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Implementation of Web-Based Integrated Electronic Archives (ARTERI) at the South Labuhanbatu Regency Library and Archives Office

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KEYWORDS

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ABSTRACT

This study aims to analyze the implementation of the Integrated Electronic Archiving System (ARTERI) based on the web at the Library and Archives Office of Labuhanbatu Selatan Regency. This research employed a descriptive qualitative approach with data collected through interviews, observations, and documentation. The informants were four individuals: the head librarian, a librarian, a records manager, and an archivist. The results indicate that the ARTERI system has enhanced staff performance efficiency, accelerated the archiving process, and improved document accessibility for both internal and external users. However, the implementation process faced several challenges, including limited human resources with information technology skills, inadequate infrastructure, and concerns about digital archive security. To address these issues, the Library and Archives Office needs to provide technical training, gradually improve infrastructure, and implement a security system based on access controls and regular data backups. The study concludes that implementing ARTERI not only enhances the efficiency of public services but also serves as an adaptive, sustainable model for digital transformation within local government bureaucracies. It is recommended that regular system evaluations and capacity-building programs be carried out to ensure the sustainability of ARTERI implementation.

KATA KUNCI

ARTERI
Arsip Elektronik Terintegrasi
Transformasi Digital
Efisiensi Layanan Publik
Keamanan Arsip Digital

ABSTRAK

Penelitian ini bertujuan untuk menganalisis implementasi Arsip Elektronik Terintegrasi (ARTERI) berbasis web di Dinas Perpustakaan dan Kearsipan Kabupaten Labuhanbatu Selatan. Metode yang digunakan adalah pendekatan kualitatif deskriptif dengan teknik pengumpulan data melalui wawancara, observasi, dan dokumentasi. Informan dalam penelitian ini terdiri dari empat orang, yaitu seorang kepala perpustakaan, seorang pustakawan, seorang yang berperan sebagai pengelola arsip dan arsiparis. Hasil penelitian menunjukkan bahwa sistem Arsip Elektronik Terintegrasi *(ARTERI)* mampu meningkatkan efektivitas kerja pegawai, mempercepat proses pengarsipan, serta mempermudah akses dokumen bagi pengguna internal dan eksternal. Meskipun demikian, proses implementasi menghadapi kendala seperti keterbatasan sumber daya manusia yang kompeten di bidang teknologi informasi, keterbatasan infrastruktur, serta isu keamanan data arsip digital. Untuk menjawab tantangan tersebut, Dinas Perpustakaan & Kearsipan perlu melakukan pelatihan teknis, peningkatan infrastruktur secara bertahap, serta menerapkan sistem keamanan berbasis kontrol akses dan pencadangan data. Kesimpulan dari penelitian ini menunjukkan bahwa implementasi Arsip Elektronik Terintegrasi *(ARTERI)*, tidak hanya mendukung efisiensi

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layanan publik, tetapi juga menjadi model transformasi digital yang adaptif dan berkelanjutan di lingkungan birokrasi lokal. Penelitian ini merekomendasikan perlunya evaluasi sistem secara berkala dan penguatan kapasitas sumber daya manusia sebagai strategi keberlanjutan implementasi.

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1. Introduction

Libraries and archives play a crucial role in organizing information, knowledge, and records in contemporary society. Libraries serve as hubs of information and literacy, providing access to diverse reading materials in both digital and print formats. Beyond acting as repositories of knowledge, libraries also serve as platforms for continuous learning that contribute to the growth of an informed community (Endarti, 2022). Meanwhile, archival institutions play a vital role in safeguarding, managing, and preserving significant documents whether digital or physical that hold legal, administrative, and historical importance (Arwana et al., 2024).

The importance of recording and preserving information is also reflected in Islamic values. Q.S. Yasin verse 12:

اِنَّا نَحْنُ نُحْيِ الْمَوْتٰى وَنَكْتُبُ مَا قَدَّمُوْا وَاٰثَارَهُمْۗ وَكُلَّ شَيْءٍ اَحْصَيْنٰهُ فِيْٓ اِمَامٍ مُّبِيْنٍ ۧ

Meaning:

> "*Verily We raise the dead, and We record what they have done and the marks they have left behind". (Q.S. Yasin: 12)*

The verse highlights the importance of documenting and recording as a form of universal accountability. From a modern archiving perspective, this notion aligns with principles for managing authentic, precise, and sustainable documents.

In today's digital era, the task of archive management has become increasingly demanding. Advancements in information technology compel government institutions to shift from traditional manual processes to digital-based systems. Common issues found in manual archiving include slow retrieval, disorganized storage, and a significant risk of archive loss. This condition is also observed in the South Labuhanbatu Regency Library and Archives Office, which, until recently, continued to apply conventional archive management practices.

Before adopting the Integrated Electronic Archive (ARTERI) system, all active records in the office were managed in a physical format with no digital support. Although precise data were not thoroughly documented, observations and staff confirmation indicate that the growing volume of archives led to a buildup of documents across units. This situation caused difficulties in retrieving archives, reduced productivity, and heightened the risk of damage or loss of essential documents. Such conditions became the primary motivation for the institution's initiative to adopt a more efficient, integrated digital archiving system.

The Integrated Electronic Archive (ARTERI) system, built on a web-based platform, was introduced to address the need for digital archiving in the local government setting. This system enables the digital recording, categorization, storage, and retrieval of archives at greater speed and effectiveness than conventional methods (Fauzi et al., 2020). Selain itu, sistem Arsip Elektronik Terintegrasi *(ARTERI)* juga dilengkapi dengan fitur perlindungan data, seperti akses terbatas, enkripsi data, dan penyimpanan rutin (Ujung et al., 2023).

This digital shift affects not only operational workflows but also fosters a transformation in employees' mindsets and work culture. Successful adaptation to the system demands proper training, mentoring, and infrastructure support. Challenges such as limited IT-skilled personnel and inconsistent internet connectivity present obstacles during implementation. Nevertheless,

this initiative marks a crucial effort in enhancing the effectiveness, transparency, and accountability of archive management and public services. (Suci Wahyu Tami Br Rambe & Abdul Karim Batubara, 2023).

Previous studies conducted by Yanto (2022) demonstrated the advantages of archive digitization within government environments; however, they did not specifically address the use of the Integrated Electronic Archives (ARTERI) system at the local government level. Likewise, Ramadhina & Batubara (2024) underscore the role of archives in informing strategic decision-making, yet their research does not provide an in-depth examination of integrated digital archiving systems. Consequently, this study seeks to address this research gap by comprehensively exploring the implementation of ARTERI within a local context.

The purpose of this research is to assess the application of the web-based Integrated Electronic Archive (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office, as well as to identify and analyze the challenges faced during its implementation. Therefore, the findings of this study are expected to contribute theoretically to advancing digital archiving practices in the public sector and to offer practical insights for local governments on adopting adaptive, secure, and sustainable digital innovations.

2. Literature Review

2.1. Electronic Archive Management

Archive management is the systematic process of collecting, organizing, storing, and preserving records to ensure they can be accessed effectively when required. Alongside the growth of information technology, archival management practices have transitioned from traditional manual methods to digital-based systems. Electronic archives are digitally formatted documents that are produced, stored, and managed through computer technology and information systems (Rochmad Fauzi et al., 2020). The use of such systems offers multiple benefits, including optimized storage space, faster document retrieval, and enhanced information administration. Conversely, manual archiving presents several drawbacks, including slow access, the risk of document loss, and uncontrolled record duplication (Aulianto, 2022).

The adoption of a digital archival system is also essential in guaranteeing the availability of accurate, easily accessible, and well-integrated data, particularly within government institutions. The implementation of the Integrated Electronic Archives (ARTERI) represents a strategic initiative to advance the modernization of archival governance and to support the establishment of a sustainable, data-driven, and information-based governmental framework.

2.2. Digital Transformation in Archives

Digital transformation in archival management represents a fundamental shift from traditional methods to a fully digital system encompassing infrastructure, operational processes, and organizational culture. The transition to digital archiving extends beyond simply converting physical documents into digital files; it also involves implementing technology-based archive management systems designed to enhance the efficiency, transparency, and accountability of bureaucratic institutions. (Dwiyantoro & Junandi, 2021).

This transition demands sufficient technological infrastructure, enhanced human resource capabilities through training, and revisions to policies and regulations that enable the successful adoption of digital archiving systems. The effectiveness of digital archive implementation is primarily influenced by workforce competence and the organization's ability to adapt its work culture to technological changes. Within the Integrated Electronic Archive (ARTERI) system, the transformation encompasses not only technical components but also managerial and strategic aspects to ensure the system operates effectively across all organizational units. (Yanto, 2022).

2.3. Information Security in Digital Archives

Ensuring information security is a significant challenge in electronic archive management. Digital archives are exposed to numerous risks, including cyberattacks, hardware failures, human errors in system operation, and unauthorized alterations to document content.

Therefore, a digital archive management system must be developed with layered security protections, including encryption, access controls, and data recovery strategies to address disruptions or data loss (Santoso & Prabowo, 2021).

The importance of information security continues to grow for government institutions, as the archives they manage often contain highly confidential data related to public administration, state finances, and population records. Digital archiving platforms like the Integrated Electronic Archives (ARTERI) must meet strict security standards to prevent data breaches and misuse. Without robust digital protection measures, archival digitization could create new challenges, particularly those related to data integrity and public confidence (Fathurrohman et al., 2023).

3. Research Methodology

This research employs a descriptive qualitative method, aiming to systematically and comprehensively portray the implementation of the web-based Integrated Electronic Archives (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office. This approach enables the researcher to gain a holistic understanding of the phenomenon without intervening in the subject of study by emphasizing the collection of narrative, observational, and documentary data that reflect actual field conditions (Assyakurrohim et al., 2022).

The research object is the South Labuhanbatu Regency Library and Archives Office located on Jalan Kota Pinang–Gunung Tua, Soopan Village, Kota Pinang District, South Labuhanbatu Regency. The scope of the study includes the processes, procedures, and effectiveness of the ARTERI system implementation for archive management and public service. Moreover, this study analyzes the system features and technical issues and their influence on the operational performance of the relevant institution. Data were gathered from December 2024 to March 2025. The participants in this study include the library head, librarians, archive administrators, and archivists directly involved in using the ARTERI system. The researcher examines in detail the experiences, perspectives, and challenges participants encounter during the implementation and use of the electronic archive system within the agency.

Several techniques were utilized for data collection, including observation, interviews, and documentation. Field observations enable the researcher to observe activities firsthand. Observation records are undertaken to obtain data through direct monitoring of ARTERI's operational processes. Interviews are conducted using flexible, open-ended question guidelines that can be expanded as the conversation unfolds. Meanwhile, documentation serves as supplementary evidence to collect written and visual materials related to system implementation, such as internal documents, policies, and interface displays.

The data analysis process is conducted interactively through stages of reduction, presentation, and conclusion drawing. Data reduction involves filtering and streamlining raw data to produce relevant information. The refined data are then systematically presented in narrative descriptions and participant quotations. The final phase involves drawing and verifying conclusions by interpreting the findings based on recurring patterns identified in the field (Assyakurrohim et al., 2022).

To ensure data credibility, this study employs source and technical triangulation. Triangulation is conducted by comparing interview, observation, and documentation results to validate the consistency and accuracy of the information. Additionally, member checking is conducted by reconfirming findings with key participants to ensure the researcher's interpretation aligns with participants' experiences and perspectives (Arwana et al., 2024).

4. Research and Discussion Results

4.1. Implementation of Web-Based Integrated Electronic Archive System (ARTERI) at the South Labuhanbatu Regency Library and Archives Office

The implementation of the Integrated Electronic Archives (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office has brought substantial improvements to previously manual archive management practices. Prior to its implementation, archival processes such as recording, storing, classification, and preservation were conducted

physically, which was considered inefficient due to the ample space required and the lengthy time needed to retrieve documents.

Following the introduction of the ARTERI system, archive management has become faster, more effective, and more precise. All records are digitized and managed within a unified web-based platform, enabling automated searches via indexing and metadata. Beyond accelerating workflow, the system minimizes the possibility of archive loss and enhances the preservation of essential documents through digital storage.

4.1.2. System Effectiveness in Supporting Service Performance

The adoption of the web-based Integrated Electronic Archive (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office has positively influenced service effectiveness, both within the institution and in its public services. Internally, the system streamlines the processes of recording, categorizing, storing, and retrieving archives, enabling staff to complete tasks more quickly and efficiently.

One Archivist stated;

> *"Before the ARTERI system was implemented, searching for a single document could take hours. However, now we type the keywords into the system, and the required archive appears immediately. This is very helpful in accelerating our work process"* (Interview with the Archivist of the South Labuhanbatu Regency Library & Archives Office, 2024).

Externally, community services have also increased in speed and accuracy. The Archivist explains;

> *"Our services have become much more efficient. The public no longer needs to wait long because the required archives have been digitized and can be accessed directly through the system".* (Interview of the Archives Manager of the South Labuhanbatu Regency Library & Archives Office, 2024).

He also added that the speed of access is beneficial in strategic decision-making and administrative reporting.

The application of information technology in dynamic archival management fosters improved employee performance and shortens service delivery processes. The digital system provides real-time data access, enhancing administrative efficiency and information accuracy (Aulianto, 2022).

Technology-driven archive management directly contributes to improved service quality and institutional effectiveness. Digital systems support more transparent and well-organized workflows, which are crucial to achieving good governance (Fathurrohman et al., 2023).

Therefore, the effectiveness of the ARTERI system is demonstrated through faster service, simpler document access, and improved employee productivity. This shift not only resolves technical challenges in manual archiving but also reinforces the institution’s capacity to deliver accountable and technology-based public services.

4.1.3. Obstacles and Challenges in Implementation

The execution of the Integrated Electronic Archives (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office faces several challenges. A significant issue is the limited availability of personnel with the necessary competencies to operate information systems. Certain staff members still lack sufficient technical skills to navigate, manage, and maintain digital archival platforms effectively.

One of the archivists said;

> *"Some of our colleagues still have difficulty understanding how the ARTE system works, especially in the process of uploading documents and managing metadata. Periodic training is needed so that all employees can operate this system smoothly"* (Interview with Archivists of the South Labuhanbatu Regency Library & Archives Office, 2024).

This condition shows that individual capacity is a key factor in the successful use of digital technology in a bureaucratic environment.

Apart from human resource constraints, challenges also arise from technological infrastructure. Several units lack sufficient hardware, such as computers and document scanners, which limits system performance. An unstable internet connection further disrupts system access, especially when handling large volumes of archives or when multiple users access the system concurrently.

The archive manager said;

> *"Access to the system is sometimes hampered due to an unstable network, especially when used simultaneously by many employees. The devices in some rooms are also still not supportive".* (Interview of the Archives Manager of the South Labuhanbatu Regency Library & Archives Office, 2024).

This indicates that the technological infrastructure's readiness remains a significant challenge for system optimization.

Furthermore, the absence of a fully reliable digital security mechanism poses another significant concern. Given that digital records contain important legal and administrative information, threats such as unauthorized access or data corruption must be mitigated through robust security protocols. The success of digital archive implementation is heavily influenced by prepared infrastructure and the application of structured, consistent data protection measures (Dwiyantoro & Junandi, 2021).

Therefore, implementing the ARTERI system requires not only technological and operational preparedness but also sustained support, including strengthening employee competencies, reinforcing digital security policies, and upgrading infrastructure across all units. Without these elements, the digital archive system risks operating inefficiently and lacking long-term sustainability.

4.1.4. Problem-Solving Strategies

To address the challenges encountered in implementing the Integrated Electronic Archive (ARTERI) system, the South Labuhanbatu Regency Library and Archives Office has undertaken a series of gradual problem-solving initiatives. A key step is providing technical training to ensure employees can understand and operate the system effectively. This training is supplemented by a written guide or user manual that serves as a reference during archival activities.

One of the employees said;

> *"We were given direct training by the system development team, accompanied by a guide module that was quite easy to understand. This is very helpful, especially for colleagues who are not used to using computers for archiving before*" (Interview of Employees of the Library and Archives Service of South Labuhanbatu Regency, 2024).

This shows that the training is not only formal but also geared towards improving users' practical skills.

Alongside human resource improvement, technological infrastructure is gradually being upgraded. Additional hardware, such as computers and document scanners, has been supplied to several work units. Enhancing internet connectivity has also been prioritized to ensure smooth access to the web-based system.

From an information security perspective, the ARTERI system now supports user-based access controls. Each employee is assigned an account with access rights aligned to their position and responsibilities. Periodic data backup procedures are also carried out to safeguard archives from technical failures or cybersecurity threats, forming part of the institution's risk-mitigation efforts.

These strategic measures are expected to improve the reliability and long-term sustainability of the ARTERI system. With reinforced training, upgraded infrastructure, and strengthened system security, the use of electronic archives can be implemented more effectively, efficiently, and securely.

4.1.5. The Impact of Implementation on the Digital Transformation of Agencies

The implementation of the Integrated Electronic Archive (ARTERI) system has substantially advanced digital transformation within the South Labuhanbatu Regency Library and Archives Office. These developments extend beyond technical improvements to the work system, influencing employees' work culture as they now use digital tools in archival processes. The adoption of electronic archiving promotes greater bureaucratic efficiency and drives organizational behavior toward modern, technology-based information governance. (Santoso & Prabowo, 2021).

The digitization of archives through the Integrated Electronic Archive (ARTERI) system significantly reduces reliance on physical documents, accelerates information retrieval, and enhances the accuracy and accountability of archive management. Information technology has been recognized as a strategic tool in realizing responsive, effective, and transparent public services (Fathurrohman et al., 2023). Within this framework, the implementation of digital archiving systems enhances administrative efficiency by facilitating auditing and reporting processes, as all archival data is systematically and securely stored on a unified digital platform.

This transformation has broad implications for improving institutional capacity. Employees are required not only to master the system technically but also to adapt to new demands related to work efficiency and information disclosure. Digital transformation, therefore, is not limited to software use; it constitutes a managerial reform that emphasizes strengthening human resource competencies in information management (Lubis et al., 2024).

The positive impact demonstrates that technology is an effective tool for improving the efficiency of public services, particularly in document and archive management. With continuous evaluation and development, the Integrated Electronic Archive (ARTERI) system has the potential to become a reference model for archive digitization that other government agencies can replicate.

This implementation supports the argument that digitized archiving is an urgent necessity in the era of technological revolution and information transparency. Dynamic archive management based on information technology plays a crucial role in supporting bureaucratic reform and enhancing institutional effectiveness (Aulianto, 2022).

4.2. Digital Transformation in Archive Management: Efficiency and Accessibility

The implementation of the Integrated Electronic Archives (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office has brought significant changes to archival management practices. The transition from manual procedures to a digital platform enables recording, classification, and archiving to be carried out more quickly, systematically, and consistently. This transformation not only reduces reliance on physical documents and paper consumption but also minimizes the risk of data loss caused by technical errors or document deterioration.

Digitization of archives offers more efficient document management by centralizing data storage in a system that can be accessed and updated as needed. Consequently, the work process becomes more concise and productive while simultaneously improving the accuracy of reporting and administrative decision-making (Ghifari Aminudin Fad'li et al., 2023).

Furthermore, digital transformation enhances accessibility to archival information. The ARTERI system provides online access that enables both internal and external users to obtain required documents without being physically present in the office. Metadata-based search capabilities and systematic indexing significantly facilitate tracking archives, thereby accelerating the information service process.

Archive digitization is not merely a change in storage media but also a strategic initiative to realize transparency and accountability in public service delivery. In this context, ARTERI supports the principles of information disclosure, reflecting the demands of modern and technology-oriented governance (Oktaviani & Pramudyo, 2020).

Therefore, the Integrated Electronic Archives (ARTERI) system functions not only as a mechanism for digital archive management but also as a crucial instrument in advancing bureaucratic reform that emphasizes work efficiency, accessibility, and the improvement of the quality of information technology–based public services.

4.2.1. Challenges in ARTERI Implementation: Data Sources and Data Security

Although the implementation of the Integrated Electronic Archive (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office provides numerous benefits, several significant challenges remain unresolved. One of the primary issues is the limited availability of skilled IT personnel. Many employees are still unfamiliar with digital archiving systems, making intensive, sustainable training essential to ensure they can operate the ARTERI system effectively.

One of the archivists said;

> *“We need continuous training so that all employees can understand the system well. Most of us were previously used to manual systems, so it took time to adapt.”* (Interview with Archivist of the Library & Archives Service of South Labuhanbatu Regency, 2024).

These limitations pose obstacles to the transition process from manual to digital procedures and may reduce the expected efficiency gains in archive management if not adequately addressed (Silalahi et al., 2024).

In addition, data security has become a crucial concern in implementing the ARTERI system. Digital archival records often store confidential and strategically important information that must be protected from unauthorized access, leakage, or potential misuse. Therefore, the application of stringent information security standards is essential to safeguard electronic archives from cyberattacks, system vulnerabilities, and other risks that may threaten the integrity and confidentiality of data.

The Archivist stated;

> *"We are well aware of the importance of data protection. We are currently working on improving our security system with regular user access control and data backups."* (Interview of the Archives Manager of the South Labuhanbatu Regency Library & Archives Office, 2024).

A reliable security system implementation should be an integral part of the system Integrated Electronic Archive *(ARTERIES)*, to ensure that stored information remains secure and accessible only to the authorities. By overcoming this challenge, the Library and Archives Service can maximize ARTERI's potential to improve the effective management of archives (Ujung et al., 2023).

4.2.2. Data Security in the Management of Electronic Archives

Data security is a critical aspect of electronic archive management, especially considering that archives often contain sensitive information with high administrative and legal value. In implementing the Integrated Electronic Archive (ARTERI) system at the South Labuhanbatu Regency Library and Archives Office, comprehensive and strict security protocols are required to prevent data leakage, misuse of information, and unauthorized access by internal or external parties.

Several preventive measures have been adopted, including the use of data encryption, access controls based on user authorization levels, and internal audit procedures to monitor user activity within the system.

One employee said;

> *"We have started implementing access control based on each user's role and scheduled regular data backups. This step is crucial to maintain the security and sustainability of archival data"* (Interview with Archivist of the South Labuhanbatu Regency Library & Archives Office, 2024).

With this strategy, it is hoped that the integrity and confidentiality of digital archives can be adequately maintained, thereby increasing user trust in *the ARTERI* system.

An adequate information security infrastructure, including the utilization of firewalls, intrusion detection systems, and periodic vulnerability inspections, must also support an effective digital archive management system. Weak digital security can have profound implications for the confidentiality, validity, and authenticity of archives as government documents (Ghofilah et al., 2022).

This implies that systematic protection is not merely a technical requirement but an institutional necessity. In addition to system-based protection, employee awareness and competence regarding information security are essential components that determine the success of digital archive protection. Many employees are still not fully aware of the potential risks associated with digital archive management, making information security training and socialization programs crucial. Increasing personnel's digital security literacy is a key strategy for building a work culture that is responsive and adaptive to cyber threats (Sumaryati et al., 2022).

By integrating robust technological safeguards and continuously developing human resource capacity, the Integrated Electronic Archive System (ARTERI) has the potential to become a safe, efficient, and reliable model of electronic archive management that supports accountable and transparent public information governance.

5. Conclusion

The implementation of the web-based Integrated Electronic Archives (ARTERI) at the South Labuhanbatu Regency Library and Archives Office has significantly accelerated archival processes, improved document accessibility, and enhanced employee work efficiency. This system has played a pivotal role in driving digital transformation in archive management, which was previously conducted manually, fragmented, and prone to inefficiencies. Nevertheless, the implementation of ARTERI still faces several challenges, including limited human resource competencies and unequal technological infrastructure across different work units. To address these challenges, the agency has initiated technical training, prepared system usage guidelines, and implemented data security mechanisms through access rights management and periodic data backups.

To ensure long-term sustainability, periodic evaluations of ARTERI should be conducted, accompanied by continuous human resource capacity building through advanced, specialized training. Strengthening technological infrastructure and digital security systems is also essential to support operational reliability and protect archival information. Furthermore, comprehensive Standard Operating Procedures (SOPs) for electronic archive management are needed to ensure consistent, controlled, and well-documented work practices. Future research could explore levels of user satisfaction and the potential integration of ARTERI with other government digital services, thereby expanding the strategic benefits of sustainable archive digitization.

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