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LIBRARY DIGITALIZATION AND MODERNIZATION: STRATEGIES FOR UTILIZING E-CLIPPING TO ENHANCE SERVICES AT THE DIGITAL LIBRARY OF THE AUDIT BOARD OF THE REPUBLIC OF INDONESIA (BPK RI) BALI PROVINCIAL OFFICE

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ABSTRACT

The rapid development of digital transformation in the 4.0 era has significantly impacted work processes and interactions across various sectors, including library management. The Audit Board of the Republic of Indonesia (BPK RI) Representative Office in Bali Province has adopted a strategic approach by transforming its conventional library into a digital library and implementing e-clipping as a tool to modernize its services. This study aims to evaluate the effectiveness of utilizing e-clipping technology in enhancing the quality of digital library services at BPK RI Bali. Using a descriptive qualitative approach, data were collected through observation, in-depth interviews, and documentation. The findings indicate that the implementation of e-clipping not only accelerates information access but also improves operational efficiency and user satisfaction. The novelty of this research lies in revealing the integration of e-clipping technology with a digital library system as an innovative model for government institutional libraries in Indonesia. The study concludes by emphasizing the importance of library digitalization as a strategic step toward modernizing technology-based services. It recommends the broader adoption of e-clipping across other government institutions to enhance public service efficiency and contribute significantly to the advancement of social sciences and humanities, particularly in digital information management.

Keywords*: Digital Transformation, E-Clipping, Digital Library, Library Modernization, Public Service Efficiency*

INTRODUCTION

The development of information and communication technology in the era of digital transformation 4.0 has significantly reshaped various aspects of life, including information management within government institutions (Alvarenga et al., 2020; Aminah & Saksono, 2021; Fyshchuk & Evsyukova, 2020). The Supreme Audit Board of the Republic of Indonesia (BPK RI), tasked with overseeing state financial management, faces challenges in managing increasingly complex and dynamic information. A key issue lies in the inefficiency of the manual clipping system currently in use, which consumes significant time and resources while often failing to meet real-time data needs (Islam et al., 2023; Mustikawati & Iskandar, 2023). This system not only consumes time and resources but also often lacks relevance to inspection needs that require real-time, up-to-date data. Studies Sharma et al. (2022) and Supriyanti et al. (2024) reveal that

information retrieval in manual systems can take hours compared to just minutes with digital systems. This underscores the importance of evaluating the effectiveness of digital transformation through the adoption of e-clipping technology to enhance digital library services at BPK RI's Bali provincial office.

Digital transformation in libraries has gained significant attention in academic literature due to its strategic role in supporting information efficiency and accessibility. Research by Rafiq et al. (2021) and Senbekov et al. (2020) emphasizes that digital libraries offer unparalleled flexibility compared to conventional ones, particularly in providing swift and easy access to information. Moreover, studies by Haryono & Nuryati (2024) and Mannayong (2024) highlight that digital technology adoption not only expedites information management but also strengthens government institutions' core functions, such as supplying information for decision-making. However, as noted by Siregar et al. (2024) , digital transformation often encounters technical challenges, particularly a lack of training and employee familiarity with new technologies.

Research by Jabbar et al. (2020) further shows that digital libraries can reduce information retrieval time by up to 70% compared to manual systems, making them highly relevant for government institutions requiring real-time data. This aligns with findings by Okunlaya et al. (2022), which demonstrate how technologies like e-clipping improve the accuracy of information delivery, particularly for oversight and audit functions. Additionally, studies by Bondar (2022) and Sufuentes et al. (2024) emphasize the importance of integrating digital library technology with data-based systems to improve the accuracy and relevance of information.

In another study, Bansal et al. (2023) and Chwiłkowska-Kubala et al. (2023) highlight that although digital technology brings significant changes, its success largely depends on infrastructure readiness and human resource competence. This is reinforced by studies by Kuziemski & Misuraca (2020) and Zuiderwijk et al. (2021), which underline the need for clear success indicators to evaluate the impact of technology implementation in the public sector. These findings provide a foundation that technologies like e-clipping require a more systematic evaluation approach.

Although various studies have discussed the benefits of digital transformation (Chouaibi et al., 2022; Maroufkhani et al., 2022; Tsou & Chen, 2023), limitations remain in exploring the role of specific technologies such as e-clipping in government settings. This research fills that gap by evaluating the contribution of e-clipping technology through a comprehensive approach, including measuring time efficiency, information relevance, and its impact on the work culture in government institutions. Additionally, this research aims to integrate previous findings with a new evaluation model that is more relevant to the needs of modern institutions. Previous studies have largely focused on the technical and operational aspects of digital libraries without specifically addressing the role of technologies such as e-clipping in the context of government institutions. Furthermore, there are few studies evaluating the direct impact of this technology on the efficiency and effectiveness of library services. Research by Bondar (2022) and Sufuentes

et al. (2024) only highlights the importance of technology adoption without presenting comprehensive evaluation indicators related to its implementation in the public sector.

While digital transformation is increasingly adopted in various institutions, the implementation of e-clipping technology has rarely received attention in academic studies, especially in government settings. Most studies, such as those by Chouaibi et al. (2022); Maroufkhani et al. (2022) and Tsou & Chen (2023) have focused only on the technical aspects or general efficiency of digital libraries without deeply analyzing how this technology can meet specific needs, such as those faced by financial oversight institutions. This creates an opportunity to further explore the potential of e-clipping in aligning information management with the strategic needs of government.

In this context, this study aims to fill the gap by further examining how e-clipping technology can be strategically integrated into digital library systems in government settings. This study not only focuses on the technical aspects of digitization but also explores its impact on improving operational efficiency, information accuracy, and user satisfaction in supporting the tasks of financial oversight institutions. With a comprehensive approach, this research provides new insights through the development of an evaluation model that assesses the effectiveness of e-clipping from various perspectives, including information relevance for strategic decision-making and changes in work culture in government settings. This model is expected to serve as a reference for other institutions seeking to leverage similar technology to optimize public information services. Through this approach, this research not only provides new insights into the benefits of e-clipping technology but also underscores the importance of digital transformation as a strategic step in modernizing information services in government institutions.

RESEARCH METHOD

This study employs a descriptive qualitative approach to explore in-depth the effectiveness of implementing e-clipping technology in enhancing digital library services at the BPK RI Representative Office in Bali Province (Ningi, 2022). The object of this research is the utilization of e-clipping technology to improve services in the digital library. The study was conducted over approximately one month, from November 4 to November 30, 2024, at the BPK RI Representative Office in Bali Province. This method was chosen because it allows researchers to holistically understand the complex phenomenon related to the use of e-clipping, both in terms of technical aspects and its impact on operations and service users.

Data collection was carried out using three main techniques: observation, in-depth interviews, and documentation. Observations were conducted to identify how e-clipping technology is applied in the daily operations of the digital library, including information retrieval processes, data presentation, and user interaction with the system. In-depth interviews involved library staff, including the Public Relations and Administration (TU) divisions, service users, and

the management of BPK RI to gain diverse perspectives on the benefits, challenges, and impact of e-clipping implementation. Documentation was used to supplement data by collecting relevant documents, such as usage reports, technical guidelines, and internal policies (Busetto et al., 2020; Ningi, 2022).

The collected data were analyzed using thematic analysis, which involves coding, identifying themes, and interpreting data to uncover patterns and relationships between themes. This analysis was carried out iteratively to ensure the validity and reliability of the findings. Additionally, data triangulation was performed by comparing the results of observations, interviews, and documentation to enhance the credibility of the study. Research subjects were selected purposively, considering their involvement in the implementation and use of e-clipping technology. Informants included library staff, auditors, and management personnel who play strategic roles in decision-making related to service digitization. This approach ensures that the data obtained are relevant and representative to address the research objectives.

To maintain research ethics, all informants were provided with complete information about the research objectives and procedures and were asked for written consent before participating. The confidentiality of informants' identities was also protected by not including names or personal information in the research report.

RESULTS AND DISCUSSION

Understanding and Implementation of E-Clipping Technology at BPK RI Representative Office in Bali Province

The implementation of e-clipping technology at the BPK RI Representative Office in Bali Province has been carried out through a structured strategy to ensure the smooth transition to digital transformation. The initial phase began in 2019, involving the Public Relations and Administration (TU) Subdivision. This process was initiated with training on the use of Intelligence Media Analytics (IMA), an advanced media analytics platform designed to collect, analyze, and filter information from various media sources, both print and digital. This platform serves as the core of the e-clipping system, enabling efficient information retrieval. The socialization was conducted in stages, starting with small units and gradually expanding to encompass all related divisions.

The launch of this technology was accompanied by a three-month trial period to identify and resolve technical challenges, such as staff's limited understanding of the new technology. These challenges were addressed through intensive training and direct assistance from experts provided by the IMA service provider. Institutional policies of BPK RI also played a critical role in supporting the adoption of this technology. Various internal policies were issued to integrate e-clipping into daily work processes, including the implementation of standard operating procedures (SOPs) to ensure consistency and effectiveness in system usage.

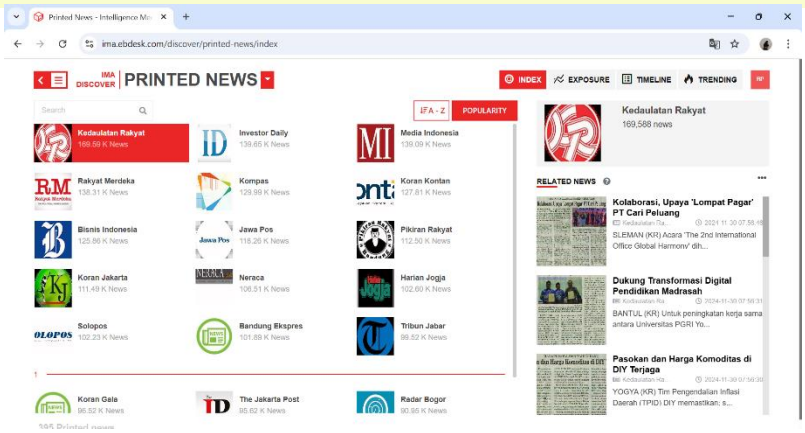

Figure 1. IMA Interface
(Source: https://ima.ebdesk.com)

The technological infrastructure supporting e-clipping enables quick access to media databases, including local sources such as Bali Post, Radar Bali, Tribun Bali, Nusa Bali, and Warta Bali. Equipped with an intuitive interface, the system facilitates users in searching for specific information according to their needs. Based on operational observations, e-clipping has become an integral part of BPK RI's digital library. Information retrieval processes that previously took hours now only require a few minutes. A library staff member remarked, "Previously, it took us a long time to manually collect information from various daily newspapers. Now, with e-clipping, our work is much faster and more accurate."

Interviews with auditors and library staff revealed that the majority of users experienced a significant increase in efficiency. One auditor stated, "We are greatly assisted by e-clipping, especially when preparing for audits. Information from the mass media helps us identify potential issues in entities to be audited." BPK management also emphasized the importance of this technology in supporting the organization's vision toward digital transformation. "E-clipping not only simplifies information access but also enhances our credibility in presenting data-based reports," said a management representative.

Digital transformation through e-clipping not only supports internal efficiency but also strengthens BPK's role in providing quality public services. As a state financial oversight institution, BPK's ability to utilize information from mass media enhances the transparency and accountability of public financial management. This technology enables faster responses to financial issues, which in turn increases public trust in the institution. The integration of e-clipping with Si-Puspa (Library Book Processing System) through annual training is also an effort to expand information accessibility among employees. In addition to improving technological literacy in the workplace, this step ensures that all employees can optimally utilize the system.

Timeliness, Operational Efficiency, and Information Access

The implementation of e-clipping technology at the BPK RI Representative Office in Bali Province has significantly enhanced operational efficiency and information accuracy, supporting the agency's role in state financial oversight. One of the primary contributions of this technology is the drastic reduction in information retrieval time, increased relevance and accuracy of accessed information, and its impact on improved public service delivery.

Before the adoption of e-clipping, information retrieval was conducted manually by examining print media, physical archive clippings, or individually searching digital news platforms. This method was time-consuming, often taking several hours to gather relevant information. With the Intelligence Media Analytics (IMA)-based technology, this process can now be completed in just a few minutes. A BPK library staff member explained, "Previously, searching for articles on specific topics required going through piles of newspapers or browsing numerous news websites. Now, simply entering a keyword in the e-clipping system brings up all relevant data immediately."

Auditors, as primary users, have also benefited significantly. One auditor remarked, "The time required for information retrieval is now very short. What used to take around two hours to gather supporting information for audits now only takes five minutes."

This time efficiency is supported by statistical data showing that the average information retrieval time has decreased by up to 80%. Before implementation, searches took 2–3 hours, but with e-clipping, only 5–10 minutes are needed. This reduction has a direct impact on audit tasks, allowing auditors to focus more on analyzing information and planning more comprehensive audit strategies.

In addition to saving time, e-clipping technology ensures the relevance and accuracy of the presented information. With specialized filters on IMA, such as keywords, time periods, and geographic locations, accessed information is always current and relevant to auditors' needs. A 2023 case study demonstrated the system's effectiveness when a BPK RI audit team successfully identified indications of budget irregularities in a district in Bali. This information was derived from media reports accessed through e-clipping, directing the team to prioritize the examination of related budget documents and prepare in-depth questions for involved parties. "E-clipping helps us identify patterns and trends from various news relevant to our audit area, enabling us to formulate more targeted audit plans," said an auditor.

In the context of public service, e-clipping also contributes to improving transparency and accountability in public financial management. With fast and accurate information access, auditors can detect potential irregularities earlier, helping to prevent greater state losses. This technology reinforces good governance principles in public financial management. Auditors with access to up-to-date information can provide more effective recommendations to improve financial governance at various levels of government (Abdou, 2021; Pomeranz & Stedman, 2020; Sari, 2023). Moreover, e-clipping enhances internal communication effectiveness within BPK. Its integration with SiPuspa (Library Book Processing System) enables all employees to easily access

important data and information anytime and anywhere. This step not only boosts work efficiency but also supports BPK's vision of transforming into a digitally and data-driven institution.

Target Accuracy and User Satisfaction Enhancement

The implementation of e-clipping technology at the BPK RI Representative Office in Bali Province has delivered significant positive impacts, not only in facilitating information access but also in enhancing user experience. Ease of use, accessibility, speed, and information availability have become key indicators measuring user satisfaction, reflecting the program's success.

Based on interviews with staff from the General Affairs Subdivision (TU), e-clipping is considered highly intuitive. One staff member noted, "E-clipping has a simple and easy-to-understand interface, even for new users. We just need to enter relevant keywords, and all related news immediately appears." Senior auditors who frequently use e-clipping also acknowledged the system's efficiency. They no longer need to search for news manually, as all information is well-organized and can be accessed anytime via a digital platform.

Ease of access stands out as one of e-clipping's main advantages, particularly after its integration with SiPuspa, the digital library information system. Library staff emphasized that with this integration, data can be accessed anytime and anywhere through digital devices, both inside and outside the office. The speed and accuracy of the presented information are also highly valued by users. A staff member from the Public Relations Subdivision mentioned that search processes that previously took over an hour now only take a few minutes, with far more accurate results.

This transformation has also impacted the work culture at BPK RI. Digitalization through e-clipping has fostered faster, more organized, and technology-based workflows. Library staff highlighted this significant change, stating, "Work processes have become faster and more organized. It not only simplifies tasks but also cultivates new habits in utilizing technology for efficiency."

Timeliness has emerged as another key element of e-clipping's success. The system is updated daily with the latest information from various local news sources, such as Bali Post, Radar Bali, and Tribun Bali. This ensures that the data provided is relevant and readily available for auditors. One auditor emphasized, "E-clipping has become an indispensable tool in audit preparation. The information is always available on time, which is crucial for supporting decision-making."

The operational efficiency generated by this technology is evident in the reduced time for gathering and processing information. While the manual process previously required hours, e-clipping now allows these tasks to be completed in minutes. Once collected, e-clipping data is uploaded to SiPuspa, which is designed with a user-friendly interface for easy navigation and document search. In an interview, a library staff member mentioned, "With SiPuspa, all e-clipping information is well-organized and easily accessible at any time."

Figure 1. SiPuspa Interface
(Source: https://perpustakaan.bpk.go.id/)

From a public service perspective, e-clipping significantly contributes to enhancing transparency and accountability. With continuously updated data, auditors can conduct deeper and more accurate analyses, supporting good financial governance principles. The efficiency in information collection and dissemination also enables staff to focus on more strategic tasks, strengthening BPK's service to the public in financial oversight. Moreover, integration with SiPuspa ensures that information access is not limited to internal use but can also be utilized by the wider public, providing tangible benefits in transparency and information openness (Gil-Garcia et al., 2020; Schnackenberg et al., 2021).

The Contribution of E-Clipping to Service Modernization

The implementation of e-clipping technology at BPK RI Representative Office in Bali Province has significantly contributed to service modernization, both through the transformation of work culture and its relevance to advancements in digital technology. One of the most notable impacts is the shift in employee mindset and work patterns. With the adoption of this technology, employees have become more accustomed to digital-based approaches for task completion. An auditor remarked that using e-clipping has made tasks more efficient while encouraging more modern work habits. This shift has also heightened awareness of the importance of digital technology in optimizing performance, even among previously skeptical staff.

Furthermore, e-clipping has enhanced collaboration across work units within BPK RI. With fast and integrated data access, employees from various units, such as auditors, the Public Relations Subdivision, and the library, can share information in real-time. One employee noted that this platform enables them to work more effectively since data is centralized and supports interdepartmental synergy. The integration of e-clipping with SiPuspa as a centralized information platform has created efficiencies that not only strengthen communication but also improve overall work quality.

From the perspective of technological relevance, e-clipping has become a modern innovation model within governmental institutions. By leveraging Intelligence Media Analytics

(IMA) integrated into SiPuspa, BPK RI has demonstrated how technology can accelerate bureaucratic transformation. This initiative aligns with digitalization trends demanding efficiency and transparency. The BPK digital library is now not just a data repository but also a strategic information hub supporting institutional tasks. A library staff member expressed pride in this transformation, which has turned the digital library into an innovation model relevant for adaptation by other institutions.

This research aligns with previous literature emphasizing the efficiency of digital libraries in information access and the reduction of manual workloads. For instance, Ali & Warraich 2024 and Winata et al. (2021) highlighted how digital libraries improve the speed of information access, while Jones & Davies (2024) noted their contribution to data accuracy. However, this study expands the discussion by highlighting the specific contribution of e-clipping in supporting audit functions and financial oversight. With e-clipping technology integrated via IMA, BPK RI has a strategic tool for analyzing relevant news, strengthening oversight processes—an area rarely discussed in previous literature.

In the Indonesian institutional context, implementing technologies like e-clipping often faces challenges, including employee resistance, budget constraints, and infrastructure limitations. Nevertheless, BPK RI successfully overcame these challenges through gradual socialization strategies and continuous training. A senior employee emphasized the importance of training in reducing resistance to technology, ultimately enabling the entire organization to understand the benefits of digital transformation. This success offers valuable lessons for other government institutions on strategies for digitalizing public services.

Overall, e-clipping not only contributes to service modernization at BPK RI Representative Office in Bali Province but also demonstrates the potential of technology to transform work culture and enhance institutional efficiency. These findings are consistent with existing literature but add new insights into the specific use of technology in supporting audits and financial oversight. This success provides evidence that digitalization is not just about technology but also about comprehensive transformation requiring collective commitment. In the context of public service, the success of e-clipping proves that government institutions in Indonesia can transform to become more efficient and accountable, delivering tangible benefits to the public on a broader scale.

Achieving Goals and Tangible Changes in the Digital Library

The implementation of E-Clipping technology at BPK RI Representative Office in Bali Province has successfully achieved its primary goal of facilitating the Audit Team in planning examination processes. One significant impact is the increased speed of information access, where data that previously took hours to collect can now be obtained within minutes through the digital platform SiPuspa (Ali & Warraich, 2024). This efficiency enables examination planning to become more structured and effective, supporting faster and more accurate identification of critical issues. Furthermore, the relevance of the data provided by E-Clipping enhances the

quality of analysis and decision-making, emphasizing the importance of organized information in supporting institutional duties (Winata et al., 2021).

Tangible changes have also been observed following the implementation of E-Clipping, although formal statistical data is not yet available. Auditors increasingly access this platform before drafting their work plans, reflecting a shift in work culture toward a data-driven approach (Jones & Davies, 2024). The integration of E-Clipping into BPK's digital library (SiPuspa) enriches the collection of available information, making the platform a reliable reference source for all employees, not just the Audit Team. With its open-access nature, all employees can now obtain the latest information without facing bureaucratic barriers that often hinder productivity (Chatterjee et al., 2024; Szukits & Móricz, 2024).

Practically, the implementation of E-Clipping offers direct benefits to the operations of BPK RI Bali Province. The time required to search for information has been drastically reduced, allowing the Audit Team to focus more on analysis and task execution (Ali & Warraich, 2024). The available information is not only relevant but also up-to-date, supporting more precise decision-making. Easy accessibility eliminates lengthy procedures, speeding up information distribution among employees (Jones & Davies, 2024; Szukits & Móricz, 2024). This success provides valuable lessons for other government institutions seeking to adopt similar technology. Initial training and socialization to increase technology adoption, integration into existing systems, and periodic evaluation of platform effectiveness are steps that can be taken to ensure successful implementation.

From a theoretical perspective, this study enriches the literature on digital libraries and information management in the public sector. The findings demonstrate how specific technologies like E-Clipping can function as strategic tools to support institutional functions such as auditing and oversight. By providing a relevant model for technology implementation, this study offers new insights that can be adapted by other government institution libraries. Additionally, future research could explore the use of other supporting technologies, such as artificial intelligence (AI), for more sophisticated data analysis. The long-term impact of library digitalization on organizational productivity and efficiency is another promising area of study, along with comparative studies on the effectiveness of E-Clipping versus other digital tools in government institutions (Bansal et al., 2023; Chwiłkowska-Kubala et al., 2023).

The successful implementation of E-Clipping highlights the great potential of digital technology to revolutionize government institution operations in Indonesia. By strategically leveraging this technology, institutions can not only improve internal efficiency but also strengthen transparency and accountability in public services (Abdou, 2021; Sari, 2023). These findings affirm that digital transformation is not solely about technology but also about cultural changes requiring comprehensive commitment from all organizational elements.

CONCLUSION

This study examines the implementation of E-Clipping technology at the BPK RI Representative Office in Bali Province as a strategic step in the transformation of digital libraries and the modernization of technology-based services. Based on the analysis, E-Clipping has proven to accelerate information access, improve operational efficiency, and enhance user satisfaction. These impacts are reflected in more structured, faster, and more accurate examination planning processes. Additionally, the adoption of this technology has driven changes in employee work culture, shifting mindsets and work patterns toward more effective digital collaboration. From a theoretical perspective, this research expands the literature on library digitalization in the public sector, particularly by highlighting the integration of E-Clipping technology into digital library systems like SiPuspa. The findings offer an innovative model for managing digital libraries in government institutions, emphasizing the importance of consistent data updates and open access to ensure the sustainability and effectiveness of the technology. The strength of this study lies in its explanation of how E-Clipping technology integration not only supports digital library services but also directly contributes to the specific auditing functions within government institutions. This research provides new insights into information management in digital libraries, making it a strategic reference for modernizing libraries in other public institutions in Indonesia. In conclusion, this study underscores the importance of digitalizing libraries as a strategic step to improve the efficiency of technology-based public services. The proposed recommendations include the broader adoption of E-Clipping technology in other government institutions to strengthen public services and make significant contributions to the development of social sciences and humanities, particularly in digital information management.

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