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Design Of A Web-Based Archive Warehouse Management Information System In Improving The Efficiency Of Archives Management

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Abstract

The development of information technology has significantly contributed to enhancing knowledge quality and operational efficiency within organizations. The use of the internet provides a rapid and comprehensive means to obtain and disseminate information in both the public and private sectors. However, many repositories still rely on manual archive management methods, which often face various challenges, such as lengthy archive search times, difficulty in locating archives, and delays in the decision-making process. This problem is further complicated by the large number of archives and uncertainty regarding archive organization and storage locations. Therefore, a web-based archive information management system is needed to address these challenges. This study aims to design and develop a web-based archive information management system to enhance archive management efficiency and facilitate archive search through integrated data management in a single location. The research method employed is Research and Development (R&D), encompassing needs analysis with problem identification, design of a web-based system prototype, implementation of key functions, and system evaluation through functionality testing. Data were collected through direct observation. The research results indicate that implementing the web-based archive information management system can improve document management accuracy and accelerate archive search processes. Additionally, the system supports simultaneous collaboration among users. For example, a comparison between conventional archive management methods and the web-based system demonstrates a significant improvement in effectiveness. It is concluded that a web-based information management platform for archive repositories is a viable alternative to address issues related to archive administration, document search, and to enhance the ability to make faster and more accurate decisions, as well as optimize the use of organizational assets.

Keywords: Web-Based Information System, Archive Warehouse Management, Archive Management Efficiency.

INTRODUCTION

Changes in information technology over the past few years have had a significant impact on various fields, including archives management. Organizations require faster, more precise, and more efficient methods for organizing information, requiring updated archives systems to meet their needs Digital transformation impacts the way data is stored, distributed, secured, and accessed. The daily increase in data volumes makes an integrated and flexible archives management system crucial.

In Indonesia, archive management is regulated by Law Number 43 of 2009 concerning Archives. However, with the development of digital transformation policies, there has been a shift towards information technology-based systems. The implementation of e-government and the digitalization of public services encourage institutions to integrate archive management with modern digital systems. However, physical archive management is still often done manually, which slows down document retrieval and can disrupt the decision-making process. Mistakes in recording storage locations and unregistered loans increase the risk of document loss.

Research shows that organizations that have not implemented a computer-based archives management system experience up to 40% delays in retrieval compared to organizations that have used a web-based system. Several previous studies have emphasized the importance of document digitization but have paid little attention to the comprehensive management of physical locations. In reality, relying solely on digitization is insufficient without planned management. Other research shows that the use of a web-based system can improve the efficiency of document searches and the accuracy of reports. The latest technologies such as cloud computing and data analytics have been proven to help make archives management more secure, flexible, and integrated. Global archives management standards emphasize the importance of consistency, accountability, and metadata

standardization for the sustainability of digital archives management. This research combines these practices through an integrative approach between physical and digital archives, with the aim of creating a system that is effective and relevant for modern organizations.

Research and Development (R&D) was used in this project, with an emphasis on problem identification and the development of a prototype system that can be implemented and tested. The research process was carried out systematically, starting from needs analysis to system testing and evaluation. The needs analysis aimed to identify problems in the management of physical and digital archives, as well as ensure compliance with national archival standards and relevant digitization practices. The system design utilized the Unified Modeling Language (UML) to model processes, data structures, and interactions between work units. The prototype was developed using the latest web technologies, integrating a web-based system to accelerate the identification of archive locations and an automatic notification feature for archive retention management. Functional testing was conducted to evaluate the speed of archive searches, data accuracy, and ease of use of the system. Evaluation and improvements were made based on user feedback and test results so that the resulting system can meet the organization's needs well. With the R&D method, this research is expected to produce a prototype that can be immediately used and contribute to strengthening sustainable archive management. The developed web-based archive warehouse management information system features the integration of physical and digital archives, simplifying the process of identifying, recording, and tracking documents. The automated web-based system accelerates archive searches and retention management. This system also provides analytical reports to identify archive usage patterns and storage needs, which will support data-driven decision making.

Initial testing demonstrated a significant improvement in document retrieval efficiency compared to manual methods, with archive access increasing by up to 40% and recording errors reduced. User evaluations indicated the system was more user-friendly and improved collaboration between work units. The development of a web-based archive warehouse management information system has proven effective in improving operational efficiency, recording accuracy, and information access. The R&D approach supports the development of a system that is structured, tested, and relevant to the organization's needs. The integration of physical and digital archives and the use of automated web-based system technology contribute to faster, safer, and more sustainable archive management. With this system, organizations can strengthen archive management, increase transparency, and support data-driven decision-making.

RESEARCH METHODS

The approach used in this study is Research and Development (R&D). Research and Development is a method aimed at designing a product and assessing how well the product functions. In this study, the resulting product is a Web-Based Archives Warehouse Management Information System, which aims to improve archive management and facilitate document searches in the archives warehouse. The research was conducted in a planned manner through several stages, including needs analysis, system design, implementation, system testing, and evaluation.

The research stages are described in the research method flow diagram which can be seen in Figure 1.

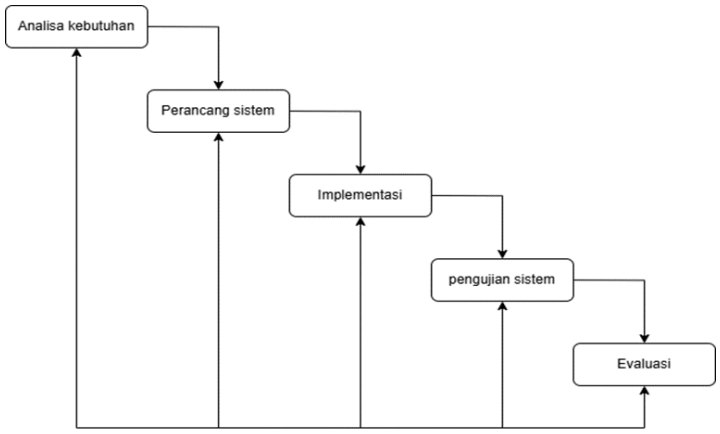

Figure 1. Stages of Research Methods

The initial stage in research to identify problems in current archives management is a needs assessment. At this stage, the manual archives management process in the warehouse was observed to collect data. The analysis results revealed several obstacles, such as difficulty finding archives, unclear document storage locations, and poorly integrated archive recording. Therefore, it is important to have an information system that supports more effective and efficient archive warehouse management. To gain a more organized understanding of the system's problems, the analysis was conducted using the PIECES method, which includes Performance, Information, Economy, Control, Efficiency, and Service.

Analysis	Old System
Performance	The process of searching for archives in the warehouse is still done manually, so it takes quite a long time to find the required documents.
Information	Information regarding the storage location of archives is often not recorded properly, making it difficult for users to find archives.
Economy	Excessive use of paper and physical storage of archives causes operational costs to increase.
Control	The archive security system is still low because archive data collection has not been systematically controlled.
Efficiency	The process of recording and searching archives takes a long time because it still uses manual methods.
Service	Services in providing archives are slow because the document search process takes quite a long time.

The system design phase is carried out after the requirements analysis is completed. In this phase, the system to be built is designed using the Unified Modeling Language (UML) to show the system structure, running processes, and the relationships between existing components. The purpose of the system design is to provide a clear understanding of the system to be created, including the database design, user interface, and archive data management processes. The system created also provides features for archive search, archive data management, archive categorization, records of archive storage locations in the warehouse, archive lending from the warehouse, and archive destruction.

The implementation phase is the system development step that follows the previously created design. In this phase, a Web-Based Archives Warehouse Management Information System application is created using a web programming language and a database to store archive information. The system being developed is designed to manage archive data in the archives warehouse, allowing users to more easily search, manage, and monitor archives more effectively and efficiently.

The system testing phase is conducted to verify that the developed system functions properly according to user requirements. This system testing utilizes the Blackbox Testing method, a testing method that emphasizes system functionality without examining the program code structure. Every feature of the system is tested, including archive data management, document search, archive storage location logging, and report generation, to ensure everything functions properly and provides the appropriate results for users.

The assessment phase was conducted to evaluate the performance of the developed system after testing was completed. During this phase, an analysis was conducted of the system's strengths and weaknesses and to identify potential improvements to enhance its performance. The evaluation results indicated that the web-based archive warehouse management information system can support increased efficiency in archive management, accelerate document retrieval, and improve accuracy in recording archive data in the archive warehouse.

RESULTS AND DISCUSSION

After completing several stages of analysis, we will now discuss the next stage. This section plays a very important role for both authors and users, as it is used to assess the performance of the information system that has been created.

Use Case Diagram

The results of the research conducted at PT. Padang Distribusindo Raya provide an overview of how the current information system implemented in archive warehouse management functions. This research was conducted to understand the system's working processes, as well as the activities carried out by users in managing archives stored in the warehouse. This includes steps from logging into the system, setting archive categories, adding archive information, to the process of borrowing and deleting archives. Through this analysis, various features and functions accessible to users in the existing system can be identified, so that archive management can be carried out in a more planned, efficient, and easily monitored manner. The results of the analysis are then used to show the relationship between users and the system through a Use Case Diagram, which provides a clearer explanation of the various functions present in the archive warehouse management system. For a better understanding, see Figure 2 below.

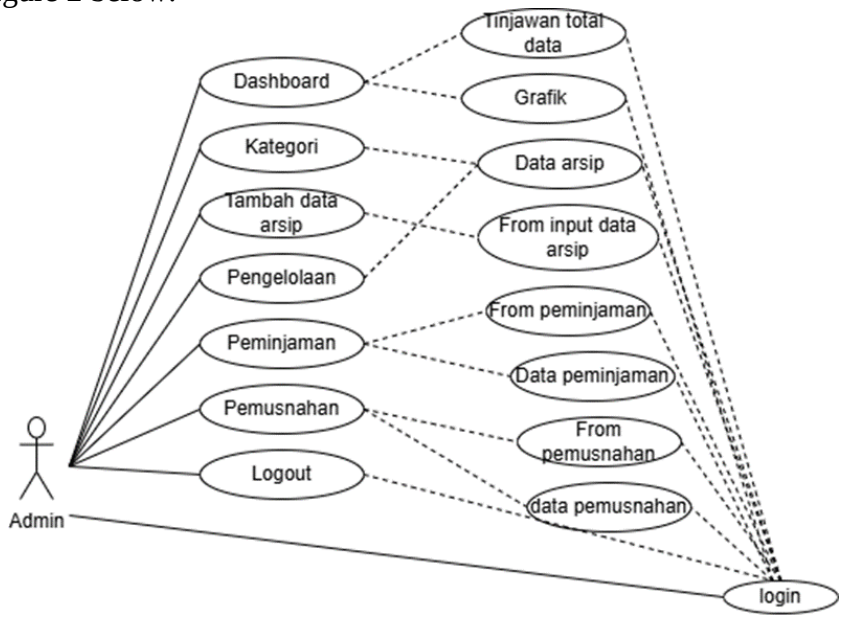

Figure 2. Use Case Diagram of Archive Warehouse Application

Login Page

This page displays the login page for the information system. This login form includes fields for a username, password, and a "Remember me" option that allows users to stay connected without having to log in again. The simple design with bright colors provides a professional and modern feel as the first step to accessing system features.

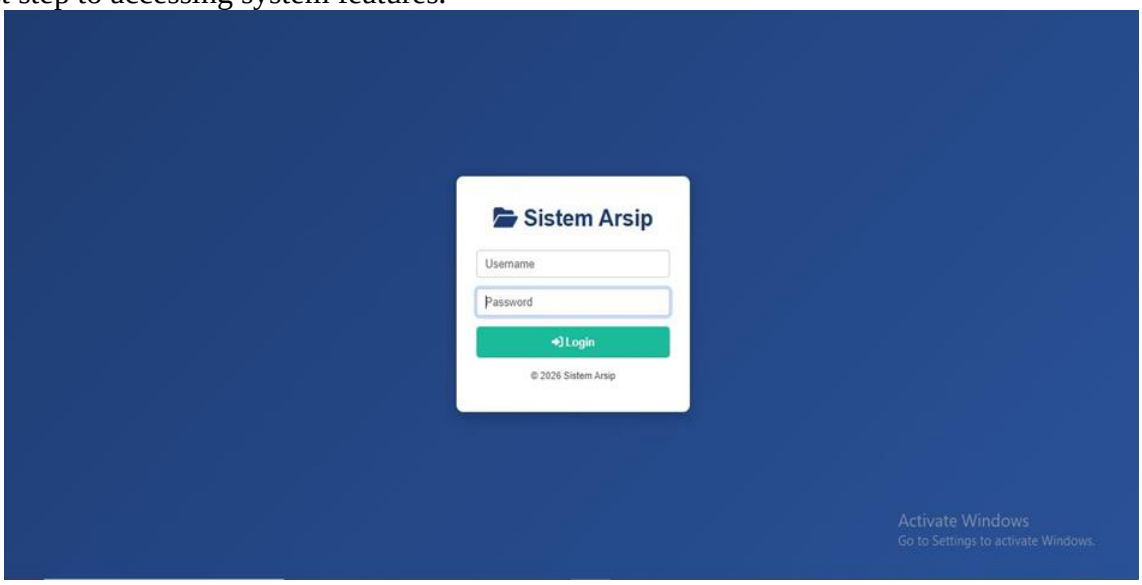

Figure 3. Login Page

Dashboard Page

Below is a view of the Archive Warehouse management system dashboard, which presents a summary of information on total archives, active archives, inactive archives, archives ready for destruction, and archive graphs based on categorization. Using this page, administrators can quickly monitor the amount of data stored in the system in real time.

Figure 4. Dashboard Page

Category Page

On the category page, the admin can see archive data based on the category/each branch of the organization in the company and on this page the admin can also see details of the archive such as archive information, layout in the archive warehouse and other additional information, on this page there is also an archive search section.

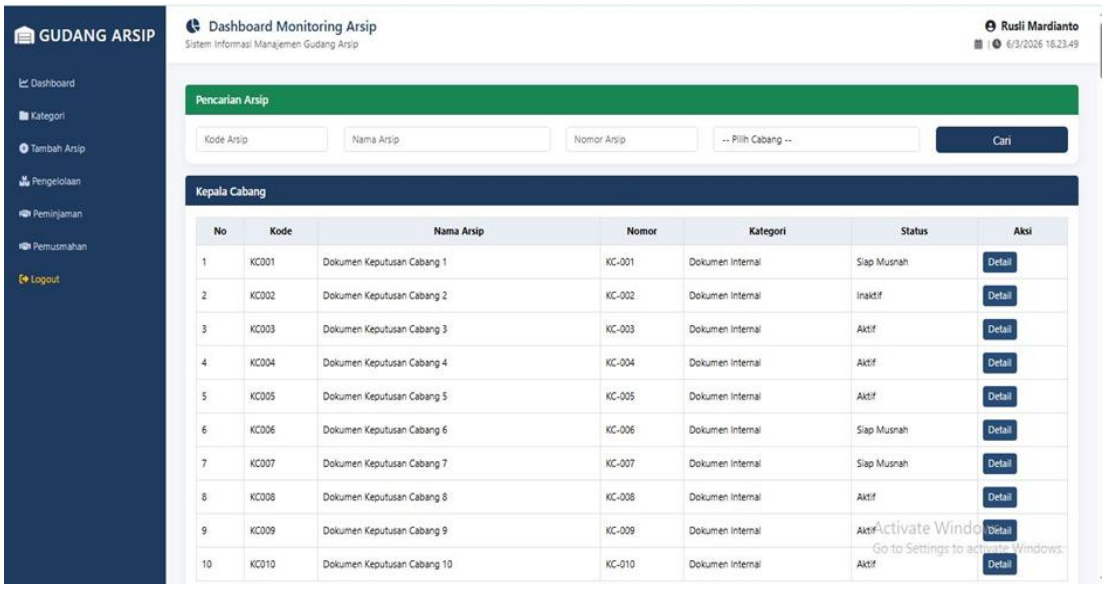

Figure 5. Category Page

Add Data Page

On the add data page, the admin can input data from the archive that will be stored in the archive warehouse in the data input form that has been provided. After saving, the data will enter the archive database.

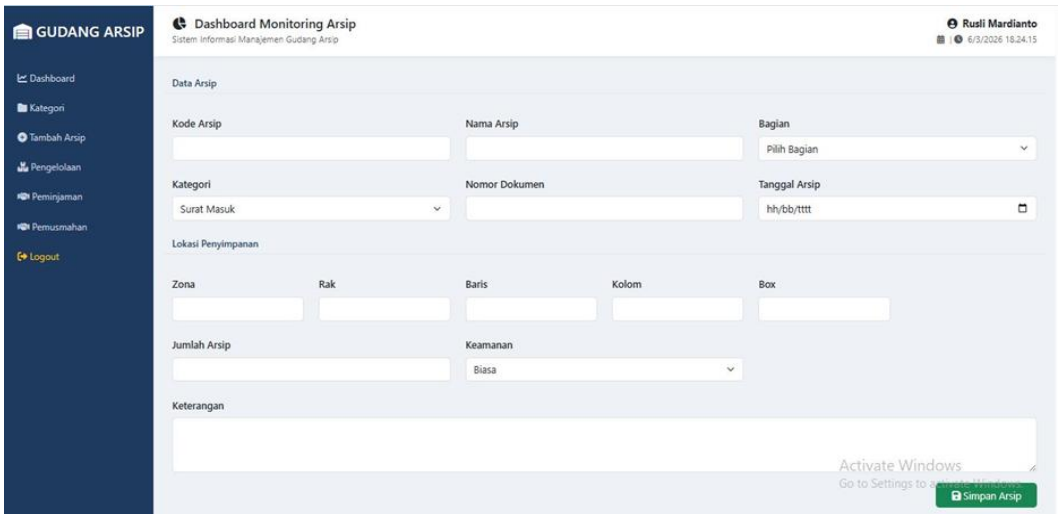

Figure 6. Add Data Page

Management Page

This management page displays a table of archive data management that has been input by the admin and also presents a summary of information on total archives, active archives, inactive archives, and archives that are ready to be destroyed and there is also a search section to make it easier to find archives.

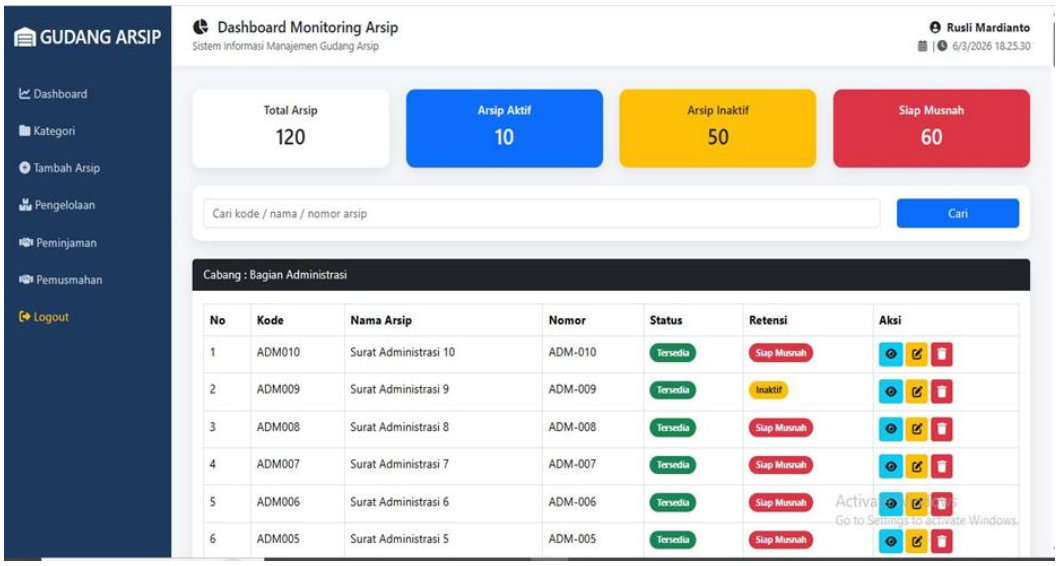

Figure 7. Management Page

Loan Page

The loan page is a page where the admin or officer can input borrower data and archive data that will be loaned on the form that has been provided and after being saved, the data will appear in the table that has been provided, in the table the admin or officer can also see the details of the archive data that was loaned and the borrower's data, after the archive is returned the admin or officer can click the back button, and on this page there is also a search section to make it easier for the admin or officer

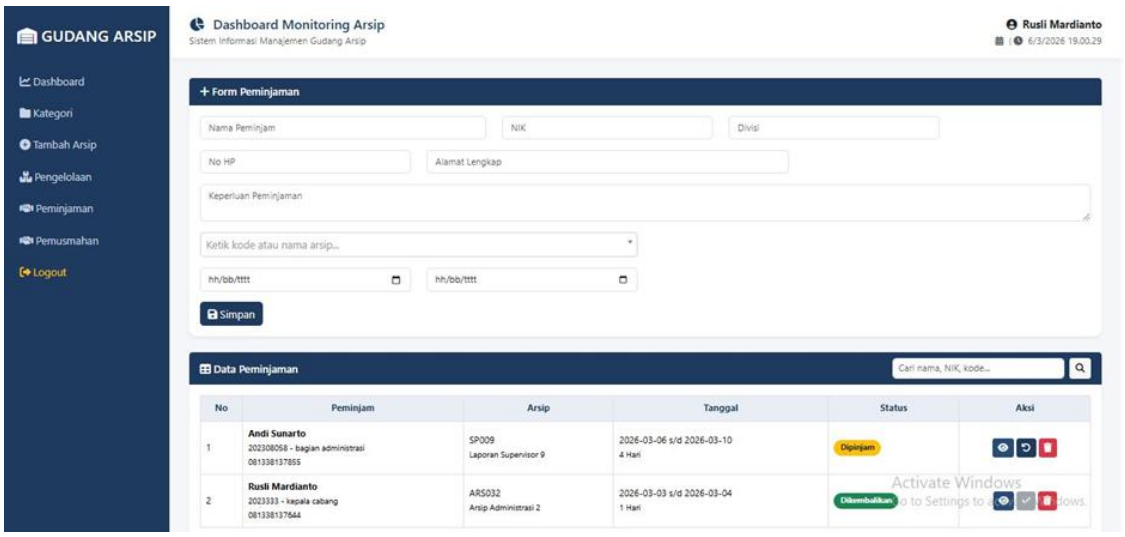

Figure 8. Borrowing Page

Destruction Page

The destruction page is a place where the admin can destroy archives that have passed the retention period by filling in the form provided and must also attach a document of the minutes for the destruction of the archives, after the archives are destroyed, the destruction data will appear in the table provided, in the table the admin can also see the details of the destruction.

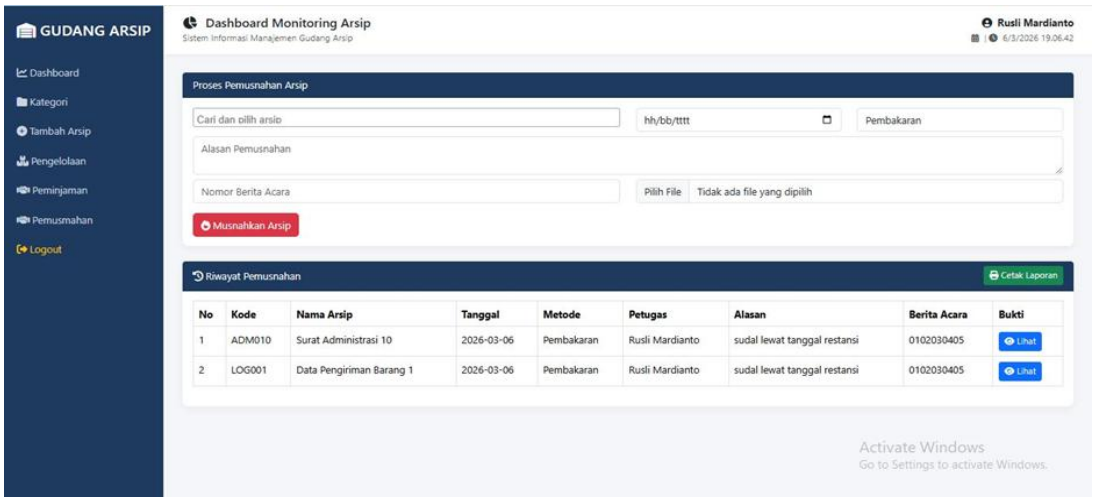

Figure 9. Destruction Page

CONCLUSION

The implementation of a web-based archive warehouse management information system at PT Padang Distribusindo Raya has proven to be able to improve the efficiency of archive management by accelerating the search process, increasing the accuracy of recording, and providing integration between physical and digital archives in one centralized platform. Key features such as recording storage locations, managing borrowing and destruction, and presenting data summaries on the dashboard help users monitor archive status in real time and support faster, data-driven decision making. The use of a Research and Development (R&D) approach, PIECES analysis, and modeling with UML resulted in a system prototype that is functional, user-friendly, and in accordance with organizational needs in the context of digital transformation and national archival standards.

However, this study still has several limitations, including the scope of testing that focuses more on functional aspects than on load testing, security, and system scalability, and the limited test subjects that are still focused on one agency, so generalization of the results to other organizations needs to be done carefully. Future research is recommended to expand testing to aspects of archive data security, integration with cloud and mobile technologies, and evaluation of system performance on a larger user scale, while measuring the quantitative impact on time efficiency, operational costs, and service quality more comprehensively. Practically, the results of this study can be used as a reference for government and private agencies that still implement manual archive management to develop similar systems, adapt modules to organizational needs, and develop internal archive policies that support digitalization and transparent, accountable, and sustainable archive governance.

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