



Design of a Desktop-Based PDD Management Information and Archiving System at PT PUSRI

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Received: August 25, 2025; Revised: September 25, 2025; Accepted: November 17, 2025

Abstract

This study aims to develop and implement a desktop-based archival management information system for the PPD division of PT Pupuk Sriwidjaja Palembang (Pusri) in Lampung, addressing the company's ongoing issues with physical document deterioration, loss, and retrieval inefficiencies. Key findings demonstrate that transitioning from paper to electronic documents (e-documents) is a highly strategic preventive measure; it safeguards physical archives against threats such as decay, humidity, fire, and natural disasters, while simultaneously boosting operational efficiency through easy backup duplication. The implementation of a MySQL relational database effectively eliminates time-consuming manual searches; the structured database—utilizing indexes and metadata—enables data retrieval within seconds, thereby drastically increasing employee productivity. Furthermore, the inclusion of role-based access authentication proves effective in restricting access to sensitive documents, protecting internal data confidentiality against misuse and information leaks. Methodologically, the study employs the Structured Systems Analysis and Design (SSAD) approach, providing a structured framework for mapping business processes. Through the use of Context Diagrams, Data Flow Diagrams (DFD), Entity-Relationship Diagrams (ERD), and program flowcharts, non-technical requirements were accurately translated into Java code, minimizing logic errors during software development. Consequently, the developed system successfully assists the company in digitally organizing documents, streamlining file retrieval, and significantly reducing the risk of physical archive loss or damage, resulting in a holistic, secure, and highly reliable archival management ecosystem.

Keyword: Management Information System, Digital Archiving, Electronic Documents, SSAD.

1. Introduction

Archives and documents serve as vital sources of information and are crucial elements in a company's daily operations (Benmakhlouf Chouaou, 2024; Wolor 2024). At the PPD branch of PT Pupuk Sriwidjaja Palembang (Pusri) in Lampung, the current archiving system relies on manual processes; important files—such as incoming and outgoing correspondence are stored in paper folders categorized by type and kept in filing cabinets. This conventional method hinders operational efficiency, as documents are susceptible to



physical damage and loss, and the retrieval process is time-consuming. To ensure the integrity, authenticity, and security of these important documents, a system is needed to transition from physical storage media (paper documents) to digital electronic media (e-documents) (Ragais et al., 2012). By scanning paper documents into computer files, records can be stored in an electronic database protected against damage.

While many organizations utilize web-based archiving systems, there is a research gap regarding the implementation of desktop-based archiving systems—specifically designed using structured modeling—to manage incoming, internal outgoing, and external outgoing correspondence in an integrated manner at fertilizer distributor branch offices (Mewengkang et al., 2022; Syukhri & Gusmayeni, 2021, Gamido et al., 2023). A stable desktop application connected directly to a local database offers a significant alternative for accelerating document entry and indexing processes. Based on this context, the research question is formulated as follows: How can an archiving management information system be designed to mitigate the risks of document damage and loss at PT Pupuk Sriwidjaja Palembang (Pusri) Lampung? The primary objective of this research is to design an information system capable of electronic document storage to minimize the risk of damage to or loss of important records. Furthermore, the study aims to develop a desktop application that enhances operational service quality, simplifies file retrieval, and facilitates the shared use of documents across organizational units.

This research is expected to provide tangible benefits to the company's archiving staff by simplifying and accelerating document location searches using specific keywords and by creating a more structured file storage system. For the company, the proposed program design is expected to reduce the risk of losing valuable documents, save physical storage space, and ensure long-term data integrity. For the organizational units under PT Pupuk Sriwijaya Palembang (Pusri) Lampung, this program is expected to enhance work efficiency by facilitating easy access to integrated information regarding incoming and outgoing correspondence.

The structure of this research report comprises five chapters: One) Introduction: Outlines the background, problem formulation, scope, objectives, benefits, and the report's structure. Two) Theoretical Framework: Covers relevant theories supporting the records management information system. Three) Research Methodology: Discusses data collection methods, requirements analysis, system design, database design, and program flowcharts. Four) Research Results and Discussion: Details the program implementation, application interface, and the analysis of functional testing results. Five) Conclusions and Recommendations: Presents the research conclusions, study limitations, and recommendations for future system development.

2. Literature Review

2.1. Main Supporting Theory

- **System**

A system is defined as a unified whole consisting of a set of elements or components that are interconnected and interact with one another. Each element within the system has a specific role and function, yet none can stand alone due to the close functional interdependencies among the components (Boardma & Sauser, 2006). These interconnections form an integrated network wherein the output of one component serves as the input for another (Schipfer et al., 2024). The primary objective of integrating these elements is to achieve a specific goal or target established collectively

(Kasinathan et al., 2022). Without a clear objective, a system loses its direction and effectiveness; thus, coordination among elements is key to the system's overall success.

- Information System

An information system is a complex network comprising data processing systems (DPS) designed to collect, process, store, and distribute information (Hastuti et al., 2025; Karnia & Purbasari, 2025). This network functions not only to transform raw data into meaningful information but also incorporates communication channels that facilitate the flow of data throughout an organization (Handayani et al., 2024). These communication channels serve as vital infrastructure connecting various organizational units, ensuring that information is disseminated rapidly, precisely, and accurately to those who need it (Dehgani et al., 2019). Through the integration of data processing and communication, information systems support decision-making, operational control, and strategic planning at the management level. Consequently, an information system is more than just technology; it is the foundation for the smooth flow of information—the lifeblood of the modern organization (Brynjolfsson & Mendelson, 1993; Sage & Rouse, 1999).

- Management System

Management is a blend of science and art involved in organizing and coordinating the various resources possessed by an organization (Obeng, 2023). As a science, management encompasses systematic principles, theories, and methods that can be learned and universally applied across diverse situations (Alharbi). Conversely, as an art, management demands practical skills, intuition, and creativity from a leader when navigating the unique dynamics and complexities encountered in practice (George et al., 2025). The management process focuses on the effective and efficient utilization of human resources—viewed as the primary asset—alongside other resources such as finances, materials, technology, and information (Ochieng, 2023). Effectiveness entails achieving established targets, whereas efficiency involves attaining those targets through the minimal yet optimal use of resources. Ultimately, effective management is the key to channeling an organization's full potential toward the sustainable achievement of its established vision, mission, and goals.

- Correspondence and Its Management

Correspondence serves as a form of written information that plays a strategic role as an official communication tool within and between institutions and organizations (Qiao et al., 2024). Letters function not merely as a medium for conveying messages but also as valid documents holding significant legal, administrative, and historical value for an institution (Sprague, 1995). Consequently, the handling of correspondence requires a structured and systematic process to ensure the information contained therein is effectively managed (Farhatuaini, 2024; Sprague, 1995). Correspondence management encompasses two primary workflows: the processing of incoming mail and the preparation of outgoing mail. For incoming mail, the process ranges from receipt, recording, and routing to organized filing based on established classifications, thereby facilitating future access and retrieval. Meanwhile, the process for outgoing mail involves conceptualization or idea formulation, drafting, review, signing, and distribution to the intended recipients. This entire process must be executed with care and consistency to ensure the accuracy, security, and reliability of records as evidence of organizational accountability (Cain & Barata, 2001; Duranti & Rogers, 2012).



2.2. Supporting Theories

- NetBeans and Java Swing: NetBeans is a Java-based Integrated Development Environment (IDE) that supports Java Swing technology for the visual design of multiplatform desktop applications.
- Databases and MySQL: A database is a collection of interrelated facts represented in tables and stored on digital media. MySQL is used as the Database Management System (DBMS) to store and process archival data (Rawat & Purnama, 2011).
- Structured Systems Analysis and Design (SSAD): A structured system analysis and design method that focuses on organizational data flow (Eddins et al., 1991; Gadhi et al., 2023).

2.3. System Development Plan

- This archiving system is designed to convert paper documents (hardcopy) into digital computer files (softcopy) through a scanning process.
- These electronic files are uploaded and managed via a desktop application connected to a local database.
- Electronic documents are stored in a structured manner based on specific categories to enable rapid retrieval of their history.

3. Method

3.1. Research Workflow

This research follows the stages of the Structured Systems Analysis and Design (SSAD) methodology:

- Policy and Planning: Securing permits and defining the research focus on the archiving division of PT Pupuk Sriwidjaja.
- Data Collection: Conducted through direct interviews with archiving staff, observation of daily archiving activities, and a literature review of relevant documents and academic sources.
- System Analysis: Mapping the workflow of the existing system (using document flowcharts) and identifying weaknesses, specifically the lack of a data backup mechanism.
- System Design: Designing data flow diagrams, database table relationships, and the user interface.
- Implementation & Maintenance: Developing the application using the Java language in NetBeans and a MySQL database.

3.2. System Development Design

- Data Flow Modeling: Utilizing a Context Diagram to illustrate system boundaries and external entities (Administration, Management, Archiving Division), as well as a Level 0 Data Flow Diagram (DFD) that divides the system into three main processes: 1.0 Incoming Mail Data Processing, 2.0 Outgoing Mail Data Processing, and 3.0 Report Printing.
- Database Design: Establishing table relationships involving five main tables: Document, Category, Mail, Storage, and Employee.
- Program Flowchart: Designing the logic for the desktop application's operation, ranging from the admin login and main menu flowcharts to the flowchart for document storage transaction workflows.

4. Result

4.1. Data Flow Modeling

The context-level diagram designed for this study, as shown in Figure 1, aims to establish the primary boundaries of the proposed system, encompassing three key stakeholders: administration, management, and the archiving department.

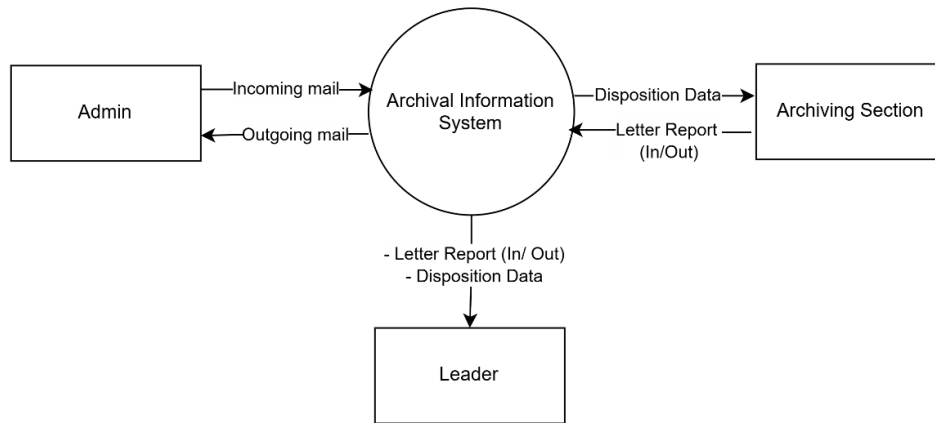


Figure 1. Context Level Diagram of the Research Design

Furthermore, the data flow design for the Level 0 Data Flow Diagram (DFD)—as shown in Figure 2—is structured into three main processes: 1.0 Incoming Mail Data Processing, 2.0 Outgoing Mail Data Processing, and 3.0 Report Printing Process.

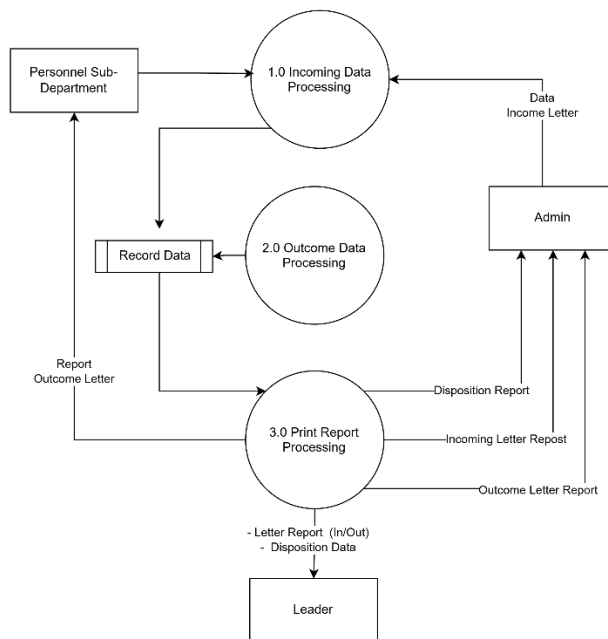


Figure 2. Level 0 DFD of the Archival Data Processing Information System

4.2. Database Design

The database design in this study establishes relationships between tables—as shown in Figure 3—involving five main tables: Document, Category, Letter, Record, and Employee.

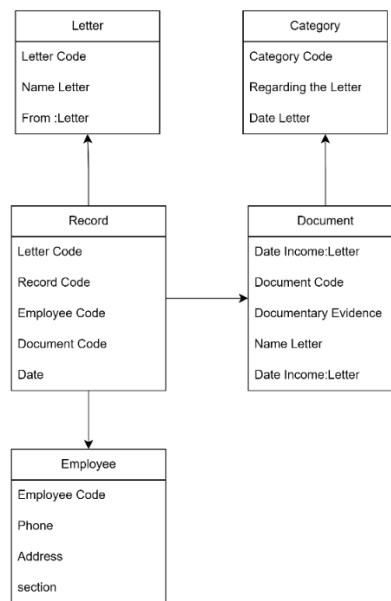


Figure 3. Table Relationship Design

4.3. Program Flowchart Design

To formulate the flowchart logic for the desktop application design, this study employs a flowchart logic (see Figure 4) that encompasses the process from the admin login and main menu to the flowchart for document storage transaction circulation.

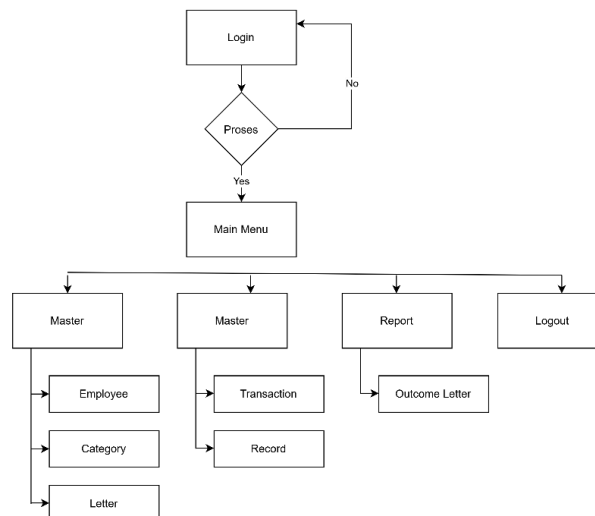


Figure 4. Program Flowchart

4.4. Prototype Development

The desktop application developed in this study utilizes Java Swing, aiming to create a functional program interface for the archiving department at PT Pupuk Sriwijaya Palembang (Pusri) Lampung. The design details are as follows:

- The Admin Login page is designed as an access control form requiring a username and password to ensure data privacy, as shown in Figure 5 below.



Figure 5. Admin Login UI Display

- The Admin Main Menu in this study is designed with a primary home screen displaying the Master, Process/Transaction, and Report menus, as well as an Exit button, as shown in Figure 6 below.

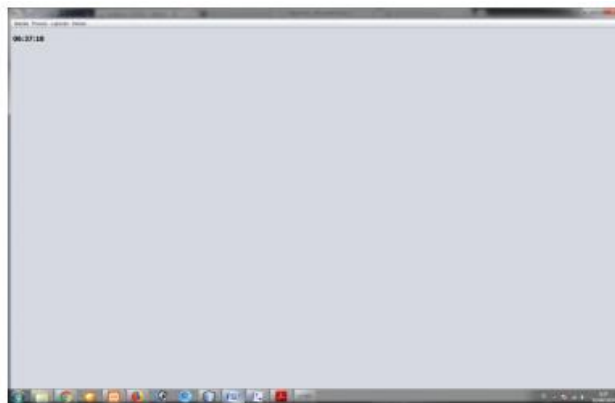


Figure 6. Admin UI view

- The Employee Data page in this study serves as an input form for employee details, including the Employee ID (NIP), Name, Address, Telephone Number, and Department, as shown in Figure 7 below.

A screenshot of a web browser window displaying an employee data form. The form has a title "KARTU KARTU" at the top. Below the title, there are five input fields: "NIP", "Nama Karyawan", "Alamat", "Telepon", and "Departemen". At the bottom of the form, there are four buttons: "Simpan", "Kembali", "Batal", and "Kirim". Below the buttons, there is a table with the following data:

NIP	Nama Karyawan	Alamat	Telepon	Departemen
1234	John Doe	1234	555-1234	IT

Figure 7. Employee Data UI Display



- The Category Data page in this study serves to define the classifications for incoming and outgoing documents, as shown in Figure 8 below.

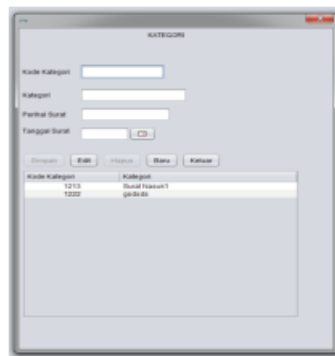


Figure 8. Admin Category Data UI

- The Location Data page is an interface design intended for managing the placement of cabinets or racks for storing physical files, as shown in Figure 9 below.

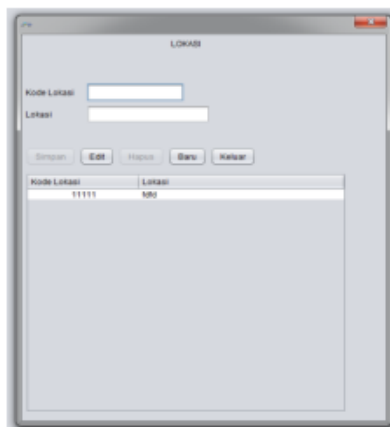


Figure 9. Admin Location Data UI Display

- The Data Storage page is where the program administrator uploads scanned digital files (e-documents) and links them to the correspondence metadata.
- The Report page in this study is designed to provide a data period filtering feature for generating summary reports of incoming and outgoing documents.

4.5. System Testing

This study employs the black-box testing method, evaluating the program's functionality by validating the buttons (Save, Edit, Delete, New, Exit) on the master and transaction forms. Functional validation of the login process was also conducted; valid input redirects the user to the Main Menu, whereas invalid input triggers an error warning dialog.

4.6. System Evaluation

System evaluation demonstrates that this archival management design successfully addresses the shortcomings of the existing system. Utilizing a MySQL database ensures secure storage of archival data, significantly accelerates the retrieval of incoming and outgoing documents via specific keywords, and minimizes the risk of document loss or physical damage.

5. Discussion

A key finding of this study conclusively demonstrates that migrating from conventional paper documents to electronic documents (e-documents) is the most strategic and effective preventive measure for preserving physical archives. Paper documents have long been vulnerable to various threats—such as age-related deterioration, damage caused by humidity and unstable room temperatures, fire hazards, and the risk of loss due to misplacement or natural disasters. By transitioning to an electronic format, vital information previously stored in stacks of physical files is converted into durable digital data that requires minimal physical storage space. Beyond physical preservation, this transformation significantly boosts operational efficiency; electronic documents can be easily duplicated for backups without compromising the quality of the information they contain. Thus, adopting e-documents not only addresses the issue of physical deterioration but also establishes a foundation for a more resilient and sustainable archiving system for the future.

In addition to preventing physical damage, implementing a MySQL relational database has proven highly effective in eliminating the manual search processes that previously plagued archive managers. A structured database system allows every electronic document to be stored with clear indices, categories, and metadata; consequently, data retrieval processes that once took hours or even days can now be completed in seconds via simple query commands. This drastically enhances employee productivity, as time previously wasted rummaging through filing cabinets can now be reallocated to high-value analytical tasks and decision-making. Furthermore, the system's role-based access authentication feature has proven highly effective in restricting access to sensitive documents. Only users with valid administrator credentials can access, modify, or delete specific data, creating a robust safeguard that protects the confidentiality of the company's internal data against misuse or unauthorized information leaks. The integration of a high-speed database, an accurate search system, and rigorous access security ultimately creates a holistic, secure, and highly reliable document management ecosystem.

The study illustrates the methodological implications, demonstrating that Structured Systems Analysis and Design (SSAD) provides a highly structured framework for mapping business processes. Through the use of Context Diagrams, DFDs, ERDs, and program flowcharts, non-technical requirements were accurately transformed into Java programming code. This structured approach minimizes logic errors (coding errors) during the software development process.

6. Conclusion

This research successfully developed a desktop-based archival management information system for the PPD division of PT Pupuk Sriwidjaja Palembang (Pusri) in Lampung. The system has proven effective in assisting the company with digital document organization, facilitating file retrieval, and significantly reducing the risk of loss or damage to physical archives.

Several limitations identified in this study include: First, the application was developed as a desktop system using Java Swing; consequently, operations are restricted to local computers where the system is installed, precluding mobile or cloud-based access. Second, the system's scope is limited to tracking the internal circulation of incoming and outgoing correspondence and their location status within the PPD PT Pupuk Sriwidjaja Lampung facility.



This study offers several recommendations for future research, including: First, evolving the archival system into a web- or cloud-based application to enable real-time, extensive data integration across PT Pupuk Sriwidjaja branch offices in other regions. Second, enhancing the user interface (UI/UX) design to make the application more visually appealing and interactive for archival staff. Third, incorporating digital file encryption within the database to strengthen the protection of confidential documents.

Acknowledgments

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