

Tradition versus Innovation: A Comparison of NARA and ANRI's Archival Management in the Digital Age

ABSTRACT

The United States (U.S.) leads at the forefront of modern archival innovation, while Indonesia advances digital transformation amidst the persistent influence of traditional approaches and conservative perspectives in conventional records management. The National Archives and Records Administration (NARA) in the U.S. and the National Archives of the Republic of Indonesia (ANRI) play key roles. A balanced approach combining tradition and innovation is essential for navigating transitional challenges. This study aims to provide a comparative analysis of archival management practices between The United States's NARA and Indonesia's ANRI, examining the interplay of traditional approaches and digital innovation. Using a descriptive qualitative methodology and literature review, the research highlights NARA's advanced digital archival system and ANRI's developmental stage, where cultural, policy and infrastructure challenges persist. The findings underline the importance of integrating traditional principles with innovative solutions for sustainable archive management. As both nations navigate the complexities of technological advancement, they prioritize data security and privacy measures.

AUTHOR

Shanti Yesi Belina Oktaviana

*Riau Islands
Provincial Government,
Tanjungpinang, Indonesia*
shantiyesi1987.sy@gmail.com

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INTRODUCTION

Background

Strengthening archival management is essential in the digital era, prioritizing effectiveness and efficiency for easy information access. The term "archival science" may have different contexts in various countries. In the U.S., archival practices differentiate between "records management" and "archives management" as interconnected

disciplines under the full authority of the National Archives and Records Administration (NARA). In Indonesia, the National Archives of the Republic of Indonesia (ANRI) holds full authority over archives management, focusing on guidance and supervision across government agencies. While NARA plays a centralized role in federal records management in the U.S., ANRI's approach is more advisory.

Table 1. Comparison of Global EDGI Rankings Between Indonesia and the U.S

Country	Rating Class	2022 Ranking	2024 Ranking	Ranking Changes (+/-)	EGDI 2024
United States (U.S)	VH (Very High)	10	19	-9	0,9195
Indonesia	V1 (below VH)	77	64	+13	0,7991

Source: *Research Data*, 2024

Departing from the continuously evolving theories of archival management, practitioners have explored various archival systems, record appraisal, studies of analogue and digital records, as well as the community and relationship between archivists and historians across various related issues (Schwartz & Cook, 2002:1). The U.S. has been a key innovator, with T.R. Schellenberg, known as the *Father of Archival Appraisal Theory*, developed the concept of appraisal and the life cycle of records- creation, use, maintenance, and disposal (Schellenberg, 2003:15).

Despite cultural differences, Indonesia and the US share a mutual archival concept. A balanced approach combining tradition and innovation is essential for comparing the two countries' archival practices in the digital era. Indonesia's public sector still relies on manual record-keeping methods, while the US has widely adopted advanced technology and sophisticated infrastructure for archival management.

Records management is crucial for governance, providing accurate data

and information for decision-making. It is closely intertwined with e-government, focusing on the effective and efficient information handling. The UN's E-Government Development Index (EGDI) measures e-government success through indicators like Online Service Index (OSI), Telecommunication Infrastructure Index (TII), and Human Capital Index (HCI) (*UN E-Government Survey 2024*, n.d.). According to the 2024 E-Government Survey published by the UN DESA (United Nations Department of Economic and Social Affairs), Indonesia climbed from 77th to 64th rank. Singapore tops ASEAN countries with the highest EGDI tier (Very High/VH), while the U.S. leads in the Americas. Table 1 presents a comparison of the global EGDI rankings between Indonesia and the U.S.

In addition to supporting transparency and accountability, archiving also plays a vital role in conserving a nation's history and culture through digital archive preservation. The U.S.'s high EDGI ranking is largely attributed to NARA's advanced digital archive preservation services. NARA

Table 2. Top 5 Countries Based on NRI Scores in 2024 and Supporting Elements

Negara	Score	Ranking	Technology	Society	Government
United States (U.S)	78,96	1	82,24	72,97	86,53
Singapore	76,94	2	71,20	69,98	86,95
Finland	75,76	3	66,63	62,58	89,37
Sweden	74,99	4	69,28	60,21	87,89
Korea	74,85	5	66,78	79,28	80,93

Source: *Research Data*, 2024

prioritizes digital archive preservation to safeguard national security, transparency, and heritage, ensuring long-term sustainable access to information (National Archives and Records Administration FY 2024 Annual Performance Report, n.d.)

The Network Readiness Index (NRI) by the World Economic Forum (WEF) assesses countries' technology adoption success in terms of infrastructure, ICT, policy, and technology adoptions and their impact on economic and social development (Dutta & Lanvin, 2024:6). According to the 2024 NRI Ranking, the U.S. secured the top position, while Indonesia ranked 48th, lagging far behind ASEAN peers like Singapore, Malaysia, Thailand, and Vietnam. Table 2 displays the countries with high NRI scores that attained into the Top 5 (*Countries Benchmarking the Future of the Network Economy*, n.d.).

The success of countries with high levels of technological adoption is deeply intertwined with robust ICT infrastructure and innovation policies.

The advancement of the digital era demands transformation in archival management. A new paradigm has emerged to address the challenges of change—how tradition and innovation can interact in archival management-, both in the U.S. and Indonesia, particularly in NARA and ANRI which play central roles in managing national archives. Issues of security, accessibility, and data integrity also pose challenges in digital-era archival management. NARA has demonstrated a more advanced capacity in leveraging cutting-edge technologies, whereas ANRI remains in the process of adaptation and technological development. A comparative analysis between these two institutions provides insights into best practices and challenges in digital archival management.

Research Questions

Technological advancements in the digital era have brought significant changes to the field of archival management. Digitization has improved

the security, efficiency and integration of record keeping processes, including creation and usage as well as maintenance and disposal. Additionally, it represents a breakthrough in archives management, enhancing historical value and sustainability for future generations. The U.S. has achieved a more advanced stage in implementing archival digitization initiatives. Through innovative applications of cutting-edge technologies such as AI and blockchain, NARA has even developed a “digital preservation program” to streamline public access. The level of archival digitization in the U.S. has permeated nearly all sectors of public and private administration. In contrast, Indonesia remains in the developmental and expansion phase of archival digitization, with uneven progress due to persistent challenges related to technological infrastructure, limited human resources, and budgetary constraints. ANRI currently focuses its digitization efforts on preserving high-value archives, although their digital collection remains significantly smaller than that of NARA. Due to limitations in digital storage capacity, conventional paper-based archival management continues to predominate within Indonesia's public sector. Moreover, the rapid change of technological advancements in the digital era poses significant challenges as they necessitate

incessant system upgrades and robust strategies to ensure data security and privacy protection. Furthermore, the advent of digital era technologies demands continuous system upgrades to maintain data security and protect sensitive information from potential breaches. Given these issues, the following research questions arise:

- a) How are traditional and innovative approaches in archival management compared between NARA and ANRI in the digital era?
- b) What is the implementation and impact of digital technology on archival management at NARA and ANRI?
- c) What are the inhibiting and facilitating factors in implementing digital archival systems at NARA and ANRI?

Conceptual Framework

Archival Management

Records Management refers to the systemic implementation of managerial functions in overseeing the complete lifecycle of records, from creation, storage, utilization to final disposition either through disposal or archival preservation. This discipline focuses on the strategic management of information within organizational context, typically encompassing archival subsystems such as form management, correspondence management, files management, records management, and

archives management (Siambaton, 2017:1).

Unlike records management, which focuses on day-to-day document administration, archive management concentrates on preserving and utilizing records of enduring value. The primary objective of archive management is to safeguard the informational integrity of archives while ensuring their accessibility for future generations (Society of American Archivist, 2020). Effective integration of both records and archive management systems is essential, assuring the preservation of valuable information and the secure disposal of obsolete records.

Tradition vs. Innovation

Tradition is defined as the inheritance of practices, values and beliefs from the past to the present (Shils, 1981:12), yet it can also be constructed or altered (Hobsbawm & Ranger, 1992:1). Meanwhile, innovation refers to the introduction and adoption of new ideas, concepts, or practices (Rogers, 2010:15). Within the archival context, tradition and innovation represents two distinct yet complementary concepts.

In archival management, tradition generally pertains to the manual handling of records and archives, adherence to conventional archival principles, hierarchical-bureaucratic

structure, and the preservation of physical records. Meanwhile, innovation refers to the idea of renewal, invention, and implementation of modern technologies. Digital innovations, such as digitization, aim to facilitate the use and access of archives while creating backups without compromising the authenticity of physical records. Where tradition tends to be rigid and less flexible, innovation is needed to address evolving challenges in archival management. The interplay between tradition and innovation ultimately influence the sustainability and effectiveness of archival management.

Digital Age

The digital era has revolutionized the storage and accessibility of information and documentation. Through digitization, conventional archives-previously in physical formats, such as paper documents, photographs, or microfilm-are converted into digital forms. Pearce & Moses (2005) define digitization as the process of creating digital copies of physical or analogue records, enabling them to be accessed, stored, and preserved in a durable and user-friendly format.

Today, digital technology has emerged as a key enabler of fostering collaboration and synergy in information and data services (Jalinur, 2024:18). The growing diversity of data and the

increasing volume of records have spurred the adoption of services such as cloud storage, big data analytics, and blockchain technology. NARA, which holds authority over record management and archive management, has developed advanced digital systems, including the Electronic Records Archive (ERA) and Digital Preservation to enhance public access to records. Similarly, ANRI has established the National Archival Information System (SIKN) and continues to improve its capacity to address digital era challenges. A comparative analysis of these two institutions can yield valuable insights into best practices and challenges in archival management in the digital age.

METHOD

This research adopts a descriptive qualitative approach, employing library research as the primary method for data collection. Literature review technique involves gathering relevant data from research reports, academic books, articles, and journals (Sugiyono, 2019:222). This qualitative comparative study relies on secondary data sourced from academic literature, national policies, archival practice reports from both Indonesia and the U.S, internet articles, and other writings related to archival management and digitization practices at NARA and ANRI. Following established procedures for qualitative

library research, the study involves tracing primary and secondary data sources, classifying data according to the research framework, processing data, presenting and abstracting data, interpreting findings, and drawing conclusions (Darmalaksana, 2020:3). Analytical descriptive techniques are employed, encompassing data collection, processing, and comparative analysis of policies and practices within a predetermined theoretical framework, ultimately generating research findings and conclusions.

DISCUSSION

Comparison of Traditional and Innovative Approaches in Archives Management: NARA and ANRI

Traditional approaches to archival management in the U.S. and Indonesia are deeply rooted in the historical context of their respective national archives. In the U.S., the National Archives was established in 1934 by President Franklin D. Roosevelt to protect state archives, which had previously suffered from neglect and poor management. Initially, records were predominantly physical and paper-based, handled manually. However, with the inauguration of technological advancement in the 1960s, the U.S. began adopting computers and electronic systems, prompting NARA to develop

early digital catalogues to facilitate archival searches (*About the National Archives*, n.d.).

Meanwhile, in Indonesia, the national archives system stemmed from the archival practices established during the Dutch colonial government (*landarchief*) through to the post-independence period. However, it was not until 1967 that ANRI was officially recognized as a non-ministerial government institution, operating under the President's authority. During this period, archival management in Indonesia remained traditional, with key government records stored in physical paper form. The early 1990s marked a shift, as some government agencies began adopting computers and digital archival management systems (*Sejarah Arsip Nasional Republik Indonesia*, n.d.)

According to Greg Bradsher, a U.S. historian and senior archivist, NARA plays a pivotal role in providing records to the public, government, and organizations in which certain records serve as critical evidence and ensure accountability (R. J. Cox & Wallace, 2002:8). The United States has a strong tradition of treating archives as a cornerstone for preserving collective memory and reinforcing national identity. This can be seen from NARA's dual role as both national archives and historical center safeguarding key documents, such as

World War records. Likewise, rooted in the Dutch colonial era, ANRI, in fact, plays a vital role in preserving historical archives and ancient manuscripts, categorized into periods - the Dutch Colonial, Pre-Independence, and Post-Independence. These archives are systematically classified by medium and form and stored as part of ANRI's static archival collection.

NARA and ANRI, as national archives, highlight the enduring importance of traditional approaches to records and archives management, emphasizing authenticity, physical preservation, and hierarchical classification as fundamental principles in archival management amidst the modern challenges. However, both institutions operate within different historical contexts. NARA, with its extensive experience, has developed well-structured archival standards, reflecting the U.S. as a leading state in advancing modern archival practices.

In terms of regulations and policies, NARA operates under the Code of Federal Regulations (CFR), the NARA Regulations, which are centrally and systematically organized within the CFR (*Code of Federal Regulations*, n.d.). As an independent agency, NARA holds full authority over records management and archives management, benefiting from more stable budgetary support and

advanced infrastructure (*Basic Laws and Authorities of the National Archives and Records Administration Book, 2016*). Meanwhile, ANRI is guided by Law No. 43 of 2009 on Archiving (Undang-Undang Republik Indonesia Nomor 43 Tahun 2009 tentang Kearsipan). In technical terms, while ANRI holds authority over the archives management, it also oversees records management across various government agencies. This differs from NARA, which maintains a centralized role in managing federal records.

The traditional approach in archival management is also evident in how both institutions adopt technology. NARA combines traditional methods with innovation preserving physical archives, while simultaneously developing digital systems. Similarly, ANRI has embarked on digital transformation, despite resource constraints that have occasionally impeded the pace of transition.

Throughout its development, the U.S. has played a pivotal role in advancing technology and standardising the use of electronic records and digital preservation techniques. American archivists have navigated the challenge of enhancing accessibility and contextualization of digital archives (Zhang & Mauney, 2013:1). This innovation has introduced a paradigm shift, as noted by renowned scholars such as F.B. Evans, Ernst Posner,

Michael Roper, and Schellenberg. Archives have evolved from being primarily as tools for historical interpretation and the conservation of ancient materials to becoming vital resources for governance and policy planning (M. Cook, 2017:2). Archival management has also significantly influenced administrative and public services, underscoring the growing significance of records and archives in modern administration (T. Cook & Schwartz, 2002:1).

The adoption of electronic records within the American archival community revolutionised archival practices. Bearman (1991), in a hypothetical case study, demonstrated the potential for governments to streamline record production through information technology ((R. Cox, 2020:1). The early 1990s marked the beginning of major digitization efforts in the U.S. During this period, NARA launched initiatives, including the *National Archives Digital Preservation Program* and *Electronic Records (E-Records) System*. The 2000s saw further innovations, such as cloud computing for digital storage, big data analytics, and AI-driven archival management (Sihab & Nurfajar, 2020:121). NARA continued to refine its Electronic Records Management (ERM) systems, exploring blockchain technology to ensure digital archive security and

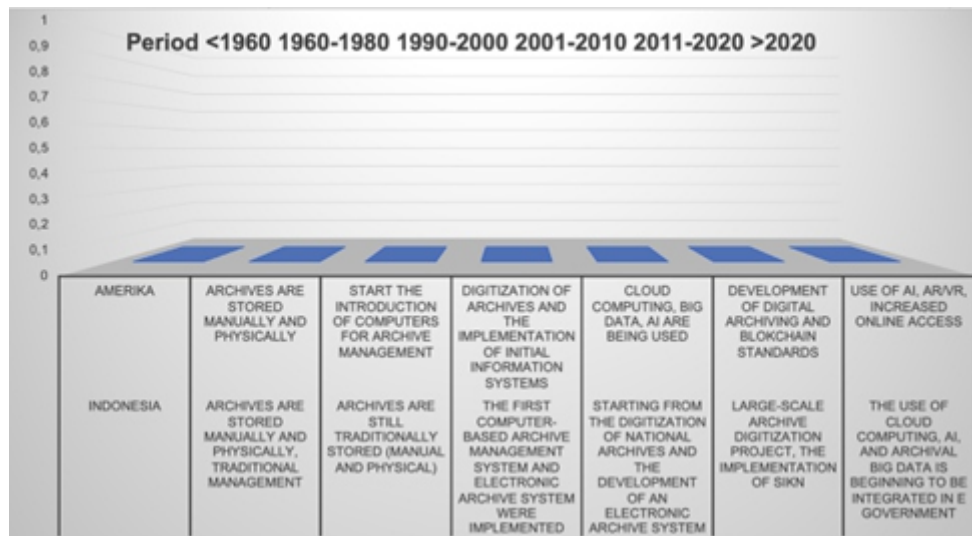


Figure 1. Comparison of Archival Innovation in the U.S and Indonesia During the Period
Source: *Research Data*, 2024

integrity. In the 2020s, the U.S. has become increasingly aggressive in driving continuous innovation in archival management.

Technological advancements have also driven significant progress in Indonesia's archival practices. In the early 2000s, Indonesia adopted digitisation technologies and began developing electronic archival systems. A major milestone was achieved in 2013 with the implementation of the National Archival Information System (SIKN), a centralized digital platform. In the 2020s, Indonesia incorporated cloud computing, AI, and big data to manage large-scale archives, alongside developing public-access digital portals. ANRI has been instrumental in accelerating digitisation projects and integrating archival systems

to support e-government initiatives. Diagram 1 illustrates a comparative timeline of key innovations in archival practices between the U.S. and Indonesia.

Implementation and Impact of Digital Technology on Archival Management at NARA and ANRI

The adoption of digital technology has had a profound and sustainable impact on archival management. In response to the challenges of managing digital archives, NARA has pioneered innovations such as the Digital Preservation Program and the Electronic Records Archives (ERA) system. The Digital Preservation Program ensures the long-term safeguarding of historical archives including -documents, photographs, and recordings- from

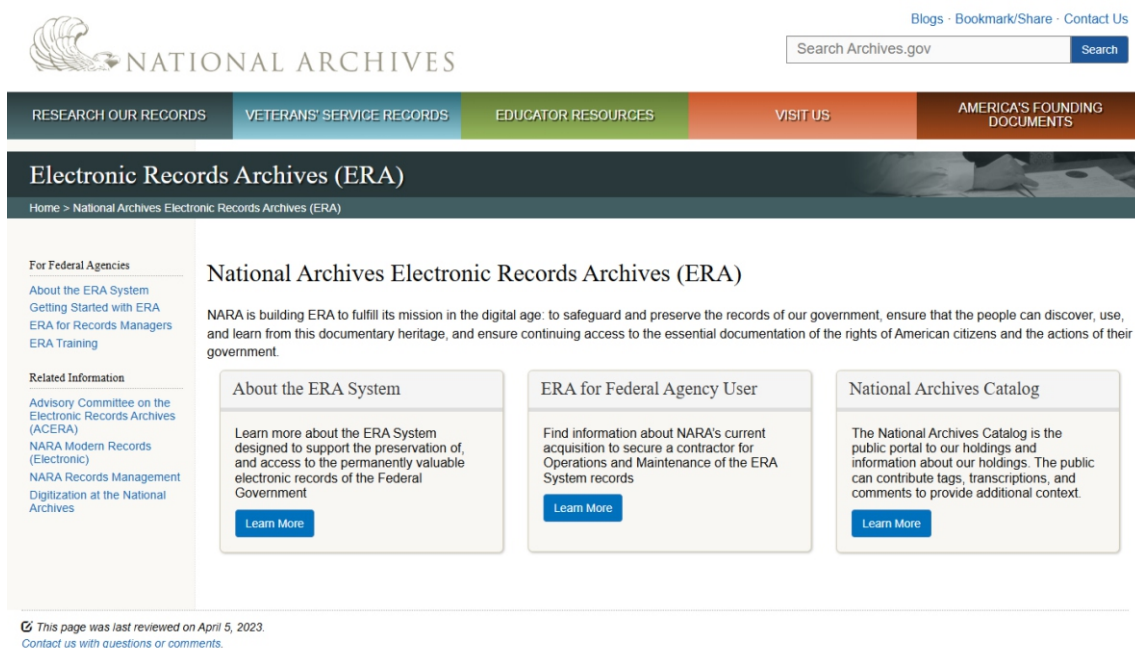


Figure 2. The Display of *Electronic Records Archives (ERA)* website services
Source: <https://www.archives.gov/era>, 2024

physical deterioration and technological obsolescence preserving their authenticity, accuracy, and functionality. Meanwhile, the ERA system is designed to manage and store electronic records throughout their lifecycle serving as a publicly accessible digital library, with automatic updates to maintain accessibility (*Electronic Records Archives (ERA)*, n.d.). Figure 1 illustrates the ERA website interface, demonstrating its user-friendly access.

ANRI has also launched the National Archival Information System (SIKN) to manage digitized archives, providing public online access through the National Archival Information Network (JIKN) website. Chart 1 indicates that a total of 543 network nodes have been

registered, including 34 ministries, 55 government institutions, 34 provincial archives, 311 district archives, 82 city archives, 25 state universities, and 2 state-owned enterprises (*Layanan SKIN Dan JIKN*, n.d.).

Both NARA and ANRI have established comprehensive digital platforms to facilitate public access to archives and digital records, particularly for academic research purposes. NARA's sophisticated online catalogue system offers diverse collections including the "Presidential Libraries Digital Library", a dedicated platform providing access to documents and archives from U.S. presidential libraries (*National Archives Catalog*, n.d.). Similarly, ANRI has developed "LARISSA", a digital platform

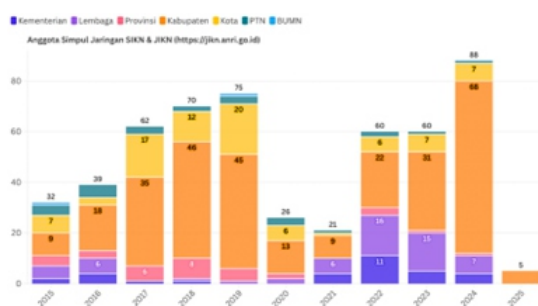


Figure 3. Number of Network Nodes Recorded in SKIN (2015-2025)

Source:

<https://anri.go.id/layanan-publik/sikn-dan-jikn>, 2025

for archival services (Layanan Arsip Statis Online (LARISSA), n.d.). facilitating integrated online archival access. Additionally, ANRI has also established the "Presidential Static Archives Study Centre", a specialized unit dedicated to managing presidential archival materials (*Pusat Studi Arsip Statis Kepresidenan*, n.d.).

The digital archival programs and systems developed by NARA and

ANRI differ significantly in terms of service features and accessibility. NARA's early adoption of digitization programs in the 2000s has resulted in substantially larger digital collections compared to ANRI. Table 3 presents a comparative overview of digitized archival holdings from both institutions, based on their respective annual reports published through 2024.

Information on the number of ANRI's digital archives available online remains limited, as ANRI prioritizes the preservation of Dutch colonial archives and ancient manuscripts. NARA adopts an open-access policy on its digital catalogue platform, whereas ANRI requires special permissions for accessing certain archival collections.

In addition to preserving archives, the digital approach also offers

Table 3. Comparison of Digitized Archive Collections at NARA and ANRI

No	Category	NARA (U.S)	ANRI (Indonesia)
1	Digital Collection Size	326 million pages of documents	10 million pages of documents (only ~ 15% accessible online)
2	Archive Types	Government documents, photos, maps, audio	Colonial/Independence- era documents, photos, ancient manuscripts
3	Digital Platform	National Archive Catalog (https://catalog.archives.gov/)	LARISSA (https://larissa.anri.go.id/)
4	Access Policy	Open to the public (free/paid options)	Restricted (some collections require permits)
5	Year Started	Mass digitization since 2000	2010s (accelerated post-2020)

Source: Research Data, 2024

educational and historical preservation benefits through virtual exhibitions. NARA's Virtual Exhibition Program presents interactive thematic concepts alongside various educational materials. Equally, ANRI's Virtual Diorama of National History features 3D visualizations of key historical events in Indonesia, such as the 1945 Proclamation and the Youth Pledge.

Overall, digital technology has brought significant changes to archival management at both NARA and ANRI, enhancing efficiency in storage, management, and access to records and archives. Today, innovations such as cloud-based and AI-integrated systems have accelerated document classification and indexing, transforming archives into accessible, fast, and accurate knowledge sources which benefit researchers, academia, and the general public.

Barriers and Enablers to the Implementation of Digital Archival Systems

A comparison of traditional and innovative archival management between NARA and ANRI highlights persistent gaps in digital archival practices. NARA's robust archival regulations and policies, strengthening the role of archives in supporting transparency and accountability (*Freedom of Information Act (FOIA)*, n.d.). The need for

accessibility and efficiency drives innovation in archival management. Some researchers in the U.S. note that cultural aspects, budget policies, and infrastructure are crucial to the successful implementation of digital archival systems. The following are the dominant influencing factors:

- a) Culture. Organizational culture is crucial to the success of digital archival management, including collaboration, openness, adaptability to technology, and regulatory-procedural compliance. NARA's innovative approach, comprehensive regulations, and adaptive culture serve as a model. To anticipate resistance to change and ensure progress, ANRI needs to strengthen digital literacy and foster a synergistic community for archivists which may reinforce organizational culture. Professional organizations like the Society of American Archivists (SAA) and the *Association of Records Managers and Administration (ARMA)* in the U.S. set standards for archival practices with SAA emphasizing on historical and cultural archival access and preservation, while ARMA on records management prioritizing efficiency and regulatory compliance. In Indonesia, the Indonesian Archivists Association (AAI) serves as a pillar in promoting archival professionalism.
- b) Policy. Policy aspects encompass

regulations, funding, and resources. NARA's robust regulations such as the *Federal Records Act* along with highly detailed e-records standardization serves as a framework. A fundamental difference between NARA and ANRI lies in their technology and budget policies. NARA proactively develops digital archival technologies with a substantial budget, allocating \$150-250 million for archival digitization, targeting over 300 million pages of online catalogue (National Archives and Records Administration FY 2024 Annual Performance Report, n.d.). In contrast, ANRI with a limited annual budget of approximately \$12,5 million (Rp. 200 billion) which remains in the development stage must carefully prioritize digitization targets, focusing on vulnerable or high-value archives. Technical challenges encompassing time-consuming curation processes such as metadata accuracy, access rights, and quality control also pose significant hurdles (*Laporan Akuntabilitas Kinerja ANRI Tahun 2024*, n.d.).

- c) Infrastructure. Robust infrastructure, as a strategic policy, is critical for efficient, speedy, secure and accessible digital archival systems supporting digitization, electronic records management, accessibility, data

security and protection (backup and encryption systems). NARA's sophisticated, standardized, and centralized infrastructure, featuring systems like ERA 2.0, digital preservation, and globally accessible public online catalogues sets high standards. Conversely, ANRI needs to invest in budgetary readiness, technology, and human resources to develop a long-term digital infrastructure.

In the digital era, both NARA and ANRI face challenges such as data security, infrastructure maintenance, and skilled human resources to ensure the sustainability of digital archival systems. To address these challenges, the U.S. government has enacted laws prohibiting the storage of sensitive-personal data abroad threatening national security. Similarly, the Indonesian government has established regulatory policies on data security (Peraturan Presiden Nomor 47 Tahun 2023 tentang Strategi Keamanan Siber Nasional Dan Manajemen Krisis, n.d.). Indonesia's National Cyber and Crypto Agency (BSSN) is also working to protect government data from cyber threats by building data centers, implementing access policies and providing assistance to stakeholders (*Information Technology Security Assessment (ITSA)*, n.d.)

CONCLUSION

The comparison of archival management between NARA and ANRI highlights distinct challenges and opportunities in integrating traditional and innovative approaches. While NARA has successfully adopted digital technology on a wide scale, demonstrating an aggressive approach to digital transformation, ANRI is still in its development. Both institutions strive to preserve records and enhance accessibility through digital archival systems. However, ANRI continues to face limitations in infrastructure, resources, and funding. Key factors such as an adaptive culture, innovation, openness to technological advancements, robust regulatory policies, infrastructure, and sufficient funding are essential to support the successful implementation of a digital archival system.

Digital technology has positively impacted archival management, enhancing accessibility, efficiency, speed, and long-term preservation. However, both NARA and ANRI must address digital-era challenges concerning data privacy and security. The US government has implemented preventive policies and technological upgrades on data security, while the Indonesian government has established regulations on data and information security and invested in cybersecurity infrastructure.

The integration of traditional and innovative approaches in archival management is crucial to sustainable record-keeping. The NARA-ANRI comparison highlights the importance of a holistic approach, considering the interplay between culture, policy, and infrastructure. To move forward, ANRI could enhance infrastructure and funding through government collaboration and public-private partnership to accelerate digitalization. Meanwhile, to foster innovation and collaboration, NARA could also establish cooperation with developing countries, promoting inclusive sustainable digital archives practices.

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