount of information at each exhibition, i.e. it is an option of switching between large content

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<sup>1</sup> AP RK Databases (AP RK DB). The Archives implements several projects on various topics in order to provide researchers with a comprehensive source base and gives citizens of Kazakhstan the opportunity to participate in restoring the memory of their family, especially participants of the Great Patriotic War and hunger victims. The databases provide for the replenishment of information from other archives and research publications on a specific topic. Users can find not only archival materials, but also get acquainted with academic studies in a subject area. See: <https://archive.president.kz/ru/projects/>.

<sup>2</sup> AP RK DB (2015) – “Kazakhstani War Prisoners During the Second World War”. It is the unified republican database with lists of former Kazakhstani war prisoners. It is compiled on the basis of the state archives, the Department of the Ministry of Defense of the Republic of Kazakhstan, military commissariats of the country. 5,274 war prisoners have been identified. The website with information on 35,000 war prisoners was launched in 2015. The database contains the following information on each prisoner: surname, first name, patronymic, place and year of birth and nationality. There is a sub-section “Sources of Reference”. In the period 2015–2019, the Archives received more than 100 requests from the citizens of Kazakhstan on searching their family members. See: <http://tutkyn.kz/?lang=ru>.

<sup>3</sup> See: <http://asharshylyq.kz/?lang=ru>.

<sup>4</sup> AP RK DB (2015) – “Nomenclature Cadres of Soviet Kazakhstan”. The database offers biographies of the heads of the Communist Party and Komsomol, administrative, financial and trade-union bodies, education and health organizations, as well as of the officials of military commissariats in Kazakhstan (1919–1991) starting from the okrug and district levels. The first part of the collection covers the period of 1919–1936. The publication contains 5,010 biographical references to 2,700 personalities. See: <https://archive.president.kz/en/bd-nomenklaturnye-kadry-sovetskogo-kazakhstana/>.

<sup>5</sup> AP RK DB (2023) – “Special Folders”. It is compiled on the basis of archival documents of the Central Committee of the Communist Party of Kazakhstan. In 2006–2008, as a result of the work of the Interdepartmental Declassification Commission, the stamp of secrecy was removed from 40 thousand cases for the period of 1937–1991. The term “special folder” appeared in the 1920s–1930s and designated the place of storage of a secret document. “Special folders” of documents for 1937–1991 are deposited in the Archives of the President of the Republic of Kazakhstan. These documents deal with politics and economics, society and culture of the Soviet era. See: <https://archive.president.kz/ru/osoby-papki/>.

<sup>6</sup> The website of the AP RK: thematic documentary photo exhibitions. The publication of electronic exhibitions is carried out according to the “Calendar of Significant and Memorable Dates” and the annual plan of the Archives. Virtual exhibitions are based on materials from the archival fonds. See: <https://archive.president.kz/en/virtual/>.

<sup>7</sup> The website of the AP RK: virtual documentary exhibitions. For instance, the virtual exhibition “Independence Above All” is based on 3D technology and dedicated to the Day of the Republic of Kazakhstan. It contains archival materials from the collections of the Archives of the President of the Republic of Kazakhstan, the National Archives of the Republic of Kazakhstan, the Central State Archives, the Central State Archives of Film and Photographic Documents and Sound Recordings, the Center for Documenting Contemporary History (Semey) and the National Library of the Republic of Kazakhstan. See: <https://archive.president.kz/en/virtual/independence-above-all/>.



blocks without reloading the page. Each exhibition has sections with a gallery of images. This gallery allows to view images of the exhibitions in the form of an album. It was decided to create a composite value to implement this functionality: it is when one element of the record (a virtual exhibition) is linked to another one (a gallery with documents) on the website. Since exhibitions do not always initially have a known number of tabs, a double functionality has been implemented: some standard tabs are always present, while it is possible to add an unlimited number of additional tabs for different exhibitions.

4. Collections of archival documents: “From the History of Deportations. Kazakhstan”<sup>1</sup> in 3 volumes with the possibility of downloading in PDF (a universal cross-platform open electronic document format that allows to present the entire layout of a document). A compilation of the documented cases is accessible through the web portal of the Archives. See a graphical representation of the data on electronic publications of the Archives of the President of the Republic of Kazakhstan (*diagram 1*).

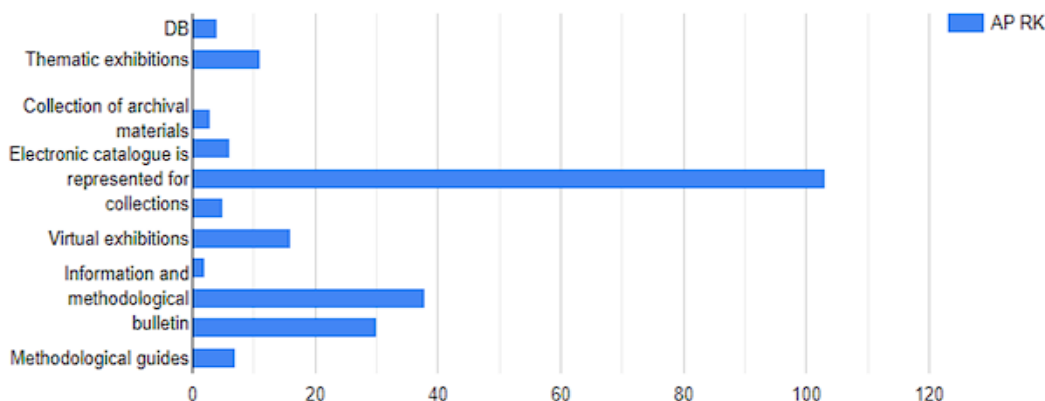


Diagram 1. Electronic Editions of the Archives of the President of the Republic of Kazakhstan (as of 2024)  
 Диаграмма 1. Электронные издания Архива Президента Республики Казахстан (на 2024 г.)

Further, the current situation regarding electronic documentary publications among the state archival institutions of the Republic of Kazakhstan is as follows:

- The Central State Archives of the Republic of Kazakhstan (CSA RK)<sup>2</sup> has two types of electronic documentary publications: exhibitions of personal collections (10) dedicated to anniversaries of public, political, cultural figures of Kazakhstan and thematic exhibitions (3): “Evacuation to Kazakhstan”, “95 Years Since the Founding of Karsakpay Copper Plant”, “Archival Documents Related to Alash Orda Party”. The total number of all exhibitions on the website is 16; the electronic catalog includes 623 collections (a brief summary of the inventory is available during registration). See a visualization of electronic publications of the CSA RK (*diagram 2*).

<sup>1</sup> The website of the AP RK: collections of documents. “From the History of Deportations. Kazakhstan” is a three volume publication in PDF. The collection publishes documents on the deportations during the collectivization period to and within the territory of Kazakhstan, which were an integral part of the campaign to “eliminate the bais and kulaks (rich landowners) as a class”. Chronologically it covers the period from 1930 to 1945. Documents from the archival fonds of a number of institutions were used: the Central State Archives of the Republic of Kazakhstan, the State Archives of Kostanay, Kyzylorda, Atyrau, Pavlodar, Taraz, Shymkent regions, the Archives of Socio-Political History of Kyzylorda region, the Regional Archives of Shymkent region. These collections of documents are available at the website of the Archives (AP RK). See: <https://archive.president.kz/en/publications/sborniki/>.

<sup>2</sup> The website of the CSA RK. There are exhibition photos on the website. It is poorly visible, there is no classification by categories (thematic and personal collections of online exhibitions together with documents reflecting the history of an object). The photo documents have a watermark of the name of the Archives and indicate the place of storage (fond, inventory, case, sheet). The Archives’ electronic publications present a wide range of information on personal fonds, news and archival events. The documents are presented in digitized text format. The electronic catalog of the Archives is available after registration. See: <http://cga.kz/Start>.

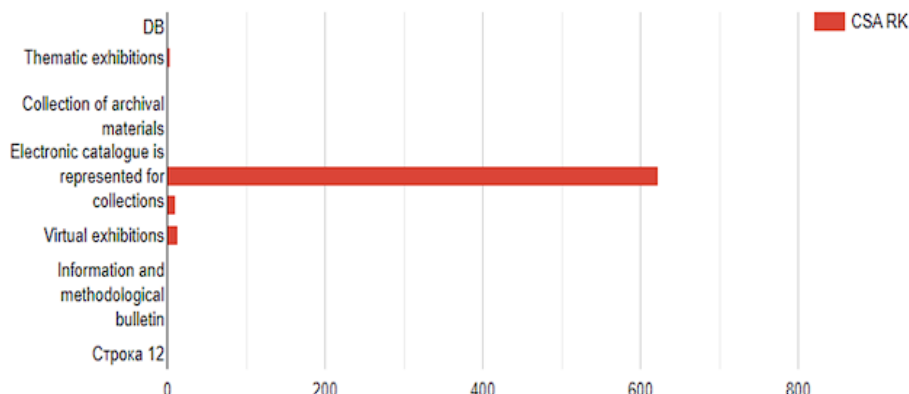


Diagram 2. Electronic Publications of the CSA RK (as of 2024)  
 Диаграмма 2. Электронные публикации ЦГА РК (на 2024 г.)

The Central State Archives of Scientific and Technical Documentation of the Republic of Kazakhstan (CSA STD RK)<sup>1</sup> stores publications of the following types: collections of documents and materials (11); guidebooks and reference books (3); brochures, booklets and albums (6); proceedings of research and practical conferences (3); textbooks (1); exhibitions (29). See the data on electronic publications of the CSA STD RK (diagram 3).

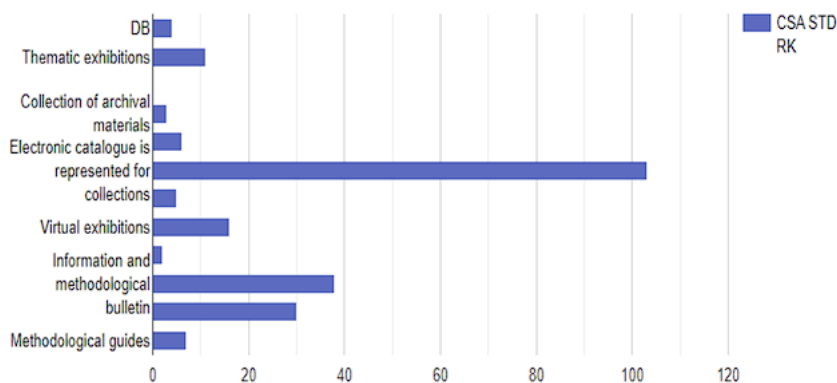


Diagram 3. Publications of CSA STD RK in the Digital Space (as of 2024)  
 Диаграмма 3. Публикации ЦГА НТД РК в цифровом пространстве (на 2024 г.)

The publications of the State Archives of Almaty (Almaty SA) are divided into three groups: the history of the city, the history of personalities, reference and information publications<sup>2</sup>. Forms of online publications include e-books, virtual exhibitions and catalogs. They contain collections of documents, refe-

<sup>1</sup> The website of the CSA STD RK. There is a list of online exhibitions on certain topics and materials from personal fonds. There is an indication of the date of a publication, information about the activities of individuals and a list of personal documents. See: <http://ntd.kz/index.php?module=Exhibitions>.

<sup>2</sup> The website of the Almaty SA. The website of the Archives presents several types of electronic publications. One of them is compiled by O. R. Belonosov — “Electronic Books of the Archives”. See: <https://ga-almaty.kz/>. A series of thematic reviews of documents from the Central State Archives of Almaty: <https://ga-almaty.kz/деятельность/издания/>. The exhibitions of the State Archives of Almaty provide a public demonstration of electronic copies of archival documents intended for posting on the Internet, as well as on publicly available electronic resources. It includes classified documents: photographs, text documents, diagrams, albums, drawings, phono, film and video documents, etc. Part of the Archives’ online exhibitions is also provided in the form of e-books, with a three-dimensional imitation of page turning. See: <https://ga-almaty.kz/деятельность/интернет-выставки/>.



rence archival publications, booklets, albums, proceedings of science-to-practice conferences on archival affairs, periodicals. A new area of publishing activity was introduced in the Archives a few years ago — the preparation of thematic reviews made in the format of electronic books. The reviews are presented as announcements, QR codes are created to access the books (but the access is difficult). The prepared reviews give documentary information on the history of the city, historical buildings and structures, some enterprises significant for the city and other archival materials. See types of electronic publications of the Almaty SA (diagram 4).

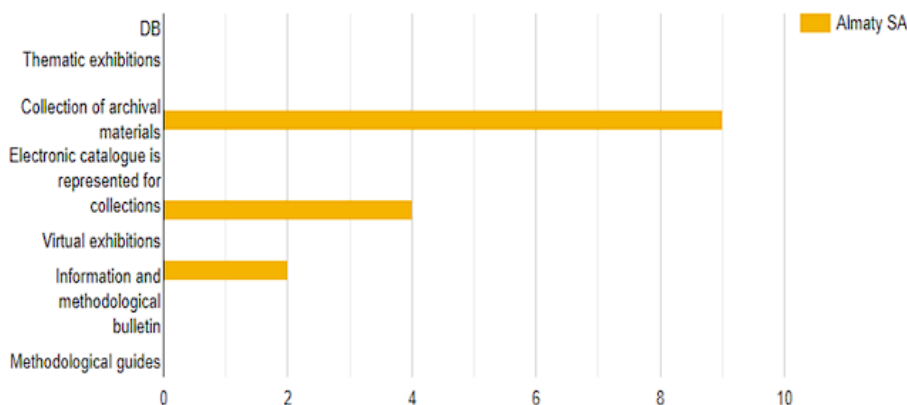


Diagram 4. Types of Electronic Publications of the Almaty SA (as of 2024)  
 Диаграмма 4. Виды электронных публикаций ГА г. Алматы (на 2024 г.)

The methodology for publishing thematic collections on the history of the city of Almaty SA was developed by Oleg R. Belonosov<sup>1</sup>. An electronic book as a collection of documentary archival materials allows to cost-effectively present a lot of information. These publications are highly specialized and intended for researchers. You can find a certain fragment of a document by using a search query (according to Belonosov). Books are created in MS Word application in tabular form, then the file is converted into PDF that is opened and converted in the Flipbook program. O. R. Belonosov considers two types of e-books: books where illustrations prevail (70–80% of the e-book comprise pictures, drawings, photographs, diagrams, etc.) and books that include primarily texts. The Flipbook program is used for reproduction, which allows to display data interactively. At the same time the more information a book contains, the longer the data is loaded. The author pays great attention to the external design of the e-books and use Photoshop to create covers (fig. 1).

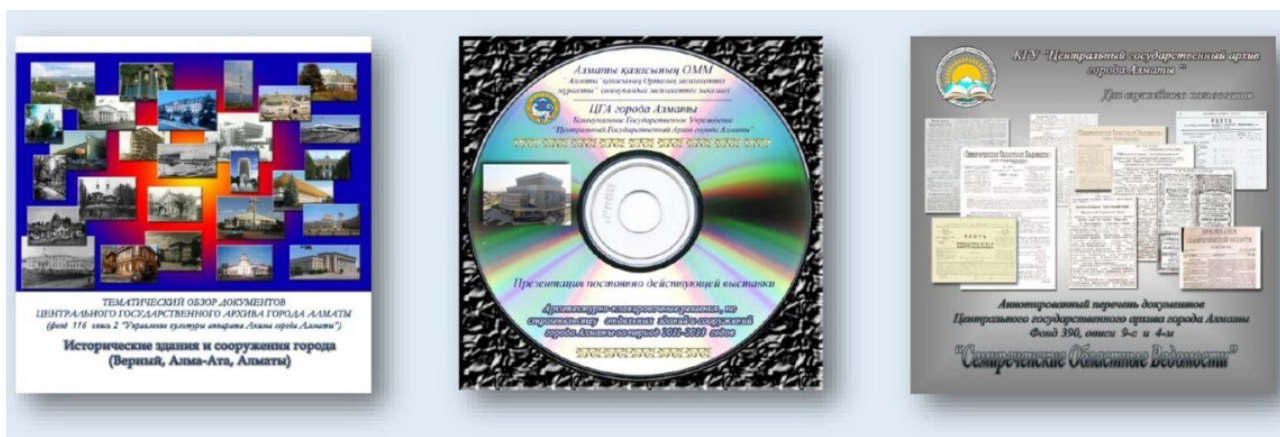


Fig. 1. Covers of Electronic Publications of the Almaty SA  
 Рис. 1. Обложки электронных изданий ГА г. Алматы

<sup>1</sup> Interview with O. R. Belonosov, the Almaty SA (March 19, 2024).



Materials on the Alma-Ata Cotton Mill contain 1,709 pages. A powerful computer is needed in order to download such a large amount of information. Therefore, O. R. Belonosov began to divide the information into several sections for a faster access. This e-book is presented as a thematic review of documents from the Almaty SA (Collection No. 249 of the Alma-Ata Cotton Mill JSC). It has UDC, LBC, ISBN and is registered by the National State Book Chamber of Kazakhstan. The book consists of an introduction and additional information about fabric materials. The main part of the book contains six albums with photographs of fabrics and a brief description. The end of the book presents catalogs of textile products, appendices and an approval sheet. The purpose of this book is to show samples of color solutions in fabrics. The introduction provides brief information on the types of fabrics: winter, summer, swimming, etc. The files contain images of small pieces of fabrics which O. R. Belonosov scanned (fig. 2, 3).

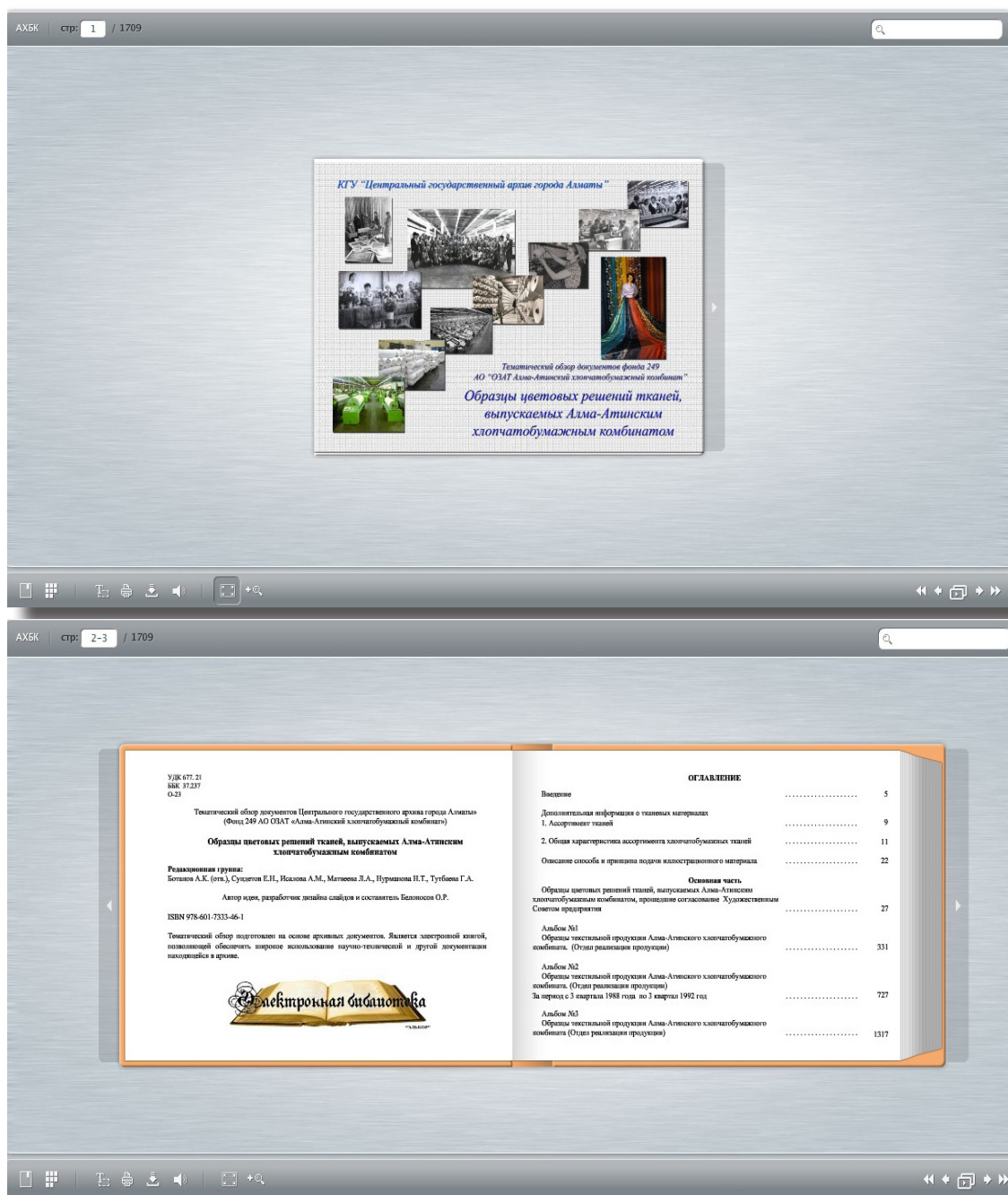


Fig. 2, 3. Book Version of the Collection of Archival Documents of the Almaty SA  
 Рис. 2, 3. Книжный вариант сборника архивных документов ГА г. Алматы



A thematic review of the documents of the Almaty SA (collection 116, inventory 2, “Department of Culture of the Almaty Akim’s Office”) was conducted by O. R. Belonosov. This book consists of an introduction, a sheet of approval and five sections. It presents materials on the work of the Department, assignments to individual buildings, structures and complexes that are located in the territory of Almaty and have the status “Monument of History and Architecture of Municipal or Republic Significance”. Each file usually includes passport of a monument, preservation obligations for the operation of a historic monument, registration card of a monument, photographs and separate technical drawings of a building, structure or complex, as well as a number of other documents confirming the historic and sociopolitical significance of an object under consideration. This thematic review is a kind of reference and information tool that allows to familiarize a wide range of interested persons with the architectural features of historically significant buildings of the city.

See the book version of the collection on the topic “Historic Buildings and Structures of the City (Vernyi — Alma-Ata — Almaty)” (fig. 4).



Fig. 4. Book Version of the Collection on the Topic “Historic Buildings and Structures of the City (Vernyi — Alma-Ata — Almaty)”  
 Рис. 4. Книжный вариант сборника на тему «Исторические здания и сооружения города (Верный — Алма-Ата — Алматы)»

- The website of the State Archives of East Kazakhstan Region of Ust-Kamenogorsk (SA EKR)<sup>1</sup> contains 4 databases, 47 exhibitions (personal collections, thematic, photo and video materials), 19 collections of archival materials and hyperlinks, 3 collections of conference proceedings, 17 methodological manuals. See electronic publications of the SA EKR (diagram 5).

<sup>1</sup>The website of the SA EKR: <http://e-arhiv.vko.gov.kz/>. It contains a number of electronic documentary publications: databases of local lore and metric books (<http://e-arhiv.vko.gov.kz/ru/Page/Index/1350>); online exhibitions that are themed and based on personal archival fonds created in the form of photographing a pre-prepared exhibition (<http://e-arhiv.vko.gov.kz/ru/Page/Index/1376>). See also the collection of archival materials that have been created since 1998 and uploaded in PDF: <http://e-arhiv.vko.gov.kz/ru/NamedContent?type=Document>. Archival video materials dedicated to significant dates and personalities of the region are available at: <http://e-arhiv.vko.gov.kz/ru/Page/Index/1603>. See also a photo gallery of cultural and public figures of the region: <http://e-arhiv.vko.gov.kz/ru/SiteGallery>.

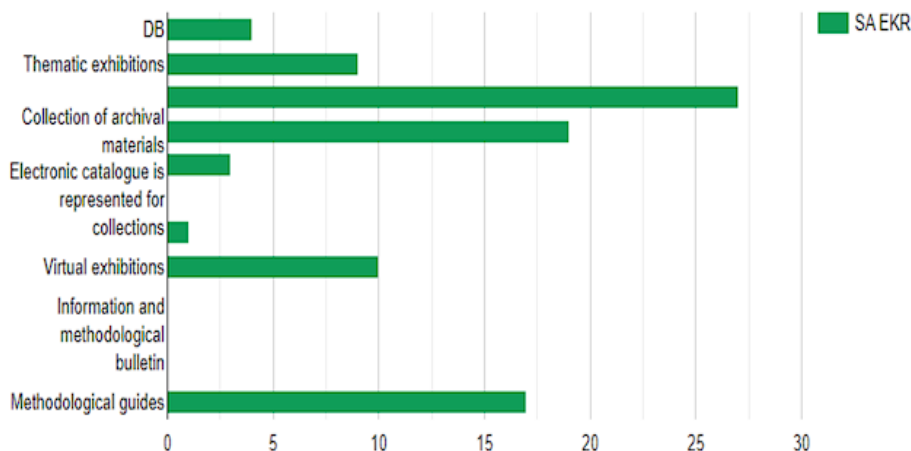


Diagram 5. Digital Editions of the SA EKR RK (as of 2024)  
 Диаграмма 5. Цифровые издания ГАВКО РК (на 2024 г.)

It is also necessary to focus on the methodological support of documentary publications in the digital space. This contributes to the improvement of the archival services in the Republic of Kazakhstan at the present stage. Thus, the Archives of the President of the Republic of Kazakhstan (AP RK) developed the “Guidelines for the Creation of Electronic (Virtual) Exhibitions”<sup>1</sup> in 2023. This document provides the purpose, objectives and a classification of virtual exhibitions, ideas for the development of the exhibition concept, description of the preparation of the thematic and exposition plan of exhibitions, the algorithm for the creation and organization of electronic (virtual) exhibitions and for the development of a model of electronic (virtual) exhibitions, the main elements of a virtual exhibition, steps of technical preparation of the project, forms of the provision of virtual exhibitions. The guidelines note that “other archives or third-party organizations and institutions may be involved in the creation of electronic (virtual) exhibitions; this allows to provide insights into the announced topics more thoroughly by using the information potential of different entities”<sup>2</sup>. To create a virtual exhibition, a range of digital tools are employed, such as Microsoft Office PowerPoint, Windows Movie Maker, website development programs, and Google products. The forms of providing a virtual exhibition include:

1. Presentation (PowerPoint, SlideShare);
2. Slide presentation (slide show) of covers and short annotations of books with a musical accompaniment (PowerPoint, PhotoPeach, PhotoSnack);
3. Video review with recommendations of an archivist and record of ‘loud readings’, video capture of users’ impressions;
4. Exhibition of documents presented as an interactive poster (PowerPoint with hyperlinks, ThingLink);
5. Exhibition of documents presented as a mind map, a thinking visualization technique used to create a map that has the main topic in the center and related keywords depicted as going in different directions (Word, PowerPoint, MindMeister, FreemindMap, Popplet);
6. Exhibition of a document in the form of a timeline (PowerPoint, Dipity, Xtimeline, Free Timeline, TimeRime, Timtoast, OurStory, Capzles);
7. Exhibition of a document as a 3D book (MS Publisher, Flip Book Maker, Flip PDF, ZooBurst, Calaméo, PhotoSnack, Myebook);
8. Exhibitions on a geographical map (Google Maps);

<sup>1</sup> “Guidelines for the Creation of Electronic (Virtual) Exhibitions” of the Archives of the President of the Republic of Kazakhstan. Almaty, 2023. [online] Available at: [https://archive.president.kz/upload/fayly/metodicheskie-posobiya/Virtualnyye\\_vystavki\\_rus.pdf](https://archive.president.kz/upload/fayly/metodicheskie-posobiya/Virtualnyye_vystavki_rus.pdf) (accessed 05.02.2024). (In Russ.).

<sup>2</sup> Ibid. P. 4.



- 9. Exhibition in the form of a virtual whiteboard (ThingLink, Google Slides);
- 10. Poster exhibition (MS Publisher, Glogster, ThingLink, Playcast).

The Emaze software should be noted among the online services that are widely used to create multimedia online presentations<sup>1</sup>.

Each state archival institution in the Republic of Kazakhstan has a specialized annual plan for publishing documents electronically. It is common practice for archives in Kazakhstan to include various anniversaries and significant historical events in their annual plans. As part of implementing these plans, the archives develop a range of electronic products. Having analyzed electronic publications of the state archival institutions, we determined the types and number of published electronic documentary items. It should be noted that the types of electronic publications differ, especially when creating collections of documentary publications. For example, the Almaty SA uses an e-book technology and the AP RK creates publications in a conventional form and uploads them on the website.

### Software product – the E-Doc Complex website

Due to the fact that electronic publishing of collections of archival materials is problematic and highly dependent on financial and technological resources in the current state of archival institutions in the Republic of Kazakhstan, we have developed a software product – the website entitled “E-Doc Complex”. This software product is based on the rules for publishing documents of the National Archival Fonds<sup>2</sup> and “Guidelines for the Preparation of Scientific Reference Apparatus for the Publication of Documents on Modern History” (approved by minutes of the Expert Panel No. 12, dated June 27, 2008)<sup>3</sup>. The developed and tested in July 2024, the E-Doc Complex website allows to create various types of electronic documentary publications of archival documents based on their intended purpose: research, popular science, educational and thematic virtual exhibitions (fig. 5).

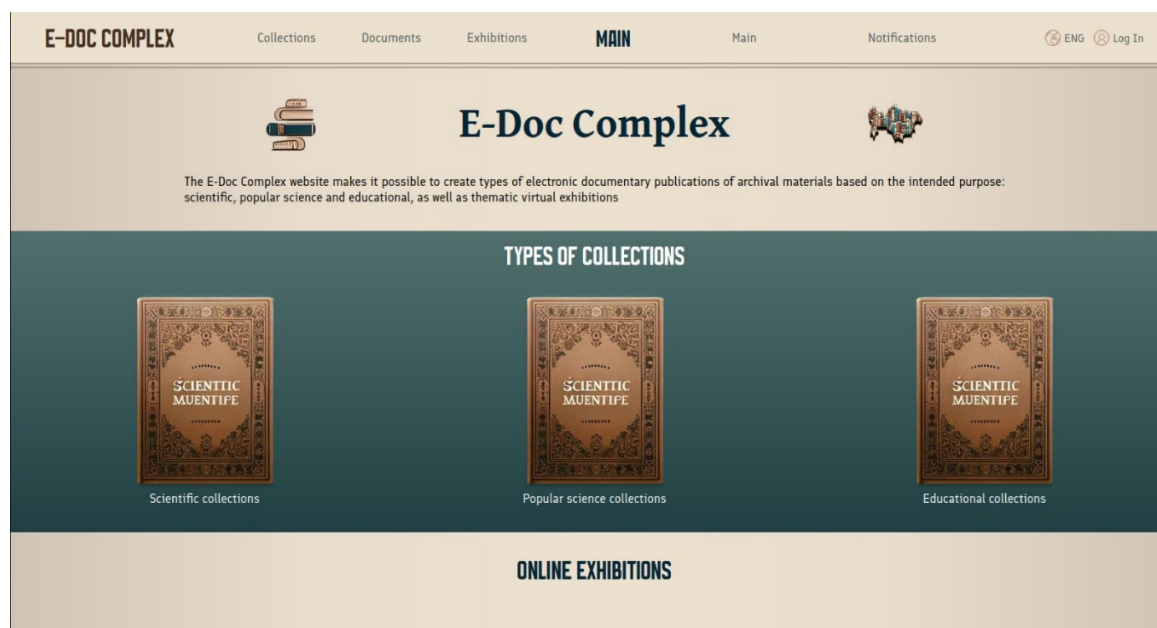


Fig. 5. Home Page of the E-Doc Complex Website  
 Рис. 5. Главная страница сайта E-Doc Complex

<sup>1</sup> Ibid. P. 11.

<sup>2</sup> Order of the Minister of Communications and Information of the Republic of Kazakhstan dated November 16, 2011, No. 349 “On Approval of the Rules for the Publication of Documents of the National Archival Fonds of the Republic of Kazakhstan”. *Information and Legal System of Regulatory Legal Acts of the Republic of Kazakhstan* [online] Available at: <https://adilet.zan.kz/rus/docs/V1100007342> (accessed 25.12.2023). (In Russ.).

<sup>3</sup> “Guidelines for the Preparation of Scientific Reference Apparatus for the Publication of Documents on Modern History” the Archives of the President of the Republic of Kazakhstan. Reference and information fonds No. 1546 of the Archives of the President of the Republic of Kazakhstan. Almaty, 2008. (In Russ.).





The process of publishing collections of archival materials is a set of works to determine the type and form of publication and to specify the steps for organization of publication preparation, identification and selection of documents, transmission of texts, archeographic registration of documents and development of reference apparatus, formation of a layout of a documentary publication.

The purpose of the development of the software of the E-Doc Complex website is the publication of digitized archival papers and audiovisual documents taking into account the objectives of collections, as well as the tasks and nature of the published sources in accordance with the methods of archeographic and polygraphic preparation. Developers of collections of archival documents may choose a type of a particular collection: academic, popular science or educational according to the Rules. They also may fill in all fields and upload materials on a special page of the E-Doc Complex website (fig. 6).

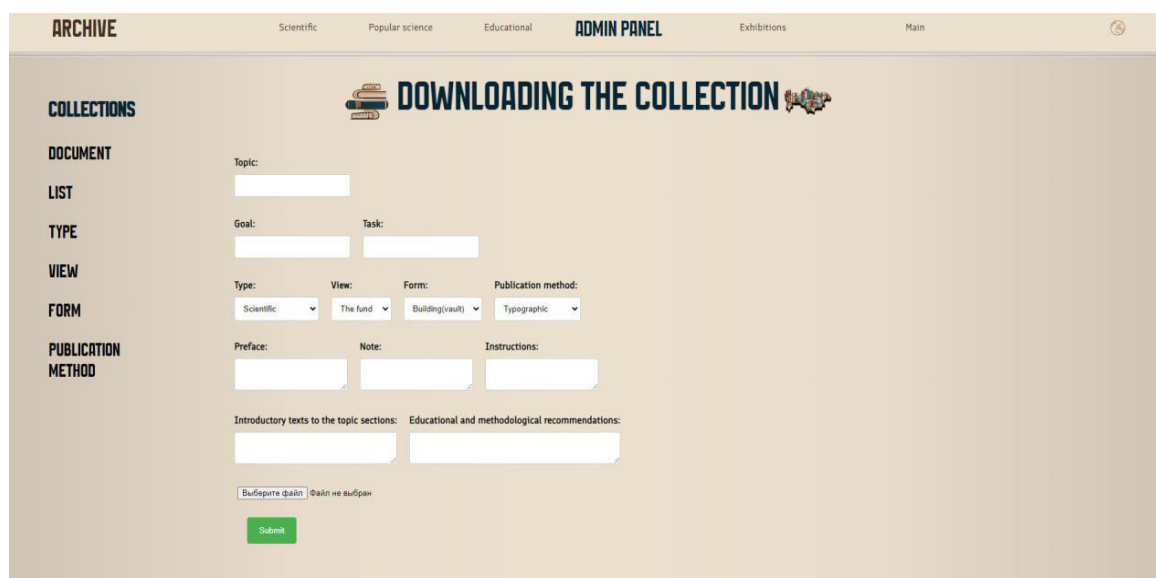


Fig. 6. Page for Uploading Collections of Archival Documents on the E-Doc Complex Website  
 Рис. 6. Страница загрузки сборников архивных материалов на сайте E-Doc Complex

This software product was created as a website based on a flexible backend developed using modern technologies and programming practices. The popular Python programming language was chosen as the basis for the backend. The following technologies and frameworks were used: FastAPI, PostgreSQL, JWT (JSON Web Tokens).

The backend of the website is built on the principle of Onion Architecture. It helps to organize the code in such a way that it is resistant to changes, easily tested and maintained. In this approach, the code is divided into layers. Each layer depends only on the inner layers and never on the outer ones. This ensures weak coupling of components and high flexibility of the system. See the Onion Architecture principle of E-Doc Complex (fig. 7).

The E-Doc Complex database is organized by a set of interrelated components that form the basis of archival data and includes the following types of electronic publications:

- Collections that combine documents into thematic and chronological groups, making navigation and search easier. Collections are additionally classified by types, categories and formats. This allows to describe their nature and structure in detail.
- Exhibitions that organize archival materials in the form of virtual exhibitions, providing users with a more visual and structured presentation of collections. See the database schema (fig. 8), functionality and features of E-Doc Complex (fig. 9).

The following main functions are provided for users of E-Doc Complex: registration and login (fig. 10).

When users visit the site for the first time, they go through the registration process, after which they can log in using a username and password. This allows to create a personal space on the website with

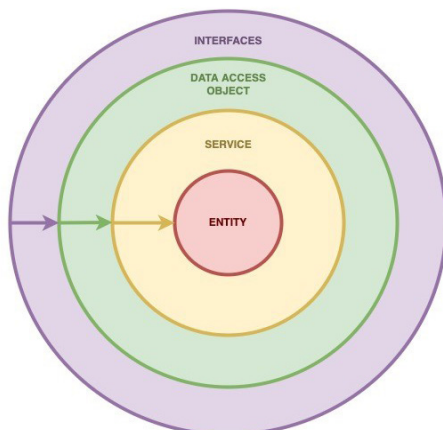


Fig. 7. The Onion Architecture Principle of E-Doc Complex  
 Рис. 7. Принцип «луковой архитектуры» E-Doc Complex

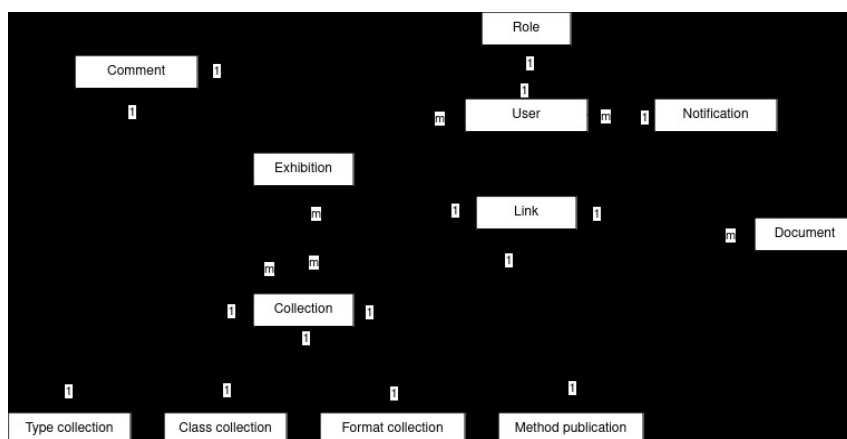


Fig. 8. The Database Schema of E-Doc Complex  
 Рис. 8. Схема базы данных E-Doc Complex

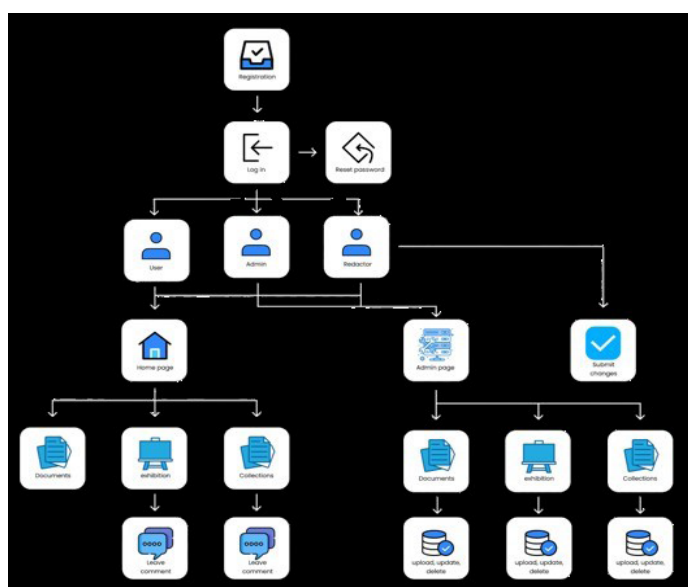


Fig. 9. Functionality and Features of E-Doc Complex  
 Рис. 9. Функциональность и возможности E-Doc Complex

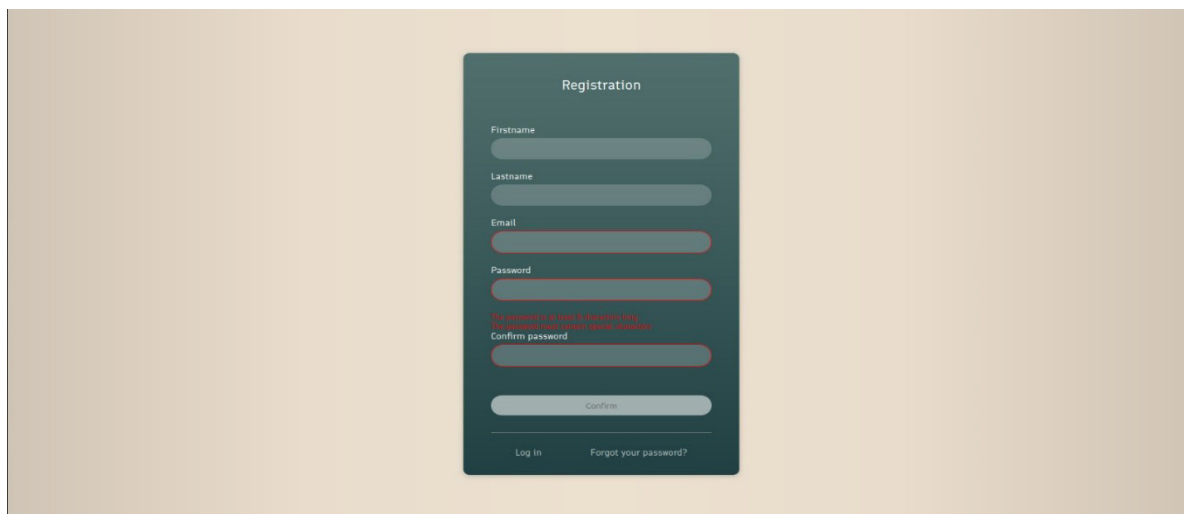


Fig. 10. Registration Page

Рис. 10. Страница регистрации

the opportunity to save the browsing history and comments as well as to select collections on the main page. After logging in, users are directed to the home page where they can choose a type of collection: academic, popular science or educational. This helps to navigate through a large number of materials and get started with the topics they are interested in; after selecting the type of interest, users see a list of all collections filtered by the selected category.

Viewing collections: users may retrieve any collection to study detailed information, view documents and post comments.

Virtual exhibitions: users may also visit virtual exhibitions from the main page and interact with materials in the same way as with collections; additional features are provided for administrators and editors.

Implementation and features: thanks to the use of FastAPI and asynchronous programming, the historical archival website is able to process a large number of requests simultaneously, ensuring a high speed of operation and responsiveness of the interface. The use of PostgreSQL guarantees reliable data storage and efficient management of complex queries, which is critical for organizing and searching information in an extensive database of historical documents.

The JWT-based authentication and authorization system provides a high level of security, allowing users to register and use their personal accounts on the website with confidence.

“Users”: It contains data about users’ accounts, including their roles in the system, which determine the level of access to the archive and functionality.

“Notifications”: It serves to inform the editors about the administrators’ actions such as updates, creation of collections, exhibitions and documents.

“Comments”: It allows users to leave feedback and notes on documents or exhibitions, facilitating interactive knowledge sharing and discussion.

Features of the implementation of E-Doc Complex:

- **Data normalization.** The developers designed the database taking into account the principles of normalization to avoid duplication of information and ensure its integrity.
- **Indexing and query optimization.** Optimized indices and carefully planned queries are used to improve search performance and data access.
- **Security.** Measures have been taken to ensure data security, including encryption of confidential information and protection against SQL injections.
- **Connections:**
  - One-to-one ratio (1:1). A one-to-one connection assumes that one entry in Table A corresponds to exactly one entry in Table B. These connections are less common and usually used to split one table into two in order to improve data organization and management.



— One-to-many connection (1:N). This type of connection assumes that one entry in Table A may be associated with many entries in Table B, but each entry in table B is associated with only one entry in Table A. The connections between these entities in the database visualize interactions and dependencies, allowing a comprehensive management of information within the archive. All entities are considered as part of a single system that provides users with convenient access to historical data.

Additional features for administrators and editors of E-Doc Complex include:

- **Admin panel.** Users with the administrator role have access to the admin panel where they may add, edit and delete data. This gives administrators the opportunity to update and manage the content of the website,
- **Working with the editor.** Administrators may send requests for approval of changes to editors. This creates a two-step verification process that guarantees the quality and accuracy of the information available for users to view,
- **Editor functions.** Editors not only approve changes proposed by administrators, but also have the authority to create and edit data in the archive. This provides an additional level of flexibility and control over the content of the website,
- **Access control.** Different access levels for ordinary users, administrators and editors ensure the security of information and allow an effective management of archival resources. This functional scheme guarantees not only a convenient access to information for all categories of users, but also a strict control over the quality and relevance of the data presented. The described functionality embodies the key principles of user convenience, security and cooperation which are fundamental for the successful functioning of modern educational web resources,
- **Performance optimization.** React and React Router jointly provide efficient resource management and performance optimization. This is critical to ensure fast loading and response of the website, even with a large amount of data and high server load. Moreover, the financial costs for supporting the E-Doc Complex website are minimal. Hosting and a domain name are needed.

Costs for virtual hosting services in Kazakhstan vary depending on the selected tariff plan and required storage capacity, ranging from KZT 28,000 to KZT 112,000 per year (fig. 11).

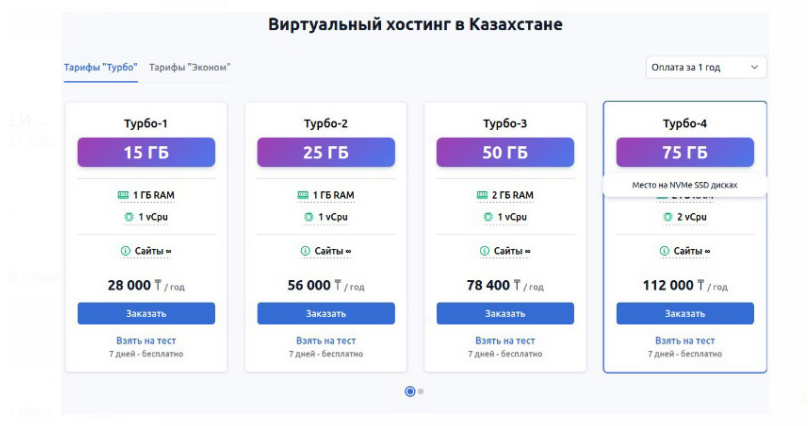


Fig. 11. Costs for Virtual Hosting in Kazakhstan  
Рис. 11. Стоимость виртуального хостинга в Казахстане

### Conclusion

Modern applied electronic archaeography has a variety of topics and models for distribution of the documentary heritage of archival institutions. The activities of archives in the digital space are diverse:

- preservation of cultural heritage;
- increasing the availability of archival materials;
- conducting high-quality archival heuristics;



- cooperation between institutions, researchers and communities to create digital collections;
- adaptation to constantly evolving technologies.

Online publications of archival materials in Kazakhstan are interactive in nature and based on a holistic, systematic approach.

However, our analysis of the electronic reference and search systems of the archival institutions and their documentary heritage in the form of web publications has shown different levels of their implementation. A comparative analysis has indicated that differences in methods for storage of documents may be due not only to various approaches of the archives, but also to their different documentary resources, technical capabilities, as well as characteristics of specific archival collections and user needs. Electronic document catalogs have been developed on all the websites of these archives, but the methods and formats of electronic documentary publication are not identical. The most active and versatile form is electronic archeography in the Archives of the President of the Republic of Kazakhstan (AP RK). Collections of archival materials are most often indicated on the websites of the archival institutions in the form of hyperlinks to publications in conventional forms. Collections of archival materials are presented as electronic books in the State Archives of Almaty (Almaty SA).

Today, modernizing the technological base of archival institutions determines the development of technologies and forms of work to create electronic documentary publications that meet modern requirements of information resources. Therefore, the archives in the Republic of Kazakhstan are developing methodological recommendations for digitalization of archival documents, creating virtual interactive exhibitions, etc. The technological level ensures a high-quality transformation of printed materials into electronic form. It is an important aspect in the methodological support of archivistics.

Our developed software product — the E-Doc Complex website — will contribute to the creation of two types of electronic publications of documentary heritage: collections of archival materials (academic, popular science and educational) and virtual thematic exhibitions. Integration with Elasticsearch makes it possible to build a powerful and fast search engine to find relevant archival documents. It supports complex queries and aggregations. This provides users with instant access to the necessary information, improves navigation and interactivity of the website. The development of appropriate indices and indexing strategies is critical to optimize the performance and relevance of search results. In addition to authentication and authorization, measures have been taken to protect the website against XSS and CSRF attacks, as well as from SQL injections through the use of ORM. Regular updates of dependencies and the use of proven libraries contribute to the overall security of the project. The E-Doc Complex website may be used by archival institutions to create collections of documents in digital format.

#### REFERENCES

- Avtokratov, V. N. (2001) *Theoretical issues of Russian archival science*. Moscow, Russian State University for the Humanities. 402 p. (In Russ.).
- Afiani, V. Yu. (2019) Contemporary issues of archaeography: A historiographical aspect. *Domestic Archives*, no. 1, pp. 25–31. (In Russ.).
- Bazyr, R. N. (2020) Visible history of Tuva in photo documents at the National Archives of the Republic of Tuva. *New Research of Tuva*, no. 2, pp. 47–62. (In Russ.). DOI: <https://doi.org/10.25178/nit.2020.2.3>
- Grum-Grzhimailo, Yu. V. and Sabennikova, I. V. (2006) Some problems of publishing archival documents in electronic editions. *Herald of an Archivist*, no. 2–3, pp. 306–318. (In Russ.).
- Kozlov, V. P. (2001) Theoretical foundations of archaeography from the perspective of modernity. *Domestic Archives*, no. 1, pp. 10–33. (In Russ.).
- Kozlov, V. P. (2017) *Documentary memory in archival knowledge*. Moscow, Archives of the RAS ; Drevlekhranilishche. 332 p. (In Russ.).
- Maadyr, M. S. (2020) The rise and history of archaeography in Tuva. *New Research of Tuva*, no. 2, pp. 32–46. (In Russ.). DOI: <https://doi.org/10.25178/nit.2020.2.2>
- Munge, B. V., Kuular, M. S. and Lamazhaa, Ch. K. (2020) The history of archival work in Tuva: A social and philosophical study. *New Research of Tuva*, no. 2, pp. 4–31. (In Russ.). DOI: <https://doi.org/10.25178/nit.2020.2.1>
- Olimpieva, E. V. (2018) Electronic publications of historical sources on the Runet. In: Mazur, L. N. (ed.). *Document. Archive. History. Modernity* : Proceedings of the 7th All-Russian science-to-practice conference with international



participation dedicated to the 80th anniversary of the Faculty of History of the Ural Federal University (Yekaterinburg, November 16–18, 2018). Yekaterinburg : Ural University Publishing House. Pp. 264–267. (In Russ.).

Pozdeeva, I. V. (2002) A new concept of editorial archival science. *Domestic Archives*, no. 1, pp. 57–62. (In Russ.).

Ponassenko, A. V. and Studenikina, V. P. (2018) *Fundamentals of theoretical and applied archaeography*. Lugansk, Knita. 88 p. (In Russ.).

Sabennikova, I. V. (2022a) Personal archives and their transformation in digital era. *RUDN Journal of Russian History*, vol. 21, no. 2, pp. 251–257. (In Russ.). DOI: <https://doi.org/10.22363/2312-8674-2022-21-2-251-257>

Sabennikova, I. V. (2022b) Cloud services for storing digital documents. Legal framework and existing risks. *History and Archives*, no. 2, pp. 73–82. DOI: <https://doi.org/10.28995/2658-6541-2022-2-73-82>

Yumasheva, Ju. Yu. (2012) Electronic copies of the archives collections of the Russian Federation: Source studies problems. *Moscow University Bulletin. Series 8: History*, no. 5, pp. 150–175. (In Russ.).

Yumasheva, Ju. Yu. (2017a) Scholarly publishing of historical documents in an electronic environment: Problems of source studies and archeography. *Historical Informatics*, no. 1, pp. 125–139. (In Russ.). DOI: <https://doi.org/10.7256/2306-0891.2017.1.21766>

Yumasheva, Ju. Yu. (2017b) Problems of electronic archeography. *Moscow University Bulletin. Series 8: History*, no. 4, pp. 97–105. (In Russ.).

Acker, A. and Kreisberg, A. (2020) Social media data archives in an API-driven world. *Archival Science*, vol. 20, no. 2, pp. 105–123. DOI: <https://doi.org/10.1007/s10502-019-09325-9>

Carroll, L. et al. (2011) A comprehensive approach to born-digital archives / L. Carroll, E. Farr, P. Hornsby and B. Ranker. *Archivaria. The Journal of the Association of Canadian Archivists*, no. 72, pp. 61–92. [online] Available at: <https://archivaria.ca/index.php/archivaria/article/view/13360/> (accessed 08.12.2023).

Kriesberg, A. (2017) The future of access to public records? Public–private partnerships in US state and territorial archives. *Archival Science*, vol. 17, no. 1, pp. 5–25. DOI: <https://doi.org/10.1007/s10502-016-9268-6>

Milligan, I. (2022) *The transformation of historical research in the digital age*. Cambridge, Cambridge University Press. iv, 80 p. DOI: <https://doi.org/10.1017/9781009026055>

Pitti, D. V. (2004) Designing sustainable projects and publications. In: Schreiber, S., Siemens, R., Unsworth, J. (eds.). *A companion to digital humanities* / ed. by. Malden, MA ; Oxford, Blackwell Publishing. xxvii, 611 p. Pp. 471–487. [online] Available at: [https://companions.digitalhumanities.org/DH/?chapter=content/9781405103213\\_chapter\\_31.html](https://companions.digitalhumanities.org/DH/?chapter=content/9781405103213_chapter_31.html) (accessed 17.12.2023).

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#### СПИСОК ЛИТЕРАТУРЫ

- Автократов, В. Н. (2001) Теоретические проблемы отечественного архивоведения. М. : РГГУ. 402 с.
- Афиани, В. Ю. (2019) Современные проблемы археографии: историографический аспект // Отечественные архивы. № 1. С. 25–31.
- Базыр, Р. Н. (2020) Зримая история Тувы в фотодокументах Национального архива Республики Тыва // Новые исследования Тувы. № 2. С. 47–62. DOI: <https://doi.org/10.25178/nit.2020.2.3>
- Грум-Гржимайло, Ю. В., Сабенникова, И. В. (2006) Некоторые проблемы публикации архивных документов в электронных изданиях // Вестник архивиста. № 2–3. С. 306–318.
- Козлов, В. П. (2001) Теоретические основы археографии с позиций современности // Отечественные архивы. № 1. С. 10–33.
- Козлов, В. П. (2017) Документальная память в архивоведческом знании. М. : Архив РАН ; Древлехранилище. 332 с.
- Маадыр, М. С. (2020) История становления археографии Тувы // Новые исследования Тувы. № 2. С. 32–46. DOI: <https://doi.org/10.25178/nit.2020.2.2>
- Мунге, Б. В., Куулар, М. Ш., Ламажаа, Ч. К. (2020) История архивного дела Тувы: социально-философский анализ // Новые исследования Тувы. № 2. С. 4–31. DOI: <https://doi.org/10.25178/nit.2020.2.1>
- Олимпиева, Е. В. (2018) Электронные публикации исторических источников в Рунете // Документ. Архив. История. Современность : мат. VII Всерос. науч.-практ. конф. с международным участием, посвященной 80-летию исторического факультета Уральского федерального университета (Екатеринбург, 16–18 ноября 2018 г.) / отв. ред. Л. Н. Мазур. Екатеринбург : Изд-во Урал. ун-та. С. 264–267.
- Поздеева, И. В. (2002) Новая концепция эдиционного архивоведения // Отечественные архивы. № 1. С. 57–62.



Понасенко, А. В., Студеникина, В. П. (2018) Основы теоретической и прикладной археографии. Луганск : Книта. 88 с.

Сабенникова, И. В. (2022a) Личные архивы и их трансформация в эпоху цифровизации // Вестник РУДН. Серия: История России. Т. 21, № 2. С. 251–257. DOI: <https://doi.org/10.22363/2312-8674-2022-21-2-251-257>

Сабенникова, И. В. (2022b) Облачные сервисы хранения цифровых документов: законодательная база и существующие риски // История и архивы. № 2. С. 73–82. DOI: <https://doi.org/10.28995/2658-6541-2022-2-73-82>

Юмашева, Ю. Ю. (2012) Электронные копии документов Архивного фонда РФ: источниковедческие проблемы // Вестник Московского университета. Серия 8: История. № 5. С. 150–175.

Юмашева, Ю. Ю. (2017a) Научное издание исторических документов в электронной среде: проблемы источниковедения и археографии // Историческая информатика. № 1. С. 125–139. DOI: <https://doi.org/10.7256/2306-0891.2017.1.21766>

Юмашева, Ю. Ю. (2017b) Проблемы электронной археографии // Вестник Московского университета. Серия 8: История. № 4. С. 97–105.

Acker, A., Kreisberg, A. (2020) Social media data archives in an API-driven world // Archival Science. Vol. 20, no. 2. P. 105–123. DOI: <https://doi.org/10.1007/s10502-019-09325-9>

Carroll, L. et al. (2011) A comprehensive approach to born-digital archives / L. Carroll, E. Farr, P. Hornsby, B. Ranker [Электронный ресурс] // Archivaria. The Journal of the Association of Canadian Archivists. No. 72. P. 61–92. URL: <https://archivaria.ca/index.php/archivaria/article/view/13360/> (дата обращения: 08.12.2023).

Kriesberg, A. (2017) The future of access to public records? Public–private partnerships in US state and territorial archives // Archival Science. Vol. 17, no. 1. P. 5–25. DOI: <https://doi.org/10.1007/s10502-016-9268-6>

Milligan, I. (2022) The transformation of historical research in the digital age. Cambridge : Cambridge University Press. iv, 80 p. DOI: <https://doi.org/10.1017/9781009026055>

Pace, A. K. (2000) Digital preservation: Everything new is old again // Computers in Libraries. Vol. 20, No. 2. P. 55–58.

Pitti, D. V. (2004) Designing sustainable projects and publications // A companion to digital humanities / ed. by S. Schreibman, R. Siemens, J. Unsworth. Malden, MA ; Oxford : Blackwell Publishing. xxvii, 611 p. P. 471–487. URL: [https://companions.digitalhumanities.org/DH/?chapter=content/9781405103213\\_chapter\\_31.html](https://companions.digitalhumanities.org/DH/?chapter=content/9781405103213_chapter_31.html) (дата обращения: 17.12.2023).

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