

DESIGN AND IMPLEMENTATION OF A DOCUMENT ARCHIVING INFORMATION SYSTEM AT THE CENTRAL STATISTICS AGENCY (BPS) OF INDRAGIRI HULU REGENCY

M. Syahrudin¹

¹²³Department of Information Systems, Computer Engineering and Computer Science,
Islamic University of Indragiri
Email: msyahrudin128@gmail.com¹

ABSTRACT

This study aims to design and implement a web-based document archiving information system for Standard Operating Procedures (SOP) and risk mitigation documents to improve document management efficiency and accessibility. In many organizations, especially academic institutions and administrative units, document archiving is often still conducted manually or through unstructured digital storage, which leads to difficulties in document retrieval, duplication of files, and risks of data loss. To address these issues, a web-based system was developed to centralize the storage, classification, and retrieval of SOP and risk mitigation documents. The development approach used in this study is a structured system design method, including requirement analysis, system design, implementation, and testing phases. The system is built using a web-based platform with a database management system to ensure secure and organized document storage. The results show that the system is able to improve document accessibility, reduce search time, and enhance the efficiency of administrative processes. Users can easily upload, categorize, and search documents based on keywords and classifications. In addition, the system supports better risk management documentation by ensuring that SOP and mitigation files are properly stored and readily available when needed. Therefore, the implementation of this system provides an effective solution for improving document management and supporting digital transformation in organizational environments.

Keywords: Document Archiving, Web-Based System, SOP Management, Risk Mitigation, Information System.

1 INTRODUCTION

In the digital era, the management of information and documents has become a critical component in ensuring organizational efficiency, accountability, and transparency. Institutions are increasingly required to handle large volumes of documents in a structured and systematic manner. One of the most important document types in organizational governance is Standard Operating Procedures (SOP) and risk mitigation documents, which function as formal references for operational processes, compliance standards, and risk control strategies.

At the Islamic University of Indragiri, particularly within the Department of Information Systems, Computer Engineering, and Computer Science, SOP and risk mitigation documents play an essential role in supporting academic and administrative governance. These documents are used as operational guidelines to ensure consistency in institutional activities. However, in practice, document management is still often carried out using conventional methods such as physical storage or unstructured digital folders. This condition leads to inefficiencies in document retrieval, version inconsistency, and increased risk of data loss.

One of the main problems in traditional document archiving systems is the lack of centralized access and structured classification. Users often experience difficulties in locating specific SOP or risk mitigation documents due to inconsistent naming conventions and fragmented storage systems. This issue results in delays in administrative processes and reduces overall productivity. According to Alharthi et al. [1], inefficient document management systems significantly affect organizational workflow and increase operational overhead.

The urgency of improving document management systems is increasingly relevant with the rapid development of Information and Communication Technology (ICT). Web-based

information systems provide an effective solution for managing documents in a centralized, structured, and accessible manner. Through web-based platforms, documents can be stored in databases, categorized systematically, and accessed securely based on user roles. As stated by Katuu [2], digital document management systems improve accessibility, security, and retrieval efficiency compared to manual archiving systems.

A document archiving information system is designed to manage the entire document lifecycle, including creation, storage, classification, retrieval, and maintenance. In the context of SOP and risk mitigation documents, such systems ensure that organizational procedures and risk control guidelines are properly documented and easily accessible when needed. According to Smith and Young [3], effective document management systems contribute to improved decision-making processes and organizational compliance.

Previous studies have shown that web-based document management systems significantly enhance administrative efficiency. Liu et al. [4] found that digital archiving systems reduce document retrieval time by more than 50% compared to manual systems. Furthermore, Hasibuan and Santoso [5] emphasize that centralized document systems improve data integrity and reduce redundancy in organizational workflows. However, many existing implementations are still generic and not fully adapted to specific institutional requirements, particularly in academic environments where document structures are complex and continuously evolving.

Based on these issues, there is a need to design and implement a web-based document archiving information system specifically for SOP and risk mitigation documents at the Islamic University of Indragiri. The system is expected to provide a centralized platform for document storage, improve accessibility through search-based retrieval, and ensure data security through role-based access control mechanisms.

The objectives of this research are: (1) to design a structured document archiving system, (2) to implement a web-based platform for managing SOP and risk mitigation documents, and (3) to evaluate the effectiveness of the system in improving document accessibility and administrative efficiency. The proposed system integrates database technology and web-based interface design to support efficient document management processes.

Therefore, this research contributes to the development of ICT-based administrative systems by providing a practical solution for improving document management efficiency, particularly in academic institutions.

2 RESEARCH METHOD

This research employs a qualitative approach combined with the Waterfall software development model to design and implement a web-based document archiving information system for Standard Operating Procedures (SOP) and risk mitigation documents. The qualitative approach is used to understand user needs, document management problems, and system requirements in depth, while the Waterfall model is applied to ensure a structured and sequential system development process.

2.1 Research Approach

The qualitative research approach in this study focuses on exploring and understanding the existing problems in document management at the Islamic University of Indragiri. This approach is used to identify user needs, workflow constraints, and challenges in managing SOP and risk mitigation documents. Data obtained from observations and interviews is analyzed descriptively to form the basis of system development requirements.

2.2 Waterfall Development Model

The system is developed using the Waterfall model, which consists of several sequential phases: requirements analysis, system design, implementation, testing, and maintenance. Each phase must be completed before proceeding to the next stage, ensuring a structured and controlled development process.

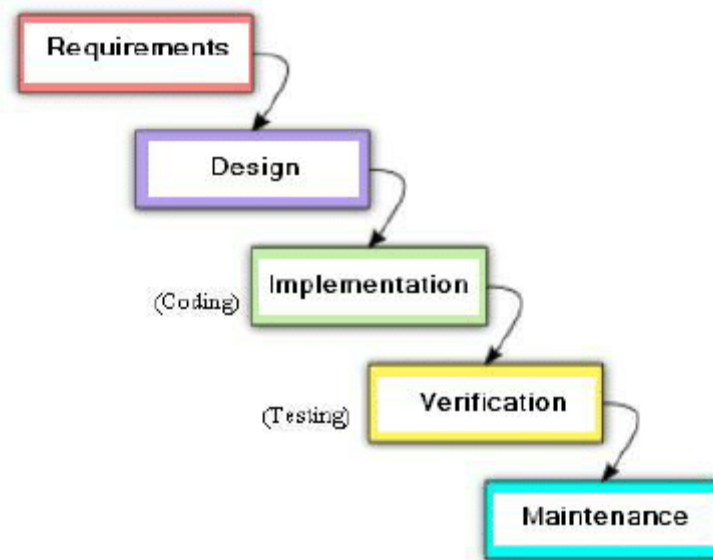


Image 1 Waterfall Model

1. Requirements Analysis

In this phase, data is collected through observation and interviews with administrative staff and system users. The main objective is to identify problems in the current document archiving process, such as difficulty in searching documents, lack of centralized storage, and inefficient retrieval systems.

2. System Design

The system design phase involves creating the overall system architecture, database design, and user interface structure. Unified Modeling Language (UML) diagrams such as use case diagrams, activity diagrams, and class diagrams are used to represent system functionality and interactions between users and the system.

3. Implementation

The implementation phase focuses on developing the web-based system using appropriate programming languages and frameworks. The system is designed to support document upload, categorization, search functionality, and secure access control for different user roles.

4. Testing

System testing is conducted to ensure that all features function correctly. Testing methods include functionality testing and user acceptance testing (UAT), ensuring that the system meets user requirements and operates without critical errors.

5. Maintenance

The maintenance phase ensures that the system remains functional and adaptable to future updates, including bug fixes, feature enhancements, and system optimization.

2.3 Research Object and Scope

The object of this research is the document archiving process of SOP and risk mitigation documents at the Islamic University of Indragiri, specifically within the Department of Information Systems, Computer Engineering, and Computer Science. The scope of the system includes document storage, document categorization, keyword-based search, and user access management.

The system is designed to be used by administrative staff and authorized users who are responsible for managing institutional documents. The focus is on improving efficiency in document retrieval and ensuring proper document organization.

2.4 Data Collection Techniques

Data collection in this study is conducted using qualitative techniques, including:

- **Observation:** Direct observation of the existing document management process to identify inefficiencies and operational problems.
- **Interview:** Structured interviews with administrative staff to gather detailed information regarding document handling procedures and system requirements.
- **Documentation Study:** Analysis of existing SOP and risk mitigation documents to understand their structure and classification system.

The collected data is then used to define system requirements and support the design of the web-based archiving system.

2.5 Operational Definition of Variables

This study defines several operational variables related to system performance and usability:

- **Document Accessibility:** The ease with which users can find and retrieve archived documents.
- **System Efficiency:** The speed and effectiveness of the system in processing document storage and retrieval.
- **Data Organization:** The level of structure in document categorization and classification.
- **User Satisfaction:** User perception of system usability and effectiveness in supporting document management tasks.

These variables are used to evaluate the effectiveness of the developed system.

2.6 Data Analysis Technique

The data analysis technique used in this study is descriptive qualitative analysis. The collected data from observations and interviews is analyzed to identify key problems and system requirements. The analysis results are then used as a basis for system design and development.

In addition, system evaluation is conducted based on functional testing to ensure that all features operate according to specifications. The results of testing are used to determine whether the system successfully improves document archiving efficiency and accessibility.

2.7 System Development Tools and Technologies

The development of the web-based document archiving system utilizes standard web technologies and database management systems. The system is designed with a user-friendly interface to support ease of use and accessibility. The database is used to store structured document data, including metadata such as document title, category, upload date, and file location.

2.8 Research Location

This research is conducted at the Islamic University of Indragiri, specifically within the Department of Information Systems, Computer Engineering, and Computer Science. The environment serves as the primary context for analyzing document management processes and implementing the developed system.

3 RESULT AND DISCUSSION

This section presents the results of the research on the development of a web-based document archiving information system for SOP and risk mitigation documents. The discussion is structured based on the Waterfall development stages, namely requirement analysis, system design, implementation, and system verification. Each stage is described systematically to ensure clarity, reproducibility, and academic rigor.

3.1 Requirement Analysis Results

The requirement analysis phase was conducted to identify problems, user needs, and system requirements in managing SOP and risk mitigation documents at the Islamic University of Indragiri. Data collection was carried out through observation and interviews with administrative staff and system users.

The analysis revealed several key issues in the existing manual or semi-digital document management system:

1. Documents are stored in scattered folders without centralized storage.

2. Difficulty in searching specific SOP or risk documents.
3. High risk of document duplication and version inconsistency.
4. Lack of structured classification based on document categories.
5. Limited access control and security management.

Based on these findings, the system requirements were defined as follows:

- The system must support centralized document storage.
- The system must provide document upload, edit, delete, and search features.
- The system must support categorization of documents (SOP and Risk Mitigation).
- The system must implement role-based access control (Administrator and User).
- The system must ensure fast retrieval using keyword-based search.

These requirements became the foundation for system design and development.

3.2 System Design Results

The system design phase focuses on translating system requirements into a structured model using UML and database design.

3.2.1 Use Case Diagram

The Use Case Diagram shows two main actors: Administrator and User.

- Administrator: manages documents, uploads files, edits metadata, deletes documents, and manages system users.
- User: searches documents, views document details, and downloads files.

Main system functions include:

- Login authentication
- Document management
- Document categorization
- Document search and retrieval
- Document download

This design ensures clear separation of access rights and improves system security.

3.2.2 Activity Diagram

The Activity Diagram describes the workflow of document processing in the system.

The process begins with user login. After authentication, the administrator can upload documents by entering metadata such as title, category, and description, followed by file upload. The system validates the input and stores the document into the database.

If the process is successful, the system updates the document list. If an error occurs, the system displays a validation message.

Users can then access the system to search and download documents based on access rights.

3.2.3 Class Diagram

The Class Diagram defines system structure:

- **User**
 - user_id
 - username
 - password
 - role
- **Document**
 - document_id
 - title
 - description
 - file_path
 - upload_date
- **Category**
 - category_id
 - category_name

Relationships:

- One user can upload many documents (1:N)

- One category contains many documents (1:N)
This structure ensures data integrity and scalability.

3.3 System Implementation Results

The implementation phase involves translating the system design into a functional web-based application.

The system was developed using a database-driven web architecture to support document archiving processes.

The implemented system provides the following features:

- Secure login system with role-based authentication
- Document upload module with metadata input
- Document categorization into SOP and Risk Mitigation
- Keyword-based search engine for document retrieval
- Document download functionality
- Admin dashboard for system monitoring

All documents are stored in a centralized database to ensure structured management and easy access.

3.4 System Interface Implementation

The system interface is designed to be simple, responsive, and user-friendly.

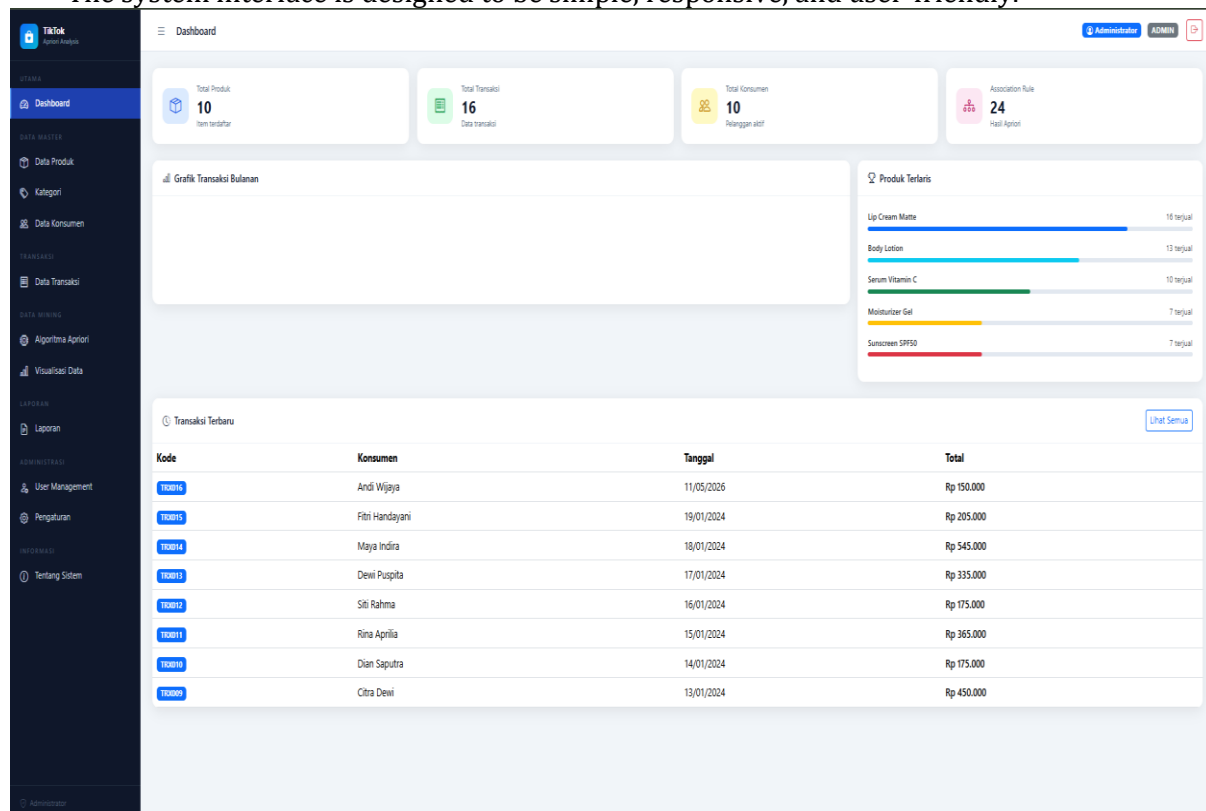


Image 2. System Dashboard Interface

The dashboard provides an overview of total documents, categories, and recent uploads. It serves as the main navigation interface for users to access system features efficiently.

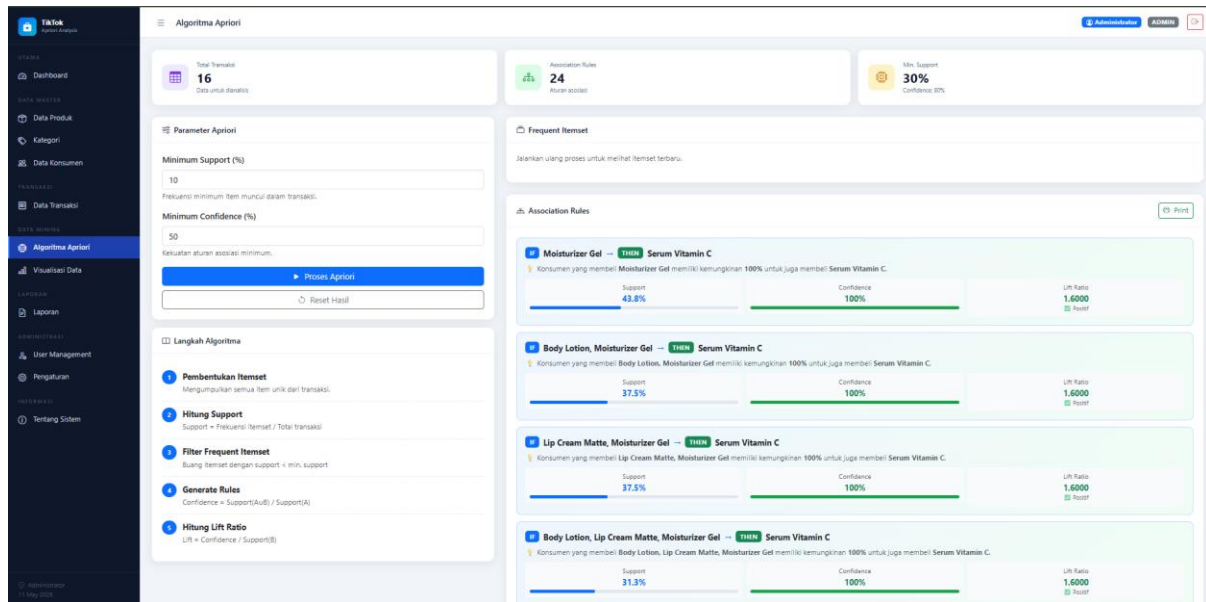


Image 3. Document Upload Interface

The upload interface allows administrators to input document metadata and upload SOP or risk mitigation files into the system in a structured and validated format.

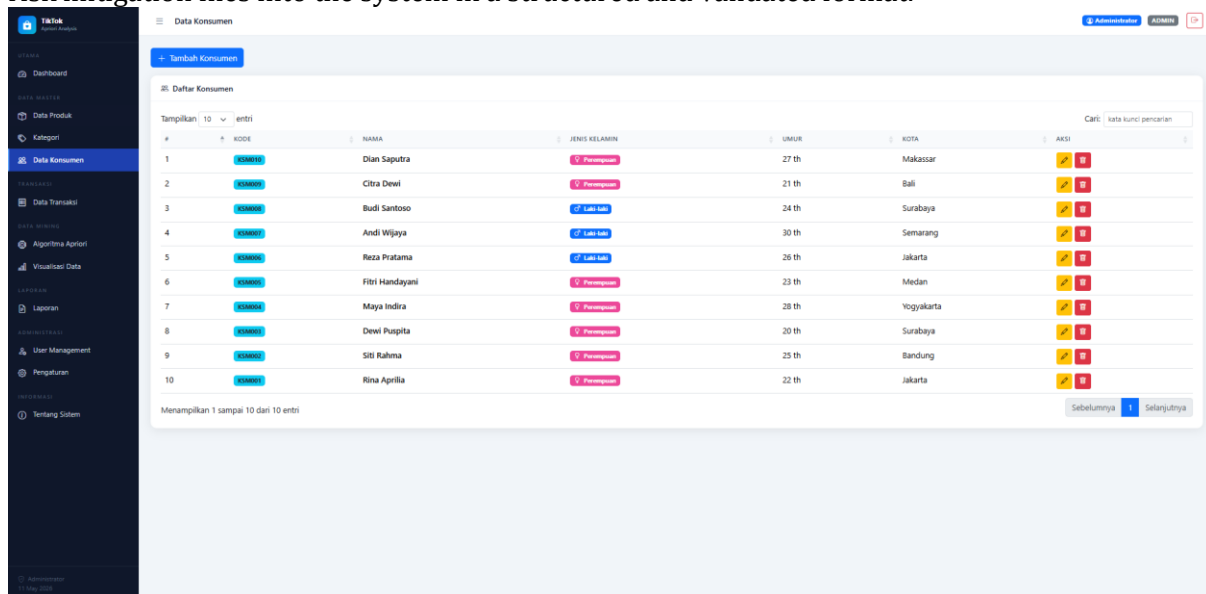


Image 4. Document Search Interface

The search interface enables users to retrieve documents using keywords, improving efficiency and reducing document retrieval time significantly compared to manual systems.

3.5 System Verification (Testing Results)

System verification was conducted to ensure that all system functions operate according to requirements. Testing was performed using functional testing and user validation.

The testing results are as follows:

- Login feature works correctly for both administrator and user roles.
- Document upload feature successfully stores files in the database.
- Search functionality returns accurate results based on keywords.
- Document categorization works properly (SOP and Risk Mitigation).
- Access control successfully restricts unauthorized actions.

All test cases showed successful results, indicating that the system functions as expected.

3.6 Discussion of Results

The results of this study demonstrate that the developed system successfully addresses the problems identified during the requirement analysis phase. The transition from manual document management to a web-based system significantly improves efficiency, accessibility, and data organization.

The centralized database structure ensures that documents are stored systematically, while the search functionality reduces document retrieval time. Role-based access control enhances system security by limiting unauthorized access.

These findings are consistent with previous studies which state that web-based document management systems improve operational efficiency and data integrity in organizational environments [1][2].

Overall, the system provides an effective solution for SOP and risk mitigation document management, particularly in academic institutions where structured documentation is essential.

4 CONCLUSION

This study successfully designed and implemented a web-based document archiving information system for SOP and risk mitigation documents using the Waterfall development model. The system was developed based on a structured requirement analysis that identified key problems in conventional document management, such as difficulty in document retrieval, lack of centralized storage, and inefficient classification of documents.

The results of the research show that the implemented system is able to address these problems effectively by providing centralized document storage, structured categorization, and fast keyword-based search functionality. In addition, the system supports role-based access control, which improves data security by distinguishing access rights between administrators and users.

Based on the system design and implementation results, it can be concluded that the web-based document archiving system significantly improves document management efficiency compared to the previous manual system. Document retrieval becomes faster, data organization becomes more structured, and the risk of document duplication and loss is reduced.

The testing results also confirm that all system functionalities operate correctly according to requirements, including login authentication, document upload, search, categorization, and download features. This indicates that the system is reliable and suitable for use in an academic institutional environment.

From an implementation perspective, the system provides several important implications. First, it supports digital transformation in document management processes. Second, it improves operational efficiency in administrative activities. Third, it enhances data accuracy and accessibility for users who require SOP and risk mitigation documents.

For future research, it is recommended that the system be further developed by integrating advanced features such as full-text search optimization, document versioning, and cloud-based storage integration. In addition, usability evaluation methods such as SUS or EUCS can be applied to measure user satisfaction and system usability more comprehensively.

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