EFFECTIVENESS OF CLOUD COMPUTING-BASED ELECTRONIC ARCHIVES

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ABSTRACT

The following research was conducted at PT XYZ. The problem in this research is the effectiveness of document management. In this research, two variables were examined, namely the Implementation of Cloud Computing-based Electronic Archives as variable X and the effectiveness of document management as variable Y. The purpose of this research is to determine the effectiveness of the implementation of cloud computing-based electronic archives and to determine the effect of the implementation of cloud computing-based electronic archives on the effectiveness of document management. The method used in this research is an explanatory survey, with data collection through questionnaires distributed to 30 employees of the Revenue Assurance and Billing Collection units. In this research, a simple regression data analysis technique was used. Based on the analysis of the research results, the results obtained were: (1) the description of the implementation of cloud computing-based electronic archives is in the "Very High" category. (2) the description of the effectiveness of document management is in the "effective" category. The results of the hypothesis test of the implementation of electronic archives have a positive and significant effect on the effectiveness of document management. This shows that the more optimal the implementation of electronic archives, the more effective the organization's document management will be.

Keyword: Electronic Archives, Cloud Computing, Effectiveness, Document Management.

INTRODUCTION

The rapid development of information and communication technology (ICT) has significantly transformed archive management, influencing how organizations manage and store electronic documents (Desi Pratiwi in Muhidin, et al., 2016). In accordance with Law No. 43 of 2009, archives are records produced by institutions or individuals in various forms and media as part of official activities, emphasizing their importance as authentic and valid information sources. Archive management includes planning, storing, maintaining, converting dynamic archives into static ones, and document destruction (Sugiarto & Wahyono in Alfianto, et al., 2023). Archiving supports organizational operations by ensuring proper recording and storage of important documents (Soesilo, 2018). However, organizations often face challenges such as difficulties in accessing and organizing archives and limited understanding of electronic systems, which hinder collaboration and efficiency (Rolan, 2015). Archive effectiveness depends on human resources, funding, facilities, and standard operating procedures (Sattar, 2020), making technology-based solutions essential. Electronic archiving is considered a strategic approach to improve service quality (Sugiarto & Wahyono, 2014). Effectiveness can be assessed through seven indicators: objective clarity, strategy, policies, planning, programs, facilities, and monitoring systems (Aprilia, Yusuf, & Arif, 2020). This study examines PT XYZ's Revenue Assurance and Billing Collection Units, where limitations in archiving expertise remain a challenge (Putri, 2022). Although electronic archives exist, continuous system updates are needed to address technological change, data security, and operational demands (Sutirman in Salsabila & Syarif, 2022)

Table 1. Effectiveness of Document Management in the Revenue Assurance and Billing Collection Unit: Current Conditions Compared to Ideal Conditions in the Use of Cloud Computing as a Company Electronic Archive

No	Aspect Management Management	Current Effectiveness Document Management Using The Cloud Now	Condition Ideal Effectiveness Of Document Management Using The Cloud
1.	Time in finding documents	Searches take a long time due to the lack of standardization of electronic archiving in archiving	Less than 3 seconds if document standardization has been implemented
2	Difficulty accessing documents	Depends on internet conditions	Stable and Fast
3	Number of lost or misplaced documents	There are still duplicate documents, causing storage space to fill up quickly and	There are no duplicate documents in storage and

		archive maintenance to be is not yet optimal	documents that are available in good condition
4	Collaboration between teams management documents	is good	is good
5	Expenses incurred for *maintenance*/maintenance of archives	A considerable amount of money is spent for maintenance	Less expenses incurred for maintenance

Source: Results of Interviews and Observations at the Revenue Assurance and Billing Collection Unit

The analysis presented in Table 1 indicates that the implementation of cloud computing at PT XYZ has achieved a relatively effective level, although further improvements are still required to reach optimal conditions. The system is expected to enhance efficiency, maintain operational stability, and accelerate document management processes while reducing dependence on internet connectivity. In addition, cloud computing provides flexible storage capacity, enabling companies to reduce costs associated with additional hardware. Security is also improved through features such as automatic data backup, duplicate detection, and strict access control, while accessibility from various locations supports greater flexibility and collaboration among teams. Pratiwi (2017) highlights that maintenance is a critical component of electronic archive management, including data protection, structured systems, and adequate supporting tools. When storage is conducted regularly and capacity remains sufficient, cloud computing can serve as a sustainable long-term solution, as seen in the Revenue Assurance and Billing Collection Unit of PT XYZ. Observational data shows notable growth in uploaded documents, with the Revenue Assurance Unit increasing from 2,401 documents in 2023 to 2,724 in 2024, and supporting documents such as BAPLA and BAST rising from 3,117 to 3,465 (Revenue Assurance Unit Data Recap, 2024). Similarly, in the Billing and Collection Unit, invoices and billing documents increased from 234 to 261, while invoice receipts rose from 212 to 237 within one month (July 2024). Findings also demonstrate faster document retrieval—less than 3 seconds—along with reduced duplication and maintenance costs (Observation & Interview Results, 2024). This study evaluates how cloud-based electronic archives influence document management effectiveness based on Gibson's indicators (in Aprilia, Yusuf, & Arif, 2020), including clarity of objectives, strategy, planning, and supervision, while supporting accessibility, flexibility, and security (Luthfiarta, 2021; Aprilia, et al., 2020). Accordingly, this research analyzes the impact of cloud implementation on document management effectiveness at PT XYZ, focusing on system implementation, effectiveness levels, and its influence on organizational performance..

METHOD

In this study, the method used is a quantitative approach to describe the research object with the data collected. With this approach, researchers can measure the extent of electronic archiving implementation and document management effectiveness. The quantitative approach is based on the objective of researching a specific population or sample using research instruments, where the data obtained is analyzed statistically to test hypotheses.

The method applied in this study is an explanatory survey, which is a method used to obtain facts and information that correspond to the actual conditions in the field. According to Silalahi (2015), the explanatory survey method aims to understand the extent of the cause-and-effect relationship between variables in a population without conducting experiments. In this case, the researcher used an interval scale questionnaire to obtain an overview of two main variables, namely the Application of Electronic Archives (X) and the Effectiveness of Document Management (Y).

RESULTS AND DISCUSSION

Respondent Criteria

Based on the criteria of the respondents, 16 respondents were female, and 14 respondents were male. The respondent units were in accordance with what was intended. As shown in Table 1, the diversity of respondents based on their length of service shows that there were 4 respondents with less than 1 year to 1 year of service, 5 respondents with 2 to 5 years of service, and 21 respondents with more than 5 years to more than 6 years of service.

Table 2 Respondent Criteria

GENDER		UNIT			WORK EXPERIENCE		
Female	Male	Revenue Assurance	Billing	Collection	< 1 – 1 Year	2 – 5 Years	5 - > 6 Years
16	14	16	7	7	4	5	21

Validity Test

Validity testing is a process that provides an overview of the level of instruments in the research to be measured (Arikunto, 2016). Questionnaire responses will be considered valid if the questionnaire statements are in accordance with what is to be measured. In this study, 30 respondents were used for instrument testing so that the value of the correlation coefficient table was at a degree of freedom (df) of n-2. N, so that db = 30-2 = 28 and a. = 5%, and the result obtained in the correlation coefficient table is 0.361. This shows that the two variables are valid because the result is greater than 0.361.

Reliability Test

A reliable instrument means that the instrument is good and accurate for collecting research data, so that it can reveal data whose results can be trusted (Muhidin and Abdurrahman, 2017). The reliability test is determined by comparing the results from the *Cronbach's Alpha* column with *N of Items*.

Table 3 Reliability Test Results of Variables X and Y

No	Variabel	Number of questions	*Cronbach's Alpha*	Information
1	Implementation of electroniv archiving	14	0.846	*Reliable*
2	Effectiveness of dokcument management	18	0.849	*Reliable*

Descriptive Data Analysis Results

Based on the respondents' answers, the description can be seen in the table and used to answer the questions formulated in the problem statement.

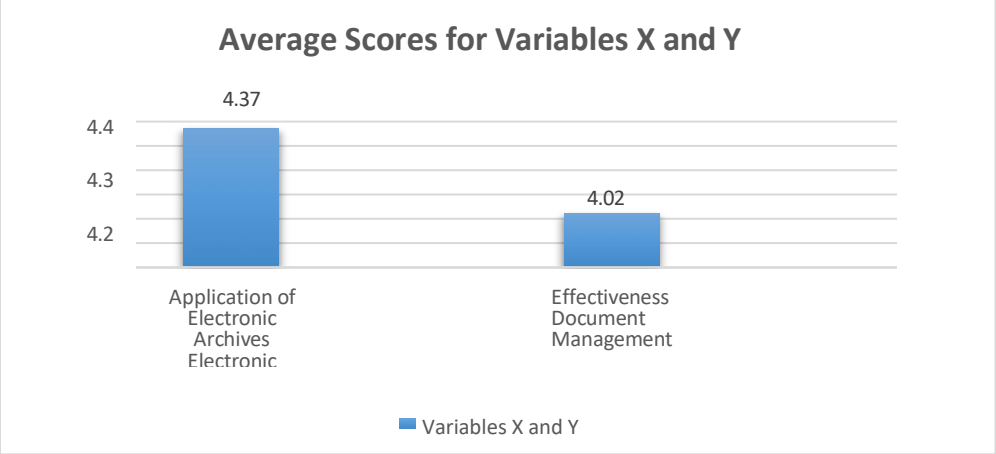

Figure 1 Average Scores for Variables X and Y

Based on Figure 1, the implementation of electronic archives has a score of 4.37, which means that the implementation of electronic archives (X) is rated "Very High", while the effectiveness of document management (Y) has an average score of 4.02, which can be interpreted as "effective".

Based on the results of the normality test, the significant value in the normality test table is

0.124. Based on the results obtained from the statistical calculations that have been carried out, it shows that 0.124 is greater than 0.05. Therefore, it can be stated that the variable of electronic file implementation on the effectiveness of document management is normally distributed.

From the results of the linearity data test, the significance value is 0.120. This shows that the value of 0.120 is greater than 0.05. Therefore, the data variation between the variables of electronic file implementation and document management effectiveness can be declared homogeneous.

Based on the results of the homogeneity data test that has been carried out, the significance value of the deviation from linearity is 0.487. This shows that the value 0.487 is greater than 0.05. These results indicate that there is a linear relationship between the implementation of electronic archives (X) and the effectiveness of document management (Y).

Inferential Data Analysis Result

The results of the inferential data analysis come from hypothesis testing using parametric statistical tests with the use of SPSS version 27 software. The purpose of this test is to determine the significant effect on the variables of electronic archive implementation and document management effectiveness.

Table 4 t-test result

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	19,316	7,186		2,688	.012
	Implementation of Electronic Archives	.875	.116	.817	7,507	.000
a. Dependent Variable: Effectiveness of Document Management						

Based on the calculation results shown in Table 6, a significance value of 0.000 was obtained, which is smaller than the significance level of 0.05. This indicates that there is a significant effect between the implementation of electronic archives and the effectiveness of document management. The t-test on the electronic archive implementation variable produced a value of

7.507. This value is compared with the t-table based on df = (N–2) = (30–2) = 28, which produces at- tablevalue of 2.048. Because 7.507 > 2.048, H(0)is rejected and H(1)is accepted. Thus, it can be concluded that the implementation of electronic archives has a significant effect on the effectiveness of document management.

The results of a simple regression analysis between the variables of electronic archiving implementation (X) and document management effectiveness (Y) using SPSS version 27 software are shown as follows. Based on the SPSS output in Table 6, the constant value (a) is 19.316 and the regression coefficient (b) for the electronic archiving implementation variable is 0.875, resulting in the regression equation: $\hat{Y} = 19.316 + 0.875X$

This equation shows that the regression coefficient is positive, meaning that every increase or decrease in variable X (implementation of electronic archives) will be followed by a corresponding change in variable Y (effectiveness of document management). Based on these results, it can be concluded that the hypothesis is accepted, namely that there is an influence between the implementation of electronic archives and the effectiveness of document management.

Table 5 Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R-Square	Standard Error of the Estimate
1	.817[a]	.668	.656	4.748
a. Predictors: (Constant), Implementation of Electronic Archives				

From the calculations performed in Table 7, the correlation coefficient (r) value obtained was 0.817. Based on the interpretation criteria according to Muhidin and Abdurrahman (2017), this indicates that the relationship between variables X and Y is strong. This is because the correlation coefficient (r) of 0.817 is in the range of 0.70–0.90, which means that the relationship is strong. Therefore, it can be concluded that the relationship between the implementation of electronic archives and the effectiveness of document management is strong.

As can be seen in Table 6, the coefficient of determination (Rsquare/r2) obtained was 0.668. These results illustrate the extent to which variability in document management effectiveness can be explained by the implementation of electronic archives. This value ranges from 0 to 1. The closer it is to 1, the greater the ability of the independent variable of electronic archiving implementation (X) to explain the variation in the dependent variable of document management effectiveness (Y). The value of the coefficient of determination is 0.668, or 66.8% when converted to a percentage. It can be concluded that the contribution of electronic archiving to document management effectiveness is 66.8%, while 33.2% is influenced by other factors not examined in this study. This is supported by research conducted by Abdillah (2015) entitled Testing the Usability of Digital Archive Management Using Cloud Computing at PT. XYZ, which explains that the use of cloud computing-based electronic archives can provide convenience and more optimal information delivery. Archive documents also require special treatment and more practical costs to improve the effectiveness of document management. Handayani et al. (2020) stated that the implementation of integrated electronic archives strengthens accountability and accelerates business processes, especially in sectors with large data volumes. This is in line with Sudarma & Sari (2021), who emphasized that cloud technology in archiving improves information efficiency and administrative performance.

CONCLUSION

The conclusions that can be drawn from this study are as follows:

1. The implementation of cloud computing-based electronic archives at PT XYZ is in the very high category.
2. The effectiveness of document management at PT XYZ is in the effective category
3. The positive impact of implementing cloud-based electronic archives on the effectiveness of document management

As an implication of this study, companies can evaluate and optimize document management. Companies can design more effective archiving policies and strengthen their information technology infrastructure and provide regular assistance and training for human resources for sustainable archive management. Researchers who wish to

conduct further research on the implementation of electronic archives and the effectiveness of document management can reach a wider range of topics and respondents.

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