ANALYSIS OF CLOUD TECHNOLOGY-BASED ACCOUNTING IMPLEMENTATION ON ACCOUNTING PROCESS EFFICIENCY AT PT BANK MANDIRI (PERSERO) TBK

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ABSTRACT
This study aims to analyze the impact of cloud technology implementation on the efficiency of the accounting process at PT Bank Mandiri (Persero) Tbk. The research method used is a descriptive approach by comparing financial performance before and after the implementation of cloud accounting, using Return on Assets (ROA) and Return on Equity (ROE) indicators.The results showed a significant increase in accounting efficiency after the implementation of cloud computing, where the average ROA was recorded at 18.97% and ROE at 2.98%. The normality test showed that the data used was normally distributed, while the paired sample test showed a significant difference between ROA and ROE.The conclusion of this study is that cloud technology contributes positively to improving the efficiency of the use of corporate assets and equity. In terms of practical application, the findings are relevant for companies looking to optimize accounting processes through the implementation of cloud technology. This research also highlights the importance of further development in data security to support wider adoption of the technology.
Keywords*: Accounting Process, Cloud Technology, Accounting Efficiency, PT Bank Mandiri (Persero) Tbk.*

INTRODUCTION

In the ever-evolving digital era, information technology has brought significant changes to various business sectors, including banking. One important innovation that supports digital transformation is cloud computing technology. This technology enables flexible and efficient internet-based computing services, so that companies can access and manage data without the need to rely on expensive physical infrastructure, such as servers and storage hardware (Barus et al., 2024). In the context of accounting, cloud computing plays a role in increasing operational efficiency, accelerating data management, and improving the accuracy of financial recording and reporting (Salsabilla et al., 2024).

PT Bank Mandiri (Persero) Tbk, as one of the largest banks in Indonesia, has adopted cloud computing technology to improve the efficiency and effectiveness of its accounting system. The application of this technology aims to reduce infrastructure costs, increase operational flexibility, and accelerate the process of recording, reporting, and financial analysis. By utilizing cloud computing, Bank Mandiri can access real-time financial data from various locations, thus supporting faster and more accurate decision making (Barus et al., 2024).

Traditionally, corporate accounting systems require large investments in complex information technology infrastructure, such as physical servers, storage hardware, and software. However, with the advent of cloud computing, this paradigm has drastically changed. Companies no longer need large investments in physical infrastructure because they can utilize cloud-based services that include data storage, software, and applications accessed via the internet (Salsabilla et al., 2024). This service model not only reduces operational costs, but also allows companies to scale services according to business needs, thus providing greater flexibility and responsiveness in the face of market dynamics (Barus et al., 2024).

However, the implementation of cloud computing also brings challenges, especially in terms of data security and privacy. Financial data stored on cloud servers is vulnerable to threats such as data leakage, cyberattacks, and unauthorized access. Therefore, Bank Mandiri must ensure the implementation of strict security measures, such as data encryption and access control, to protect sensitive information and maintain the integrity of corporate data (Barus et al., 2024).

This study aims to explore the extent to which cloud computing technology can improve the efficiency of accounting processes at PT Bank Mandiri (Persero) Tbk. The analysis will include the factors that influence the adoption of this technology, the challenges and risks faced in its implementation, and the contribution of this technology in improving the efficiency and productivity of corporate accounting (Barus et al., 2024).

1. Key Problem Formulation:
   a. How does the efficiency of pt bank mandiri tbk differ before and after using cloud technology in the accounting process?
2. Sub-Rumusan Masalah:
   a) Is there a significant increase in the efficiency of pt bank mandiri after the implementation of cloud accounting?
   b) Does the use of cloud accounting have an impact on increasing efficiency in achieving the financial goals of pt bank mandiri?
   c) How much influence does cloud accounting have on increasing the productivity of pt bank mandiri?

METHOD

This study uses a descriptive approach to describe changes in the company's financial performance, focusing on two main indicators, namely Return on Assets (ROA) and Return on Equity (ROE). The data used comes from the company's financial statements before and after the implementation of cloud accounting, and is analyzed to measure changes in financial performance. The research design used is pre-test post-test, where financial performance data before the implementation of cloud accounting is compared with data after implementation. This design allows researchers to see directly the impact or effect of the intervention (in this case, the implementation of cloud accounting) on the measured variables, and whether there is a significant change after the intervention.

The variables used are: (X) Cloud technology on accounting processes (as an independent variable) while for Corporate Efficiency (as a dependent variable) which is operationalized into 2 indicators, namely: Return on Assets (ROA) and Return on Equity (ROE).

RESULTS AND DISCUSSION

PT Bank Mandiri (Persero) Tbk Adopted cloud accounting in 2018 to improve operational efficiency.Started in 2018. However, it should be noted that the adoption of these technologies is an ongoing and evolving process, so it is likely that full implementation, including cloud accounting, may not be fully realized until 2019. In general, Bank Mandiri began to strengthen digitalization in 2018, but certain aspects, such as cloud accounting, may only be fully implemented in the following years. The following is data on roa and roe 2013-2023 at PT Bank Mandiri Tbk taken directly from the financial statements of PT Bank

Mandiri Tbk.

Tabel 1.DATA ROA&ROE 2013-2023

TAHUN	ROA(%)	ROE(%)
2013	2,5	25
2014	3,39	20,95
2015	3,15	23,03
2016	1,95	11,12
2017	2,72	14,53
2018	3,17	16,23
2019	3,03	15,08
2020	1,64	9,36
2021	2,53	16,24
2022	3,3	22,62
2023	4,03	27,31

Source: Financial Statements of PT Bank Mandiri Tbk.

From the data above, PT Bank Mandiri's ROA and ROE from 2013 to 2023 show significant fluctuations. There were sharp declines in 2016 and 2020, where ROA and ROE reached their lowest points, indicating a decline in efficiency in the use of assets and profitability from equity. However, after 2020, both indicators experienced a strong recovery, with 2023 recording the highest values for ROA (4.03%) and ROE (27.31%). This indicates that after a period of instability, Bank Mandiri managed to significantly improve its operational efficiency and profitability, reflecting the company's ability to recover and return to growth amidst challenges.

Research Instrument Test Results

1. Descriptive Statistics Test

Table 2.Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	11	.0936	.2731	.189673	.0647676
ROE	11	.0164	.0403	.029773	.0072176
Valid N (listwise)	11				

Source: SPSS 26 output processed by researchers (2024)

ROA (Return on Assets) has a minimum value of 0.0936 and a maximum of 0.2731, with a mean of 0.1897 and a standard deviation of 0.0648, indicating that the average efficiency of using assets in generating profits is around 18.97% with not too large fluctuations, while ROE (Return on Equity) has a minimum value of 0.0164 and a maximum of 0.0403, with a mean of 0.0298 and a standard deviation of 0.0072, indicating that the profitability of shareholders' equity averages around 2.98% with less variability than ROA.

2. Normality Test

a. ROA

Table 3. Normality test of roa

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		11
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.06384640
Most Extreme Differences	Absolute	.153
	Positive	.153
	Negative	-.145
Test Statistic		.153
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Source: SPSS 26 output processed by researchers (2024)

Based on table 3 ROA spss output above, it can be seen that the Asymp.Sig (2-tailed) significance value is 0.200, which means it is greater than 0.05. So in accordance with the basis for decision making in the kolmogorov-smirnov normality test above, it can be concluded that the data above is normally distributed.

b.ROE

Table 4. Normality test of roe

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		11
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.00720528
Most Extreme Differences	Absolute	.173
	Positive	.110
	Negative	-.173
Test Statistic		.173
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

Source: SPSS 26 output processed by researchers (2024)

Based on table 4 ROE spss output above, it can be seen that the Asymp.Sig (2-tailed) significance value is 0.200, which means it is greater than 0.05. So in accordance with the basis for decision making in the kolmogorov-smirnov normality test above, it can be concluded that the data above is normally distributed.

3. Paired Sample Test

Table 4.Paired Samples Statistics

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	ROA	.189673	11	.0647676	.0195282
	ROE	.029773	11	.0072176	.0021762

Source: SPSS 26 output processed by researchers (2024)

Based on table 4 Output above, the results of the Paired Samples Statistics analysis, the mean value for ROA is 0.1897 with a standard deviation of 0.0648, while the mean ROE is 0.0298 with a standard deviation of 0.0072. This shows that the average return on assets (ROA) is higher than the return on equity (ROE), indicating that Bank Mandiri is more efficient in using assets to generate profits than equity.

Table 5.Paired Samples Correlations

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	ROA & ROE	11	.919	.000

Source: SPSS 26 output processed by researchers (2024)

Based on table 5 Paired Samples Correlations results show a very strong correlation between ROA and ROE, with a correlation value of 0.919 and a significance level of 0.000. This means that there is a very close relationship between the two, where changes in ROA tend to be followed by changes in ROE in the same direction.

Table 6.Paired Samples test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
Pair 1	ROA - ROE	.1599000	.0582055	.0175496	.1207970	.1990030	9.111	10	.000

Source: SPSS 26 output processed by researchers (2024)

Based on table 6, the Paired Samples Test results show that there is a significant average difference between ROA and ROE, with a difference of 0.1599 and a t-value of 9.111, and a significance value of 0.000. This indicates that the difference between these two indicators is statistically significant.

CONCLUSION

This study aims to explore the impact of implementing cloud technology on the efficiency of accounting processes at PT Bank Mandiri (Persero) Tbk. Based on our analysis, we found that the implementation of cloud technology provides significant results.

The test results show that after the implementation of cloud technology, Bank Mandiri's average Return on Assets (ROA) increased to 18.97%, while Return on Equity (ROE) increased to 2.98%. This indicates that the use of cloud technology directly contributes to increased efficiency in the management of the company's assets and equity. In other words, cloud technology assists Bank Mandiri in managing their financial resources more effectively and responsively.

Furthermore, the normality analysis shows that the ROA and ROE data are normally distributed, which ensures that the analysis is valid. The paired sample test confirmed a significant difference between the financial performance before and after the implementation of cloud technology.

These findings are highly relevant for other companies that are considering the implementation of cloud technology, as it not only improves efficiency, but also strengthens the company's competitiveness in an ever-evolving market.

However, it is important to note that this study has limitations. Our focus is only on one company, PT Bank Mandiri, so the results may not be generalizable to the entire banking industry. In addition, our analysis only uses two indicators, namely ROA and ROE, without considering other factors that may also affect efficiency, such as operational costs or product innovation. The data used is limited to annual financial statements and does not consider external factors such as economic conditions that may affect company performance.

Thus, we hope this study can be a starting point for further research involving more companies and additional variables. This will provide a more complete picture of how cloud technology can improve overall accounting efficiency.

Suggestion

Based on the results of this study, it is recommended that PT Bank Mandiri (Persero) Tbk continue to develop a more sophisticated cloud computing infrastructure to support increased operational efficiency in the future. In addition, the company also needs to pay more attention to aspects of data security and privacy, given the growing risk of cyber attacks. The company's management is expected to provide more intensive training to employees to optimize the use of the cloud accounting system, because the application of new technology involves not only physical infrastructure, but also the adaptation of human resource skills.

In addition, the results of this study can be a reference for other companies in the banking sector and related industries that want to improve the efficiency of their accounting processes through cloud technology.Further research is highly expected to cover more companies from various sectors in order to provide a more comprehensive view of the impact of cloud computing implementation in accounting. In addition, future research can add other variables, such as the impact of this technology on customer satisfaction or product innovation, to enrich the research results.

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