Creating Of Electronic Filing System Based Microsoft Access at PT Mitra Rajawali Banjaran

Manda Rahima Syarifatunnisa[1] , Yayan Firmansyah[2]
Politeknik Negeri Bandung [1,2]
Email: syarifatunnisamr@gmail.com[1], yayan.firmansyah@polban.ac.id[2]

Abstract

PT. Mitra Rajawali Banjaran (PT.MRB) is one of the subsidiaries of PT. Rajawali Nusantara Indonesia (Persero). PT.MRB is a medical equipment factory that produces various products such as condoms, syringes, gloves, and other medical devices. The company's current mail management activities still use manual methods, using handwritten agenda books as a tool for recording letters, which has some limitations in its usage. In an effort to overcome the problems that arise from manual mail management, an electronic mail management system is developed using Microsoft Access. This project aims to create an electronic archive system that can save time in recording and retrieving archives. The system development method used is the waterfall method, starting with data collection through literature study, observation, and interviews. The result of this project is a letter management application based on Microsoft Access. Based on testing and interviews with users, it was found that this system is quite effective in meeting the company's needs, including assisting in the process of archiving correspondence and searching for letters. The trial was conducted using 116 archived data for incoming and outgoing letters. 115 out of the 116 archived data were successfully found, resulting in an archival inaccuracy rate of 0.8%. This indicates that 0.8% of the evaluated archives had inaccuracies or errors in archive management. The lower the archival inaccuracy rate, the higher the accuracy and quality of archive management.

Keywords : Letter archiving, Microsoft Access, Waterfall

INTRODUCTION

PT. Mitra Rajawali Banjaran (PT.MRB) is one of the subsidiaries of PT. Rajawali Nusantara Indonesia (Persero). PT.MRB is a medical equipment factory that produces various products such as condoms, syringes, gloves, and other healthcare products. PT Mitra Rajawali Banjaran's Human Resources and General Affairs department receives incoming and outgoing documents daily, both from internal and external sources. These documents serve specific functions, thus they need to be archived for easy retrieval when needed. PT Mitra Rajawali Banjaran's current document management system shows that it is still not efficient, as shown in Figure 1. below:

Figure 1: Manual Record-keeping of Incoming Letters at PT Mitra Rajawali Banjaran
Source: Data from the Human Resources and General Affairs Department of PT Mitra Rajawali Banjaran in 2023

In Figure 1, it can be observed that the record-keeping of letters in the Human Resources and General Affairs department is still done using a conventional method, which

involves manually recording archive data in an agenda book. PT Mitra Rajawali Banjaran has not implemented electronic archive management due to limited knowledge of electronic archiving and the absence of a system developed by PT Mitra Rajawali Banjaran. The impact of this issue at PT Mitra Rajawali Banjaran is an inefficient archive management system that requires a significant amount of time for retrieving archives.

Archive

According to(Nyfantoro, 2019), the word "archive" was first used by the Greeks, with the term "Archium" referring to a storage box or "Arkheion" referring to a Town Hall. In ancient Greece, the term "archive" referred to the place or location of document storage. However, over time, the meaning of the word shifted to refer to the documents themselves. In English, the term "archive" is defined as a collection of documents or records. According to Standard Operational (SO) 15489-1 (Records Management Part 1: General), an archive is defined as "documents created, received, and maintained as evidence and information by an entity, organization, or individual, to fulfill legal obligations or business requirements."

In Law Number 43 of 2009 concerning Archiving, archives are defined as records of activities or events that can take various forms and media by the development of information and communication technology, created and received by state institutions, local governments, educational institutions, companies, political organizations, social organizations, and individuals in the implementation of social, national, and state life.

According to (Mustika et al., 2018) archiving plays an important role in both government and private organizations. This role includes serving as a memory center, source of information, and monitoring tool that is crucial in various activities such as planning, development, policy formulation, decision-making, report creation, accountability, assessment, and control. In each of these activities, archives play a significant role. Archives play a crucial role in providing the necessary information for leaders to make decisions and formulate policies. Therefore, to provide complete, fast, and accurate information, it is important to have a good system and working procedures in the field of archiving. With a good archiving system and working procedures, an organization can ensure that the required information is available in its entirety, can be accessed quickly, and has the correct validity. In addition, archiving also serves as a memory center that documents the history and development of an organization, as well as a monitoring tool to ensure transparency and accountability in organizational activities. In this context, every organization needs to give serious attention to records management to ensure efficiency and effectiveness in information management and the fulfillment of organizational needs related to archives.

Archiving System is a document storage system used to facilitate archiving work and enable quick retrieval of stored documents when needed. Records management systems are divided into five systems: alphabetical system, chronological system, numerical system, geographic system, and subject system (Afifah, 2022).

Based on the explanations in the paragraphs above, it can be concluded that archives refer to records of activities or events created, received, and stored by institutions, organizations, or individuals as evidence and information. Archiving also serves as a repository of memories that documents the history and development of an organization, as well as a tool for supervision to ensure transparency and accountability in organizational activities. By paying serious attention to records management, organizations can achieve efficiency and effectiveness in information management and meet the organizational needs related to archives.

Electronic Archives

According to Law number 11 of 2008 concerning Electronic Information and Transactions, electronic information is defined as one or a collection of electronic data, including but not limited to text, sound, images, maps, designs, photos, electronic data interchange (EDI), electronic mail (email), telegrams, telex, facsimiles or similar, letters, signs, numbers, access codes, symbols, or perforations that have been processed and have meaning or can be understood by individuals capable of understanding.

Tini Martini, (2021) explains that electronic archives encompass two main forms, namely electronic files and electronic documents. Electronic archives can be defined as a collection of information recorded and processed using computer technology as electronic documents, which can be viewed and reused. Furthermore, electronic archives also refer to various types of documents created using electronic media, such as computers, and stored in digital file formats. Electronic archives can also include original

documents that have been converted through photography or scanning and then stored in digital file formats. Examples of electronic archives include images, emails, digital documents (text files, data files, databases), and similar types. With electronic archives, information can be processed and stored in digital form, allowing for easier access, continuity, and reliability. This facilitates efficient searching, reuse, and exchange of information. Electronic archives have benefits in improving efficiency and reducing dependence on physical media, as well as enabling more effective storage space. It is important to maintain the security, integrity, and authenticity of electronic archives by implementing security measures such as the use of passwords, encryption, and appropriate access policies. Additionally, having adequate backup and data recovery strategies is crucial to protect electronic archives from the risks of loss or damage.

From the various definitions above, it can be concluded that electronic archives have the same connotation as electronic files and electronic documents. Therefore, electronic archives are synonymous with both electronic archives and electronic documents. The definition of electronic archives is a collection of information stored as electronic documents using computer technology, which can be viewed and reused.

Putra & Nelisa, (2020) outline the benefits of managing electronic archives as follows: (1) Dynamic and static archives can be managed from the early planning or document creation stage. (2) Meeting the demands of top-level management in terms of speed and accuracy. (3) Facilitating accessibility and ensuring accountability. (4) Moving towards a paperless

society and saving physical space or resources (from buildings to servers). (5) Management and supervision become easier, faster, and more accountable towards good governance. (6) Enhancing public service. (7) Electronic archives have benefits such as fast searching. (8) Easy indexing and document modification. (9) Easy file search based on keywords or document names. (10) Minimal risk of file loss. (11) Space-saving. (12) Reducing the risk of document damage. (13) Easy sharing of archives. (14) Enhancing security. (15) Easy data recovery.

Based on the opinions above, it can be concluded that electronic archives have many benefits, including reducing the risk of file loss, fast searching, ease of sharing archives, and a high level of storage security.

Conventional archives refer to physical documents stored in the form of paper, letters, printed photographs, or other physical recordings. Conventional archives require physical storage space and manual management, such as manual indexing and arrangement. Accessing conventional archives can be time-consuming as it requires searching and retrieving documents from their physical locations. However, conventional archives tend to have long-term sustainability as the documents are not dependent on constantly evolving digital technology (Hedstrom & King, 2019).

On the other hand, electronic archives refer to documents stored in digital formats, such as text files, PDF documents, digital images, or electronic databases. Electronic archives enable storage in digital media, such as servers, computers, or electronic document management systems (EDMS). The management of electronic archives can utilize software that allows for automatic indexing, searching, and maintenance. Accessing electronic archives is easier as it can be done online through computer networks or the internet (Muller, 2020).

Microsoft Access

Microsoft Access is a computer relational database application program used for designing, creating, and manipulating various medium-sized data sets to be suitable for use in small to medium-sized enterprises. This application utilizes the Microsoft Jet Database Engine and offers a user-friendly graphical interface, making it easy for users to work with. The latest version is Microsoft Access 2013, which is part of the Microsoft Office 2013 suite (Rerung, 2018). Microsoft Access can work with data stored in Microsoft Access format, the Microsoft Jet database engine, Microsoft SQL Server, Oracle Database, or other database formats that support Open Database Connectivity (ODBC). Users with advanced programming skills can utilize it to develop complex software applications, while less experienced programmers can use Access to develop simpler applications. Access also supports object-oriented programming techniques, although it is not categorized as an object-oriented programming toolkit.

The final data in Microsoft Access is in the form of a database and is ideally combined with programming system files. However, using the application is not recommended for managing network-based information systems. According to (Radiyyah et al., 2022), there are several advantages to using the Microsoft Access application, including the ease of designing programming structures, and allowing data to be derived from calculations. This enables project control and monitoring, as well as processing that

takes into account project data activities, providing an overview of the situation in reports. With Microsoft Access, the design of programming structures becomes simpler and allows for the utilization of calculated data. The application also assists in controlling and monitoring projects and processing project activity data that can be illustrated in reports.

Based on the paragraphs above, it can be concluded that Microsoft Access is a computer-based relational database application used to design, create, and process medium-sized data. This application is suitable for use in medium to small income companies and provides a user-friendly graphical interface. Microsoft Access can work with various database formats, including Microsoft Access, Microsoft Jet Database Engine, Microsoft SQL Server, Oracle Database, and other database formats that support Open Database Connectivity (ODBC). The application allows users with different levels of programming skills to develop both complex and simple software applications. However, using Microsoft Access is not recommended for managing network-based information systems. The advantages of using Microsoft Access include easy design of programming structures, project control and monitoring, and processing project data to provide an overview of the situation through reports.

Based on the problem, PT Mitra Rajawali Banjaran requires an electronic archiving system using Microsoft Access. According to the results of an interview conducted with structured questions in an informal setting with one of the HR executives, on December 20, 2022, at the PT Mitra Rajawali Banjaran office, Microsoft Access was chosen for several factors, one of

which is its effectiveness and ease of use with an intuitive graphical interface. Therefore, with the implementation of this electronic archiving system, it is expected that archive management will not only serve as storage but also include procedures for organizing archive storage. This aims to facilitate future retrieval and enhance the effectiveness and efficiency of employees' performance in completing their tasks. As a result, the title chosen for this thesis is "Design and Development of an Electronic Archiving System Based on Microsoft Access at PT Mitra Rajawali Banjaran.".

METHOD

In this project, the software development is carried out using the waterfall method. According to(Kurniawan et al., 2020) , "Waterfall is a classic sequential pattern in software design." This waterfall method depicts a systematic and sequential approach (step by step) in software development. The phase of gathering user requirements is followed by the planning phase, which includes planning, modeling, construction, systematization, and delivering the system to users, and software support, which is fully produced. The methods used in data collection for this project are literature study, observation, and interviews.

Data Flow Diagram (DFD)

Data Flow Diagram (DFD) is a graphical representation technique used in systems analysis and design to depict the flow of data within a system. It provides a visual illustration of how data moves from one process to another, as well as how it is stored and transformed along the way. DFDs are commonly used to model the

logical structure of a system, allowing analysts to analyze, understand, and communicate the flow of information within a process or system (Alan Dennis, 2018).

In the design of this electronic archiving information system, there are 2 levels of Data Flow Diagram (DFD). The first level is Level 0 DFD, which provides an overall overview of the system, also known as the context diagram. Here is the Level 0 DFD of PT Mitra Rajawali Banjaran's electronic archiving system:
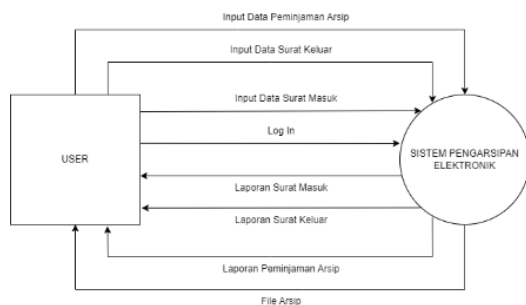

Figure 2. DFD Level 0 Electronic Filing System

Source: 2023 Project Process

From the explanation of Figure 3.3 above, we can see the connection and interaction between the system and external entities. Level 0 DFD provides a general overview of the electronic archiving system. To obtain a more detailed understanding, here is the Level 1 DFD of PT Mitra Rajawali Banjaran's electronic archiving system :
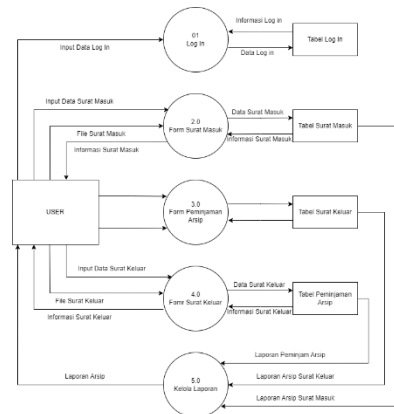
Figure 3: Level 1 DFD of Electronic Archiving System

Source: Project Documentation 2023

Figure 3. above provides a more detailed data flow in the electronic archiving system for incoming and outgoing letters of PT Mitra Rajawali Banjaran. It shows the flow starting from the user to the final reports of incoming letters, outgoing letters, and archive borrowing data.

Entity Ralationship Diagram (ERD)

Entity Relationship Diagram (ERD) is a visual representation used in database design to illustrate the relationships between entities or tables in a database. It depicts the logical structure of a database system and shows how different entities are connected and related to each other through relationships (Silberschatz Abraham et al., 2019).

Entity Relationship Diagram (ERD) It is an abstract and conceptual representation of existing data. The following is the Entity-Relationship Diagram (ERD) in the Design of the Electronic Archiving System of PT Mitra Rajawali Banjaran :
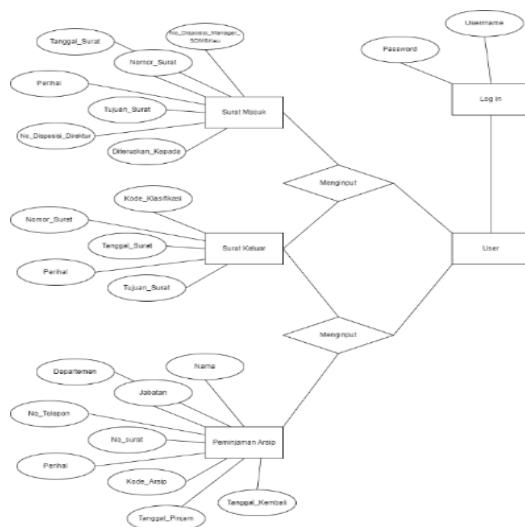
Figure 4 shows the ERD (Entity-Relationship Diagram) of the Electronic Archiving System.

Source: Project Analysis 2023

RESULTS AND DISCUSSION

Login Form

The first step to initiate the electronic archiving system process is to open the Microsoft Access File for Electronic Archiving of PT Mitra Rajawali Banjaran, and the login interface will appear as shown in Figure 1 below :
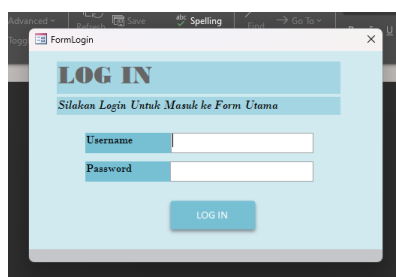

Figure 5: Log In Form

Source: Project Compilation 2023

The Log In Form is the initial part of the electronic filing system interface that has been created. The function of this form is to serve as

the main gateway to access the system. Users need to enter their username and password, which are stored in the database. As shown in above Figure 2, the login form displays a welcome message prompting users to enter their username and password in the provided fields, along with a login button. Upon entering the correct username and password, this button will open the next form.

Main Form

The Main Form is the subsequent part of the login form, accessible after entering the correct username and password. The function of this form is to serve as the main page for entering data related to incoming and outgoing letters, as well as archive borrowing data. The results of the Main Form can be seen in Figure 2 below.":

Figure 6: Main Form

Source: Project Compilation 2023

As seen in the above Figure 3, the Main Form contains the logo of PT Mitra Rajawali Banjaran and several buttons that can open other forms or generate reports. These buttons include the Archive Borrowing Form, Archive Borrowing Report, Incoming Letter Form, Incoming Letter Report, Outgoing Letter Form, and Outgoing Letter Report. With this Main Form layout, users can easily input incoming letter data as well as archive borrowing data.

Incoming Letter Form

The Incoming Letter Form is the next form that appears after clicking the 'Incoming Letter Form' button on the Main Form. This form is used to record incoming letters and can be seen in Figure 7 below :

Figure 7: Incoming Letter Form

Source: Project Compilation 2023

In the Incoming Letter Form, users can input incoming letter data by the required columns, including attaching the letter file. As seen, there are 5 buttons at the bottom of the form. These buttons are useful for users to add, save, and delete letter data. There are also back and next buttons to facilitate users in viewing letter details. The Incoming Letter Form also includes a search feature to help users easily find archives by entering keywords that match the details of the desired letter.

Outgoing Letter Form

Similar to the Incoming Letter Form, the Outgoing Letter Form is the next form that appears after clicking the 'Outgoing Letter Form' button on the Main Form. This form is used to record outgoing letters and can be seen in Figure 8 below:

Figure 8: Outgoing Letter Form

Source: Project Compilation 2023

In the Outgoing Letter Form, users can input outgoing letter data in accordance with the required columns, including attaching the letter file. As seen, there are 5 buttons at the bottom of the form. These buttons are useful for users to add, save, and delete letter data. There are also back and next buttons to facilitate users in viewing letter details. The Outgoing Letter Form also includes a search feature to help users easily find archives by entering keywords that match the details of the desired letter.

Archive Loan Form

Similar to the previous form, the Archive Loan Form is the next form that appears after clicking the 'Archive Loan Form' button on the Main Form. This form is used to record archive loans and can be seen in Figure 9 below:

Figure 9: Archive Loan Form

Source: Project Compilation 2023

In the Archive Loan Form, users can input data for the archive borrower and the borrowed archive, including the required columns and attaching the letter file. As seen, there are 5 buttons at the bottom of the form. These buttons are useful for users to add, save, and delete data.

There are also back and next buttons to facilitate users in viewing data details.

Incoming and Outgoing Letter Report

The last part of the system is the detailed report of incoming and outgoing letters, as well as archive loan data. This report contains data that is not much different from the previously created tables. The function of this report is to summarize the data of incoming and outgoing letters, as well as archive loans, during a specific period of time. As seen in Figure 10 below, it shows an example display of the incoming letter report :

Figure 10: Incoming Letter Report

Source: Project Compilation 2023

As seen in Figure 11 below, it shows an example display of the outgoing letter report.

Figure 11: Outgoing Letter Report

Source: Project Compilation 2023

As seen in Figure 12 below, it shows an example display of the archive borrowing report.

Figure 12: Archive Borrowing Report

Source: Project Compilation 2023

PT. Mitra Rajawali Banjaran (PT.MRB) is one of the subsidiaries of PT. Rajawali Nusantara Indonesia (Persero). PT.MRB is a Medical Equipment Factory that produces condoms, syringes, gloves, and other healthcare products. The HR and General Affairs department of PT Mitra Rajawali Banjaran receives incoming and outgoing documents on a daily basis, both from internal and external sources. These documents serve different functions and need to be properly archived for easy retrieval when needed. According to (Barthos, 2013), archives play an important role in organizational operations as a memory center, a source of information, and a means of monitoring. They are crucial in planning processes, analysis, policy formulation, decision making, reporting, accountability, evaluation, and control.

In this case, the author designed an electronic archiving information system using Microsoft Access to facilitate the recording of incoming and outgoing letters and the retrieval of archives. Microsoft Access is a computer-based relational database application used to design, create, and process various medium-sized data. It is suitable for use in medium to small-income companies. The application utilizes the Microsoft Jet Database Engine and provides an intuitive graphical interface that facilitates user work. The

latest version is Microsoft Access 2013, which is part of the Microsoft Office 2013 system (Rerung, 2018).

Once the project's interface design was established using Data Flow Diagrams (DFD) and Entity Relationship Diagrams (ERD), a trial of the created project was conducted. The trial was carried out by the HR and General Affairs department, specifically the HR executive. On the first day, a socialization session was conducted to explain the system and provide the Electronic Archiving Manual Book. After a period of trial usage, a limited test was conducted to assess the effectiveness of the Microsoft Access-based E-Archive application in retrieving archives at PT Mitra Rajawali Banjaran. This test used incoming and outgoing letter data from January to February 2023 as an example. The total sampling technique was employed, and a total of 116 incoming letter data were included. These data were input into the E-Archive application, and an effectiveness test was conducted using a prerequisite test technique adapted from (Gie, 2009). The effectiveness of archiving was measured based on the level of achievement of archiving objectives, namely the extent to which the application ensures archive accuracy, safety, and speed in providing archives. To determine the effectiveness of archive retrieval in the E-Archive system, an Uncertainty Number test was conducted.

To test the effectiveness of archive retrieval, an HR executive from PT Mitra Rajawali Banjaran was asked to conduct a trial using the search feature in the E-Archive system. During the trial, with 116 archived data from incoming and outgoing letters, 115 out of 116 data were successfully retrieved. One data was not found due to an input error in the data code by the HR executive in the E-Archive system. Thus, the Uncertainty Number can be determined as follows:

$$AK = \frac{1}{116} \times 100\% = 0,8\ \%$$

The inaccuracy rate of the archives is 0.8%, indicating that 0.8% of the evaluated archives have inaccuracies or errors in archive management. The lower the inaccuracy rate of the archives, the higher the level of accuracy and quality in archive management. It can be concluded that the implementation of the Microsoft Access-based E-Arsip application in the HR and General Affairs department of PT Mitra Rajawali Banjaran is quite effective in retrieving archives. An interview was conducted as an evaluation to assess the good and optimal results with one of the HR staff, Ms. Irma Setiawati, on May 13, 2023, at the PT Mitra Rajawali Banjaran office. The interview was conducted in a structured manner but in an informal setting.

Based on the results of the trial interview, it can be concluded that the design of the information system that has been created is quite good and easy to operate. It helps in the process of archiving correspondence and enables faster archiving and document retrieval. Some benefits mentioned include faster archiving process, more organized filing, and easier and quicker document search. However, this system may require adjustments both with users and the format of correspondence or the flow of document storage in the company, which can be updated as needed.

The interview also mentioned a comparison of the time taken to retrieve archives before the implementation of the electronic archiving system (manual) and after the implementation of the electronic archiving system (E-Arsip). Previously, we sometimes had to conduct manual searches where some letters or documents were not stored in the archive room, requiring us to search in other departments or divisions. This often took a day or two. However, with the implementation of this system, the search process can be easily performed and only takes a few seconds. There is also a comparison of record-keeping before and after the implementation of the electronic archiving system. Previously, the HR staff had to manually record and sometimes the filing was not well organized. After the implementation of the electronic archiving system, the archiving process can be done in a more organized, fast, and structured manner.

Therefore, the conclusion drawn from the interview is that the design of the Microsoft Access-based electronic archiving system is in accordance with the needs of the company and the expectations of the HR staff responsible for incoming and outgoing letters. It can assist in recording incoming and outgoing letters and facilitate the retrieval of archives without requiring much time.

CONCLUSION

Conclusion

Based on the results of the project to create a Microsoft Access-based electronic archiving system at PT Mitra Rajawali Banjaran, it can be concluded that the recording of incoming and outgoing letters in the HR and General Affairs Department is still done manually, by writing

them in an agenda book. This manual process slows down the retrieval of archives, which can take around one to two days because sometimes there are letters or documents that are not stored in the HR and General Affairs archive room, requiring a search in other departments or divisions. Therefore, an electronic archiving system was designed and implemented gradually using the Waterfall method, and the project's interface design was created using Data Flow Diagram (DFD) and Entity Relationship Program (ERD). A trial run of the created system will be conducted.

This system is considered satisfactory in meeting the company's needs, including assisting in the process of archiving correspondence, facilitating faster archiving and document retrieval. Prior to the implementation of the electronic archiving system, the retrieval of archives took one to two days because some archives were not stored properly in the archive room, necessitating a search in other departments or divisions. During the trial run of the electronic archiving system using incoming and outgoing letter data, 115 out of 116 archive data were successfully found. One data was not found due to input error. The resulting inaccuracy rate of the archives is 0.8%, indicating that 0.8% of the evaluated archives had inaccuracies or errors in archive management. The lower the inaccuracy rate of the archives, the higher the level of accuracy and quality in archive management.

Recommendations

Based on the conclusions of this final project report, the following recommendations are proposed as input for the future: The company should optimize the electronic archiving system as the company grows and develops, utilizing the

flexibility of Microsoft Access. It is advisable to have dedicated staff who handle document scanning to facilitate archive management using online programs.

REFERENCES

Afifah. (2022). Rancangan Sistem Penyimpanan Arsip Surat Puskesmas Dengan Microsoft Access. Jurnal Pendidikan Administrasi Perkantoran (JPAP), Volume 10, Nomer 3, 257–258.

Alan Dennis, B. H. W. R. M. R. (2018). Systems Analysis and Design. Wiley.

Barthos, B. (2013). Manajemen Kearsipan. PT Bumi Aksara.

Gie, T. L. (2009). Administrasi Perkantoran Modern. Liberty.

Hedstrom, M., & King, A. (2019). Archival practices and the myth of postmodernism. Society of American Archivists.

Kurniawan, H., Apriliah, W., Kurniawan, I., & Firmansyah, D. (2020). Penerapan Metode Waterfall Dalam Perancangan Sistem Informasi Penggajian Pada SMK Bina Karya Karawang. Jurnal Interkom: Jurnal Publikasi Ilmiah Bidang Teknologi Informasi Dan Komunikasi, 14(4), 13–23. https://doi.org/10.35969/interkom.v14i4.5 8

Muller, T. (2020). Digital Preservation Essentials. Facet Publishing.

Mustika, R., Chairunesa, A., Putri, D. D., & Pratama, E. (2018). Pengelolaan arsip di detik Sumatera Selatan. Jurnal Iqra, Volume 12 No.01.

Nyfantoro, F. , A. S. T. , M. A. (2019). Perkembangan Pengelolaan Arsip Elektronik di Indonesia: Tinjauan Pustaka Sistemati. Diplomatika : Jurnal Kearsipan Terapan, VOL. 3, NO. 1,1-15.

Putra, W. I., & Nelisa, M. (2020). Pengelolaan Arsip Elektronik Di Unit Kearsipan PT Semen Padang. Jurnal Ilmu Informasi Perpustakaan Dan Kearsipan, VOl. 8, No 2.

Radiyyah, A. F., Lubis, M. P., Pasaribu, Y. O., & Nazara, B. S. (2022). Pengenalan Serta Penggunaan Microsoft Eccess pada Perusahaan. Jurnal Ilmu Komputer, Ekonomi Dan Manajemen (JIKEM), Vol. 2 No. 2.

Rerung, R. R. (2018). Data base dengan aplikasi Microsoft Access. Perkumpulan Karir Dosen Indonesia.

Silberschatz Abraham, Korth Henry F., & S. Sudarshan. (2019). Database System Concepts. McGraw-Hill Education.

Tini Martini, S. Pd. , M. M. (2021). Pengelolaan Arsip elektronik. Jurnal Komputer Bisnis, VOL 14 NO 1.

Undang-Undang Nomor 11 Tahun 2008. (n.d.). Informasi Transaksi Informasi Elektronik.

Undang-undang Nomor 43 Tahun 2009. (n.d.). Kearsipan.