

Archival Information Systems: An Overview of the Lithuanian Experience

Dr. Youcef Ouled Hacini¹, Dr. Fares Boukhoudem², Pr. Slimane Ouzar³

¹Associate Professor (A), Laboratory of Scientific and Cultural Heritage of the Tamanrasset Region, University of Tamanrasset (Algeria), E-mail: youcef.ouledhacini@univ-tam.dz

²Associate Professor (B), Laboratory of Scientific and Cultural Heritage of the Tamanrasset Region, University of Tamanrasset (Algeria), E-mail: fares.boukhoudem@univ-tam.dz

³Professor, Laboratory of Scientific and Cultural Heritage of the Tamanrasset Region, University of Tamanrasset (Algeria), E-mail: slimane.ouzar@univ-tam.dz

Received: 01/2025, Published: 03/2025

Abstract:

This study aims to shed light on archival information systems within the digital environment, which operates in the context of growing electronic transactions under what is known as e-government policies, the digital economy, e-commerce, and related electronic services. The cornerstone of these services is electronic documents and information security. All these points aim to secure collaborative work, preserve information, and ensure easy access to it when needed at various decision-making levels within organizations of different forms. The need to rely on more advanced systems that provide modern information services based on more advanced technologies has increased to meet specialized requirements.

Building an archival information system requires a solid technological and knowledge base within human and institutional structures. From this perspective, this study attempts to provide some basic knowledge about archival information systems and their key pillars, while also applying this theoretical knowledge to the Lithuanian experience in creating an archival information system within modern standards.

To achieve the study's objectives, a descriptive approach was adopted to present and describe Lithuania's archival information systems and highlight their importance.

Keywords: Archival Information Systems, Lithuanian Experience, Electronic Archives, Electronic Documents.

Introduction:

The digital invasion of the human world within the boundaries of a digital environment necessitates digital transactions within a set of human management policies, including e-government, e-commerce, the digital economy, and related electronic services. It is impossible for these services to exist without electronic documents and information security policies. All these points rely on a technological infrastructure that evolves with advancements in information technology and human needs.

In this context, most organizations and governments have adopted information systems to support their policies for digital transformation. These systems provide a wide range of institutional requirements for their daily activities and information services for their users. The elements provided by electronic information systems are not limited to services, activities, or tasks but extend to ensuring the preservation and safety of their current and future documents through an archival

information system platform. This platform is a form of information system that primarily manages electronic archival documents resulting from internal and external transactions of organizations and institutions.

In this framework, the concept of modern archival information systems emerges from the perspective of traditional information systems, which are based on creating and preserving analog archival documents in storage systems built on specific standards and environmental conditions to enable access under necessary conditions. All these processes are a series of traditional procedures that carry a set of costs and increasing timeframes, which have been reduced in modern systems by providing new capabilities.

I. Definition of Information Systems:

According to Jean Gered, information systems are a structured set of information and functions used in the activities of an organization and its strategic sectors. The discussion about them varies in terms of the medium and content, as they are integral to every activity within the organization and carry different issues, one technical related to information processing and the other strategic related to how they are organized and managed. Despite these differences in their concerns, they are complementary.

J. Thomasson, on the other hand, sees information systems as a set of human, technical, and objective means for managing the information necessary to perform the functions of an organization. They cover major functions such as input, archiving, access, and availability of information. Therefore, they require reliance on computer technologies to manage data, processing, and communication, in addition to methods for designing and implementing these technologies.

II. Archival Information Systems:

The term "archival information systems" is a relatively new concept in the lexicon of library, information, and archival sciences. It emerged from the integration of these fields with computer science, aided by advancements in information technology and networks.

Given the increasing use of information technology and networks in documentary institutions, many authors and experts have provided different definitions and specialized perspectives describing the concept of archival information systems. One of the most prominent is the French archival thought leader Marie-Anne Chabin, who defined archival information systems as "an organizational approach within an institution aimed at identifying, managing, and securing all documents that link the institution with other institutions or third parties. These documents regulate the future activity of the institution, and their absence poses a risk to the institution."

This definition gives rise to a set of ideas that indicate the general form of an archival information system as follows:

- The basic unit of an archival information system revolves around the document, which is the physical entity composed of a medium carrying information.
- The archival information system includes all data, information, and documents, whether original or copies, and whether they are files or isolated documents.

- The concept of archival information systems is associated with all forms of documents, both analog and electronic.

III. **Functions of Archival Information Systems:**

Archival information systems operate through various units to perform several functions that are the foundation and purpose of their creation. Each unit works in an integrated manner to perform a partial role within the archival information system chain.

- **Input Unit:** The functions of this unit include receiving, monitoring, and authenticating digital entities to be archived, which are then sent to the storage unit. Meanwhile, the necessary information for describing and managing them over time is sent to the data management unit.
- **Storage Unit:** Ensures the physical preservation of archival entities, sending them to the access unit while adhering to the rules set by the management unit, which performs multiple copies and renews old media.
- **Data Management Unit:** Its function is to update all internal information—related to databases—necessary for the archival information system. It also provides other units of the system with metadata for archival entities (including the access unit) and all information related to technical and archival management.
- **Management Unit:** This unit ensures the overall coordination and integration of the system, sets internal rules, and ensures the general quality of the service provided, improving it while considering external management.
- **Planning Unit:** Acts as a vigilance and planning cell for the system, preparing the external environment and setting guidelines for necessary improvements. Additionally, in light of current technological developments, the unit prepares and plans for these technologies.

It is also responsible for monitoring changes that may occur among the intended user base to ensure that the availability service remains aligned with what users expect.

- **Access or Availability Unit:** Gathers all services that are the direct interface with users. In addition to access control functions, it primarily allows beneficiaries to search the catalog of archival entities and present the requested entities.

IV. **Components of Archival Information Systems:**

Archival information systems are known for integrating a set of elements into a unified automated environment. These elements include archival holdings, information services, and automated equipment.

- **Archival Holdings:** The diversity of archival holdings and the increasing production of archives in institutions of various types are indicators of the volume and variety of an institution's activities. Therefore, it is necessary for these institutions to establish archival information systems that enable comprehensive control and management of their electronic documents.
- **Descriptive Database (Metadata for digital entities).**

- Documentary Database (Reference sources for the archival information system).
- Archival Database (Electronic archival documents, electronic archival image bank, etc.).
- Information Services: The information services of archival information systems aim to provide users with various tools, whether automated or not. These services can take multiple forms, such as:
 - Services enabling access to information and documents.
 - Services enabling communication and responding to users.
 - Services providing and managing information.
- Automated Equipment: Archival information systems are built on automated equipment, which is the essential tool for managing archival holdings in their electronic form. Providing various information services within archival information systems requires the selection and installation of software for managing archival holdings. The selection process is based on work requirements and market offerings, and it is of great importance, requiring in-depth study and awareness of current and future developments and user needs.

As for hardware, including servers, professional computers equipped with necessary control modes, reading devices, internal networks, and internet access, the nature of archival information systems requires maintenance and monitoring of the hardware to ensure the quality of the information services provided.

V. **Overview of Lithuania's Archival Information System:**

Lithuania's national archival information system was established in 2011 due to the vast amount of information contained in archival documents, records, and traditional information systems in general. The large and growing volume of paper documents that need to be stored in preservation institutions, along with the documentary requests received from various institutions, made it imperative to create a national information system that allows the transfer of electronic documents to preservation institutions for storage using appropriate information technologies. This system also organizes effective preservation processes and provides users with electronic services for searching, accessing, and displaying electronic documents for users at various functional levels.

Lithuania's archival information system is used by public institutions that submit their documents to the government archives, as well as legal entities that conduct information searches in the government archives.

The system ensures the long-term or indefinite use of electronic documents by converting their content into a long-term storage format (PDF/A), which is periodically reviewed and updated. Electronic documents are physically stored in two centers: the main electronic archive data center and the backup electronic archive data center. The system creates backups of the main data center's information in a backup data center, with the ability to switch operations between centers in case of

a failure. The system's operation mode can also be changed if there is a possibility of a failure in one of the data centers.

VI. Units of Lithuania's Electronic Archival Information System:

Lithuania's electronic archival information system consists of the following units:

1. Document Management Supervision Unit.
2. Electronic Document Transfer and Acceptance Unit.
3. Electronic Document Storage Unit.
4. Document Publication and Presentation Unit.
5. Archival Information System Management Unit.

These units within the archival information system perform various functions, which can be divided into the following subsystems:

1. General Subsystem: Related to institutions that transfer files and documents. It facilitates the transfer of electronic documents and data necessary for supervising the document management processes of public institutions and legal entities. It also facilitates the search and display of documents, requests, and receipt of certificates and copies of electronic documents, as well as the verification and review of electronic documents and files.
2. Internal Subsystem: Related to employees of the public document management system. It manages system users and their rights, supervises the management of documents submitted by institutions, and handles the reception and authentication of electronic documents for storage. It also manages risks associated with storage and prepares and presents authenticated copies of electronic documents by archival information system officials.
3. Storage Subsystem: Aims to store electronic documents and official data related to storage (administrative metadata), search for electronic documents, and manage risks.

VII. Main Functions of Lithuania's Electronic Archival Information System:

The main functions of Lithuania's EAIS (Electronic Archive Information System) are as follows:

1. Supervising the administrative management of documents transferred by institutions to the national archival information system through information and communication technologies (organizing accounting document data, submitting reports to the National Archives Center).
2. Transferring electronic documents to the National Archives Center.
3. Storing electronic documents to ensure their integrity, authenticity, confidentiality, and durability.
4. Searching and accessing electronic documents, including the National Documentary Fund (NDF) stored in the National Archives Center, through information and communication technologies.

5. Providing metadata about documents in the National Documentary Fund (NDF) stored in the National Archives Center, regardless of their format, size, or medium, through information and communication technologies.
6. Submitting requests to the National Archives Center to issue documents confirming legal information and issuing copies of certificates and electronic documents in electronic form.

VIII. **General Principles of Managing Lithuania's Archival Information Systems and Electronic Documents:**

The main legal procedure on which Lithuania's archival information system operates is the regulation of electronic document management in the public sector, as outlined in the Electronic Document Management Regulations adopted in 2012. These regulations set the general requirements for preparing, managing, monitoring, and storing electronic documents, as well as managing electronic archival information systems for all institutions and individuals authorized by the Lithuanian state.

The regulations require that electronic documents be managed throughout their existence in an electronic system that complies with the applicable requirements for electronic document management as stipulated in the legislation.

The electronic archival information system is part of the document management system of an institution that operates based on information technology. Its purpose is to prepare and control electronic documents, leading to their storage or deletion.

Lithuania's archival information system requires the registration of electronic documents created or received by an institution and related to its activities in the electronic archival information system to prove their authenticity and ensure their searchability and accessibility.

The Lithuanian system organizes electronic documents created or received by an institution and registered in the electronic document management system according to the institution's document plan. Electronic files are created from electronic documents created or received by the institution.

To preserve electronic documents, they must be "updated" periodically, meaning they are transferred (copied) to new technical storage media and converted into new file formats that meet the requirements of modern software. The complete electronic files of the institution must be controlled, and the retention period of electronic documents must be calculated from the end of the year in which the electronic file is completed.

The Electronic Document Management Regulations in force within Lithuania's national legal framework outline possible procedures for preserving electronic documents in an institution, including:

- Updating storage media.
- Changing the package.
- Conversion by retrieval.
- Procedures for preserving the content of electronic documents.

- Guidelines for the validity of electronic document signatures.

After the administrative retention period for storing electronic files has expired, the electronic files and documents are evaluated, and a decision is made regarding further storage or deletion. Electronic documents registered in the institution's electronic document management system cannot be deleted before a decision is made and approved to delete the electronic documents.

IX. Main Components and Services of Lithuania's Archival Information System:

Lithuania's electronic archival information system consists of three main components:

- Public Portal: Ensures service for all external users. It can be accessed via the following link: <https://eais-pub.archyvai.lt>.
- Internal Portal: Serves employees of the National Archives Center and the Office of the Chief Archivist of Lithuania. It can be accessed via the following link: <https://eais-int.archyvai.lt>.
- Electronic Document Storage Centers: Consists of two storage centers, the main storage center located in Vilnius and the backup storage center located in Šiauliai. Access to both centers is only possible through the internal portal.

Lithuania's electronic archival information system provides electronic information services, which primarily include:

- Information and document search services.
- Services for providing and delivering documents and information to users.
- Services for transferring electronic documents to the National Archives for storage using information technology.
- Access to part of the electronic documents in the National Documentary Fund (NDF).
- Storage and preservation services for electronic documents in the National Documentary Fund (NDF).
- Registration services for government bodies and institutions on one hand, and government employees on the other.
- Dialogue and inquiry services linked to the e-government platform.
- Technical services related to the electronic archival information system.

X. Logical Organization of Lithuania's Electronic Archival Information System Units:

The electronic document storage unit of Lithuania's EAIS (Electronic Archive Information System) includes the following logical databases:

1. Original Documents.
2. Digitized Archive (PDF/A).

3. Public Documents (PNG/JPEG).
4. Copies.

As for the metadata of the archival information system, it includes two types of packages:

1. Original Package.
2. Authenticated Archival Package.

XI. Operation of the Electronic Archival Information System:

An electronic file is retained through the Saperion system structure by placing the file in the appropriate logical position, and the metadata is stored in the database. At the end of the specified retention period or upon request, a repeated check is conducted on the authenticity of certain sets of documents or individual documents (from copies of their converted contents), as well as verifying the integrity of their parts related to administrative authentication. After a certain period or upon request, the contents of document sets or individual documents (from copies of their converted contents) are converted into new file formats, and the entire process is managed by the EAIS data center administrator.

During the storage process, backup data is copied as vigilance measures, and the process is carried out periodically or upon request. This involves testing the scanning of documents on storage media, with the aim of early detection of defects in storage media or equipment and verifying the validity of electronic documents (based on the results of verifying the approval signature of archival documents).

Within the Saperion system environment, the expiration date of the electronic signature is verified, along with other practices and procedures related to storage.

Conclusion:

The Lithuanian government, within the framework of the 2011 Lithuanian Innovation Plan, worked to improve the operation of the electronic archival information system, starting with the enactment of decrees and laws recognizing the evidentiary value of electronic documents. The initiative began with the preparation and issuance of original decrees in electronic form.

The government also developed the technical aspects of Lithuania's archival information system in terms of interoperability, enabling the reception and acceptance of electronic documents from the Lithuanian National Documentary Fund to preserve their integrity, authenticity, and immutability. Additionally, it made these documents accessible to various user groups and provided the necessary information services.

Through the above, Lithuania's electronic archival information system is considered one of the leading experiences in the field of electronic archives. This is due to a set of fundamental experiences on which the project was based in government institutions, leading to the development and transfer of experiences to national preservation institutions. These institutions directly contributed to supporting the system as a national archival information system that provides archival information within Lithuanian territory in a seamless manner, facilitating citizens' access to their documents and enabling researchers to conduct their scientific research.

References:

1. Arūnas Stočkus. Electronic Archive Services in Lithuania. Available at: <http://player.slideplayer.com/download/19/5869153/E8kNpCkHVIIdPt-rcY74rWg/1602348623/5869153.ppt>
2. CHABIN Marie-Anne. Nouveau glossaire de l'archivage online. Archive 17, 2010 accessed March 27, 2018. Available at: http://www.archive17.fr/component/option,com_performs/Itemid,55/
3. Ludivine Magrez. Comment choisir une solution de gestion d'archives : le cas de la Communauté d'Agglomération de la Porte du Hainaut. Master's Thesis: Information and Documentation Management in Enterprises. Université Charles de Gaulle Lille 3, 2010, p.10. Available at: https://memsic.ccsd.cnrs.fr/mem_00526158/document/
4. Michel Auffret. L'archivage pérenne des documents numériques. France: Centre Informatique National de l'Enseignement Supérieur, 2005. P.4. Available at: <http://2005.jres.org/paper/47.pdf>
5. Lucile Collignan. Les systèmes d'information, entre usagers et bibliothécaires. Master's Thesis: Diploma of Library Curator. Lyon: Enssib, 2003. p.11
6. Gramondi, Laurence. L'offre de service en ligne d'un système d'information documentaire : besoins et usages dans le contexte universitaire du SCD Lyon 1. Master's Thesis: Diploma of Library Curator. Lyon: Enssib, 2005. p.31
7. Lucile Collignan. Les systèmes d'information, entre usagers et bibliothécaires. Master's Thesis: Diploma of Library Curator. Lyon: Enssib, 2003. p.11
8. Saulius Ragaisis. Electronic Archive Information System, 2014. P.109. Available at: <http://ceur-ws.org/Vol-924/paper11.pdf>
9. Andrius Zilnys. ELECTRONIC ARCHIVE INFORMATION SYSTEM. Available at: <https://www.archyvai.lt/en/new/system.html>